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DRUGS AND DRIVING: A SELECTED BIBLIOGRAPHY
SUPPLEMENT TWO

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16. Abstract

This report presents a bibliography of literature dealing primarily with the relationship of drug use (other than alcohol alone) and highway safety. This volume is the third of a series of annotated bibliographies designed to provide ready access to archival, technical, and popular publications. This supplement updates previous bibliographic reports and continues coverage of research areas that support the development and application of methods to study the drug and driving problem. This report provides a detailed description of the scope and method of the literature search and review effort that resulted in this compilation.

The bibliography consists of four appendices, including a Topical Index, an Author Index, a Title Index, and an Abstract Index, which contains approximately six hundred abstracts of the selected publications. A revised topical index provides access to abstracts according to type of publication, area of drug and driving research, methods applied in research on drugs and highway safety, drugs and classes of drugs. Within the topical index, drugs are cross-indexed by generic and trade names. A drug classification scheme is provided.

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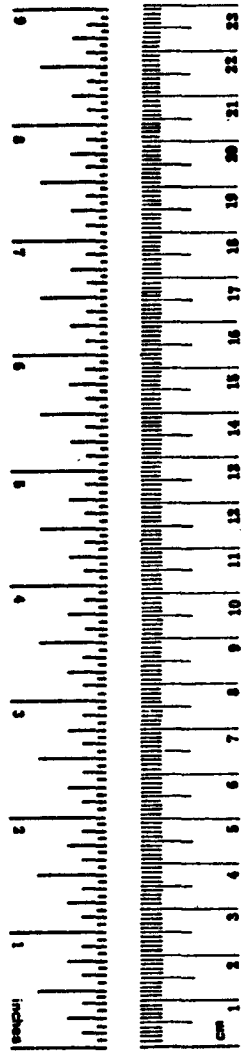
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
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m^3	cubic meters	1.3	cubic yards	yd^3
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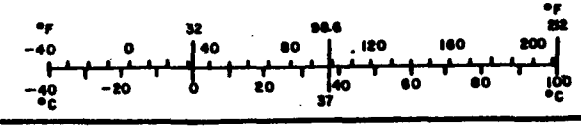

ACKNOWLEDGEMENT

This report results from efforts by many persons. It continues a series of bibliographic reports devoted to literature pertaining to drugs and highway safety.

The basic design of these reports was developed by Kent B. Joscelyn, J.D., and Roger P. Maickel, Ph.D. Volumes supplementing the parent bibliography both update the collection of literature abstracts and expand the scope of specific topics covered. Mr. Joscelyn guided the present study effort and the production of this report.

The introductory report contained in this bibliographic supplement was prepared by Alan C. Donelson, Ph.D., who also supervised the literature search, document collection, review, abstracting, and indexing described in this report. Dr. Donelson also extensively revised the topical index contained in this volume, in particular, the indexing and classifying of drugs.

Other staff members of the Policy Analysis Division were instrumental in preparing and producing this volume.

Mary B. Veldkamp, B.A., A.M.L.S., a medical librarian specialist, conducted manual and computer-assisted searches of the literature and collected documents for review. She also prepared, edited, and indexed the abstracts contained in this bibliography. Without her dedicated efforts and her ability to sift through and collate literature relevant to drugs and highway safety, this report would never have been.

Lawrence D. Segel, B.A., developed the programs that created the computer-based bibliographic files that allowed production of this report. Without his contribution, the processing and presenting of the vast amounts of collected material would have been impossible. He used proprietary programs available through the Michigan Terminal System at The University of Michigan, including TEXTEDIT, developed by Daniel J. Fox, Manager of Systems and Programming and Assistant Director of the Statistical Research Laboratory. These programs, when fully applied, offer an opportunity to access bibliographic files and to conduct searches for topics of special interest. The literature base now includes the material contained in all volumes of this series.

Jerry S. Vidis, B.S. (Pharmacy), M.S., greatly assisted in several areas of effort. He participated in the design and development of drug indices, identifying alternative drug names and classifying substances mentioned in the literature. Mr. Vidis also made a key contribution in the final production of the report. He coordinated the application of the TEXTEDIT program and the computerized typesetting capability of the Wayne State University Computer Center. The format of the camera-ready copy was produced by computer and then printed on a Xerox 9700 page printer.

Other HSRI personnel also made important contributions. Anne L. VanDerworp served as Word Processing Supervisor/Editor. Doris L. Dunger of the Word Processing staff entered drafts of report text into computer files. The clerical staff of the Policy Analysis Division under the supervision of Janet C. Peters also assisted in the production of this report.

We thank all who contributed.

Kent B. Joscelyn
Principal Investigator

Alan C. Donelson
Principal Investigator

PREFACE

This report presents an annotated bibliography of literature dealing primarily with the relationship between drug use (other than alcohol alone) and highway safety. This report was prepared by the Policy Analysis Division of The University of Michigan Highway Safety Research Institute (HSRI) for the National Highway Traffic Safety Administration as part of a larger research program on drugs and driving. A reader interested in the subject area will find other reports produced under the research program of value.

This report was prepared under contract number DOT-HS-7-01530, entitled "Drug Research Methodology." Under this same contract, a series of workshops on methodological issues in research on drugs and highways safety was conducted. The workshops addressed discrete--but interrelated--topics. The workshop reports are:

- Drug Research Methodology. Volume One. The Alcohol-Highway Safety Experience and Its Applicability to Other Drugs.
- Drug Research Methodology. Volume Two. The Identification of Drugs of Interest in Highway Safety.
- Drug Research Methodology. Volume Three. The Detection and Quantitation of Drugs of Interest in Body Fluids from Drivers.
- Drug Research Methodology. Volume Four. Epidemiology in Drugs and Highway Safety: The Study of Drug Use Among Drivers and Its Role in Traffic Crashes.
- Drug Research Methodology. Volume Five. Experimentation in Drugs and Highway Safety: The Study of Drug Effects on Skills Related to Driving.

Other reports prepared under the HSRI project include the previous volume in this series of bibliographic volumes:

- Joscelyn, K.B., and Donelson, A.C. 1979. Drugs and Driving: A Selected Bibliography. Supplement One. National Highway Traffic Safety Administration technical report DOT-HS-803-879;

as well as a comprehensive review of past, ongoing, and planned efforts related to the study of and the response to the drug and driving problem:

- Joscelyn, K.B.; Donelson, A.C.; Jones, R.K.; McNair, J.W.; and Ruschmann, P.A. 1980. Drugs and Highway Safety 1980. National Highway Traffic Safety Administration contract no. DOT-HS-7-01530.

The latter report supported the preparation of a report to Congress by the U.S. Department of Transportation as requested in Section 212 of Title II of the Surface Transportation Act of 1978 (the Highway Safety Act of 1978). This section required the Secretary of Transportation to report to Congress concerning efforts to detect and prevent marijuana and other drug use by motor vehicle operators:

- U.S. Department of Transportation. 1980. Marijuana, Other Drugs and Their Relation to Highway Safety. A Report to Congress. National Highway Traffic Safety Administration report no. DOT-HS-805-229.

The reports cited above developed from and extended similar work done under earlier contracts from NHTSA:

- Joscelyn, K.B., and Maickel, R.P. 1977. Drugs and Driving: A Research Review. National Highway Traffic Safety Administration technical report DOT-HS-802-189.
- Joscelyn, K.B., and Maickel, R.P. 1977. Drugs and Driving: A Selected Bibliography. National Highway Traffic Safety Administration technical report DOT-HS-802-188.
- Joscelyn, K.B., and Maickel, R.P. eds. 1977. Report On An International Symposium on Drugs and Driving. National Highway Traffic Safety Administration technical report DOT-HS-802-187.
- Joscelyn, K.B.; Jones, R.K.; Maickel, R.P.; and Donelson, A.C. 1979. Drugs and Driving: Information Needs and Research Requirements. National Highway Traffic Safety Administration technical report DOT-HS-804-774.
- Jones, R.K., and Joscelyn, K.B. 1979. Alcohol and Highway Safety 1978: A Review of the State of Knowledge. National Highway Traffic Safety Administration technical report DOT-HS-803-714.
- Jones, R.K., and Joscelyn, K.B. 1979. Alcohol and Highway Safety 1978: A Review of the State of Knowledge. Summary Volume. National Highway Traffic Safety Administration technical report DOT-HS-803-764.
- Jones, R.K.; Joscelyn, K.B.; and McNair, J.W. 1979. Designing A Health/Legal System: A Manual. The University of Michigan Highway Safety Research Institute report no. UM-HSRI-79-55.

These reports provide entry points to the literature on alcohol, other drugs, and highway safety for readers desiring general reviews as well as information on specific topic areas. In addition, the reports can serve as sources for identifying both U.S. and foreign literature pertinent to each reader's needs.

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1.0 INTRODUCTION

This report presents an annotated bibliography of literature pertaining to drugs and highway safety. This volume is the third of a series of bibliographic reports, prepared for the U.S. Department of Transportation National Highway Traffic Safety Administration (NHTSA) and produced under contract DOT-HS-7-01530, entitled "Drug Research Methodology."

The report is intended as a resource document. Its purpose is to aid current efforts in determining the relationship of drugs and highway safety. The primary objective is the presentation of literature, not the analysis of research. The contents of the report are representative, but not inclusive, of the available literature. No claim of scientific validity of all the materials included is made.

1.1 Background

The extent to which the use of drugs by drivers contributes to highway safety problems is unknown (Joscelyn and Maickel 1977a; Willette 1977; Organisation for Economic Co-operation and Development 1978; Seppala, Linnoila, and Mattila 1979; Joscelyn, Jones, Maickel and Donelson 1979). Research has not established that any drug besides alcohol increases the probability of a traffic crash and associated losses. (The term "alcohol" is used here and throughout this report to mean ethyl alcohol, or ethanol.) Although present knowledge about drugs and driving is limited, available evidence indicates that drugs alone or in combination with alcohol or other drugs can impair driving skills and may increase the likelihood of traffic crashes. Further inquiry in this area is warranted. Among the factors that limit the state of knowledge are problems and issues in major areas of drug and driving research.

In November 1976, The University of Michigan Highway Safety Research Institute (HSRI) received a contract entitled "Drug Research Methodology" from the National Highway Traffic Safety Administration (NHTSA). Its general objectives were:

- to develop a greater understanding of the nature of the drug and driving problem on the basis of existing literature; and
- to define directions for future research with greater precision than has been done in the past NHTSA-sponsored efforts.

The project emphasized the generation of possible solutions to research issues in drugs and highway safety. The overall task is to identify and develop methods of research in the area of drugs and driving. Specific objectives of this study were:

- to identify problem areas that should be addressed in drug methodology;
- to identify alternative approaches to research that could be implemented with current technology; and

- to provide a listing of priority items of research that NHTSA could address in the foreseeable future.

To accomplish these objectives, an approach based on workshops was used to examine issues in four distinct but interrelated areas:

- The Identification of Drugs of Interest in Highway Safety;
- The Detection and Quantitation of Drugs of Interest in Body Fluids from Drivers;
- Epidemiology in Drugs and Highway Safety: The Study of Drug Use Among Drivers and Its Role in Traffic Crashes; and
- Experimentation in Drugs and Highway Safety: The Study of Drug Effects on Skills Related to Driving.

The division of topics had advantages as well as a possible disadvantage. For example, on one hand, a tighter focus on specific issues could be achieved. On the other hand, for some topics the wisdom and expertise of participants in other workshops might be lost. To offset this disadvantage, summaries of earlier workshops were mailed to invitees, and participants were later asked to comment on findings as well as issues in those areas.

These workshops, conducted in the spring and summer of 1978, were highly productive and brought to focus other issues in related areas of drugs and driving. In 1978, a contract modification called for additional workshops within the scope of the statement of work. In January 1978, a fifth workshop dealt with the alcohol and highway safety experience and its relation to the study and control of the drug and driving problem.

Under this contract also, a literature search and review task was carried out. Its purpose was twofold:

- to update the literature review performed for NHTSA under contract DOT-HS-4-00994 (Joscelyn and Maickel 1977a,b,c); and
- to satisfy informational needs in the design and conduct of workshops on methodological issues related to drugs and highway safety.

An earlier report produced under this contract (Joscelyn and Donelson 1979) was the first supplement to the parent bibliography. This report is the second supplement. A detailed account of the history of this bibliographic series follows.

1.2 History of the Bibliographic Series

This bibliography is the product of a continuing literature search conducted under the sponsorship of the U.S. Department of Transportation National Highway Traffic Safety Administration (NHTSA) as part of efforts under contracts DOT-HS-4-00994, DOT-HS-5-01217, and DOT-HS-7-01530.

Contract DOT-HS-4-00994, received by Indiana University (IU) from NHTSA in June 1974 and entitled "Drug/Driving Research Review and Symposium," reviewed the relationship between the use and abuse of drugs (other than alcohol alone) and highway safety. The principal investigators for this project, Kent B. Joscelyn and Roger P. Maickel, developed the basis from which later contracts efforts were derived.

The central objectives of the IU study may be summarized as follows:

- to ascertain and document on the basis of existing research literature the relationship between drug use (other than alcohol alone) and highway safety;
- to ascertain the "state of the art" of research in the field of drugs and highway safety; and
- to define areas in drugs and highway safety that require further research and suggest, insofar as present knowledge permits, possible drug/driving countermeasures that can be implemented in the immediate future.

The research plan to achieve these objectives contained several elements. A literature search identified published literature to be included in the study. An international symposium provided a forum to determine the state of the art in current knowledge and to develop directions for future research. Finally, a research review collated and synthesized the information obtained in the literature search and symposium. The project produced a series of reports (Joscelyn and Maickel 1977a,b,c), one of which is the parent volume of this bibliographic series, entitled "Drugs and Driving: A Selected Bibliography" (DOT-HS-802-188) and produced from the file of reports compiled under that contract.

Under Contract DOT-HS-5-01217, entitled "The State of Knowledge and Information Needs in Alcohol/Drugs and Highway Safety," the examination of drugs and highway safety was part of a larger project involving alcohol-related objectives. For example, two reports on the state of knowledge about alcohol and highway safety were prepared (Jones and Joscelyn 1979a,b). The general objectives of this project related to drugs (other than alcohol alone) were:

- to critically review, evaluate, and summarize existing knowledge concerning the drug/crash problem; and
- to recommend further research on the drug/crash problem that is a priority need and is likely to produce the most significant results.

In pursuing these objectives, the role of drugs in highway crashes was examined from the following topical standpoints:

- problem definition,
- measurement of agent effects,
- measurement of agent presence,
- relationship between agent presence and driver impairment, and
- countermeasures.

The critical review of existing information in these areas led to a summary of current knowledge and recommendations for future directions in research (Joscelyn et al. 1979). As part of the literature examination and review process, a literature search was performed. The document identification and collection activity was broad-based to (1) supplement the existing information base and (2) satisfy literature requirements in hitherto unsearched areas. This effort enlarged the hard copy file of documents developed under DOT-HS-4-00994.

The present contract, DOT-HS-7-01530 (described above in Section 1.1), extended literature search activities. A first supplement to the parent bibliography was produced, including literature identified under DOT-HS-5-01217 and DOT-HS-7-01530. The literature search and review task continued and led to the preparation of two additional supplements. This report is the second supplement to the parent volume.

1.3 Report Organization

This report consists of a series of introductory sections and a set of appendixes that index and reference publications relevant to drugs and highway safety.

Section 2.0 describes the technical approach to compiling the bibliography. The scope of topics and the criteria for selection of literature are defined.

Section 3.0 describes the format of the bibliography and the use of its indexes.

Appendix A is a detailed topical index that includes comprehensive subindexes for drugs discussed in the selected literature.

Appendixes B and C index the literature alphabetically by title and author(s), respectively.

Appendix D is the collection of abstracts of literature related to drugs and highway safety.

2.0 TECHNICAL APPROACH

The general approach to compiling this bibliographic supplement continues that used under contract DOT-HS-4-00994 to produce the parent volume (Joscelyn and Maickel 1977b). The literature search included both manual and computer-assisted techniques. The scope of recent search under the present contract broadened somewhat compared to the previous effort, so that additional sources were used.

The technical approach was designed to meet three main objectives:

- to maintain comprehensive files of literature specifically dealing with issues related to drugs and driving;
- to broaden the topical scope of the bibliography, including literature pertaining to specific research requirements and information needs in drugs and highway safety; and
- to provide access to the main bodies of relevant literature and especially to major area reviews.

Our primary concern has been to include all documents directly related to the general topic area of drugs and driving. The expanded scope of bibliographic coverage, however, proportionately increased the representation of support areas indirectly related to drugs and highway safety. The collected material is not all-inclusive of the available literature in these areas. However, an attempt was made to identify and collect major reviews of subtopical areas, and to provide ready access to peripheral research relevant to the central objectives of drugs and highway safety efforts. The identification and collection of other bibliographies and research compilations supported this objective.

Literature search activity encompassed technical and nontechnical sources as well as scientific literature bases. Consequently, the bibliography contains entries from the general literature and from the archival literature. As pointed out in the parent volume, caution must be exercised in using the bibliographic references. We remind the reader here to consult each original article of interest to determine its degree of relevance for special concerns, and to assess independently its scientific validity.

In the attempt to include research areas indirectly related to drugs and highway safety, several massively documented areas were touched upon. The sheer volume of available material required exclusionary criteria. The following sections present a detailed description of the literature search and selection process that led to the production of this bibliography.

2.1 Literature Search Scope and Document Selection

This section discusses the major topic areas in which literature was identified for inclusion in the bibliography. It defines the scope of the literature search in terms of specific research areas and describes criteria used to exclude documents of lesser importance.

The expansion in bibliographic topics is intended to better represent the multidisciplinary nature of the field. Epidemiology and experimentation are two general approaches used to define the drug and driving problem. Within these distinct research branches are specific research requirements, information needs, and methodological issues. There are also areas of related needs, due to the complementary nature of these research approaches. In the following subsection, a brief background discussion of drug and driving research is presented to develop the rationale of the literature search.

2.1.1 Research in the Field of Drugs and Highway Safety. As stated from the outset, the existence of a "drug-and-driving problem" remains a presumption. The role of drugs in traffic crash causation is still hypothetical and unconfirmed. Broadly speaking, determining the relationship between the use of drugs (other than alcohol) alone by drivers and highway safety requires systematic research. This research constitutes a many-faceted study of drug interactions with individual, vehicular, and environmental factors related to driving. A multidisciplinary approach must be engaged to define a problem so complex as this one. As an applied research field, drugs and highway safety involves the conjunction of pharmacology and pharmaco-behavioral sciences with highway safety research and its allied concerns.

The central objectives of research on drugs and highway safety concern problem definition and countermeasure development. The "state of the knowledge" is such that much basic and applied research is required to determine adequately the nature and extent of any drug-and-driving problem. If a problem is identified, additional research will be necessary to develop and to evaluate alternative approaches to deal with it. Ancillary research areas also contribute significantly in the overall endeavor. For example, research in these areas provides:

- information on which to base decisions regarding experimental design or countermeasure development;
- methodological support in exploratory research or in project evaluation; and
- technological support in the execution of experiments or surveys or in the implementation of countermeasures.

Because the capability of these areas for meeting requirements of drug and driving research warrants periodic assessment, we consider that access to this special literature is desirable and should be included.

Bodies of literature relevant to the information needs of drug and highway safety research can be outlined in terms of major research areas and supporting fields. In the following subsection, the scope of the literature search is defined.

2.1.2 Scope of Literature Search. To describe the literature search, literature in relevant areas of research is described below. Criteria for exclusion of documents are specified within each area.

2.1.2.1 Epidemiological Literature. The epidemiological approach to the study of drugs and driving includes both direct and indirect lines of research. The direct assessment of actual highway safety risk attributable to drug use by drivers involves field surveys. Methodological issues involve study design and methods for the analysis of drugs in body fluids from drivers. All literature directly related to the epidemiological study of drugs and driving was collected upon identification.

The indirect assessment of drug use by the general or special populations aids in the estimation of drug risk potential. Thus, literature pertaining to drug usage patterns was identified and collected. Toxicological studies that indicated drugs likely to be misused or used to excess were also deemed relevant. Reports describing drug user characteristics were considered important in the identification of target groups for countermeasure activity. Reports of this nature were excluded if the drugs or specific topic areas were deemed inappropriate to the indirect assessment of potential crash risk due to drug use by drivers.

Literature dealing with basic issues in epidemiologic research was also included in the bibliography if the documents were related to the study of drug-related problems in society. Reports describing general drug screening were collected as described below.

2.1.2.2 Experimental Literature. In the experimental approach to the study of drugs and driving, the nature and magnitude of drug effects on driving skills is measured under controlled conditions. Types of experiments range from those related to the actual driving task (for example, closed course driving tests) to simple tests of human performance (for example, choice reaction time). All identified studies involving the perceptual, sensory, and psychophysical evaluation of drug effects in man were included in the bibliography. While some reports did not mention driving per se, these were included on the basis of their similarity to experimental drug and driving research. Experimental investigations that attempt to characterize the nature of drug effects in man were also included if, in the judgment of the compiler, they might support the analysis of driver impairment by drugs. Reports dealing with drug effects in animals were generally excluded; exceptions included studies that contributed to the

understanding of the nature of drug effects in man, and reports that simultaneously dealt with drug effects in man, with the chemical analysis for drugs and metabolites of drugs in body fluids, or both.

Papers dealing with methodological issues in behavioral research were included on the basis of their relevance to measuring drug effects on human performance related to driving. Reviews of behavioral research methods were also collected.

2.1.2.3 Literature Concerning Drug Analysis. In the epidemiology of drugs and highway safety, analytical capability appears required for the detection, identification, and quantitation of drugs in body fluids from drivers. Depending on specific study objectives, a general drug screening system may be employed for the purpose of drug detection and preliminary identification. Confirmatory drug analysis methods usually permit quantitation. Specific screening techniques, also useful in the systematic approach to drug screening in body fluids, have an important place in drug and driving research.

All identified reports describing general drug screening methods were included in the bibliography. Documents dealing with specific screening methodology and confirmatory/quantitative methods were included (1) if the drugs were determined in biological specimens and (2) if the drugs were of possible interest in highway safety (see Joscelyn and Donelson 1980a; Joscelyn et al. 1980). Since the body of literature pertaining to drug analysis is massive and ever expanding, particular emphasis has been placed on the identification and collection of methodology reports in which drug concentrations were determined in human subjects.

Technical reviews of the "state of the art" in drug analysis are important to the area of countermeasure development. Evaluations of drug analytical methodology and intercomparisons of specific methods are useful in the design of research involving drug analysis. Therefore, reviews of analytical techniques and their application to drug analysis were included in the bibliography.

The epidemiological study of drug use among drivers may also require the use of independent laboratories for the purpose of drug analysis. Laboratory evaluation may become important in this regard. Papers dealing with quality control and proficiency testing were included as distinct topic areas.

2.1.2.4 Drug Concentration-Effect Literature. Meaningful interpretation of epidemiologic data on drug concentrations in accident- and nonaccident-involved drivers requires a substantial information base relating drug concentrations in body fluids to drug effects. Greatest interest in the significance of blood concentrations of drugs has been evident in the area of clinical pharmacology. Relatively few reports could be identified that correlated drug levels with performance of driving-related skills.

Most identified reports dealing with correlations between drug concentrations in body fluids and drug effects were included in the bibliography. Although some investigations used measures of drug effect unrelated to the driving task per se, other considerations contributed to their relevancy. These reports cited drug analysis methods adequate for the determination of therapeutic drug levels and reported drug blood concentrations resulting from common dosage levels. They also described the effects of therapeutic drugs that might increase a driver's risk of accident. Reports that inadequately described these aspects of clinical investigation were excluded from the bibliography.

2.1.2.5 Drug Concentration Literature. Data pertaining to the therapeutic or toxic blood concentrations of drugs in body fluids are important for the following reasons:

- approximate drug concentrations representing threshold ranges for therapeutic, impairing, and toxic effects are indicated;
- the sensitivity required of analytical methodology for the detection, identification, and quantitation of drugs in body fluids is specified prior to selection of drug analysis methods;
- the time course of pharmacokinetic phases of absorption, distribution, metabolism, and excretion is described as reflected in blood concentrations of parent drug and (some) metabolites; and
- the intersubject (interpatient) variability in drug blood concentrations after single- and/or multiple-dose administration is indicated.

The relevance of these data is found in the interpretation of drug concentration data from epidemiologic research; in designing and developing countermeasures; in the designing of drug screening methodology and the selection of adequate confirmatory and quantitative methods; and in assessing the use of drug concentration as a valid measure of drug effect.

Literature reports containing drug concentration data are diverse in nature and type. Compilations presenting comprehensive tabulations of drug concentration ranges were identified and collected. Less inclusive reports of a toxicological nature were also included in the bibliography. Reports of epidemiological findings including drug concentrations determined in nondriver groups were included only if the drugs themselves were of interest in highway safety.

Specific reports of human drug concentration data were also considered within the scope of this topic area. Often in the clinical or experimental context, drug concentrations in the blood would be determined following acute and chronic drug administration. In fact, many of these documents were included as a result of relevance to other areas. However, purely pharmacokinetic or drug metabolism studies involving drugs of interest were also identified and collected. Reports of specific analytical methods for these drugs would often involve determination of drug concentrations in body

fluids as a demonstration of method applicability. Many of this latter type of document were identified and collected in the search of literature pertaining to drug analysis. While these studies typically involved small groups of subjects, the preliminary indication of drug concentration variability among subjects was considered useful.

2.1.2.6 Miscellaneous Topic Areas. Several other topic areas were included within the scope of the literature search.

Socio-legal studies dealing with drug-related problems in society were included if a relation to the drugs and driving problem was evident. Literature pertaining to the development, evaluation, and implementation of drug countermeasures was identified and collected. Reports dealing with alcohol only were generally excluded. Exceptions included documents dealing with general countermeasure issues applicable also to other drugs.

General pharmacological effects of drugs whose use by drivers may increase traffic crash risk were also of interest. Abstracts in this bibliography include literature on drug interactions, studies of the sites and mechanisms of drug action, and reports dealing with the time-dependency of drug effects. As an information base for the interpretation of drug concentration data, reviews and individual reports that discuss factors influencing drug concentration-effect relationships were compiled. Articles and papers dealing with the basic pharmacology of drugs or drug classes were generally excluded.

The following section briefly outlines the literature search methods used in the compilation of this bibliography.

2.2 Literature Search Methods

The literature search procedure involved the following steps:

- identification;
- collection; and
- review.

Following these steps, documents were abstracted (if not already abstracted) and included in the bibliography according to selection criteria.

2.2.1 Manual Literature Search. On the basis of previous efforts in preparing previous volumes (Joscelyn and Maickel 1977b; Joscelyn and Donelson 1979), a list of journals in which relevant documents had been frequently identified was compiled. Journal issues were searched for related material as they appeared. Journals pertaining to research areas newly included within the scope of the bibliography were searched according to the specific topic area.

Author indexes were used to identify recent reports by active researchers in the field of drugs and highway safety. Other bibliographic services (such as Highway Safety Literature) and selected abstract series (for example, CA Selects: Forensic Chemistry) proved useful in identifying relevant papers. Bibliographies from major reviews of topic areas within the scope of our literature source were also searched.

2.2.2 Computer-assisted Searching. Computer-based information retrieval services played an important role in identifying literature pertaining to drugs and driving. Two data bases were used in compiling this bibliography: Exerpta Medica and Medline. Exerpta Medica identifies articles from over 3,500 biomedical journals published throughout the world since 1974. It covers the entire field of human medicine and related disciplines, including forensic science, health economics, and public health. Medline, a data base maintained by the National Library of Medicine, contains references to over 500,000 citations from 3,000 biomedical journals published throughout the world since 1966.

Each data base was searched for papers concerned with three separate but related concepts of the general area of drugs and traffic safety. The primary area of interest was that of drug effects on psychomotor performance related to driving. Included under this concept were various aspects of drug effects on sensory, psychological, cognitive, and physiological parameters.

A second area of interest was that of the nature and extent of drug use and abuse, especially as it relates to driving, that is, the epidemiology of drug use and its consequences. Computer searching of this concept yielded papers on drug use in the general population as well as subpopulations such as automobile drivers, accident victims, psychiatric patients, and specific ethnic groups.

The third major area of interest was that of the presence and amount of drugs in body fluids, their behavior, and their analysis. This area included such topics as pharmacokinetics, drug interactions, drug monitoring, and analytical methods.

These computer searches were done by the staff of the Highway Safety Research Institute Information Center and the University of Michigan Medical Library. Periodic updates were done in order to provide continuing surveillance of recently published material.

2.2.3 Other Search Methods and Efforts. The topic area drugs and driving is one of the search topics of the HSRI Information Center. The Information Center staff broadly searches highway safety and other literature sources, continually adding selected publications to the extensive HSRI document collection. Upon identifying publications dealing with drugs and highway safety, the staff collects them or brings them to our attention for inclusion in the drug and driving bibliography.

In addition to the formal search methods described above, the staff is in personal communication with leading researchers in the field. Previously unidentified material and conference papers were frequently received during the course of the literature search by research staff and the HSRI Information Center.

No matter how thorough and extensive a literature search and review task becomes, cost, time, and other constraints influence the final work product. In the following section, limitations on the literature search are described and the effectiveness of criteria for document selection is briefly discussed.

2.3 Limitations of Literature Search and Document Selection Procedures

Joscelyn and Maickel (1977b) discussed general and specific limitations applying to the parent bibliography. Some limitations in the original work apply equally to succeeding volumes. The expanded search relative to the first bibliography has engendered other problems. This section describes factors that influenced the comprehensiveness and the quality of material included in this report. The discussion incorporates points made previously in Joscelyn and Maickel (1977c).

The omission of relevant material is inevitable. A number of factors war against the ideal of all-inclusiveness, and may lie well beyond the control of compilers. For example, the literature search task has occupied a subsidiary position relative to other contract objectives. Available resources--both staff time and funding level--limited the search and collection of literature. This nearly universal restriction was ameliorated by efficient planning and by the previous effort devoted to the parent bibliography. In many areas, including the general topic of drugs and driving, the literature search was a simple update of that comprehensive collection.

A fundamental limitation arises from the nature of the literature base pertaining to the field of drugs and highway safety. Drugs and highway safety is an applied field of loosely knit research areas. The determination of drug influence on traffic crash causation requires a systematic, multidisciplinary approach. "Drugs and driving," however, remains an isolated, special topic in journals serving the respective disciplines. Thus, the relevant documents to be identified are scattered throughout many journals and other literature sources. Multidisciplinary fields provide other pitfalls for broad-based literature searches. Although many research areas as such are reasonably well-defined, their relation to drugs and highway safety often is not. Many reports occupy a gray area of semi-relevance in which the personal biases of reviewers hold sway. Time and cost limits forced cursory searches of some relatively large research areas, for example, methodology in drug analysis and behavioral research.

The weaknesses and limitations of literature search methods exacerbate problems in dealing with the literature of drugs and highway safety. To search every likely publication for relevant material is impossible. The manual search is made manageable by selection of lists of journals and authors, abstract services, and other bibliographies. These tools aid in examining source material. The weaknesses and strengths of each index and list, however, are carried forth into the search. Titles and indexes included by document sources themselves may be incorrect; compilations of abstracts or bibliographies reflect the (unknown) biases of their compilers. The use of computer-assisted techniques is a valuable supplement to the literature search by manual means. The ability to elicit relevant output from information storage, search, and retrieval systems depends on the selection of key works or topic indicators as well as on the way a document was identified originally in the system. Some broad topics and specific issues appeared refractory to automated searches.

The fact that one can't find what isn't there also limits the apparent inclusivity of both bibliographies. The coverage of material published or issued within two years of the literature search is most likely incomplete. The publication process is itself lengthy; there is a significant "lag time" between the completion and reporting of research findings. The indexing and dissemination of abstracts as well as the entry of material into computer systems takes even longer since it follows initial publication. Foreign language publications share these--and exhibit other--problems. Mistranslations of titles and inaccurate or uninformative abstracts of article content combine with cost and availability factors in hindering the inclusion of foreign documents.

In addition to the directing influence of contract objectives, the personal biases of individual searchers and reviewers also affect the selection of documents. For example, a judgmental selection was necessary in peripheral research with massive documentation. Exclusionary criteria, described in section 2.1.2, aided in this process. Nevertheless, the distribution of reports within and among research areas reflects the impact of human value judgments.

The quality of selected documents is another matter requiring a cautionary note. A wide range of sources contributed the full spectrum of articles and reports: technical and nontechnical, general and archival, scientific and popular documents are included in this collection. Limitations of the literature base itself become important to the user, who must also evaluate the material.

In general, the published archival literature is viewed as factually accurate and reliable. This is due in part to a significant level of peer review during the editorial process. The rigor with which submissions are reviewed, however, varies. Data presentation, experimental design, and methodological accuracy may still be of

questionable validity. Statements made or conclusions drawn in discussion sections are usually those of the authors and are subject to bias and error. The technical literature includes reports published by government agencies, commercial organizations, private research foundations, and universities. Selections of this nature must be examined carefully since, for the most part, they represent literature that has not been subjected to any peer review process. For example, an independent assessment of methodology should always be made. The popular literature requires still more caution, since simplifications for the lay audience may blur critical distinctions, either intentionally or unwittingly. Articles written to persuade often downplay facts contrary to chosen sides of emotional issues. Controversial topics are present in drugs and driving, and their treatment in the popular literature deserves close inspection.

In summary, a general caveat included in the parent volume is repeated in this supplement. The reader should be careful to recognize that this selection does not represent an inclusive list of available literature, nor does it define the "state of the art" in drugs-and-driving research. It is believed, however, that the citations and accompanying abstracts present a useful and usable information base and form a valuable research collection.

2.4 Summary of Bibliographic Contents

This section has thus far detailed the technical approach used to compile material for this report. The scope and methods of literature search have been discussed with specific reference to topic areas in drugs and highway safety. This subsection focuses on what was found. A brief overview of the abstract collection presents information about the contents of this bibliography.

More than 600 abstracts comprise nine categories in Appendix D, Abstract Index. The single largest category is the D series (see section 3.1). This collection deals with the general topic of "drugs and driving" and with closely related subtopics. Although a detailed analysis of the available literature is not possible here, suggestive characteristics of the abstract collection are noted below.

The Topical Index in Appendix A indicates the relative representation of topical areas in the abstract collection. More experimental than epidemiological research is included. Reports of drug effects on human performance are most often included, but few involve actual vehicle-based driving tests. The sheer volume of experimental research is deceptive, however, since the number of drugs and variety of methods are great. Papers that concern drug detection and quantitation constitute another significant group of abstracts. Here, a bias toward gas chromatographic procedures is quite noticeable. The large number of citations that concern drug concentrations in body fluids derives

mainly from experimental and analytical reports. Relatively few abstracts are found in sections dealing with socio-legal and countermeasure topic areas, due more to the available literature than to efforts to collect it.

The primary purpose of this report is to identify and to present literature related to drugs and highway safety. Readers desiring a review and analysis of literature and a discussion of research in drugs and highway safety are here referred to other reports produced under Contracts DOT-HS-5-01217 and DOT-HS-7-01530 (Joscelyn et al. 1979; Joscelyn et al. 1980; Donelson et al. 1980; Joscelyn and Donelson 1980a,b,c,d). The use of this bibliography, its appendixes, and its collection of abstracts is covered in Section 3.0 and in Appendix A.

3.0 USE OF THE BIBLIOGRAPHY

This section presents in detail the format of the bibliography and the use of its indexes.

This bibliography is intended for use as a resource document for research in the field of drugs and highway safety. Its primary aims are as follows:

- to describe the literature base available to persons interested in drugs and highway safety;
- to provide a convenient means of access to the relevant literature in specific topic areas; and
- to give an accurate, informative indication of document contents to aid the user in selecting material for specific needs.

To facilitate use of this bibliography, the arrangement of bibliographic material is summarized in the next section. Subsequent sections deal separately with each appendix and describe the various indices.

3.1 Summary of Bibliography Contents

The bibliography consists of several indexes in addition to the primary content material. Four sections that comprise the bibliography are presented in the following appendixes:

- Appendix A: Topical Index
- Appendix B: Title Index
- Appendix C: Author Index
- Appendix D: Abstract Index

Each document entered into the bibliography is identified by a unique accession number. The accession number consists of letter-number combinations that sequence documents presented in Appendix D. In addition, an accession number allows preliminary identification of the general type of subject area of a document as well as the year of its publication. A sample number appears below.

UM-75-D0606

The first two letters (UM) signify that the selection was placed in the file by University of Michigan researchers. A previous designator used in the parent volume IU indicated researchers at Indiana University. All selections in this bibliographic supplement are from the University of Michigan effort and are prefaced by UM.

Immediately following the research designator, a pair of numbers (75) indicates the year of publication (1975). If the selection was presented at a conference, the year of presentation is given. If a document was both presented at a meeting and subsequently published, the publication date is used in the accession number and the selection is cited as published. Occasionally, both papers are included.

The letter preceding the last number set classifies the selection by category. Categories used for this supplement are as follows:

- A (bibliographies)
- B (books, collections of papers)
- C (countermeasures)
- D (selections dealing with drugs and driving or closely related topics)
- E (documents pertaining to epidemiology, the study of drug use in populations, and methodology)
- F (behavioral research methodology and studies of factors other than drugs that can impair driving skills)
- L (social and legal topics related to drug use and highway safety)
- M (methods and techniques for the analysis of body fluids for drugs)
- P (pharmacokinetics)

The last four digits simply represent the sequential assignment of documents to a given category. Appendix D lists the document abstracts alphabetically by category and sequentially by number within a category. Other appendixes list the accession number in whole or part to allow cross reference to Appendix D.

The following sections describe each index in more detail and provide suggestions for their use.

3.2 Topical Index (Appendix A)

A revised and expanded topical index has been developed to improve user access to document abstracts. To some extent, the changes reflect the reorganization of some topic areas under more general headings. However, the primary intent of the revision was to permit the inclusive citation of all selections in one or more topic areas or categories.

As in previous volumes, the index headings are not mutually exclusive. This has permitted multiple referencing for papers relevant to several topic areas. General categories have been included within the topical index. Used in combination with more specific headings (e.g., a drug name), selections more closely related to user needs may be quickly located. Detailed subheadings have been provided in those topical areas where a large number of selections have been included or where differentiation among closely related subtopics may be of value to the user.

Within the topical index are subindexes that list drug by name and by class. Section 8.0 is the Drug Name Subindex, which indexes drugs cited in the literature alphabetically by common, nonproprietary nomenclature, generic or chemical. Chemical names were used to identify a compound only when necessary. Also included in the Drug Name Subindex are common trade names of prescription and other therapeutic drugs, cross-referenced to generic names under which accession numbers are cited.

Section 9.0 is the Drug Class Subindex. Section 9.1 indexes literature pertaining generally to drug classes; section 9.2 lists members of drug classes indexed in Section 8.0. Finally, in section 9.3, a drug classification scheme is presented, incorporating chemical, pharmacological, and therapeutic classes in outline form. Members of each class are listed alphabetically under each heading.

The drug classification scheme was developed so that readers interested in literature pertaining to all members of a drug class could identify both which drugs of a class were indexed and which documents pertain to one or more members of a class. In general, only documents dealing substantively with a drug indexed in Section 8.0 are listed by accession number. Every effort was made to identify the most appropriate name for each drug or substance (hereafter referred to as the "preferred drug name") as well as placing each drug into the proper drug class or classes. Toward this end, many references were investigated and those found to be most useful are listed below.

Griffith, M.C., ed. 1979. USAN and the USP Dictionary of Drug Names. Rockville, Md.: United States Pharmacopeial Convention, Inc.

Kastrup, E.K., ed. 1980. Facts and Comparisons. St. Louis: Facts and Comparison, Inc.

Windholz, M., ed. 1976. The Merck Index. 9th ed. Rahway, N.J.: Merck and Co., Inc.

Goodman, L.S., and Gilman, A., eds. 1975.. The Pharmacological Basis of Therapeutics. 5th ed. New York: Macmillan Publishing Co., Inc.

Lowry, W.T., and Garriott, J.C. 1979. Forensic Toxicology: Controlled Substances and Dangerous Drugs. New York: Plenum Press.

Vinson, J.A., ed. 1979. Cannabinoid Analysis in Physiological Fluids. Washington, D.C.: American Chemical Society.

Reilly, M.J., ed. 1979. Hospital Formulary Service. Washington, D.C.: American Society of Hospital Pharmacists.

Remington's, Pharmaceutical Sciences. 1975. 5th ed. Easton, Pa.: Mack Publishing.

Wade, A., ed. 1977. Martindale's: The Extra Pharmacopeia. 27th ed. London: Pharmaceutical Press.

Modell, W., ed. 1979. Drugs in Current Use and New Drugs. New York: Springer Publishing

Lewis, A.J., ed. 1973. Modern Drug Encyclopedia and Therapeutic Index. 12th ed. New York: Dun-Donnelly Publishing.

Claus, E.P.; Tyler, V.E.; and Brady, L.R. 1979. Pharmacognosy. 6th ed. Philadelphia: Lea Febiger

When multiple names for a drug or substance were found, the preferred drug name was chosen based on information from the above references as to its accepted or official name. The preferred drug name was thus defined as:

a) the U.S. Adopted Name for a chemical or substance, if such a name had been assigned;
b) for substances that did not appear in the USAN dictionary, the other references were searched and the most frequently used name and spelling of that name was adopted; and
c) if no entry for a chemical was found in the reference, the spelling used by the author was adopted.

If a discrepancy existed between the author's spelling and the spelling for the preferred drug name found in the references, an additional entry was added to the Drug Name Subindex that shows the author's spelling and directs the reader to the preferred spelling.

An exception was made in the use of U.S. Adopted Names for drug products containing more than one active ingredient. These products are listed in the Drug Name Subindex by brand name and followed by the list of active ingredients, in parentheses.

Finally, to aid users that may have a brand name but not the preferred drug name (for drugs marketed in the U.S., this is the generic name), representative brand names for the more common drug products and for drug products referenced in the abstracted document by brand name have been included in the Drug Name Subindex. Note that brand names included in the subindex are not all-inclusive but are a sample of all possible brand names for the drug products cited in abstracted documents.

To aid in the identification of recent publications, all documents cited by accession number in the Topical Index include the last two digits of the year of publication.

The organization of the Topical Index is presented in outline form in the first pages of Appendix A. An explanation of each topical heading is provided. The type of documents indexed under each heading is described in a general and inclusive manner. Use of the drug and chemical indexes is further detailed.

3.3 Title Index (Appendix B)

All selections are listed alphabetically by title in Appendix B. Titles as originally published have been used. Foreign language titles are followed by an English translation in brackets. The abstract itself may be consulted to identify the original language. Associated with each title is the full accession number. The abstract of the document may be found by referring to Appendix D. (See below).

3.4 Author Index (Appendix C)

All names that appear as editors, authors, or compilers have been included in the Author Index. Editors and compilers have been identified by the abbreviations ed. and comp., respectively. The publications associated with each name are identified by accession number. All authors are listed regardless of their order of appearance on the original publication. The year of publication is also indicated.

3.5 Abstract Index (Appendix D)

Literature abstracts are presented in Appendix D. The general approach followed for abstract preparation is that outlined in "NHTSA Document Analysis Manual," Rev. Ed. (HS-820-085). Within space limitations and other constraints, the bibliographic effort has been responsive to requests for increased information content. The following paragraphs describe the format and abbreviations used in preparing the abstracts.

Each document is identified by an accession number located immediately above and to the right of the abstract. (Government documents are further identified by report numbers cited below each abstract.) Accession numbers are continued serially from previous volumes. Headnotes identifying the number of the first abstract on each page are provided to facilitate use of Appendix D.

The importance of full, accurate referencing is reflected in document citation. Full titles of articles and other documents have been provided, along with the initials and last names of each author. The journal name has been given in full. Volume and issue numbers, full paging, and date of publication have been included.

In accordance with the aims of the bibliography as a resource document, each abstract is intended to provide an accurate indication of document contents. The primary purpose of the abstract collection is to allow the user to make a preliminary selection of literature relevant to specific needs, eliminating from consideration selections whose main focus is not appropriate. As noted above, the informative capacity of this abstract collection has been maximized within space and time constraints. Inherent limitations in the bibliographic effort have prevented the preparation of informative abstracts consistent with the length and quality of some abstract services, such as the Highway Safety Literature System.

Also in previous volumes, author-prepared abstracts were used when consistent with the standards described above. Often a journal abstract was modified by HSRI staff to include more information. Abstracts were prepared only for those selections without an appropriate synopsis. Abstracts prepared by indexing or bibliographic services were used when author abstracts were not available, or when their use allowed the efficient presentation of more complete information.

In order to inform the reader as to the source of abstracts included in Appendix D, letter combinations signifying the various sources utilized in this bibliography are included in parentheses at the end of each abstract. The following designations are used:

- JA, JAM (journal abstract, journal abstract modified);
- AA, AAM (author abstract, author abstract modified);
- HSL, HSLM (abstract from Highway Safety Literature [HSL], modified abstract from HSL);
- EM, EMM (abstract from Exerpta Medica [EM], modified abstract from EM);
- CA, CAM (abstract from other computer data base [for example, Medline], modified abstract from computer data base); and
- HSRI (abstract prepared by HSRI staff).

Such designations as JA, AA, HSL, etc., identify abstracts used verbatim; the designations JAM, AAM, and HSLM indicate that some modification of the original abstract was made. Most often, additional material was included to increase the information content without altering the main structure of the abstract. If the preparation of an abstract resulted in a substantial revision of an abstract, the designation HSRI was used. Newly prepared abstracts were also given this latter designation.

Additional information regarding each selection is presented along with the abstract, including:

- the number of references cited in the publication;
- the number of pages, if not included in the citation;
- the language of the publication, if not English;
- the report number, if a technical or government publication; and
- a set of keywords that indicate where in the Topical Index the document was indexed.

3.6 Computerization of Drug and Driving Literature Base

The preparation, indexing, and compilation of abstracts for hundreds of documents collected over several years comprise a gargantuan task. The editing, correction, and (ultimately) the production of this bibliography were particularly suited for computerization. The University of Michigan Michigan Terminal System (MTS) and the availability of data base storage and text processing programs facilitated this process and allowed the efficient, reliable production of this bibliography.

Several programs from different sources at The University of Michigan were applied. Two data base management programs were used: TAXIR (developed by the university Computing Center staff) and DRUGIN (developed at HSRI for an unrelated project funded by the Motor Vehicle Manufacturers Association). These programs allow efficient storage and simple access to each bibliographic entry. Output from these programs is fed into

INDEX (developed by The University of Michigan Computing Center) and TEXTEDIT (a text processing program developed by The University of Michigan Statistical Research Laboratory).

When fully developed, the computerized drug and driving literature base will be accessible to persons interested in conducting their own computer searches on topics related to drugs and highway safety.

BIBLIOGRAPHY

Donelson, A.C.; Marks, M.E.; Jones, R.K.; and Joscelyn K.B. 1980. Drug research methodology. Volume one. The alcohol-highway safety experience and its applicability to other drugs. National Highway Traffic Safety Administration contract no. DOT-HS-7-01530.

Jones, R.K., and Joscelyn, K.B. 1979a. Alcohol and highway safety 1978: A review of the state of knowledge. National Highway Traffic Safety Administration technical report no. DOT-HS-803-714.

Jones, R.K., and Joscelyn, K.B. 1979b. Alcohol and highway safety 1978: A review of the state of knowledge. Summary Volume. National Highway Traffic Safety Administration technical report no. DOT-HS-803-764.

Jones, R.K.; Joscelyn, K.B.; and McNair, J.W. 1979. Designing a health/legal system: A manual. National Highway Traffic Safety Administration technical report no. DOT-HS-805-138.

Joscelyn, K.B., and Donelson, A.C. 1979. Drugs and driving: A selected bibliography. Supplement one. National Highway Traffic Safety Administration technical report DOT-HS-803-879.

Joscelyn, K.B., and Donelson, A.C. 1980a. Drug research methodology. Volume two. The identification of drugs of interest in highway safety. National Highway Traffic Safety Administration technical report DOT-HS-805-299.

Joscelyn, K.B., and Donelson, A.C. 1980b. Drug research methodology. Volume three. The detection and quantitation of drugs of interest in body fluids from drivers. National Highway Traffic Safety Administration contract no. DOT-HS-7-01530.

Joscelyn, K.B., and Donelson, A.C. 1980c. Drug research methodology. Volume four. Epidemiology in drugs and highway safety: The study of drug use among drivers and its role in traffic crashes. National Highway Traffic Safety Administration contract no. DOT-HS-7-01530.

Joscelyn, K.B., and Donelson, A.C. 1980d. Drug research methodology. Volume five. Experimentation in drugs and highway safety: The study of drug effects on skills related to driving. National Highway Traffic Safety Administration contract no. DOT-HS-7-01530.

Joscelyn, K.B.; Donelson, A.C.; Jones, R.K.; McNair, J.W.; and Ruschmann, P.A. 1980. Drugs and highway safety 1980. National Highway Traffic Safety Administration contract no. DOT-HS-7-01530.

Joscelyn, K.B.; Jones, R.K.; Maickel, R.P.; and Donelson, A.C. 1979. Drugs and driving: Information needs and research requirements. National Highway Traffic Safety Administration technical report no. DOT-HS-804-774.

Joscelyn, K.B., and Maickel, R.P. 1977a. Drugs and driving: A research review. National Highway Traffic Safety Administration technical report DOT-HS-802-189.

Joscelyn, K.B., and Maickel, R.P. 1977b. Drugs and driving: A selected bibliography. National Highway Traffic Safety Administration technical report DOT-HS-802-188.

Joscelyn, K.B., and Maickel, R.P. 1977c. Report of an international symposium on drugs and driving. National Highway Traffic Safety Administration technical report no. DOT-HS-802-187.

Moskowitz, H., ed. 1976. Drugs and driving. New York: Pergamon Press

Organisation for Economic Co-operation and Development. 1978. New research on the role of alcohol and drugs in road accidents. Paris, France: OECD

Perrine, M.W., ed. 1974. Alcohol, drugs and driving. National Highway Traffic Safety Administration technical report no. DOT-HS-801-096.

Seppala, T.; Linnoila, M.; and Mattila, M.J. 1979. Drugs, alcohol and driving. Drugs 17:389-408.

U.S. Department of Transportation. 1980. Marijuana, other drugs and their relation to highway safety. A report to Congress. National Highway Traffic Safety Administration report no. DOT-HS-805-229.

Willette, R.E., ed. 1977. Drugs and driving. National Institute on Drug Abuse Research Monograph 11. U.S. Department of Health, Education, and Welfare publication no. (ADM)77-432.

DRUGS AND DRIVING:

A SELECTED BIBLIOGRAPHY

SUPPLEMENT TWO

APPENDIX A

TOPICAL INDEX

TOPICAL INDEX USAGE GUIDE

The organization of the topical index is presented below in outline form. Explanatory paragraphs are associated with each topical and subtopical heading. The purpose of this presentation is to define the scope of each heading in the topical index, and to facilitate the location of relevant documents.

1.0 REVIEWS AND COMPILATIONS

This section contains topic headings pertaining both to general and to specific research areas in drugs/highway safety. In addition, headings indicating certain types of documents are included. The selections for the most part do not report original research. Cited documents not strictly of a review nature do treat subject matter in a general and nonexperimental fashion. Collections of research reports and other compilations are cited under the appropriate category. These documents may also be cited under specific research areas elsewhere in the topical index.

1.1 Reviews of Drugs and Highway Safety

These selections deal directly with aspects of the drugs and driving problem. While not all treat the problem in a comprehensive fashion, most documents utilize findings from several research areas in discussing specific topics.

1.2 Research on the Use of Drugs

This section includes reviews of research done attempting to determine the prevalence of drug use and abuse in both the general population and the driving population as well as various subpopulations. Reviews of geographic and temporal patterns of drug use are also cited here.

1.3 Research on the Effects of Drugs

The study and characterization of drug effects are topic areas included under this heading. Two subtopical divisions differentiate between selections:

1.3.1 Reviews of Drugs or Classes of Drugs. Reviews of the biochemical, pharmacological, behavioral, and other effects of specific drugs or drug classes are included.

1.3.2 Reviews of the Relationships Between Drug Effects and Their Concentration in Body Fluids. The interpretation of drug levels in body fluids and the characterization of drug concentration-effect relationships are subjects of referenced documents. Selections of a general nature as well as reviews of specific drugs or drug classes are included.

1.4 Methodology in Drugs and Highway Safety

Selections reviewing the methodology of epidemiologic and experimental studies of drug use are included here. Issues and problems in methodology are discussed and specific methodologies evaluated, referenced according to the type of data collection used.

1.4.1 Methodology in Survey Research. Reviews of studies describing and evaluating the use of questionnaires, interviews, and examination of driving records to determine drug use and abuse are referenced.

1.4.2 Methodology in Behavioral Research. Documents under this heading pertain to the study of behavior related to driving or to the methodology used in the assessment of drug effects on human performance.

1.4.3 Methodology in Drug Analysis. This section includes reviews of studies using the most direct approach to assessing drug involvement in traffic crashes--determining the identity and amounts of drugs in driver body fluids--and the methodological issues involved. Technical reviews of specific analytical methods are referenced here.

1.5 Selected Reviews

Reviews not specifically related to the above subheadings are cited here. The primary subject matter of each selection is indicated in parentheses.

1.6 Compilations

Collections of research reports, monographs, and other unitary aggregations of material related to one or more research areas in drugs/highway safety are referenced. Conference proceedings are included under this heading.

2.0 EPIDEMIOLOGIC RESEARCH

Under this general heading, studies related to the incidence and distribution of drug use are cited, based on observation of the real world. Documents are cited under three subheadings according to the population or subgroup studied.

2.1 Studies of Drug Use Among Drivers and Its Consequences

Research studies directly pertaining to drug use in the driving population are cited. Documents are referenced under the three types of data collection used.

2.1.1 Analysis of Drivers' Body Fluids for Drugs. Cited here are studies directly determining the identity and amounts of drugs in driver body fluids. Studies involving drinking drivers, "driving under the influence" cases, accident-involved drivers, and fatally injured drivers are included.

2.1.2 Self-Reported Drug Use by Drivers. Investigations of self-reported drug use based on questionnaires and interviews are referenced. Studies of type or specific drug used and frequency of use are included.

2.1.3 Record-Based Surveys. Studies indirectly assessing the effects of certain types of drug use on driving performance by analysis of driving and arrest records of drug user groups are included.

2.2 Studies of Drug Use in Nondriving-Specific Populations

Referenced are studies of medical, nonmedical, and quasi-medical drug usage patterns among the general population.

2.2.1 National Surveys. Cited here are surveys of drug use on the national level in both the United States and in foreign countries, based on data gathered from such sources as household interviews, prescription sales, and arrest statistics.

2.2.2 Regional or Local Surveys. Surveys of drug use among subpopulations from specific geographical areas or with specific demographic characteristics are cited. Studies of street drug analysis programs and studies of drug use among university students and emergency room admissions are of the type of papers cited here.

2.3 Crash Investigation

Included here are studies of traffic accidents that investigate the causes or factors associated with crashes such as environment, behavioral patterns, vision, and vigilance.

3.0 EXPERIMENTAL RESEARCH

Under this general heading, all studies are included which involve the "laboratory approach" in investigating the effects of drug use. Two complementary subclassification schemes have been developed. First, drug studies are differentiated according to the number of drugs administered to experimental subjects. Second, the documents are cited under subheadings which specify the type of methodology or experimental test used to study drug effects. The drugs used in these studies are cited individually in Section 8.0, Drug Name Subindex.

The combined use of general and specific topic headings allows the user to locate directly those documents closely related to subjects of special concern. For example, psychological studies involving marijuana may be quickly identified by comparing accession numbers under the respective headings. Selections pertaining to this research area are indicated by matching accession numbers. Combined use of more general headings will locate certain types of experimental study, irrespective of the drugs employed.

Specific types of experimental study related to drug concentration-effect relationships as well as investigations involving animal research are also included in this section. Subheadings are described in greater detail below.

3.1 Studies of Drugs Administered Alone

Cited documents include those experiments involving the study of one drug, in addition to placebo. Reports which describe the effects of several drugs, but whose experimental design allowed the separate study of each are differentiated as follows:

3.1.1 Studies Comparing Different Drugs. Studies that examine the effects of drugs which have similar chemical structures and are in the same therapeutic class are cited.

3.1.2 Studies of Acute Doses. Investigations of the effects of a drug administered once to experimental subjects are cited. Studies involving both acute and chronic dose regimens are cited under each appropriate subheading. Dose-response studies, where single doses of increasing amounts of drugs are administered, are cross-referenced below.

3.1.3 Studies of Chronic Doses. Investigations in which the subjects are administered two or more serial doses of a drug are included. Chronic dosage studies involving the examination of drug effects following the first dose in a series are cited also as acute dosage studies.

3.1.4 Studies Relating Dose and Effects. Investigations which examine subject responses to two or more dosage levels of a drug (excluding placebo) are referenced.

3.1.5 Other Studies. In this category studies investigating the effects of undetermined dosages of single drugs are cited such as those to which some individuals are habitually or occupationally exposed. Examples include studies of the effects of carbon monoxide in professional drivers, effects of halothane and nitrous oxide in operating room personnel, and effects of smoking on auditory vigilance.

3.2 Studies of Two or More Drugs Administered Together ("Drug Interaction" Studies)

Investigations which examine the combined effects of two or more drugs are classified as the following:

3.2.1 Studies of Combined Effects of Drugs. Investigations are cited which deal specifically with the interactions of drugs administered in such a way as their separate effects overlap. Studies include those which attempt to describe the additive effects of drug combinations.

3.2.2 Other Studies. Miscellaneous reports dealing with drug combinations are included in this section. The interaction of conditions resulting from use (e.g., tolerance, enzyme induction) and the effects of specific compounds are topic cited under this heading.

3.3 Research on the Effects of Drugs or on Driving Performance Skills

Experimental studies involving drug effects in man are cited according to the methodology used or the general test methods employed. Special subheadings are described.

Also referenced under this heading are studies of various components of driving performance, categorized by the general test methods used to assess them.

3.3.1 Studies with Behavioral Methods Related to the Driving Task. The evaluation of drug effects on driving performance may be made utilizing the actual driving task or laboratory simulation. Three main subheadings have been used to classify relevant studies:

3.3.1.1 Tests on the Open Road. Studies in which subjects administered drugs were observed in actual driving situations are included.

3.3.1.2 Tests on Closed Driving Courses. Cited are studies in which experimental subjects drive a motor vehicle in a closed course or in an area devoid of actual traffic situations.

3.3.1.3 Tests on Driving Simulators. All studies are referenced which include a laboratory test, simple or complex, which is designed to replicate, at least in part, the actual driving task. Other tests related to driving skills are cited below.

3.3.2 Studies with Psychophysical Tests. Nearly all laboratory tests of human performance related to driving involve the participation of psychological (or mental) and physical (or somatic) functions. The relative significance of these various functions in a given test is often unclear. Therefore, a series of approximate classifications are used as described. Under this general heading, tests which involve perceptual elements in the measurement of motor or sensory performance specify the inclusion of a document. Those studies involving several different tests are cited under each appropriate subheading.

3.3.2.1 Tests of Psychomotor Skills. Investigations which employ tests of psychomotor behavior are cited. Simple and complex tests of reaction time, tests of balance and steadiness, tracking tasks other than driving simulation, and eye-hand coordination tasks are examples of experimental methods considered to be psychomotor tests.

3.3.2.2 Tests of Sensory Functions. Studies which use methods which measure sensory functions are included. The critical flicker fusion frequency test and tests of visual and audio acuity are examples of such methods.

3.3.3 Studies with Psychological Tests. Investigations are cited which employ tests which measure the effects of drugs on psychological functions. Tests of memory, learning, perception, mood, and mental performance are among those which qualify a document for this classification.

3.3.4 Studies with Physiological Tests. Investigations which include the measurement of physiological parameters are cited under this subheading. Galvanic skin response, heart rate, and electroencephalographic effects are specific examples.

3.3.5 Clinical Studies. Investigations are cited which study the effects of drugs in patient groups or which attempt to determine the clinical efficacy of drugs in patients. Those studies employing similar tests to those described above are cross-referenced accordingly.

3.3.6 Studies Including Self-Evaluation of Drug Effects by Test Subjects. Investigations which include self-evaluation of drug effects by experimental subjects are included. Subject ratings of the intensity or nature of a drug's effect, or the degree of performance impairment, are examples of the self-evaluation approach which classify documents under this subheading.

3.3.7 Factors Influencing the Effects of Drugs on Human Behavior. Cited here are studies on nondrug factors possibly influencing the effects of drugs on human behavior. Studies of variables possibly accounting for the wide range of response to drugs among individuals are referenced under the following categories.

3.3.7.1 Age. Studies of the influence of physiological, psychological, and pharmacokinetic correlates of age on drug effects are cited. Investigation of protein binding in the elderly is an example of the studies included.

3.3.7.2 Gender. Comparisons of drug effects in male and female subjects are cited. The possible influence on drug effects of differences in role perception, perceived social expectations, and physiology are discussed in studies cited here.

3.3.7.3 Personality. Cited here are studies attempting to determine how such personality traits as introversion and extroversion, anxiety, willingness to take risks, and artistic tendencies influence effects of drugs in individuals.

3.3.7.4 Other. Referenced are studies investigating the influence on drug effects of such variables as socioeconomic background of the subject, prior drug experience, social and physical setting of the drug experience, and physical characteristics of the drug.

3.4 Research on the Relationship Between Drug Effects and Their Concentration in Body Fluids

The need to quantify drug effects by means of objective, chemical measures, and the importance of data interpretation in field survey of drugs in drivers led to the inclusion of this section dealing with the topic of drug concentration-effect relationships. Documents are differentiated according to their relevance to drug effects on driving performance:

3.4.1 Studies of Skills Related to Driving. Cited are studies which attempt to correlate behavioral measures related to the driving task and drug levels in body fluids.

3.4.2 Clinical Studies. Studies are included which describe the efficacy of therapeutic drugs in terms of drug concentration in the blood or other body fluids.

3.5 Research Involving Animals

Generally, studies of drug effects in animals were excluded from this bibliography. Documents relevant to the nature of drug effects in man, or which report relevant research involving the incidental use of animals, are included under this subheading.

4.0 DETECTION, IDENTIFICATION, AND QUANTITATION OF DRUGS IN BIOLOGICAL SPECIMENS

This general heading includes those topic areas directly or indirectly related to the detection, isolation, identification, or quantitative determination of drugs (and metabolites) in biological liquids. Studies involving the development, evaluation, and application of drug analysis methods are specifically cited.

Main divisions within this general research area reflect whether the methodology has been applied to the screening of one or more drugs in unknown samples, or to the determination of specific drugs known to be present in solution. Within each major subheading, reports are distinguished by the type of techniques used to determine drug presence. Investigations pertaining to the evaluation of analytical methods and to the evaluation of laboratories engaged in drug analysis are cited under separate subheadings as described below.

4.1 General Methods of Screening for Drugs

Reports concerning the development or application of methodology designed to detect a wide range of drugs with diverse chemical structures are classified according to the following types of techniques:

4.1.1 Thin-Layer and Paper Chromatography. Methods which involve the separation of drugs by paper or thin-layer chromatographic techniques are referenced. Techniques used to confirm or quantitate results of the separation step may be other than paper or thin-layer chromatography.

4.1.2 Optical Techniques. Documents pertaining to methods primarily involving absorption spectrophotometry or spectrophotofluorometry are cited. Common techniques include ultraviolet, visible, and infrared absorption spectrometry, as well as fluorometric procedures.

4.1.3 Gas Chromatography. Methods involving vapor phase column chromatography are included under this heading. With the exception of gas chromatography, almost all of the referenced methods utilize columns containing a high-boiling, inert liquid (stationary phase) coated on a solid support--a technique called gas-liquid chromatography. A variety of detectors which can be used to increase sensitivity are also indexed here, including flame ionization, nitrogen-phosphorous, electron capture, and mass spectrometer detectors. The special instances in which a mass spectrometer is used as a gas chromatographic detector are cited in the following section.

4.1.4 Other Techniques. Methods which involve the application of an analytical technique to general drug screening, and which are not included in the above sections, are cited under this heading. Reports dealing with general drug screening by gas chromatograph-mass spectrometric and high-pressure-liquid-chromatographic techniques are included.

4.1.5 Screening Systems. Screening methods which employ two or more primary analytical techniques in general drug screening are referenced.

4.2 Specific Methods of Screening for Drugs

Articles describing methods developed for the specific analysis of individual drugs, small groups of drugs, therapeutic drug classes (e.g., anticonvulsive agents), or chemically-related drugs (e.g., barbiturates) are cited under this heading. The primary purpose of these methods is the detection and identification of specific drugs which may be present in body fluid samples. The differentiation of reports is similar to that used above for general screening methodology:

4.2.1 Thin-Layer and Paper Chromatography. See Section 4.1.1 for an explanation of the topic heading.

4.2.2 Optical Techniques. See Section 4.1.2 for an explanation of the topic heading.

4.2.3 Gas Chromatography. See Section 4.1.3 for an explanation of the topic heading.

4.2.4 Immunoassay. The immunochemical methods are characterized by their use of antibodies obtained from the antisera of animals injected with drug-attached antigens. Papers on the basic theory and techniques of the four most common techniques are referenced: free radical assay technique, enzyme multiplied immunoassay technique, hemagglutination inhibition, and flame ionization.

4.2.5 Other Techniques. Techniques not specifically included in the above section are included under this heading. Examples are mass fragmentography, differential pulse polarography, and "hybrid" methods using a combination of techniques such as high pressure liquid chromatography-mass spectrometry.

4.3 Methods for Confirmatory/Quantitative Drug Analysis

Included are articles describing analytical methods which are used to confirm the identity of drugs detected by other methods and/or which are used to quantitate specific drugs present in biological liquids. Documents are cited according to specific techniques, as follows:

4.3.1 Optical Techniques. See Section 4.1.2 for an explanation of the topic heading.

4.3.2 Gas Chromatography. See Section 4.1.3 for an explanation of the topic heading.

4.3.3 Gas Chromatography-Mass Spectrometry. Quantitative or confirmatory methods which utilize a gas chromatography-mass spectrometer (GC-MS) are referenced. Several GC-MS ionization modes, including electron-impact and chemical ionization techniques, may be represented.

4.3.4 Immunoassay. See 4.2.4 for an explanation of the topic heading.

4.3.5 Other Techniques. Confirmatory/quantitative methods not specifically included in the above sections are included under this heading.

4.4 Evaluation of Analytical Methods

Articles which deal with the evaluation of drug analytical methodology are cited in one of the two following categories:

4.4.1 Evaluation of Methods. Included are reports which detail the development and evaluation of drug analysis methods, or which evaluate a method or technique currently available for use.

4.4.2 Intermethod Comparison. Included are reports which describe the evaluation of newly developed methods by comparison with established methods, or which evaluate existing methods (in terms of cost, availability, analytical characteristics, etc.) for specific purposes, for example, the analysis of morphine.

4.5 Evaluation of Analytical Performance

Documents dealing with the evaluation of laboratory analytical performance are included under this heading. Articles are cited under two separate headings:

4.5.1 Quality Control. Intra-laboratory aspects of analytic capability are topics included under this heading. The accuracy and precision of an analytical procedure, as well as consistency of method application are examples of factors involved in quality control.

4.5.2 Testing Laboratory Proficiency. Documents included under this heading pertain to the external evaluation of laboratories for proficiency in drug analysis. Studies include the multi-laboratory assessment of analytic capability as well as discussions of methodology appropriate for use in proficiency testing.

5.0 CONCENTRATIONS OF DRUGS IN THE HUMAN BODY

The importance of drug concentration data, for data interpretation as well as in the design of drug screening systems, is reflected in this general topic area. Reports which contain drug concentration data or which deal specifically with the determination of drug levels in body fluids are cited under three categories:

- Data compilations (5.1),
- Incidental reports of drug concentrations following drug administration (5.2), and
- Factors which influence the concentration of drugs in body fluids (5.3).

These categories are further broken down as described below:

5.1 Compilations.

Reports which contain collections of drug concentration data are cited under two main subheadings as follows:

5.1.1 Tabulated Data. Documents which report general data pertaining to therapeutic, toxic, or fatal levels of drugs in body fluids are included.

5.1.2 Epidemiologic Research. Collections of drug concentration data which result from original research are cited according to the following populations:

5.1.2.1 Studies of Drugs in Drivers. Investigations of actual drug levels in the body fluids of drivers are cited.

5.1.2.2 Studies of Drugs in Patients. Drug concentration data obtained from patients, including drug-overdose victims, are contained in referenced documents.

5.1.2.3 Studies of Drugs in Other Groups. Drug concentration data collections not specifically included above are cited. Reports primarily deal with the determination of drug blood levels in drug-involved deaths.

5.2 Specific Reports of Drug Concentrations in Man

Articles in which the determination of drug body fluid levels followed the administration of one or more dosage levels are here cross-referenced according to the mode of drug administration and according to the type of study in which these determinations were made:

5.2.1 Studies with Acute Doses. Investigations in which drug concentration determinations were made following a single drug dose administration are cited. Studies which involve the one-time administration of a drug to experimental subjects described as "chronic users" are included under this heading.

5.2.2 Studies with Chronic Doses. Investigations in which drug concentration determinations were made following two or more dose administrations are cited.

5.2.3 Studies of Pharmacokinetics. More extensive investigations into the level of drugs in body fluids as a function of time after drug administration are included under this heading. Relevant reports are classified according to the mode of drug administration:

5.2.3.1 Acute Doses. See Section 5.2.1 for an explanation of the topic heading.

5.2.3.2 Chronic Doses. See Section 5.2.2 for an explanation of the topic heading.

5.2.4 Studies Correlating the Concentrations of Drugs in Different Body Fluids. Investigations which attempt to correlate human drug levels in two or more body fluids are referenced. Experiments usually involve the simultaneous collection of different body fluid samples following the administration of a single drug.

5.3 Studies of Factors Influencing Drug Concentrations in Body Fluids

Articles dealing with background variables which influence drug levels are included under this heading. Both experimental reports and review documents are cited according to the following subheadings:

5.3.1 Absorption and Distribution of Drugs. Reviews and studies of variables which operate during the pharmacokinetic phases of drug absorption and distribution are cited. The relationship of bioavailability in drug formulation and variability of patient response, and the influence of simultaneous food intake on resulting drug levels are examples of specific topics.

5.3.2 Metabolism of Drugs. Factors such as metabolic enzyme induction and inhibition and the first-pass metabolism of administered drugs are included under this heading.

5.3.3 Analytical Variables. Documents which discuss the influence of analytical methods on the objective determination of drug levels in body fluids are cited.

5.3.4 Other Factors. Articles which deal in a general way with this topic area, or which deal with factors not specified above, are included under this heading.

6.0 SOCIOLEGAL STUDIES

Documents concerned with the social and legal factors involved in the drug-driving problem are classified according to specific issues in the topic area.

6.1 Research with Human Subjects

In this section are cited papers concerned with the ethical considerations of using humans in scientific research, particularly laboratory experimentation. Cited are papers dealing with studies of driving performance, behavior, and drug effects.

6.2 Informed Consent

Papers in this section discuss the historical, theoretical, ethical, legal, and practical aspects and implications of informed consent in medical procedures and experimental research. Studies discussing the implications of informed consent for both researcher and subject are included.

6.3 Researcher Privilege

At present, most state laws require that researchers disclose relevant data obtained in laboratory experimentation or scientific research in a court of law even though disclosure of that data might subject the individual to criminal prosecution or civil liability. Papers cited here discuss the issue of exempting the researcher from being forced to testify against a subject.

6.4 Right of Privacy/Confidentiality

Due to the personal and potentially incriminating nature of the data collected for drug and driving research, it is unlikely that a representative sample of the general driving population or accident population will cooperate with researchers unless they have assurance that this information will not be made public. Cited in this category are papers dealing with the subject's right of privacy, particularly the legal complexities involved.

6.5 Other Sociolegal Topics

Cited are papers on a broad variety of sociolegal subjects not related to those above. This category includes publications discussing scheduling of drugs, federal regulations for drugs, prosecution and adjudication of drug-impaired driving, decriminalization of marijuana, state medico-legal death investigative systems, and government drug control programs.

7.0 COUNTERMEASURES IN DRUGS AND HIGHWAY SAFETY

Referenced here are papers on efforts to reduce the drug-driving problem. Underlying theories of these countermeasure programs, their development activities, and implementation are described and evaluated. Studies are cited under the following subheadings indicating chronological stage of development.

7.1 Concepts

Social, legal, political, psychological, and economic theories, considerations, and implications of countermeasures for drug abuse and unsafe driving are discussed in papers referenced in this category. Specifically included are papers discussing conceptual frameworks and themes for drug abuse treatment programs, public information and education campaigns, and legislation related to the drug-driving problem.

7.2 Development, Testing, and Evaluation

Referenced are studies reporting specific programs or types of programs directed at reducing use of drugs while driving, drug abuse, and unsafe driving. These programs are described and evaluated in terms of their history, objectives, activities, and results.

7.3 Demonstration and Implementation

Papers referenced here provide practical recommendations for carrying out countermeasure programs for the drug-driving problem. Also referenced are representative pamphlets of some recent public information and education campaigns.

8.0 DRUG NAME SUBINDEX

This section provides an index of papers by drug. In general, papers are not listed under a given drug if the study only mentions the drug in an incidental or anecdotal manner. Rather, an attempt was made to list only those papers containing significant information about a drug.

Papers pertaining to each drug are listed under its preferred name by accession number in alphanumeric order. An asterisk beside an accession number indicates that the cited document (1) contains information concerning drug concentrations in body fluids or (2) reports the measurement of body fluid concentrations following the drug's administration to human subjects.

Three types of drug names are used in this drug index. The majority of drugs are identified by a preferred drug name, that is, the chemical or generic name. Under this preferred drug name all relevant papers are cited. For preparations having no chemical or generic name or containing more than one drug, trade names are used. Accession numbers are listed under a trade name only when there is no other chemical or generic name. For all other trade names the reader is referred to the preferred drug name for the relevant accession numbers.

A third type of drug identification that appears occasionally in this index is the drug class name. Papers will be cited under a drug class name only when no specific drug is mentioned in the paper. In all other cases relevant papers will be cited under the preferred drug name or trade name.

9.0 DRUG CLASS SUBINDEX

The purpose of this section is to aid the user in identifying common therapeutic uses of a drug and to provide a succinct listing of identified drugs by type. The classification scheme developed for Supplement One was revised for this bibliographic supplement.

Three separate lists of drug classes comprise this subindex. Section 9.1 identifies documents that refer to drug classes, rather than specific drugs or substances. Section 9.2 shows each drug class followed by preferred drug names from the Drug Name Subindex (Section 8.0). The final listing, Section 9.3, presents the drug classification scheme. The outline is structured by prefix numbers for the different drug classes. The number is divided into three parts, separated by dashes. The first part identifies the general group of drug classes; the second, two-digit part identifies the major drug classes, and the last digit identifies minor drug classes. In this way, drugs that are chemically, pharmacologically, or therapeutically similar can be identified by using Sections 9.2 or 9.3, and the documents discussing them can be located by referring to Section 8.0. Also, articles that only discuss a class of drugs, rather than individual agents, are easily found in Section 9.1.

TOPICAL INDEX

1.0 REVIEWS AND COMPILATIONS

1.1 Reviews of Drugs and Highway Safety

73-D0721	75-D0724	75-D0725	75-D0731	75-D0735	75-D0742	73-D0764
74-D0778	77-D0829	77-D0833	77-D0848	76-D0851	77-D0866	77-D0869
74-D0873	77-D0887	77-D0893	77-D0901	72-D0902	77-D0905	78-D0907
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79-D0959	74-D0965	78-D0967	74-D0985	76-D0989	76-D0990	

1.2 Research on the Use of Drugs

74-A0012	76-D0711	76-D0720	76-D0723	72-D0860	72-D0861	77-D0870
78-D0911	78-D0915	79-D0959	77-D0998	77-D0999	76-D1000	77-E0005
76-E0009	71-E0014	77-E0016	77-E0017	75-E0019	72-E0024	72-E0025
72-E0026	72-E0027	74-E0033	77-E0035	77-E0036	78-E0040	77-E0067
77-E0068	77-E0069	77-E0070	73-E0073			

1.3 Research on the Effects of Drugs

1.3.1 Reviews of Drugs or Classes of Drugs

75-B0010	76-D0704	75-D0735	76-D0754	75-D0755	76-D0756	76-D0757
74-D0760	75-D0761	76-D0771	76-D0774	75-D0796	76-D0797	76-D0807
75-D0820	75-D0821	75-D0822	77-D0828	76-D0839	77-D0847	74-D0857
72-D0859	72-D0860	72-D0861	71-D0864	71-D0865	77-D0866	77-D0870
77-D0875	76-D0881	78-D0884	71-D0894	72-D0895	75-D0896	75-D0897
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74-E0033	77-E0035	77-E0070				

1.3.2 Reviews of the Relationships Between Drug Effects and Their Concentration in Body Fluids

75-B0010	75-D0736	74-D0760	75-D0761	74-D0799	75-D0819	75-D0898
75-D0899						

1.4 Methodology in Drugs and Highway Safety

1.4.1 Methodology in Survey Research

75-D0726	75-D0727	75-D0745	74-E0003	77-E0004	77-E0005	75-E0008
76-E0009	77-E0038	77-E0055	78-E0061	78-E0062	77-E0067	77-E0068
73-E0073	74-E0074	77-L0100				

1.4.2 Methodology in Behavioral Research

75-D0737	75-D0745	67-D0753	76-D0774	74-D0940	74-D0964	73-D0977
77-E0038	77-F0001	76-F0002	70-F0004	70-F0005	71-F0006	71-F0007
71-F0008	77-F0009	77-F0021	77-F0022	77-F0024	77-F0025	64-F0028
78-F0029						

1.4.3 Methodology in Drug Analysis

79-D0959	74-M0200	75-M0201	72-M0202	75-M0203	75-M0204	75-M0208
75-M0209	75-M0211	76-M0213	70-M0214	74-M0216	72-M0221	73-M0226
75-M0227	75-M0233	75-M0234	74-M0236	74-M0237	76-M0246	76-M0248
74-M0251	76-M0258	76-M0263	75-M0272	77-M0274	77-M0275	77-M0279
78-M0287	73-P0030					

1.5 Selected Reviews

76-B0009 (drug abuse)
65-D0809 (pharmacogenetics)
72-D0811 (pharmacogenetics)
76-D0816 (pharmacokinetic and pharmacodynamic aspects of treatment of depression with tricyclic drugs)
76-D0817 (relation of pharmacokinetics to pharmacological activity)
76-D0840 (motor vehicle accident causal system)
72-D0860 (treatment of barbiturate dependence)
77-D0890 (relationship between subjective feelings and critical flicker frequency)
77-D0891 (relationship between mental set and vigilance)
75-D0900 (drug interactions)
75-D0994 (epilepsy and driving)
74-E0007 (theories of drug dependence)
76-E0009 (quality of street drugs)
77-E0016 (drug use by the elderly)
77-E0017 (drug abuse by the elderly)
76-E0018 (personality factors in highway accidents)
75-E0019 (street drug analysis programs)
72-E0023 (legal and illegal distribution of amphetamines and barbiturates)
72-E0024 (cocaine use)
72-E0025 (amphetamine abuse)
72-E0026 (amphetamine use)
69-E0028 (illegal distribution and manufacture of amphetamines)
77-E0051 (history of nonmedical opiate use in Canada)
77-E0052 (history of nonmedical opiate use in Canada)
76-F0003 (social interaction patterns in driver behavior)
78-F0035 (medical and legal aspects of placebo use)
59-F0036 (pharmacology of placebos)
74-M0207 (mathematical models for drug actions)
76-M0213 (factors affecting laboratory drug analysis)
73-M0226 (affinity chromatography)
75-M0227 (development of gas chromatography)
72-M0278 (street drug analysis by community based drug programs)
77-M0279 (techniques used in biochemical and molecular studies)
77-M0280 (quality control in the clinical laboratory)
72-P0007 (bioavailability and the public interest)
76-P0023 (the utility of pharmacokinetics to the pharmaceutical industry)

1.6 Compilations

71-A0010 (drugs of abuse)
75-A0011 (drugs and driving)
74-A0012 (nonmedical use of drugs in occupational and industrial settings)
75-A0013 (benzodiazepines)
69-A0014 (levels and effects of carbon monoxide in drivers)
76-A0015 (coca and cocaine effects and abuse)
74-A0016 (women and drug use)
72-A0017 (methaqualone)
69-A0018 (stimulants)
78-A0019 (drugs and driving)
77-A0020 (theory, operational performance, and physiological correlates of vigilance)
77-A0021 (economic aspects of the ethical pharmaceutical industry)
72-B0011 (analytical profiles of specific drugs)
73-B0012 (analytical profiles of specific drugs)
74-B0013 (analytical profiles of specific drugs)
75-B0014 (analytical profiles of specific drugs)
76-B0015 (analytical profiles of specific drugs)
74-B0016 (drug use by the elderly)
79-D0708 (behavioral aspects of smoking)
76-D0808 (self-evaluation of drug effects by test subjects)
77-D0825 (drugs, alcohol, and driving)
77-D0848 (drugs and driving)
76-D0851 (drugs and driving)
77-D0871 (drugs and driving)
77-D0885 (cocaine effects and use)
78-D0942 (alcohol, drugs, and driving)
76-D0995 (use of narcotic antagonists in the treatment of opiate addiction)

76-D0996 (l-alpha-acetylmethadol as an alternative to methadone for treatment of heroin addicts)
76-D0997 (use of naltrexone as a narcotic antagonist in the treatment of opiod addiction)
77-D0998 (adverse effects of inhalant abuse)
77-D0999 (epidemiology, etiology, and effects of smoking)
76-D1000 (psychosocial aspects of cocaine use)
77-E0005 (epidemiologic issues of drug abuse)
77-E0016 (drug use by the elderly)
76-L0109 (drugs and crime)
77-L0110 (drug users and the criminal justice system)
79-M0362 (cannabinoid analysis in physiological fluids)
78-M0367 (instrumental applications in forensic drug chemistry)

2.0 EPIDEMIOLOGIC RESEARCH

2.1 Studies of Drug Use Among Drivers and Its Consequences

2.1.1 Analysis of Drivers' Body Fluids for Drugs

76-D0701 79-D0707 76-D0719 75-D0728 75-D0729 75-D0732 75-D0739
75-D0741 75-D0746 75-D0747 79-D0759 77-D0838 77-D0843 77-D0856
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76-F0012 75-F0034

2.1.2 Self-Reported Drug Use by Drivers

76-D0702 75-D0730 75-D0733 73-D0765 77-D0831 77-D0868 77-D0886
78-D0911 76-D0960

2.1.3 Record-Based Surveys

76-D0719 75-D0730 73-D0765 77-D0886 78-D0915 76-D0960

2.2 Studies of Drug Use in Nondriving-Specific Populations

2.2.1 National Surveys

77-C0008 77-C0009 76-D0710 79-D0759 74-E0002 76-E0032 77-E0039
78-E0041 78-E0042 77-E0043 77-E0044 78-E0061 77-E0072

2.2.2 Regional or Local Surveys

75-D0705 75-D0713 75-D0717 72-D0862 78-D0933 74-E0001 75-E0006
74-E0010 75-E0011 74-E0012 77-E0013 71-E0015 75-E0020 75-E0021
75-E0022 69-E0029 76-E0030 75-E0031 77-E0034 71-E0045 77-E0046
77-E0048 74-E0049 77-E0050 78-E0053 77-E0054 77-E0056 78-E0057
77-E0058 77-E0059 76-E0060 78-E0062 77-E0063 75-E0064 77-E0065
77-E0066 77-E0071 74-L0090 76-L0103 72-M0276 75-M0281

2.3 Crash Investigation

76-D0750 71-D0751 75-D0793 77-D0803 77-D0886 76-D0960 76-E0018
77-E0037 77-E0047 76-F0010 76-F0012 77-F0026

3.0 EXPERIMENTAL RESEARCH

3.1 Studies of Drugs Administered Alone

3.1.1 Studies Comparing Different Drugs

76-D0703 79-D0706 79-D0722 75-D0738 75-D0761 76-D0762 76-D0770
73-D0775 75-D0780 74-D0783 75-D0784 77-D0789 76-D0790 76-D0791
76-D0792 77-D0794 74-D0795 75-D0798 77-D0800 76-D0801 76-D0834
77-D0842 76-D0850 77-D0852 76-D0867 77-D0906 78-D0921 76-D0923
78-D0930 78-D0939 72-D0941 75-D0948 76-D0950 75-D0957 75-D0958
77-D0963 78-D0968 78-D0973 75-D0983 76-D0984

3.1.2 Studies of Acute Doses

79-D0706 79-D0709 79-D0722 76-D0749 75-D0761 76-D0767 76-D0768
76-D0769 73-D0775 73-D0776 75-D0781 74-D0783 75-D0784 74-D0787
77-D0789 76-D0792 77-D0800 76-D0805 76-D0832 75-D0835 77-D0842
77-D0849 77-D0852 77-D0853 74-D0858 72-D0862 77-D0872 77-D0875
77-D0878 77-D0880 77-D0889 77-D0892 75-D0904 78-D0929 77-D0931
78-D0946 76-D0949 74-D0956 76-D0966 76-D0970 64-D0972 76-D0984
71-D0993

3.1.3 Studies of Chronic Doses

76-D0703 75-D0761 76-D0762 76-D0770 76-D0772 75-D0777 75-D0782
75-D0785 74-D0786 76-D0790 76-D0791 77-D0794 77-D0800 76-D0802
76-D0804 76-D0805 76-D0815 76-D0823 75-D0824 77-D0830 77-D0841
76-D0846 70-D0863 77-D0882 76-D0888 77-D0909 78-D0914 78-D0919
76-D0922 74-D0936 72-D0941 74-D0951 75-D0952 74-D0953 75-D0957
74-D0961 77-D0963 74-D0974 71-D0982 74-D0986 78-D1001

3.1.4 Studies Relating Dose and Effects

76-D0700 79-D0706 79-D0709 75-D0761 73-D0766 76-D0767 76-D0768
76-D0770 76-D0772 73-D0775 73-D0776 75-D0782 74-D0786 76-D0791
75-D0798 77-D0800 76-D0801 76-D0802 76-D0804 77-D0810 76-D0815
76-D0818 75-D0824 76-D0834 77-D0836 76-D0846 76-D0850 76-D0867
77-D0875 77-D0876 77-D0878 77-D0879 77-D0883 76-D0888 77-D0889
75-D0903 77-D0909 74-D0916 76-D0918 77-D0928 77-D0931 68-D0976
71-D0982 75-D0983 71-D0993 77-E0034

3.1.5 Other Studies

78-D0758 77-D0844 78-D0925 78-D0954 74-D0978 74-D0979

3.2 Studies of Two or More Drugs Administered Together ("Drug Interaction" Studies)

3.2.1 Studies of the Combined Effects of Drugs

76-D0703 76-D0704 75-D0740 75-D0743 75-D0744 75-D0761 76-D0762
76-D0773 74-D0779 75-D0780 74-D0783 77-D0789 76-D0790 76-D0806
76-D0814 76-D0826 75-D0827 76-D0834 77-D0837 77-D0842 77-D0845
77-D0877 77-D0906 77-D0937 72-D0941 75-D0948 74-D0951 75-D0957
76-D0971 77-D0991

3.2.2 Other Studies

75-D0854 75-D0855

3.3 Research on the Effects of Drugs or on Driving Performance Skills

3.3.1 Studies with Behavioral Methods Related to the Driving Task

3.3.1.1 Tests on the Open Road

75-D0777 77-D0830 77-D0908 78-D0914 74-D0936 77-F0015
76-F0016 78-F0030 58-F0032

3.3.1.2 Tests on Closed Driving Courses

79-D0722 77-D0794 76-D0834 77-D0882 77-D0889 77-D0909
78-D0914 76-D0922 74-D0961 77-D0963 76-D0970

3.3.1.3 Tests on Driving Simulators

79-D0706 79-D0709 75-D0740 76-D0749 76-D0769 73-D0775
73-D0776 77-D0788 77-D0789 77-D0830 77-D0842 76-D0867
77-D0883 74-D0916 78-D0925 72-D0941 75-D0948 78-D0954
77-D0962 77-F0001 77-F0011 77-F0018 77-F0019

3.3.2 Studies with Psychophysical Tests

3.3.2.1 Tests of Psychomotor Skills

76-D0700 76-D0703 75-D0744 76-D0749 75-D0761 76-D0762
73-D0766

3.3.2.1 Tests of Psychomotor Skills

76-D0767 76-D0768 76-D0769 76-D0770 76-D0772 73-D0776
74-D0779 75-D0780 75-D0781 75-D0782 74-D0783 75-D0784
74-D0786 74-D0787 77-D0789 76-D0790 76-D0791 76-D0792
77-D0794 76-D0818 76-D0832 76-D0834 77-D0841 76-D0846
77-D0852 77-D0853 75-D0855 74-D0858 77-D0876 77-D0877
77-D0882 77-D0906 76-D0918 78-D0919 78-D0921 76-D0923
78-D0925 78-D0929 77-D0937 77-D0938 74-D0956 75-D0957
75-D0958 77-D0963 76-D0970 76-D0971 64-D0972 78-D0973
74-D0974 68-D0976 71-D0982 75-D0983 76-D0984 74-D0986
77-D0991 77-D0992 71-D0993

3.3.2.1 Tests of Psychomotor Skills

77-F0014 76-F0016 77-F0017 77-F0023 58-F0032

3.3.2.2 Tests of Sensory Functions

79-D0709 75-D0738 75-D0761 73-D0766 76-D0767 76-D0772
75-D0781 75-D0782 74-D0783 75-D0784 76-D0790 76-D0792
77-D0794 76-D0826 75-D0827 76-D0834 77-D0842 77-D0844
77-D0845 76-D0846 77-D0853 74-D0858 76-D0867 77-D0880
77-D0883 75-D0903 75-D0904 76-D0918 74-D0936 72-D0941
74-D0951 77-D0963 76-D0970 64-D0972 78-D0973 74-D0974
74-D0975 68-D0976 76-D0984 78-F0029 74-F0033

3.3.3 Studies with Psychological Tests

76-D0767 76-D0768 76-D0770 76-D0772 73-D0775 73-D0776 75-D0777
74-D0779 75-D0780 75-D0782 74-D0783 75-D0785 74-D0786 76-D0792
77-D0794 77-D0800 76-D0802 76-D0805 76-D0818 76-D0832 77-D0841
77-D0844 76-D0850 75-D0854 75-D0855 74-D0858 72-D0862 70-D0863
77-D0875 77-D0876 77-D0877 77-D0879 77-D0892 75-D0904 78-D0919
76-D0922 76-D0923 78-D0929 77-D0937 77-D0938 78-D0939 72-D0941
76-D0949 75-D0952 75-D0958 78-D0973 68-D0976 71-D0982 75-D0983
77-D0992 71-D0993 77-E0034 77-E0037 77-F0020 78-F0027 58-F0032

3.3.4 Studies with Physiological Tests

75-D0743 76-D0749 76-D0772 74-D0787 76-D0805 76-D0806 77-D0810
76-D0814 76-D0818 76-D0832 76-D0834 75-D0835 77-D0836 74-D0858
70-D0863 77-D0877 77-D0889 77-D0906 78-D0921 76-D0923 77-D0928
78-D0930 77-D0931 74-D0936 77-D0938 78-D0939 76-D0950 75-D0958
78-D0968 71-D0982 77-F0023 78-F0030 78-F0031

3.3.5 Clinical Studies

76-D0772 75-D0777 74-D0786 76-D0791 77-D0800 76-D0802 77-D0830
77-D0837 75-D0854 75-D0855 74-D0953 76-D0966 78-D0973 77-E0034

3.3.6 Studies Including Self-Evaluation of Drug Effects by Test Subjects

76-D0772 73-D0776 75-D0777 75-D0785 74-D0786 76-D0792 75-D0798
77-D0810 77-D0830 74-D0858 72-D0862 77-D0882 78-D0921 78-D0930
77-D0931 74-D0974 71-D0982

3.3.7 Factors Influencing the Effects of Drugs on Human Behavior

3.3.7.1 Age

74-D0936

3.3.7.2 Gender

77-D0844

3.3.7.3 Personality

75-D0733 77-D0844 70-D0863 74-D0961 71-D0993

3.3.7.4 Other

75-D0781 (previous use of marijuana)
75-D0785 (physical environment)
76-D0805 (previous use of marijuana)
77-D0928 (physical environment, specifically noise)
78-D0929 (motivation to compensate for impairing drug effects)
78-D0933 (lifestyle of the drug user)
78-D0946 (social environment)

3.4 Research on the Relationship Between the Effects of Drugs and Their Concentration in Body Fluids

3.4.1 Studies of Skills Related to Driving

76-D0700 75-D0798 76-D0818 77-D0962 74-D0974 77-D0992

3.4.2 Clinical Studies

77-D0800 76-D0802 76-D0815 76-D0949 76-D0950 74-M0239

3.5 Research Involving Animals

75-D0743 76-D0773 74-D0795 76-D0801 76-D0806 76-D0814 76-D0823
75-D0824 77-D0849 77-D0872 76-D0888 76-D0995 78-D1001

4.0 DETECTION, IDENTIFICATION, AND QUANTITATION OF DRUGS IN BIOLOGICAL SPECIMENS

4.1 General Methods of Screening for Drugs

4.1.1 Thin-Layer and Paper Chromatography

71-M0223 74-M0232 74-M0250 76-M0262 74-M0264 72-M0276 72-M0277

4.1.3 Gas Chromatography

77-M0245 75-M0269

4.1.4 Other Techniques

74-M0228 74-M0229 75-M0241 76-M0257 75-M0260 76-M0261 72-M0276
78-M0288

4.1.5 Screening Systems

73-M0215 75-M0255 77-M0273 75-M0281

4.2 Specific Methods of Screening for Drugs

4.2.1 Thin-Layer and Paper Chromatography

75-M0210 76-M0212 74-M0232 74-M0250 76-M0256 75-M0268

4.2.2 Optical Techniques

71-M0206 74-M0231 75-M0266

4.2.3 Gas Chromatography

76-M0212 73-M0238 76-M0244 75-M0267 74-M0270 77-P0027

4.2.4 Immunoassay

4.2.5 Other Techniques

77-D0926 73-M0230 76-M0252 76-M0271 77-M0289

4.3 Methods for Confirmatory/Quantitative Analysis

4.3.1 Optical Techniques

75-M0225

4.3.2 Gas Chromatography

75-M0225 73-M0238 74-M0239 75-M0243 75-M0259 74-M0285 76-M0286

4.3.3 Gas Chromatography-Mass Spectrometry

76-M0212 75-M0242 75-M0283

4.3.4 Immunoassay

75-M0235

4.3.5 Other Techniques

75-M0235 74-M0240 77-M0282 75-M0284 74-M0285

4.4 Evaluation of Analytical Methods

4.4.1 Evaluation of Methods

74-L0107 73-M0215

4.4.2 Intermethod Comparison

71-M0206 70-M0214 75-M0235 76-M0247 76-M0249 75-M0260 77-M0265
77-M0290

4.5 Evaluation of Analytical Performance

4.5.1 Quality Control

75-M0211

4.5.2 Testing Laboratory Proficiency

75-M0217 77-M0274

5.0 CONCENTRATIONS OF DRUGS IN THE HUMAN BODY

5.1 Compilations

5.1.1 Tabulated Data

70-M0218 73-M0219 75-M0220 77-P0025 77-P0028

5.1.2 Epidemiologic Research

5.1.2.1 Studies of Drugs in Drivers

76-D0701 76-D0719 77-D0856 75-M0225

5.1.2.2 Studies of Drugs in Patients

76-P0032 76-P0033 78-P0042

5.1.2.3 Studies of Drugs in Other Groups

79-D0759 75-D0780 75-M0224 75-M0225 77-P0025 78-P0037
78-P0038 78-P0039

5.2 Specific Reports of Drug Concentrations in Man

5.2.1 Studies with Acute Doses

74-D0783 75-D0784 76-D0792 75-D0798 75-D0899 78-D0921 76-D0949
76-M0205 74-M0239 74-M0240 75-M0243 75-M0259 75-M0269 74-M0270
77-M0282 76-P0014 75-P0015 79-P0045

5.2.2 Studies with Chronic Doses

75-D0782 76-D0802 76-D0815 76-D0818 77-M0282 77-M0289 75-P0016
78-P0036 78-P0041 78-P0042 79-P0045

5.2.3 Studies of Pharmacokinetics

5.2.3.1 Acute Doses

75-D0899 78-D0921 76-D0950 74-M0240 75-M0242 75-M0253
75-M0259 76-M0271 75-M0283 75-M0284 74-M0285 76-M0286
76-P0021 77-P0026 77-P0027 76-P0029

5.2.3.2 Chronic Doses

76-D0950 74-D0974 75-M0283 74-M0285 76-M0286 76-P0021
77-P0027 76-P0029 78-P0040

5.2.4 Studies Correlating the Concentrations of Drugs in Different Body Fluids

76-M0205 73-M0230 74-M0240 75-M0242 74-M0270 75-M0284 74-M0285
76-M0286 78-P0036 78-P0037 78-P0038 78-P0039 78-P0041 79-P0045

5.3 Studies of Factors Influencing Drug Concentrations in Body Fluids

5.3.1 Absorption and Distribution of Drugs

76-D0817 75-P0001 76-P0004 72-P0009 72-P0010 76-P0012 75-P0013
76-P0014 73-P0018 73-P0019 76-P0020 76-P0022 76-P0024 78-P0046

5.3.2 Metabolism of Drugs

76-D0817 75-P0013

5.3.3 Analytical Variables

72-P0011 78-P0041

5.3.4 Other Factors

75-D0899 76-M0254 76-P0002 76-P0003 76-P0005 76-P0006 76-P0008
75-P0015 73-P0017 73-P0031 76-P0034 76-P0035 78-P0040 78-P0042
78-P0043 78-P0044

6.0 SOCIOLEGAL STUDIES

6.1 Research with Human Subjects

77-L0088 77-L0092 77-L0094 72-L0102

6.2 Informed Consent

77-L0092 72-L0102

6.3 Researcher Privilege

6.4 Right of Privacy/Confidentiality

6.5 Other Sociolegal Topics

75-D0714 76-D0763 77-D0828 75-D0987 75-D0988 75-L0089 74-L0090
72-L0091 77-L0095 77-L0097 77-L0098 77-L0100 78-L0101 76-L0103
78-L0104 74-L0107 78-L0111 78-L0112 78-L0113 75-L0114 72-M0222
72-P0007

7.0 COUNTERMEASURES IN DRUGS AND HIGHWAY SAFETY

7.1 Concepts

71-C0005 78-C0013 75-C0014 76-C0015 77-C0017 76-D0712 76-D0715
75-D0716 75-D0718 75-D0734 75-D0748 76-D0763 77-D0893 75-D0969
71-E0014 77-E0067 77-E0068 76-F0013 78-F0030 78-F0031 75-L0085
72-L0091 76-L0093 78-L0106 77-L0108 77-L0115

7.2 Development, Testing, and Evaluation

76-C0001 76-C0002 76-C0003 77-C0004 73-C0006 77-C0007 77-C0009
77-C0010 78-C0011 78-C0012 75-C0014 70-C0016 79-D0707 75-D0718
75-D0746 75-D0752 77-E0063 77-L0086 77-L0087 77-L0096 77-L0099
78-L0104 76-L0105 75-L0114

7.3 Demonstration and Implementation

75-D0752

8.0 DRUG NAME SUBINDEX

9.0 DRUG CLASS SUBINDEX

9.1 Drug Class and Accession Number List

Analgesics and Antipyretics
76-D0702 74-D0953*

Anesthetics
77-D0848

Antibiotics
76-P0035

Antidepressants
76-D0807 76-D0816 70-D0910 75-D0981 76-M0258

Antihistamine Agents
78-D0907

Antituberculars
76-D0702

Barbiturates
77-D0843 76-D0851 75-D0855 72-D0860 78-D0884 75-D0898* 78-D0907
70-D0910 75-E0020 72-E0023 72-E0027 77-E0035 78-E0040 74-E0049
75-M0235

Cannabis Sativa L. and Related Agents
78-D0942

Cardiovascular Agents
76-P0035

Central Nervous System (CNS) Agents
76-D0797 77-D0869 75-D0900 76-P0035

Hallucinogens and Related Agents
77-D0848 70-D0910 75-E0020 76-E0032 78-E0041 78-E0042 77-E0043
77-E0044 77-E0046 74-E0049 75-E0064 78-P0044

Minor Tranquilizers (Anti-Anxiety and Ataractics)
75-A0013 76-D0701

Opiates and Related Agents
75-D0717 75-D0729 75-D0755 76-D0839 77-D0848 76-D0851 75-D0855
76-D0995 74-E0003 76-E0032 78-E0041 78-E0042 77-E0043 77-E0044
74-E0049 77-E0051 77-E0052

Other Toxicants
75-D0713 77-D0998 76-E0032 77-E0044 74-E0049

Sedatives and Hypnotic Agents
76-D0704 75-D0729 77-D0848 75-D0855 78-D0884 74-E0002 76-E0032
77-E0043 77-E0044 77-E0059

Stimulants
69-A0018 73-D0721 76-D0806 77-D0831 77-D0848 76-D0851 78-D0907
70-D0910 75-E0020 72-E0023 72-E0025 72-E0026 69-E0028 69-E0029
76-E0032 78-E0040 77-E0043 77-E0044 77-E0046 74-E0049

Tranquilizers
77-D0848 76-D0851 78-D0907 70-D0910 75-E0020 76-E0032 77-E0043
77-E0044 74-E0049 77-E0054 77-E0059

Volatile Solvents
75-D0713 77-D0998 76-E0032 77-E0044 74-E0049

9.2 Drug Class and Drug Name List

Adrenals
- corticosterone
- dexamethasone
- fludrocortisone
- methylprednisolone sodium succinate
- triamcinolone

Analgesics and Antipyretics
- acetaminophen
- alclofenac
- aminopyrine
- antipyrine
- carbamazepine
- cyclazocine
- Distalgesic(R) (dextropropoxyphene + acetaminophen)
- hydroxychloroquine
- indomethacin
- methotrimeprazine
- phenacetin
- phenazopyridine
- phenylbutazone
- propoxyphene
- propyphenazone
- salicylate
- tramadol

Androgens
- testosterone

Anorectic (Appetite Control) Agents
- chlorphentermine
- clortermine
- dextroamphetamine
- diethylpropion
- fenfluramine
- levamphetamine
- phenmetrazine
- phentermine

Anti-Anginal Agents
- amyl nitrite
- bupranolol
- isosorbide dinitrate
- propranolol

Anti-Arrhythmia Agents
- chinidine
- disopyramide
- lidocaine
- mexiletine
- practolol
- procainamide
- propranolol
- quinidine sulfate

Anti-Asthmatics
- aminophylline
- ephedrine
- etofylline
- proxyphylline
- theophylline

Anti-Coagulants
- dicumarol
- heparin
- warfarin

Anti-Emetics

buclizine
chlorpromazine
cyclizine
metoclopramide
prochlorperazine
promethazine
propiomazine
tiapride
trimethobenzamide hydrochloride

Anti-Inflammatory Agents (Steroidal)
fludrocortisone

Anti-Parkinsonism Agents
levodopa
procyclidine

Anticonvulsants (Anti-Epileptics)
bromine
carbamazepine
clonazepam
ethosuximide
mephenytoin
methsuximide
nitrazepam
phenobarbital
phenytoin
primidone
sulthiame
valproate sodium

Antidepressants
amitriptyline
clomipramine
desipramine
doxepin
imipramine
isocarboxazid
lithium
mianserin
nomifensine
nortriptyline
oxypertine
phenelzine
protriptyline
tandamine
tranylcypromine
trazodone
viloxazine

Antidiarrhea Agents
difenoxin

Antiflatulents (Carminatives)
myristica

Antifungal Antibiotics
flucytosine

Antihistamine Agents
Actifed(R) (pseudoephedrine HCl + triprolidine HCl)
azatadine
chlorpheniramine
clemastine
cyclizine
dexchlorpheniramine
diphenhydramine
diphenylpyraline
Dristan(R) (phenylephrine HCl + chlorpheniramine maleate + aspirin)
hydroxyzine
ketotifen
mebhydrolin
methapyrilene

phenindamine
terfenadine
tripelennamine
triprolidine hydrochloride

Antineoplastic Agents
fluorouracil
methotrexate
procarbazine
testolactone
vinblastine sulfate
vincristine sulfate

Antituberculars
cycloserine
rifampin

Barbiturates
amobarbital
barbital
butabarbital
butalbital
heptabarbital
methohexital
pentobarbital
phenobarbital
secobarbital
Tuinal(R) (amobarbital sodium + secobarbital sodium)

Blood Derivatives
albumin
bilirubin
purine
pyrimidine

Cannabis Sativa L. and Related Agents
cannabichromene
cannabichromenic acid
cannabicyclol
cannabidiol
cannabidiolic acid
cannabielsoic acid
cannabigerol
cannabigerolic acid
cannabinol
cannabinolic acid
hashish
marijuana
delta-1-tetrahydrocannabinolic acid

Cannabis Sativa L. and Related Agents
delta-8-tetrahydrocannabinol
delta-9-tetrahydrocannabinol
delta-9-trans-tetrahydrocannabinol

Cardiac Glycosides
digitalis
digitoxin
digoxin

Cephalosporins
cefazolin
cephalexin
cephalothin
cephradine

Decongestant and Cold Preparations
phenylephrine
phenylpropanolamine
pseudoephedrine

Diagnostic Agents
diatrizoic acid

iodipamide

Diuretics
- bendroflumethiazide
- cyclothiazide
- methyclothiazide
- spironolactone

Emetics
- apomorphine

Enzyme Inhibitors
- allopurinol
- oxypurinol

Estrogens
- estradiol
- estrogen
- piperazine estrone sulfate

Expectorant and Cough Preparations (Antitusive Agents)
- codeine

Ganglionic Blocking and Stimulating Agents
- 2,5-dimethoxy-4-methylamphetamine (DOM) (STP)
- nicotine

Gases
- carbon monoxide
- nitrous oxide
- oxygen

General Anesthetics
- enflurane
- halothane
- hexobarbital
- nitrous oxide
- propanidid
- thiopental

Hallucinogens and Related Agents
- bufotenine
- cyclohexamine (PCE)
- N,N-diethyltryptamine (DET)
- N,N-dimethyltryptamine (DMT)
- 2,5-dimethoxy-4-bromoamphetamine (DOB)
- 2,5-dimethoxy-4-methylamphetamine (DOM) (STP)
- lysergic acid diethylamide (LSD)
- mescaline
- 5-methoxy-3,4-methylenedioxyamphetamine (MMDA)
- 4-methoxyamphetamine (PMA)
- methylenedioxyamphetamine (MDA)
- myristica
- nitrous oxide
- phencyclidine
- phenethylamine (PEA)
- 1(1-phenylcyclohexyl) pyrrolidine
- psilocin
- psilocybin
- 3,4,5-trimethoxyamphetamine
- yohimbine

Heavy Metals and Heavy Metal Antagonists
- copper
- lead
- mercury
- zinc

Hypotensive (Antihypertensive) Agents
- bendroflumethiazide
- clonidine
- cyclothiazide
- methyclothiazide

methyldopa
propranolol
reserpine
trimethaphan camsylate

Insulins
insulin

Laxatives
dioctyl sodium sulfosuccinate

Local Anesthetics
coca
cocaine
lidocaine
mepivacaine
prilocaine
procaine

Major Tranquilizers (Antipsychotics and Neuroleptics)
butaperazine maleate
chlorpromazine
chlorprothixene
clazepam
clozapine
droperidol
flupentixol
fluphenazine
halazepam
haloperidol
loxapine
mesoridazine
perazine
perphenazine
prochlorperazine
promethazine
reserpine
sulforidazine
sulpiride
thioridazine
tiapride
trifluoperazine
trifluopromazine hydrochloride

Metabolites of Drugs and Other Agents
7-acetamido clonazepam
6-O-acetylmorphine
N-acetylprocainamide
7-amino clonazepam
benzoylecgonine
carbamazepine-10,11-epoxide
demethylchloroimipramine
N-1-desalkylflurazepam
N-1-desalkyl-3-hydroxyflurazepam
desmethylchlordiazepoxide
N-desmethyldiazepam
desmethyldoxepin
didesethylflurazepam
10,11-dihydroxycarbamazepine
2-ethylidene-1,5,-dimethyl-3,3-diphenylpyrrolidine
flurazepam-N-1-acetic acid
N-1-hydroxyethylflurazepam
4-hydroxy-2-ethyl-2-phenylglutarimide
10-hydroxynortriptyline
3-hydroxypinazepam
monodesethylflurazepam
morphine 3-ethereal sulfate
morphine 3-glucuronide
morphine 3,6-diglucuronide
morphine 6-glucuronide
normeperidine
normorphine
normorphine 6-glucuronide

norpropoxyphene
oxazepam
psilocybin
ritalinic acid
temazepam
delta-1-tetrahydrocannabinolic acid
11-nor-delta-9-THC-9-carboxylic acid

Minor Tranquilizers (Anti-Anxiety and Ataractics)
bromazepam
buclizine
chlordesmethyldiazepam
chlordiazepoxide
clobazam
clorazepate
N-desmethyldiazepam
diazepam
etifoxine
hydroxyzine
lorazepam
medazepam
meprobamate
methyloxazepam
oxanamide
oxazepam
phenaglycodol
pinazepam
temazepam
tofizopam
trazodone
triflubazam (ORF 8063)
tybamate

Miotics
echothiophate iodide

Muscle Relaxants (Central)
benzoctamine
carisoprodol
diazepam

Mydriatics
atropine sulfate
scopolamine
tropicamide

Neurochemicals, Neurotransmitters, and Neurohormones
gamma-hydroxybutyric acid (GABA)
levarterenol
serotonin

Neuromuscular Blocking (Antimuscarinic) Agents
clidinium bromide
isopropamide
propantheline

Nonbarbiturates
benzoctamine
bromine
carbromal
chloral hydrate
chlormethiazole
diphenhydramine
ethanol (ethyl alcohol)
ethchlorvynol
flunitrazepam
flurazepam
fosazepam
glutethimide
hydroxyzine
methaqualone
methotrimeprazine
methyprylon

nitrazepam
propiomazine
triazolam

Opiates and Related Agents
1-alpha-acetylmethadol
apomorphine
codeine
difenoxin
fentanyl
heroin
hydromorphone
ketobemidone
levallorphan
methadone
morphine
nalorphine
naloxone
naltrexone
norcodeine
normorphine
opium
pentazocine
pethidine

Oral Contraceptives
ethynodiol diacetate

Oral Hypoglycemics
acetohexamide
chlorpropamide
phenformin
tolbutamide

Other Anti-Infective Agents
nitrofurantoin
trimethoprim

Other Antibiotics
amikacin
chloramphenicol
erythromycin
gentamicin

Other Cardiovascular Agents
ephedrine

Other CNS Agents
3-(2-benzylmethylaminoethyl) benzoic acid methyl ester hydrochloride (PRL-8-53)
fenmetozole
lithium

Other Electrolytic, Caloric, and Water Balance Agents
cyclamate

Other Toxicants
butyl nitrite
glue (model builder's)
paint, spray

Parasympatholytic (Cholinergic Blocking) Agents
atropine sulfate
clidinium bromide
Donnatal(R) (phenobarbital + atropine sulfate + hyoscine HBr + hyoscyamine sulfate)
isopropamide
methscopolamine
myristica
physostigmine
procyclidine
propantheline
scopolamine

Penicillins

ampicillin
cloxacillin
methicillin
penicillin V potassium

Pituitary
$ACTH_{4-10}$ (Org CI-63)
luteinizing hormone (LH)

Plasmodicides
amodiaquine
chloroquine
hydroxychloroquine
quinine

Progestogens
hydroxyprogesterone
noretnindrone
norgestrel

Sedatives and Hypnotic Agents
apronalide
Mandrax(R) (methaqualone + diphenhydramine)

Skin and Mucous Membrane Preparations
salicylic acid
triclobisonium chloride

Stimulants
amphetamine
1-benzylpiperazine
caffeine
clortermine
coca
cocaine
cotinine
dextroamphetamine
ephedrine
ethamivan
fenethylline
kola
levamphetamine
methamphetamine
methylphenidate
nicotine
theophylline

Sulfonamides
sulfadiazine
sulfameter
sulfamethoxazole
sulfasalazine
sulfisoxazole

Sulfones
dapsone

Sympatholytic (Adrenergic Blocking) Agents
atenolol

Sympathomimetic (Adrenergic) Agents
chlorphentermine
dextroamphetamine
diethylpropion
dopamine
ephedrine
fenfluramine
isoproterenol
levarterenol
phentermine
phenylephrine
phenylpropanolamine
pseudoephedrine

Thyroid and Anti-Thyroid
- levothyroxine

Trichomonacides
- metronidazole

Unclassified Agents
- calcium carbimide
- disulfiram
- ginseng
- 3-methylamino-1,1 diphenylprop-1-ene (BW247)
- Mobiletten(R)
- oxyphencycline
- 1-phenylcyclohexalamine
- 1-piperidinocyclohexane-carbonitrile
- tobacco
- trithiozine
- tryptamine
- UK-14,304

Uricosurics and Other Antigout Agents
- allopurinol

Vasodilating Agents
- amyl nitrite
- hexobendine
- Instenon(R) (hexobendine + etamivan + etofylline)
- oxprenolol
- papaverine
- pindolol

Vitamins
- copper
- alpha-tocopheryl acetate
- l-tryptophan
- vitamin B complex
- zinc

Volatile Solvents
- chloroform
- ethylbenzene
- gasoline
- xylene

9.3 Drug Classification Scheme

1-00-0 Central Nervous System (CNS) Agents

1-01-0 Anesthetics

1-01-1 Local Anesthetics
- coca
- cocaine
- lidocaine
- mepivacaine
- prilocaine
- procaine

1-01-2 General Anesthetics
- enflurane
- halothane
- hexobarbital
- nitrous oxide
- propanidid
- thiopental

1-02-0 Anticonvulsants (Anti-Epileptics)
- bromine
- carbamazepine
- clonazepam
- ethosuximide
- mephenytoin
- methsuximide
- nitrazepam
- phenobarbital
- phenytoin
- primidone
- sulthiame
- valproate sodium

1-03-0 Antidepressants
- amitriptyline
- clomipramine
- desipramine
- doxepin
- imipramine
- isocarboxazid
- lithium
- mianserin
- nomifensine
- nortriptyline
- oxypertine
- phenelzine
- protriptyline
- tandamine
- tranylcypromine
- trazodone
- viloxazine

1-04-0 Cannabis Sativa L. and Related Agents
- cannabichromene
- cannabichromenic acid
- cannabicyclol
- cannabidiol
- cannabidiolic acid
- cannabielsoic acid
- cannabigerol
- cannabigerolic acid
- cannabinol
- cannabinolic acid
- hashish
- marijuana
- delta-1-tetrahydrocannabinolic acid

delta-8-tetrahydrocannabinol
delta-9-tetrahydrocannabinol
delta-9-trans-tetrahydrocannabinol

1-05-0 Hallucinogens and Related Agents
bufotenine
cyclonexamine (PCE)
N,N-diethyltryptamine (DET)
N,N-dimethyltryptamine (DMT)
2,5-dimethoxy-4-bromoamphetamine (DOB)
2,5-dimethoxy-4-methylamphetamine (DOM) (STP)
lysergic acid diethylamide (LSD)
mescaline
5-methoxy-3,4-methylenedioxyamphetamine (MMDA)
4-methoxyamphetamine (PMA)
methylenedioxyamphetamine (MDA)
myristica
nitrous oxide
phencyclidine
phenethylamine (PEA)
1(1-phenylcyclohexyl) pyrrolidine
psilocin
psilocybin
3,4,5-trimethoxyamphetamine
yohimbine

1-06-0 Opiates and Related Agents
1-alpha-acetylmethadol
apomorphine
codeine
difenoxin
fentanyl
heroin
hydromorphone
ketobemidone
levallorphan
methadone
morphine
nalorphine
naloxone
naltrexone
norcodeine
normorphine
opium
pentazocine
pethidine

1-07-0 Stimulants
amphetamine
1-benzylpiperazine
caffeine
clortermine
coca
cocaine
cotinine
dextroamphetamine
ephedrine
ethamivan
fenethylline
kola
levamphetamine
methamphetamine
methylphenidate
nicotine
theophylline

1-08-0 Sedatives and Hypnotic Agents
apronalide
Mandrax(R) (methaqualone + diphenhydramine)

1-08-1 Barbiturates
- amobarbital
- barbital
- butabarbital
- butalbital
- heptabarbital
- methohexital
- pentobarbital
- phenobarbital
- secobarbital
- Tuinal(R) (amobarbital sodium + secobarbital sodium)

1-08-2 Nonbarbiturates
- benzoctamine
- bromine
- carbromal
- chloral hydrate
- chlormethiazole
- diphenhydramine
- ethanol (ethyl alcohol)
- ethchlorvynol
- flunitrazepam
- flurazepam
- fosazepam
- glutethimide
- hydroxyzine
- methaqualone
- methotrimeprazine
- methyprylon
- nitrazepam
- propiomazine
- triazolam

1-09-0 Tranquilizers

1-09-1 Major Tranquilizers (Antipsychotics and Neuroleptics)
- butaperazine maleate
- chlorpromazine
- chlorprothixene
- clazepam
- clozapine
- droperidol
- flupentixol
- fluphenazine
- halazepam
- haloperidol
- loxapine
- mesoridazine
- perazine
- perphenazine
- prochlorperazine
- promethazine
- reserpine
- sulforidazine
- sulpiride
- thioridazine
- tiapride
- trifluoperazine
- triflupromazine hydrochloride

1-09-2 Minor Tranquilizers (Anti-Anxiety and Ataractics)
- bromazepam
- buclizine
- chlordesmethyldiazepam
- chlordiazepoxide
- clobazam
- clorazepate
- N-desmethyldiazepam
- diazepam
- etifoxine
- hydroxyzine
- lorazepam
- medazepam

meprobamate
methyloxazepam
oxanamide
oxazepam
phenaglycodol
pinazepam
temazepam
tofizopam
trazodone
triflubazam (ORF 8063)
tybamate

1-10-0 Other CNS Agents
3-(2-benzylmethylaminoethyl) benzoic acid methyl ester hydrochloride (PRL-8-53)
fenmetozole
lithium

2-00-0 Autonomic Nervous System (ANS) Agents

2-01-0 Parasympathomimetic (Cholinergic) Agents

2-02-0 Parasympatholytic (Cholinergic Blocking) Agents
atropine sulfate
clidinium bromide
Donnatal(R) (phenobarbital + atropine sulfate + hyoscine HBr + hyoscyamine sulfate)
isopropamide
methscopolamine
myristica
physostigmine
procyclidine
propantheline
scopolamine

2-03-0 Sympathomimetic (Adrenergic) Agents
chlorphentermine
dextroamphetamine
diethylpropion
dopamine
ephedrine
fenfluramine
isoproterenol
levarterenol
phentermine
phenylephrine
phenylpropanolamine
pseudoephedrine

2-04-0 Sympatholytic (Adrenergic Blocking) Agents
atenolol

2-05-0 Ganglionic Blocking and Stimulating Agents
2,5-dimethoxy-4-methylamphetamine (DOM) (STP)
nicotine

2-06-0 Muscle Relaxants and Spasmolitic Agents

2-06-1 Muscle Relaxants (Central)
benzoctamine
carisoprodol
diazepam

2-06-2 Neuromuscular Blocking (Antimuscarinic) Agents
clidinium bromide
isopropamide
propantheline

2-06-3 Neuromuscular Blocking (Depolarizing) Agents

2-07-0 Other ANS Agents

3-00-0 Cardiovascular Agents

3-01-0 Anti-Arrhythmia Agents
chinidine
disopyramide
lidocaine
mexiletine
practolol
procainamide
propranolol
quinidine sulfate

3-02-0 Hypotensive (Antihypertensive) Agents
bendroflumethiazide
clonidine
cyclothiazide
methyclothiazide
methyldopa
propranolol
reserpine
trimethaphan camsylate

3-03-0 Cardiac Glycosides
digitalis
digitoxin
digoxin

3-04-0 Vasoconstricting Agents

3-05-0 Vasodilating Agents
amyl nitrite
hexobendine
Instenon(R) (hexobendine + etamivan + etofylline)
oxprenolol
papaverine
pindolol

3-06-0 Antilipemic (Anticholesteremic) Agents

3-07-0 Anti-Anginal Agents
amyl nitrite
bupranolol
isosorbide dinitrate
propranolol

3-99-0 Other Cardiovascular Agents
ephedrine

4-00-0 Gastrointestinal (GI) Agents

4-01-0 Antacids and Adsorbants

4-02-0 Antidiarrhea Agents
difenoxin

4-03-0 Antiflatulents (Carminatives)
myristica

4-04-0 Cathartics and Laxatives

4-04-1 Cathartics

4-04-2 Laxatives
dioctyl sodium sulfosuccinate

4-05-0 Digestants

4-06-0 Emetics and Anti-Emetics

4-06-1 Emetics
apomorphine

4-06-2 Anti-Emetics
buclizine
chlorpromazine
cyclizine
metoclopramide
prochlorperazine
promethazine
propiomazine
tiapride
trimethobenzamide hydrochloride

4-99-0 Other GI Agents

5-00-0 Anti-Infective and Antineoplastic Agents

5-01-0 Amebicides

5-02-0 Anthelmintics

5-03-0 Antibiotics

5-03-1 Antifungal Antibiotics
flucytosine

5-03-2 Cephalosporins
cefazolin
cephalexin
cephalothin
cephradine

5-03-3 Penicillins
ampicillin
cloxacillin
methicillin
penicillin V potassium

5-03-4 Tetracyclines

5-03-5 Other Antibiotics
amikacin
chloramphenicol
erythromycin
gentamicin

5-04-0 Antituberculars
cycloserine
rifampin

5-05-0 Antivirals

5-06-0 Plasmodicides
amodiaquine
chloroquine
hydroxychloroquine
quinine

5-07-0 Sulfonamides
sulfadiazine
sulfameter
sulfamethoxazole
sulfasalazine
sulfisoxazole

5-08-0 Sulfones
dapsone

5-09-0 Treponemicides

5-10-0 Trichomonacides
metronidazole

5-11-0 Other Anti-Infective Agents
nitrofurantoin
trimethoprim

5-12-0 Antineoplastic Agents
fluorouracil
methotrexate
procarbazine
testolactone
vinblastine sulfate
vincristine sulfate

6-00-0 Other Therapeutic Agents

6-01-0 Antihistamine Agents
Actifed(R) (pseudoephedrine HCl + triprolidine HCl)
azatadine
chlorpheniramine
clemastine
cyclizine
dexchlorpheniramine
diphenhydramine
diphenylpyraline
Dristan(R) (phenylephrine HCl + chlorpheniramine maleate + aspirin)
hydroxyzine
ketotifen
mebhydrolin
methapyrilene
phenindamine
terfenadine
tripelennamine
triprolidine hydrochloride

6-02-0 Blood Derivatives, Formulation and Coagulation

6-02-1 Blood Derivatives
albumin
bilirubin
purine
pyrimidine

6-02-2 Anti-Anemia Agents

6-02-3 Coagulants

6-02-4 Anti-Coagulants
dicumarol
heparin
warfarin

6-02-5 Hemostatics

6-02-6 Thrombolitic Agents

6-03-0 Electrolytic, Caloric, and Water Balance Agents

6-03-1 Diuretics
bendroflumethiazide
cyclothiazide
methyclothiazide
spironolactone

6-03-2 Uricosurics and Other Antigout Agents
allopurinol

6-03-3 Caloric Agents

6-03-4 Other Electrolytic, Caloric, and Water Balance Agents
cyclamate

6-04-0 Antinauseants, Antivertigo, and Antimigraine Agents

6-05-0 Expectorant and Cough Preparations (Antitusive Agents)
codeine

6-06-0 Eye, Ear, Nose, and Throat (EENT) Preparations

6-06-1 Miotics
echothiophate iodide

6-06-2 Mydriatics
atropine sulfate
scopolamine
tropicamide

6-06-3 Vasoconstrictors (EENT)

6-06-4 Decongestant and Cold Preparations
phenylephrine
phenylpropanolamine
pseudoephedrine

6-06-5 Other EENT Preparations

6-07-0 Anti-Parkinsonism Agents
levodopa
procyclidine

6-08-0 Anorectic (Appetite Control) Agents
chlorphentermine
clortermine
dextroamphetamine
diethylpropion
fenfluramine
levamphetamine
phenmetrazine
phentermine

6-09-0 Analgesics and Antipyretics
acetaminophen
alclofenac
aminopyrine
antipyrine
carbamazepine
cyclazocine
Distalgesic(R) (dextropropoxyphene + acetaminophen)
hydroxychloroquine
indomethacin
methotrimeprazine
phenacetin
phenazopyridine
phenylbutazone
propoxyphene
propyphenazone
salicylate
tramadol

6-10-0 Anti-Inflammatory Agents (Steroidal)
fludrocortisone

6-11-0 Skin and Mucous Membrane Preparations
salicylic acid
triclobisonium chloride

6-12-0 Anti-Asthmatics
aminophylline
ephedrine
etofylline
proxyphylline
theophylline

7-00-0 Hormones, Synthetic Substitutes, and Antagonists

7-01-0 Adrenals
corticosterone
dexamethasone
fludrocortisone
methylprednisolone sodium succinate
triamcinolone

7-02-0 Androgens
testosterone

7-03-0 Estrogens
estradiol
estrogen
piperazine estrone sulfate

7-04-0 Progestogens
hydroxyprogesterone
norethindrone
norgestrel

7-05-0 Oral Contraceptives
ethynodiol diacetate

7-06-0 Gonadotropins

7-07-0 Other Corpus Luteum Hormones

7-08-0 Oxytocics

7-09-0 Insulins and Anti-Diabetic Agents

7-09-1 Insulins
insulin

7-09-2 Oral Hypoglycemics
acetohexamide
chlorpropamide
phenformin
tolbutamide

7-10-0 Thyroid and Anti-Thyroid
levothyroxine

7-11-0 Parathyroid

7-12-0 Pituitary
$ACTH_{4-10}$ (Org OI-63)
luteinizing hormone (LH)

7-13-0 Prostaglandins

7-14-0 Neurochemicals, Neurotransmitters, and Neurohormones
gamma-hydroxybutyric acid (GABA)
levarterenol
serotonin

7-15-0 Hypothalamus

7-99-0 Miscellaneous Hormonal and Related Agents

8-00-0 Other Chemical Agents and Substances

8-01-0 Enzymes and Enzyme Inhibitors

8-01-1 Enzymes

8-01-2 Enzyme Inhibitors
allopurinol
oxypurinol

8-02-0 Vitamins
copper
alpha-tocopheryl acetate
l-tryptophan
vitamin B complex
zinc

8-03-0 Serum, Toxoids, and Vaccines

8-04-0 Heavy Metals and Heavy Metal Antagonists
copper
lead
mercury
zinc

8-05-0 Radioactive Agents

8-06-0 Diagnostic Agents
diatrizoic acid
iodipamide

8-07-0 Food Additives

8-08-0 Metabolites of Drugs and Other Agents
7-acetamido clonazepam
6-0-acetylmorphine
N-acetylprocainamide
7-amino clonazepam
benzoylecgonine
carbamazepine-10,11-epoxide
demethylchloroimipramine
N-1-desalkylflurazepam
N-1-desalkyl-3-hydroxyflurazepam
desmethylchlordiazepoxide
N-desmethyldiazepam
desmethyldoxepin
didesethylflurazepam
10,11-dihydroxycarbamazepine
2-ethylidene-1,5,-dimethyl-3,3-diphenylpyrrolidine
flurazepam-N-1-acetic acid
N-1-hydroxyethylflurazepam
4-hydroxy-2-ethyl-2-phenylglutarimide
10-hydroxynortriptyline
3-hydroxypinazepam
monodesethylflurazepam
morphine 3-ethereal sulfate
morphine 3-glucuronide
morphine 3,6-diglucuronide
morphine 6-glucuronide
normeperidine
normorphine
normorphine 6-glucuronide
norpropoxyphene
oxazepam
psilocybin
ritalinic acid
temazepam
delta-1-tetrahydrocannabinolic acid

11-nor-delta-9-THC-9-carboxylic acid

8-99-0 Unclassified Agents
calcium carbimide
disulfiram
ginseng
3-methylamino-1,1 diphenylprop-1-ene (BW247)
Mobiletten(R)
oxyphencycline
1-phenylcyclohexalamine
1-piperidinocyclohexane-carbonitrile
tobacco
trithiozine
tryptamine
UK-14,304

9-00-0 Environmental Gases, Toxicants, and Pollutants

9-01-0 Gases
carbon monoxide
nitrous oxide
oxygen

9-02-0 Air Pollutants

9-03-0 Pesticides

9-04-0 Herbicides

9-05-0 Insecticides

9-06-0 Volatile Solvents
chloroform
ethylbenzene
gasoline
xylene

9-07-0 Other Toxicants
butyl nitrite
glue (model builder's)
paint, spray

DRUGS AND DRIVING:

A SELECTED BIBLIOGRAPHY

SUPPLEMENT TWO

APPENDIX B

TITLE INDEX

TITLE INDEX

UM-76-D0774

A BEHAVIORAL MODEL OF MARIHUANA TOLERANCE. D.P. Ferraro. The Pharmacology of Marihuana. M.C. Braude; S. Szara, eds., v2 p475-86. New York: Raven Press (1976)

UM-76-M0212

A CHROMATOGRAPHIC METHOD FOR THE DETECTION OF LSD IN BIOLOGICAL LIQUIDS. J. Christie; M.W. White; J.M. Wiles. Journal of Chromatography. v120 p496-501 (1976)

UM-77-D0838

A COMPARISON OF DRUG USE IN DRIVER FATALITIES AND SIMILARLY EXPOSED DRIVERS. R.R. Blackburn; E.J. Woodhouse (Jul 1977)

UM-77-M0265

A COMPARISON OF THE BORATE-CELITE COLUMN SCREENING TECHNIQUE WITH OTHER EXTRACTION METHODS IN FORENSIC TOXICOLOGY. L.J. Dusci; L.P. Hackett. Journal of Forensic Sciences. v22 n3 p545-9 (Jul 1977)

UM-77-P0028

A COMPENDIUM OF THERAPEUTIC AND TOXIC CONCENTRATIONS OF TOXICOLOGICALLY SIGNIFICANT DRUGS IN HUMAN BIOFLUIDS. R.C. Baselt; R.H. Cravey. Journal of Analytical Toxicology. v1 p81-103 (Mar-Apr 1977)

UM-70-F0004

A FACTOR ANALYTIC APPROACH TO THE DRIVING TASK. V.S. Ellingstad. Behavioral Research in Highway Safety. v1 n2 p115-26 (Summer 1970)

UM-76-D0771

A MODEL OF MARIHUANA'S COGNITIVE EFFECTS. J.R. Tinklenberg; C.F. Darley. The Pharmacology of Marihuana. M.C. Braude; S. Szara, eds., v1 p429-39. New York: Raven Press (1976)

UM-76-D0840

A MOTOR VEHICLE ACCIDENT CAUSAL SYSTEM: THE HUMAN ELEMENT. J.C. Fell. Human Factors. v18 n1 p85-94 (Feb 1976)

UM-77-D0886

A PROFILE OF FATAL ACCIDENTS INVOLVING ALCOHOL. J.C. Fell. American Association for Automotive Medicine. 21st Conference. Proceedings. D.F. Huelke, ed., p197-218. AAAM (1977)

UM-77-L0086

A PSYCHOLOGICAL STUDY OF DRIVERS' CONCERN FOR ROAD SAFETY AND THEIR OPINIONS OF VARIOUS PUBLIC POLICY MEASURES AGAINST DRINKING AND DRIVING. G.J.S. Wilde. 7th International

Conference on Alcohol, Drugs, and Traffic Safety, Melbourne, Australia, 24-28 Jan, 1977 (1977)

UM-75-M0255

A RAPID AND COMPREHENSIVE SYSTEM FOR THE ROUTINE IDENTIFICATION OF DRUGS IN BIOLOGICAL MATERIAL BASED ON MICROPHASE EXTRACTION AND DRUG COLOUR PROFILES, W.J. Serfontein; D. Botha; L.S. DeVilliers, Journal of Chromatography, v115 p507-18 (1975)

UM-72-M0277

A RAPID THIN LAYER CHROMATOGRAPHIC SCREENING PROCEDURE FOR VARIOUS ABUSED PSYCHOTROPIC AGENTS, S.H. Schnoll; R.D. Cohn; W.H. Vogel, Journal of Psychedelic Drugs, v5 n1 p75-8 (Fall 1972)

UM-75-M0284

A REPRODUCIBLE GAS CHROMATOGRAPHIC MASS SPECTROMETRIC ASSAY FOR LOW LEVELS OF METHYLPHENIDATE AND RITALINIC ACID IN BLOOD AND URINE, R.M. Milberg; K.L. Rinehart; R.L. Sprague; E.K. Sleator, Biomedical Mass Spectrometry, v2 p2-8 (1975)

UM-75-M0204

A REVIEW OF DETECTORS FOR GAS CHROMATOGRAPHY, E.R. Adlard, CRC Critical Reviews in Analytical Chemistry, v5 iss1 p1-36 (May 1975)

UM-78-D0911

A REVIEW OF DRINKING AND DRUG-TAKING IN ROAD ACCIDENTS IN GREAT BRITAIN, B.E. Sabey, Proceedings of the AAAM (22nd) and The International Association for Accident and Traffic Medicine (VII) Ann Arbor, Mich., D.F. Huelke, ed., v1 p188-98, Morton Grove, Illinois: American Association for Automotive Medicine (Jul 1978)

UM-75-D0917

A REVIEW OF THE EFFECTS OF DIAZEPAM ON COGNITIVE AND PSYCHOMOTOR PERFORMANCE, R.A. Kleinknecht; D. Donaldson, The Journal of Nervous and Mental Disease, v161 n6 p399-411 (1975)

UM-77-D0829

A REVIEW OF THE SAFETY HAZARD DUE TO POOR HEALTH, DRUGS, AND THEIR INTERACTION, F.B. Benjamin, Human Factors, v19 n2 p127-37 (Apr 1977)

UM-75-M0210

A SIMPLE METHOD FOR THE DETERMINATION OF THE SMOKING OF MARIJUANA, L.C. Kier, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p623-6, Toronto, Canada: Addiction Research Foundation of Ontario (1975)

UM-74-M0232

A SIMPLE, RAPID THIN-LAYER CHROMATOGRAPHIC DRUG SCREENING PROCEDURE, K.G. Blass; R.J. Thibert; T.F. Draisey, Journal of Chromatography, v95 p75-9 (1974)

UM-75-D0713

A STUDY OF ACHIEVEMENT MOTIVATION AND FRUSTRATION IN GLUE SNIFFERS, G.L. Schmidt, Drug Forum, v4 n4 p331-48 (1975)

UM-76-C0001

A STUDY OF ATTITUDES OF SPECIALISTS TOWARDS CURRENTLY PROPOSED COUNTERMEASURES FOR THE ALLEVIATION OF THE DRINKING-DRIVING PROBLEM, S. Israelstam; S. Lambert, Blutalkohol, v13 n6 p419-30 (Nov 1976)

UM-74-M0207

A SYSTEM OF MODELS FOR THE ACTION OF DRUGS APPLIED SINGLY OR JOINTLY TO BIOLOGICAL ORGANISMS, J.R. Ashford; J.M. Cobby, Biometrics, v30 n1 p11-31 (Mar 1974)

UM-77-F0022

A TAXONOMIC ANALYSIS OF VIGILANCE PERFORMANCE, R. Parasuraman; D.R. Davies, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p559-74, New York: Plenum Press (1977)

UM-76-D0710

ABUSE OF MEDICINES. A REPORT BY A WORKING PARTY 1975, COUNCIL OF EUROPE, EUROPEAN PUBLIC HEALTH COMMUNITY. PART I. SELF MEDICATION, Drug Intelligence and Clinical Pharmacology, v10 n1 p16-33 (Jan 1976)

UM-76-D0712

ABUSE OF MEDICINES. A REPORT BY A WORKING PARTY 1975, COUNCIL OF EUROPE, EUROPEAN PUBLIC HEALTH COMMUNITY. PART THREE. GENERAL RECOMMENDATIONS, Drug Intelligence and Clinical Pharmacy, v10 n3 p172-178 (Mar 1976)

UM-76-D0711

ABUSE OF MEDICINES. A REPORT BY A WORKING PARTY 1975, COUNCIL OF EUROPE, EUROPEAN PUBLIC HEALTH COMMUNITY. PART TWO. PRESCRIPTION MEDICINES, Drug Intelligence and Clinical Pharmacology, v10 n2 p94-110 (Feb 1976)

UM-76-F0002

ACCIDENTS, RISKS, AND MODELS OF EXPLANATION, D.H. Taylor, Human Factors, v18 n4 p371-80 (Aug 1977)

UM-76-D0839

ACTIONS OF NARCOTICS ON BRAIN DOPAMINE METABOLISM AND THEIR RELEVANCE FOR "PSYCHOMOTOR" EFFECTS, K. Kuschinsky, Arzneimittel-Forschung (Drug Research), v26 n4 p563-7 (1976)

UM-76-D0773

ACUTE AND SUBACUTE BEHAVIORAL AND PHARMACOLOGICAL INTERACTIONS OF DELTA-9-TETRAHYDROCANNABINOL WITH OTHER DRUGS, G.T. Pryor, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v2 p543-54, New York: Raven Press (1976)

UM-75-D0755

ACUTE EFFECTS OF ETHANOL AND OPIATES ON THE NERVOUS SYSTEM, E. Eidelberg, Research Advances in Alcohol and Drug Problems, R.J. Gibbins; et al., v2 p147-76, New York: John Wiley and Sons (1975)

UM-77-D0810

ACUTE SYSTEMATIC EFFECTS OF COCAINE IN MAN: A CONTROLLED STUDY BY INTRANASAL AND INTRAVENOUS ROUTES, R.B. Resnick; R.S. Kestenbaum; L.K. Schwartz, Science, v195 p696-8 (18 Feb 1977)

UM-75-D0896

ADVERSE EFFECTS OF COMMONLY USED SYSTEMIC DRUGS ON THE HUMAN EYE--PART III, H.I. Silverman; R.J. Harvie, American Journal of Optometry and Physiological Optics, v52 n4 p275-87 (Apr 1975)

UM-73-M0226

AFFINITY CHROMATOGRAPHY, H.H. Weetall, Separation and Purification Methods, v2 n2 p199-229 (1973)

UM-77-E0069

ALCOHOL ABUSE BY DRUG-DEPENDENT PERSONS: A LITERATURE REVIEW AND EVALUATION, J.F.X. Carroll; T.E. Malloy; F.M. Kenrick, American Journal of Drug and Alcohol Abuse, v4 n3 p293-315 (1977)

UM-77-E0050

ALCOHOL AND DRUG USE AMONG ONTARIO STUDENTS IN 1977, R.G. Smart; M.S. Goodstadt; I.J. Sone, Toronto, Canada: Addiction Research Foundation of Ontario (1977)

UM-78-D0912

ALCOHOL AND DRUGS IN TRAFFIC ACCIDENT VICTIMS, B. Ojerskog; B. Herner; B. Jacobsson; M. Sjoden; R. Bonnichsen; L. Ysander, Proceedings of the AAAM (22nd) and The International Association for Accident and Traffic Medicine (VII) Ann Arbor, Mich., D.F. Huelke, ed., v1 p199-209, Morton Grove, Illinois: American Association for Automotive Medicine (10-14 Jul 1978)

UM-76-D0745

ALCOHOL AND HIGHWAY CRASHES: CLOSING THE GAP BETWEEN EPIDEMIOLOGY AND EXPERIMENTATION, M.W. Perrine, Modern Problems in Pharmacopsychiatry, v11 p22-41 (1976)

UM-75-D0796

ALCOHOL AND ITS DRUG INTERACTIONS, F.A. Seixas, Annals of Internal Medicine, v83 p86-92 (1975)

UM-77-E0066

ALCOHOL AND MARIJUANA CONSUMPTION AMONG UNDERGRADUATE POLYDRUG USERS, M. Hochhauser, American Journal of Drug and Alcohol Abuse, v4 n1 p65-76 (1977)

UM-75-D0827

ALCOHOL AND MARIJUANA EFFECTS ON STATIC VISUAL ACUITY, A.J. Adams; B. Brown; M.C. Flom; R.T. Jones; A. Jampolsky, American Journal of Optometry and Physiological Optics, v52 n11 p729-35 (Nov 1975)

UM-76-D0826

ALCOHOL AND MARIJUANA EFFECTS ON OCULAR TRACKING, M.C. Flom; B. Brown; A.J. Adams; R.T. Jones, American Journal of Optometry and Physiological Optics, v53 n12 p764-73 (Dec 1976)

UM-77-C0004

"ALCOHOL AND MEDICATIONS DON'T MIX" CAMPAIGN, D. Strads, Australian Journal of Alcoholism and Drug Dependence, v4 n1 p11-12 (Feb 1977)

UM-75-M0217

ALCOHOL AND OTHER DRUG TESTING IN TRAFFIC DEATHS: A REPORT ON CURRENT PRACTICES IN CANADA, H.M. Simpson; B. Heayn, Ottawa, Ontario: Traffic Injury Research Foundation of Canada (Oct 1975)

UM-73-D0977

ALCOHOL INFLUENCES ON DRIVING-RELATED BEHAVIOR: A CRITICAL REVIEW OF LABORATORY STUDIES OF NEUROPHYSIOLOGICAL, NEUROMUSCULAR, AND SENSORY ACTIVITY, M.W. Perrine, Journal of Safety Research, v5 n3 p165-84 (Sep 1973)

UM-77-D0825

ALCOHOL, DRUGS, Prevention Routiere Internationale, n9 p1-46, International Road Safety Council (Feb 1977)

UM-78-D0943

ALCOHOL, DRUGS AND ACCIDENT RISK, G.A. Starmer, Medical Journal of Australia, v1 n2 p78-9 (28 Jan 1978)

UM-74-D0873

ALCOHOL, DRUGS AND YOUNG DRIVERS, R.B. Voas (May 1974)

UM-75-D0729

ALCOHOL, DRUGS, AND CARBON MONOXIDE IN TRAFFIC FATALITIES IN PUERTO RICO, S. Kaye, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p85-92, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-75-D0739

ALCOHOL, DRUGS, AND DRIVING BEHAVIOR IN SWITZERLAND, P. Kielholz, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p395-7, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-75-D0731

ALCOHOL, DRUGS, AND DRIVING: RELATIVE PRIORITIES FOR BASIC AND APPLIED RESEARCH, M.W. Perrine, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p107-28, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-71-C0005

ALCOHOL, DRUGS, AND TRAFFIC ACCIDENTS. A SOCIOLOGICAL ANALYSIS, D.J. Pittman, International Congress on Alcoholism and Drug Dependence. 29th, L.G. Kiloh; D.S. Bell, eds., p270-4, Australia: Butterworths (Feb 1971)

UM-75-D0730

ALCOHOL, MARIJUANA AND OTHER DRUG PATTERNS AMONG OPERATORS INVOLVED IN FATAL MOTOR VEHICLE ACCIDENTS, R.S. Sterling-Smith, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p93-105, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-74-D0961

ALCOHOL, SLEEP DEPRIVATION, AND DRIVING SPEED EFFECTS UPON CONTROL USE DURING DRIVING, M.S. Huntley; T.M. Centybear, Human Factors, v16 n1 p19-28 (Feb 1974)

UM-76-D0846

AMNESIC ACTION OF AND SKILLS RELATED TO DRIVING AFTER INTRAVENOUS FLUNITRAZEPAM. K. Korttila; M. Linnoila. Acta anaesthesiologica scandinavica. v20 p160-8 (1976)

UM-69-E0029

AMPHETAMINE ABUSE IN NEW YORK CITY 1966 TO 1968. B.M. Angrist; S. Gershon. Journal of Psychedelic Drugs. v2 n2 p84-91 (Spring 1969)

UM-74-D0787

AMPHETAMINE EFFECTS IN MAN. PARADOXICAL DROWSINESS AND LOWERED ELECTRICAL BRAIN ACTIVITY (CNV). J.J. Tecce; J.O. Cole. Science. v185 p451-3 (2 Aug 1974)

UM-72-E0025

AMPHETAMINE USE AND MISUSE WITH RECOMMENDATIONS FOR STIMULANT CONTROL POLICY. J.C. Kramer; R. Pinco. Journal of Psychedelic Drugs. v5 n2 p139-45 (Winter 1972)

UM-71-D0751

AN ACCIDENT-BASED ANALYSIS OF ROAD-USER ERRORS. A.B. Clayton. Journal of Safety Research. v4 n2 p69-74 (Jun 1972)

UM-72-E0026

AN ANALYSIS OF AMPHETAMINE TOXICITY AND PATTERNS OF USE. J.F.E. Shick; D.E. Smith; D.R. Wesson. Journal of Psychedelic Drugs. v5 n2 p113-30 (Winter 1972)

UM-75-C0014

AN APPRAISAL OF DRUG EDUCATION PROGRAMS. G. Globetti. Research Advances in Alcohol and Drug Problems. R.J. Gibbins; Y. Israel; H. Kalant, eds., v2 p93-122. New York: John Wiley and Sons (1975)

UM-76-D0818

AN INTEGRATED APPROACH FOR THE EVALUATION OF PSYCHOTROPIC DRUGS IN MAN.I. STUDIES ON AMPHETAMINE. RELATIONSHIP BETWEEN DRUG LEVELS AND PSYCHOPHYSICAL MEASUREMENTS. P.L. Morselli; G.F. Placidi; C. Maggini; R. Gomeni; M. Guazelli; G. DeLisio; S. Standen; G. Tognoni. Psychopharmacologia. v46 p211-7 (1976)

UM-75-E0019

AN INTERPRETATION OF TRENDS IN STREET DRUG ANALYSIS PROGRAMS: WHOM DO THEY SERVE? E.R. Kealy; R. Webber. Journal of Psychedelic Drugs. v7 n3 p281-9 (Jul-Sep 1975)

UM-77-F0017

AN INVESTIGATION OF TIME-SHARING ABILITY AS A FACTOR IN COMPLEX PERFORMANCE. A.E. Jennings; W.D. Chiles. Human Factors. v19 n6 p535-47 (Dec 1977)

UM-72-P0009

AN OVERVIEW OF THE ANALYSIS AND INTERPRETATION OF BIOAVAILABILITY STUDIES IN MAN. J.G. Wagner. Pharmacology. v8 p102-17 (1972)

UM-77-F0025

AN UPDATE OF FINDINGS REGARDING VIGILANCE AND A RECONSIDERATION OF UNDERLYING MECHANISMS, M. Loeb; E.A. Alluisi, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p719-49, New York: Plenum Press (1977)

UM-76-D0815

ANALGESIA, PLASMA LEVELS, AND DOSAGE OF PROPOXYPHENE, S.O. Waife; C.M. Gruber; B.E. Rodda; J.F. Nash, International Journal of Clinical Pharmacology, v13 n3 p177-81 (1976)

UM-72-M0222

ANALYSIS FOR DRUGS OF ABUSE: CURRENT METHODS OF URINE SCREENING AND LEGAL CONSIDERATIONS, D. Sohn; J. Simon; M.A. Hanna; G.Z. Ghali; R. Tolba, Legal Medicine Annual: 1972, C.H. Wecht, ed., p123-35, New York: Appleton-Century-Crofts (1972)

UM-72-B0011

ANALYTICAL PROFILES OF DRUG SUBSTANCES V1, K. Florey, ed., New York: Academic Press (1972)

UM-73-B0012

ANALYTICAL PROFILES OF DRUG SUBSTANCES V2, K. Florey, ed., New York: Academic Press (1973)

UM-75-B0014

ANALYTICAL PROFILES OF DRUG SUBSTANCES V4, K. Florey, ed., New York: Academic Press (1975)

UM-74-B0013

ANALYTICAL PROFILES OF DRUG SUBSTANCES V3, K. Florey, ed., New York: Academic Press (1974)

UM-76-B0015

ANALYTICAL PROFILES OF DRUG SUBSTANCES V5, K. Florey, ed., New York: Academic Press (1976)

UM-74-E0033

ANXIETY OR CAFFEINISM: A DIAGNOSTIC DILEMMA, J.F. Greden, American Journal of Psychiatry, v131 n10 p1089-92 (Oct 1974)

UM-77-E0034

ANXIETY, DEPRESSION AND CAFFEINISM AMONG PSYCHIATRIC INPATIENTS, J.F. Greden; P. Fontaine; M. Lubetsky; K. Chamberlain, American Psychiatric Association Meeting, 2-6 May 1977, Toronto, Ontario, Canada (1977)

UM-78-F0030

APPLICABILITY OF DRIVERS' ELECTRODERMAL RESPONSE TO THE DESIGN OF THE TRAFFIC ENVIRONMENT, M. Helander, Journal of Applied Psychology, v63 n4 p481-8 (Aug 1978)

UM-75-M0260

APPLICATION OF AMBERLITE XAD-2 RESIN FOR GENERAL TOXICOLOGICAL ANALYSIS, G. Ibrahim; S. Andryauskas; M.L. Bastos, Journal of Chromatography, v108 p107-16 (1975)

UM-74-M0228

APPLICATION OF GAS CHROMATOGRAPHY-MASS SPECTROMETRY IN ROUTINE AND RESEARCH IN CLINICAL CHEMISTRY, L. Eldjarn; E. Jellum; O. Stokke, Journal of Chromatography, v91 p353-66 (1974)

UM-73-P0017

APPLICATION OF PHARMACOKINETIC PRINCIPLES TO THE ELUCIDATION OF POLYGENICALLY CONTROLLED DIFFERENCES IN DRUG RESPONSE, E.S. Vesell, Journal of Pharmacokinetics and Biopharmaceutics, v1 n6 p521-40 (Dec 1973)

UM-77-M0275

APPLICATIONS OF COMBINED LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY, W.H. McFadden; D.C. Bradford; D.E. Games; J.L. Gower, American Laboratory, v9 n10 p55-6, 58-60,62,64 (Oct 1977)

UM-76-M0263

APPLICATIONS OF HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY IN THE PHARMACEUTICAL INDUSTRY, F. Baily, Journal of Chromatography, v122 p73-84 (1976)

UM-74-D0778

ARZNEIMITTEL AND VERKEHRSSICHERHEIT [DRUGS AND TRAFFIC SAFETY], H. Lewrenz, Zeitschrift fur Allgemeinmediza, v50 n17 p787-91 (20 Jun 1974)

UM-75-D0746

ASPECTS OF DRUG ANALYSES IN RELATION TO ROAD TRAFFIC LEGISLATION AND SUPERVISION, R. Bonnichsen, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p495-508, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-76-D0768

ATTENTION, LEARNING AND SPEED IN PSYCHOMOTOR PERFORMANCE AFTER MARIHUANA SMOKING, L. Vachon; A. Sulkowski, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v1 p449-52, New York: Raven Press (1976)

UM-76-B0008

ASSAYS OF DRUGS AND OTHER TRACE COMPOUNDS IN BIOLOGICAL FLUIDS, Methodological Developments in Biochemistry, v5, E. Reid, ed., Amsterdam: North-Holland Publishing Company (1976)

UM-76-D0715

AUTO MAN, J.J. Neen, Road and Track, v28 n4 p92-5 (Dec 1976)

UM-72-D0860

BARBITURATE TOXICITY AND THE TREATMENT OF BARBITURATE DEPENDENCE, D.R. Wesson; D.E. Smith, Journal of Psychedelic Drugs, v5 n2 p159-65 (Winter 1972)

UM-77-D0843

BARBITURATES AND ALCOHOL IN B.C. TRAFFIC FATALITIES. H.M. Simpson; R.A. Warren; D. Collard; L. Page-Valin. American Association for Automotive Medicine. 21st Conference. Proceedings. D.F. Huelke. ed., p219-25. AAAM (1977)

UM-77-E0035

BARBITURATES: THEIR USE, MISUSE, AND ABUSE. D.R. Wesson; D.E. Smith. New York: Human Sciences Press (1977)

UM-78-D1001

BEHAVIORAL ANALYSIS OF CHRONIC COCAINE INTOXICATION IN THE CAT. S. Castellani; E.H. Ellinwood; M.M. Kilbey. Biological Psychiatry. v13 n2 p203-15 (1978)

UM-77-A0020

BIBLIOGRAPHY. Vigilance: Theory, Operational Performance, and Physiological Correlates. R.R. Mackie, ed., p751-814. New York: Plenum Press (1977)

UM-72-P0007

BIOAVAILABILITY, CLINICAL EFFECTIVENESS, AND THE PUBLIC INTEREST. G. Levy. Pharmacology. v8 p33-43 (1972)

UM-78-E0074

BIOSTATISTICAL PERSPECTIVES IN THE EPIDEMIOLOGY OF NARCOTIC ABUSE. H. Smith; J. D. Goldberg; D. C. Korts. Annals of the New York Academy of Sciences. v311 p25-34 (1978)

UM-74-L0107

BLOOD ALCOHOL IN AUTOMOBILE DRIVERS: MEASUREMENT AND INTERPRETATION FOR MEDICOLEGAL PURPOSES. I. EFFECT OF TIME INTERVAL BETWEEN INCIDENT AND SAMPLE ACQUISITION. T.A. Loomis. Quarterly Journal of Studies on Alcohol. v35 p458-72 (1974)

UM-75-M0224

BLOOD CODEINE CONCENTRATIONS IN FATALITIES ASSOCIATED WITH CODEINE. J.A. Wright; R.C. Baselt; C.H. Hine. Clinical Toxicology. v8 n4 p457-63 (1975)

UM-76-D0949

BLOOD LEVEL, MOOD AND MHPG RESPONSES TO DIAZEPAM IN MAN. R.C. Smith; H. Dekirmenjian; J. Davis; R. Casper; L. Gosenfeld; C. Tsai. Pharmacokinetics of Psychoactive Drugs: Blood Levels and Clinical Response. L.A. Gottschalk; S. Merlis. eds., p141-56. New York: Spectrum Publications (1976)

UM-76-P0021

BLOOD LEVELS OF METHAQUALONE IN MAN FOLLOWING CHRONIC THERAPEUTIC DOSES. A.F. DeLong; R.D. Smyth; A. Polk; R.K. Navak; N.H. Reavy-Cantwell. Archives internationales de Pharmacodynamie et de Therapie. v222 n2 p322-31 (Aug 1976)

UM-75-D0855

BRAIN DYSFUNCTION IN CHRONIC SEDATIVE USERS. L.L. Judd; I. Grant. Journal of Psychedelic Drugs. v7 n2 p143-9 (Apr-Jun 1975)

UM-78-D0954

BRAKE REACTION TIME--EFFECTS OF AGE, SEX, AND CARBON MONOXIDE, G.R. Wright; R.J. Shephard, Archives of Environmental Health, v33 n3 p141-50 (May-Jun 1978)

UM-76-D0756

CAFFEINE AS A DRUG OF ABUSE, R.M. Gilbert, Research Advances in Alcohol and Drug Problems, R.J. Gibbins; et al., v3 p49-176, New York: John Wiley and Sons (1976)

UM-75-D0824

CAFFEINE: PREFERENTIAL CONSUMPTION BY RATS, M.V. Vitiello; S.C. Woods, Pharmacology Biochemistry and Behavior, v3 p147-9 (1975)

UM-73-D0775

CANNABIS AND ALCOHOL: EFFECTS ON SIMULATED CAR DRIVING AND PSYCHOLOGICAL TESTS. CORRELATION WITH URINARY METABOLITES, O.J. Rafaelsen; P. Bech; J. Christiansen; L. Rafaelsen, Psychopharmacology, Sexual Disorders, and Drug Abuse, T.A. Ban, ed., p689-91, Amsterdam: North Holland Publishing Co. (1973)

UM-76-D0754

CANNABIS AND EXPERIMENTAL STUDIES OF DRIVING SKILLS, H. Moskowitz, Research Advances in Alcohol and Drug Problems, R.J. Gibbins; et al., v3 p283-95, New York: John Wiley and Sons (1976)

UM-78-P0040

CAPACITY-LIMITED ELIMINATION OF PROCAINAMIDE IN MAN, W.J. Tilstone; D.H. Lawson, Research Communications in Chemical Pathology and Pharmacology, v21 n2 p343-6 (Aug 1978)

UM-69-A0014

CARBON MONOXIDE: EXPECTED LEVELS AND THEIR EFFECTS ON AUTOMOBILE DRIVERS (Mar 1969)

UM-78-D0968

CARDIORESPIRATORY ASSESSMENT OF DECONGESTANT-ANTIHISTAMINE EFFECTS ON ALTITUDE, $+G_z$, AND FATIGUE TOLERANCES, M.T. Lategola; A.W. Davis; P.J. Lyne; M.J. Burr, Oklahoma City: Civil Aeromedical Institute (Apr 1978)

UM-75-D0793

CAUSAL CHAINS: ATTRIBUTION OF RESPONSIBILITY AS A FUNCTION OF IMMEDIATE AND PRIOR CAUSES, P. Brickman; K. Ryan; C.B. Wortman, Journal of Personality and Social Psychology, v32 n6 p1060-7 (1975)

UM-76-D0702

CHARACTERISTICS OF DRIVING IN RELATION TO THE DRUG AND ALCOHOL USE OF FINNISH OUTPATIENTS, M. Maki; M. Linnoila, Modern Problems in Pharmacopsychiatry, v11 p11-21 (1976)

UM-74-M0216

CHEMICAL AND BIOCHEMICAL METHODS OF DRUG DETECTION AND MEASUREMENT, J.A. Marshman, Research Advances in Alcohol and Drug Problems, R.J. Gibbins; Y. Israel; H. Kalant; et al. eds., v1 p33-91, New York: John Wiley and Sons (1974)

UM-74-M0251

CHROMATOGRAPHY AND FORENSIC CHEMISTRY, A.S. Curry, Journal of Chromatographic Science, v12 p529-34 (Oct 1974)

UM-77-D0847

CHRONIC CANNABIS USE AND PSYCHOMOTOR FUNCTION, Medical Journal of Australia, v1 n7 p201-2 (12 Feb 1977)

UM-78-D0921

CLAZEPAM: PHARMACOKINETICS AND EFFECTS ON PERFORMANCE, J.F. Giudicelli; A. Berdeaux; N. Idrissi; C. Richer, British Journal of Clinical Pharmacology, v5 n1 p65-9 (Jan 1978)

UM-76-L0105

CLINICAL EXAMINATION AS MEDICOLEGAL PROOF OF ALCOHOL INTOXICATION, A. Penttila; M. Tenhu, Medicine, Science, and the Law, v16 n2 p95-103 (1976)

UM-76-P0029

CLINICAL PHARMACOKINETICS OF CHLORDIAZEPOXIDE, D.J. Greenblatt; R.I. Shader; J. Koch-Weser, Pharmacokinetics of Psychoactive Drugs: Blood Levels and Clinical Response, L.A. Gottschalk; S. Merlis, eds., p127-139, New York: Spectrum Publications, Inc. (1976)

UM-74-D0760

CLINICAL PHARMACOLOGY OF MARIHUANA, L.E. Hollister, Research Advances in Alcohol and Drug Problems, R.J. Gibbins; et al., v1 p243-66, New York: John Wiley and Sons (1974)

UM-77-D0882

CLOBAZAM, A 1,5-BENZODIAZEPINE, AND CAR-DRIVING ABILITY, I. Hindmarch; G.W. Hanks; A.J. Hewett, British Journal of Clinical Pharmacology, v4 n5 p573-8 (Oct 1977)

UM-76-A0015

COCA AND COCAINE: A BIBLIOGRAPHY, M. Schatzman; A. Sabbadini; L. Forti, Journal of Psychedelic Drugs, v8 n2 p95-128 (Apr-Jun 1976)

UM-75-D0820

COCAINE, S. Cohen, Journal of the American Medical Association, v231 n1 p74-5 (6 Jan 1977)

UM-77-D0885

COCAINE: 1977, NIDA Research Monograph 13, R.C. Petersen; R.C. Stillman, eds., Washington, D.C.: U.S. Government Printing Office (May 1977)

UM-77-P0026

COCAINE AND BENZOYLECGONINE EXCRETION IN HUMANS, H.E. Hamilton; J.E. Wallace; E.L. Shimek; P. Land; S.C. Harris; J.G. Christenson, Journal of Forensic Sciences, v22 n4 p697-707 (Oct 1977)

UM-76-D1000

COCAINE--SUMMARIES OF PSYCHOSOCIAL RESEARCH, G.A. Austin; J. Phillips; N. Soifer; C. Spotts; R. Eichberg, eds., NIDA Research Issues 15 (Dec 1976)

UM-76-P0014

COCAINE: PLASMA CONCENTRATIONS AFTER INTRANASAL APPLICATION IN MAN. C. Van Dyke; P.G. Barash; P.I. Jatlow; R. Byck, Science, v191 p859-61 (27 Feb 1976)

UM-77-D0906

COMBINED EFFECTS OF TOBACCO AND CAFFEINE ON THE COMPONENTS OF CHOICE REACTION-TIME, HEART RATE, AND HAND STEADINESS. D.L. Smith; J.E. Tong; G. Leigh, Perceptual and Motor Skills, v45 p635-9 (1977)

UM-75-F0034

COMBINING THE BLOOD ALCOHOL AND CLINICAL EXAMINATIONS FOR ESTIMATING THE INFLUENCE OF ALCOHOL, M. Kataja; A. Penttila; M. Tenhu, Blutalkohol, v12 n2 p108-15 (1975)

UM-75-D0958

COMPARATIVE PSYCHOTROPIC EFFECTS OF METOCLOPRAMIDE AND PROCHLORPERAZINE IN NORMAL SUBJECTS, E.R.S. Nakra; A.J. Bond; M.H. Lader, Journal of Clinical Pharmacology, v15 n5-6 p449-54 (May-Jun 1975)

UM-77-D0868

COMPARISON OF ALCOHOL INVOLVEMENT IN EXPOSED AND INJURED DRIVERS. FINAL REPORT, R. Farris; T.E. Malone; M. Kirkpatrick (Sep 1977)

UM-77-E0072

COMPARISON OF DRUG ABUSE CLIENTS IN URBAN AND RURAL SETTINGS, B.S. Brown; T.C. Voskuhl; P.E. Lehman, American Journal of Drug and Alcohol Abuse, v4 n4 p445-54 (1977)

UM-72-M0276

COMPOSITION OF ILLICIT DRUGS AND THE USE OF DRUG ANALYSIS IN ABUSE ABATEMENT, J.B. Hart; J.D. McChesney; M. Grief; G. Schulz, Journal of Psychedelic Drugs, v5 n1 p83-8 (Fall 1972)

UM-75-D0738

COMPUTER-ELECTRONYSTAGMOGRAPHY: A USEFUL TOOL IN EVALUATING INFLUENCE OF PSYCHOPHARMACOLOGICAL DRUGS ON TRAFFIC SAFETY, J.C. Aschoff; W. Becker; D. Weinert, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p319-27, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-74-F0033

COMPUTER-NYSTAGMOGRAPHIE ALS NEUE BESTIMMUNGSMETHODE VON VIGILANZ UND REAKTIONSVERHALTEN UNTER PSYCHOPHARMAKA [COMPUTER-NYSTAGMOGRAPHIE, A NEW METHOD OF DETERMINING CHANGES IN VIGILANCE AS A RESPONSE TO PSYCHOTROPIC DRUGS], J. C. Aschoff; W. Becker; D. Weinert, Arzneimittel Forschung, v24 n8 p1085-7 (1974)

UM-79-P0045

CONCENTRATIONS OF PHENOBARBITAL, FLURAZEPAM, AND FLURAZEPAM METABOLITES IN AUTOPSY CASES, S.D. Ferrara; L. Tedeschi; M. Marigo; F. Castagna, Journal of Forensic Sciences, v24 n1 p61-9 (Jan 1979)

UM-76-P0032

CONCENTRATIONS OF PHENYTOIN IN PLASMA CNS INTOXICATION, J.L. Schelling; T. Deonna; G. de Crousaz; S. Blanc, Drug Interference and Drug Measurement in Clinical Chemistry,

G. Seist; D.S. Young, eds., p159-63, Third International Colloquium on Prospective Biology, Pont-a-Mousson, 6-10 Oct. 1975. Basel, Switzerland: S. Karger AG (1976)

UM-71-F0007

CONSISTENCY IN DRIVER RISK TAKING, P.M. Hurst, Behavioral Research in Highway Safety, v2 n2 p73-82 (Fall 1971)

UM-78-P0043

CONSTITUENTS OF CANNABIS SATIVA L. XIII: STABILITY OF DOSAGE FORM PREPARED BY IMPREGNATING SYNTHETIC (-)-DELTA-9-TRANS-TETRAHYDROCANNABINOL ON PLACEBO CANNABIS PLANT MATERIAL, G.S. Lewis; C.E. Turner, Journal of Pharmaceutical Sciences, v67 n6 p876-8 (Jun 1978)

UM-65-D0809

CONTRIBUTION OF HEREDITARY FACTORS TO THE RESPONSE TO DRUGS, W. Kalow, Federation Proceedings, v24 p1259-73 (Nov-Dec 1965)

UM-78-P0041

CORRELATION OF ANTEMORTEM AND POSTMORTEM DIGOXIN LEVELS, T.E. Vorpahl; J.I. Coe, Journal of Forensic Sciences, v23 n2 p329-34 (Apr 1978)

UM-74-E0002

CROSS-NATIONAL STUDY OF THE EXTENT OF ANTI-ANXIETY/SEDATIVE DRUG USE, M.B. Balter; J. Levine; D.I. Manheimer, New England Journal of Medicine, v290 n14 p769-74 (4 Apr 1974)

UM-72-E0024

CURRENT PERSPECTIVES ON COCAINE USE IN AMERICA, N.A. Eiswirth; D.E. Smith; D.R. Wesson, Journal of Psychedelic Drugs, v5 n2 p153-7 (Winter 1972)

UM-74-D0795

DELTA-9-TETRAHYDROCANNABINOL AND SOME CNS DEPRESSANTS: EVIDENCE FOR CROSS-TOLERANCE IN THE RAT, L.M. Newman; M.P. Lutz; E.F. Domino, Archives Internationales de Pharmacodynamic et de Therapie, v207 n2 p254-9 (Feb 1974)

UM-76-D0971

DER EINFLUSS VON COFFEIN AUF DIE RESORPTION UND EINIGE ZENTRALE WIRKUNGEN VON ATHANOL, O. Strubelt; K. Bohme; C.-P. Siegers; P. Bruhn, Zeitschrift fur Ernahrungswissenschaft, v15 n2 p125-31 (Jun 1976)

UM-72-P0011

DESIGN OF IN VIVO STUDIES OF BIOAVAILABILITY--BIOMETRICAL CONSIDERATIONS, J.E. Bearman; R.B. Loewenson, Pharmacology, v8 p44-54 (1972)

UM-73-M0231

DETECTION AND IDENTIFICATION OF DELTA-8-(AND) DELTA-9-TETRAHYDROCANNABINOL IN THE SALIVA OF MAN AND AUTORADIOGRAPHIC INVESTIGATION OF THEIR DISTRIBUTION IN THE SALIVARY GLANDS OF THE MONKEY, W.W. Just; G. Werner; M. Wiechmann; G. Erdmann, Jugoslavica Physiologica et Pharmacologica Acta, v9 n2 p263-8 (1973)

UM-74-M0230

DETECTION OF DELTA-9-TETRAHYDROCANNABINOL IN SALIVA OF MEN BY MEANS OF THIN-LAYER CHROMATOGRAPHY AND MASS SPECTROMETRY. W.W. Just; N. Filipovic; G. Werner. Journal of Chromatography. v96 p189-94 (1974)

UM-71-M0223

DETECTION OF SOME PSYCHOTHERAPEUTIC DRUGS AND THEIR METABOLITES IN URINE. J.C. Garriott; A. Stolman. Clinical Toxicology. v4 n2 p225-43 (Jun 1971)

UM-76-M0271

DETERMINATION OF CHLOROIMIPRAMINE AND ITS DEMETHYL METABOLITE IN PLASMA BY ION-PAIR PARTITION CHROMATOGRAPHY. P.-O. Lagerstrom; I. Carlsson; B.-A. Persson. Acta Pharmaceutica Succica. v13 p157-66 (1976)

UM-74-M0285

DETERMINATION OF FLURAZEPAM (DALMANE AND ITS MAJOR METABOLITES IN BLOOD BY ELECTRON-CAPTURE GAS-LIQUID CHROMATOGRAPHY AND IN URINE BY DIFFERENTIAL PULSE POLAROGRAPHY. J.A.F. de Silva; C.V. Puglisi; M.A. Brooks; M.R. Hackman. Journal of Chromatography. v99 p461-83 (1974)

UM-75-M0243

DETERMINATION OF PERPHENAZINE AND ITS SULPHOXIDE METABOLITE IN HUMAN PLASMA AFTER THERAPEUTIC DOSES BY GAS CHROMATOGRAPHY. N.-E. Larsen; J. Naestoft. Journal of Chromatography. v109 p259-64 (1975)

UM-75-M0242

DETERMINATION OF PINAZEPAM AND ITS METABOLITES IN SERUM, URINE AND BRAIN BY GAS-LIQUID CHROMATOGRAPHY AND MASS SPECTROMETRY. A. Trebbi; G.B. Gervasi; V. Comi. Journal of Chromatography. v110 p309-19 (1975)

UM-79-E0063

DETERRENCE OF METHAQUALONE ABUSE THROUGH MASS URINALYSIS. E. K. Jeffer. International Journal of the Addictions. v14 n3 p445-50 (1979)

UM-75-E0031

DIAZEPAM USE BY PATIENTS IN A METHADONE PROGRAM--HOW SERIOUS A PROBLEM? G.E. Woody; J. Mintz; K. O'Hare; C.P. O'Brien; R.A. Greenstein; E. Hargrove. Journal of Psychedelic Drugs. v7 n4 p373-9 (Oct-Dec 1975)

UM-78-D0955

DIAZEPAM, ALCOHOL AND DRIVERS. A.W. Missen; W. Cleary; L. Eng; S. McMillan. New Zealand Medical Journal. v87 n610 p275-7 (26 Apr 1978)

UM-75-D0988

DIE ALKOHOLBEDINGTE FAHRUNTUCHTIGKEIT--IST SIE ABSOLUT ODER RELATIV? [THE ABILITY TO DRIVE RELATED TO ALCOHOL--IS IT ABSOLUTE OR RELATIVE?]. V. Kaufmann. Blutalkohol. v12 n5 p301-7 (1975)

UM-75-D0987

DIE ANFLUTUNGSWIRKUNG BEIM FAHREN UNTER ALKOHOLEINFLUSS [THE FLOODING EFFECT IN DRIVING UNDER THE INFLUENCE OF ALCOHOL]. V. Kaufmann. Blutalkohol. v12 n1 p39-42 (1975)

UM-75-D0980

DIE BEEINTRACHTIGUNG DER FAHRTUCHTIGKEIT BEI BLUTALKOHOLKONZENTRATION UM 0.05%, R. Richter; V. Hobi, Schwizerische Medizinische Wochenschrift, v10 n27 p884-90 (1975)

UM-77-D0992

DIE ERMITTLUNG DES RISIKOFAHRERS DURCH DOKUMENTIERTE KLINISCHE UNTERSUCHUNG [DETECTION OF THE DANGEROUS DRIVER BY DOCUMENTED INVESTIGATION], H. Roer, Blutalkohol, v14 n5 p315-30 (1977)

UM-77-E0036

DIMENSIONS OF MARIJUANA USE IN A MIDWEST CATHOLIC UNIVERSITY: SUBCULTURAL CONSIDERATIONS, D.L. Dodge, The International Journal of the Addictions, v12 n7 p971-81 (1977)

UM-77-M0290

DIPHENYLHYDANTOIN. A COMPARISON STUDY OF THE ENZYME IMMUNOASSAY AND A CHEMICAL METHOD, J. Vasiliades; D. Shettlesworth; K. Owen, Journal of Analytical Toxicology, v1 p73-4 (Mar-Apr 1977)

UM-76-D0801

DISCRIMINABLE EFFECTS OF BENZODIAZEPINES, D.A. Overton, Psychopharmacology Communications, v2 n4 p339-43 (1976)

UM-77-D0879

DOSE-RELATED HEART-RATE, PERCEPTUAL, AND DECISIONAL CHANGES IN MAN FOLLOWING MARIHUANA SMOKING, C.F. Schaefer; C.G. Gunn, K.M. Dubowski, Perceptual and Motor Skills, v44 n1 p3-16 (Feb 1977)

UM-71-D0982

DOSE-RESPONSE ANALYSIS OF THE EFFECTS OF TETRAHYDROCANNABINOL IN MAN, G.F. Kiplinger; J.E. Manno; B.E. Rodda; R.B. Forney, Clinical Pharmacology and Therapeutics, v12 n4 p650-7 (Jul-Aug 1971)

UM-78-C0013

DRIVER LICENSING AND PUBLIC HEALTH: A PROPOSAL FOR COLLABORATIVE EFFORTS, P.F. Waller, Proceedings of the AAAM (22nd) and the International Association for Accident and Traffic Medicine (VII) Ann Arbor, Michigan, 10-14 July 1978, D.F. Huelke, ed., v2 p125-31, Morton Grove, Illinois: American Association for Automotive Medicine, (1978)

UM-78-F0031

DRIVER PERFORMANCE TESTS: THEIR ROLE AND POTENTIAL, P.F. Waller; L.K. Li; R.G. Hall; J.C. Stutts, Chapel Hill, N.C.: University of North Carolina Highway Safety Reseach Center (Mar 1978)

UM-78-F0029

DRIVER VISION AND ACCIDENT INVOLVEMENT: NEW FINDINGS WITH NEW VISION TESTS, D. Shinar, Proceedings of the AAAM (22nd) and the International Association for Accident and Traffic Medicine (VII) Ann Arbor, Mich., D.F. Huelke, ed., v2 p81-91, Morton Grove, Illinois: American Association for Automotive Medicine (10-14 Jul 1978)

UM-77-F0019

DRIVERS' EYE MOVEMENTS AS RELATED TO ATTENTION IN SIMULATED TRAFFIC FLOW CONDITIONS, A. Ceder, Human Factors, v19 n6 p571-81 (Dec 1977)

UM-78-D0914

DRIVING BEHAVIOR OF CANNABIS USERS AND NON-USERS IN CLOSED-COURSE AND NORMAL TRAFFIC SITUATIONS, S. Casswell, Proceedings of the AAAM (22nd) and the International Association for Accident and Traffic Medicine (VII) Ann Arbor, Michgian, 10-14 July 1978, D.F. Huelke, ed., v1 p330-41, (1978)

UM-70-F0005

DRIVING SIMULATION: AN OVERVIEW, T R. Schori, Behavioral Research in Highway Safety, v1 n4 p236-49 (Winter 1970)

UM-78-D0915

DRIVING UNDER THE INFLUENCE OF ALCOHOL AND THE COMBINED USE OF MEDICINE, D. Van Ooijen, Journal of Traffic Medicine, v6 n2 p22-6 (June 1978)

UM-77-L0095

DRIVING, DISEASE AND THE PHYSICIAN'S RESPONSIBILITY, G.S. Sharpe, American Association for Automotive Medicine, 21st Conference, Proceedings, D.F. Huelke, ed., p64-85, Morton Grove, Illinois: AAAM (1977)

UM-71-E0045

DRUG ABUSE AND CRIME IN NEW JERSEY. A UNIFORM CRIME REPORTING SURVEY, Dissemination Document No. 10 (Jun 1971)

UM-77-C0008

DRUG ABUSE AND ITS TREATMENT IN CANADA, R.G. Smart, Addictive Diseases: an International Journal, v3 n1 p5-10 (1977)

UM-77-E0070

DRUG ABUSE BY ALCOHOLICS AND PROBLEM DRINKERS: A LITERATURE REVIEW AND EVALUATION, J.F.X. Carroll; T.E. Malloy; F.M. Kenrick, American Journal of Drug and Alcohol Abuse, v4 n3 p317-41 (1977)

UM-75-D0742

DRUG AFTER EFFECTS AND TRAFFIC SAFETY, A.E. LeBlanc; A. Wilson, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p449-52, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-70-M0218

DRUG AND CHEMICAL BLOOD LEVELS, C.L. Winek, Legal Medicine Annual: 1970, C.H. Wecht, ed., p67-77, New York: Appleton-Century-Crofts (1970)

UM-70-M0219

DRUG AND CHEMICAL BLOOD LEVELS--UPDATE, C.L. Winek, Legal Medicine Annual: 1973, C.H. Wecht, ed., p115-20, New York: Appleton-Century-Crofts (1973)

UM-78-P0036

DRUG CONCENTRATION IN SALIVA. J.C Mucklow; M.R. Bending; G.C. Kahn; C.T. Dollery. Clinical Pharmacology and Therapeutics, v24 n5 p563-70 (Nov 1978)

UM-74-D0799

DRUG CONCENTRATIONS IN THE PLASMA AS AN INDEX OF PHARMACOLOGIC EFFECT. D. Perrier; M. Gibaldi. Journal of Clinical Pharmacology, v14 n8-9 p415-7 (Aug-Sep 1974)

UM-71-E0014

DRUG CULTURE IN THE SEVENTIES, K.D. Charalampous, American Journal of Public Health, v61 n6 p1225-8 (Jun 1971)

UM-75-D0735

DRUG EFFECTS ON EMOTIONS: RELEVANCE TO DRIVING ACCIDENTS, M. Frankenhaeuser, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety. S. Israelstam; S. Lambert, eds., p259-70, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-77-E0065

DRUG INFORMATION SOURCE CREDIBILITY AMONG JUNIOR AND SENIOR HIGH SCHOOL YOUTHS, R. Dembo; J. Schmeidler; D.V. Babst; D.S. Lipton, American Journal of Drug and Alcohol Abuse, v4 n1 p43-54 (1977)

UM-75-D0761

DRUG INTERACTIONS: THE EFFECTS OF ALCOHOL AND MEPROBAMATE APPLIED SINGLY AND JOINTLY IN HUMAN SUBJECTS. Journal of Studies on Alcohol. J.A. Carpenter, Suppl. 7 p1-193 (Nov 1975)

UM-76-B0009

DRUG MISUSE...HUMAN ABUSE OF THERAPEUTICS, FIFTH EDITION, H.I. Green; M.H. Levy, eds., New York: Marcel Dekker, Inc (1976)

UM-75-E0011

DRUG USAGE: AN ALTERNATIVE TO RELIGION? J. Westermeyer, V. Walzer, Diseases of the Nervous System, v36 n9 p492-5 (Sep 1975)

UM-77-E0044

DRUG USE AMONG HIGH SCHOOL STUDENTS 1975-1977, L.D. Johnston; J.G. Bachman; P.M. O'Malley (1977)

UM-77-E0016

DRUG USE AMONG THE ELDERLY: A REVIEW, D.M. Petersen; F.J. Whittington, Journal of Psychedelic Drugs, v9 n1 p25-37 (Jan-Mar 1977)

UM-77-L0100

DRUG USE AND ABUSE: SOME CULTURE-CROSSING QUESTIONS, M.H. Agar, Journal of Psychedelic Drugs, v9 n1 p69-73 (Jan-Mar 1977)

UM-75-E0008

DRUG USE DATA: A DIFFERENT PERSPECTIVE. A.M. Lee. Journal of the American Medical Association. v234 n12 p1242-4 (22 Dec 1975)

UM-77-L0097

DRUG USE IN AUSTRALIA AND THE UNITED STATES AS REFLECTIONS OF LEGISLATION AND SOCIAL ATTITUDES. D.A. Knapp; D.E. Knapp; G.E. Brooks. Drug Intelligence and Clinical Pharmacy. v11 n5 p298-303 (May 1977)

UM-77-D0871

DRUG USERS AND DRIVING BEHAVIORS. Research Issues 20. B.A. Austin; R.S. Sterling-Smith; M.A. Macari; et al., Washington, D.C.: U.S. Government Printing Office (Jun 1977)

UM-77-L0110

DRUG USERS AND THE CRIMINAL JUSTICE SYSTEM. G.A. Austin; D.J. Lettieri, eds., NIDA Research Issues 18 (Jun 1977)

UM-76-D0723

DRUG UTILIZATION REVIEW: CURRENT STATUS AND RELATIONSHIP TO ASSURING QUALITY MEDICAL CARE. J.E. Knoben. Drug Intelligence and Clinical Pharmacy. v10 n4 p222-8 (Apr 1976)

UM-77-D0813

DRUG-PRODUCED CHANGES IN HUMAN SOCIAL BEHAVIOR: FACILITATION BY D-AMPHETAMINE. R.R. Griffiths; M. Stitzer; K. Corker; G. Bigelow; I. Liebson. Pharmacology Biochemistry and Behavior. v7 n4 p365-72 (1977)

UM-76-D0719

DRUGS (OTHER THAN OR IN ADDITION TO ALCOHOL) AND DRIVING. Toxicology Section, American Academy of Forensic Sciences, 20 Feb 1976, Washington,D.C. (1976)

UM-74-D0940

DRUGS AND ALCOHOL AS FACTORS IN ROAD ACCIDENTS. A.B. Clayton. Journal of Social and Occupational Medicine. v24 n2 p62-5 (April 1974)

UM-76-L0109

DRUGS AND CRIME: THE RELATIONSHIP OF DRUG USE AND CONCOMITANT CRIMINAL BEHAVIOR. G.A. Austin; C. Phil; D.J. Lettieri, eds., NIDA Research Issues 17 (Dec 1976)

UM-77-D0848

DRUGS AND DRIVING. R.E. Willette. NIDA Research Monograph 11 (Mar 1977)

UM-78-D0947

DRUGS AND DRIVING. Drug and Therapeutics Bulletin. v16 n17 p65-7 (18 Aug 1978)

UM-76-D0851

DRUGS AND DRIVING. H. Moskowitz, ed., New York: Pergamon Press (1976)

UM-77-D0924

DRUGS AND DRIVING. Medical Letter on Drugs and Therapeutics. v19 n24 p99-100 (2 Dec 1977)

UM-77-C0007

DRUGS AND DRIVING (pamphlet), Canada Safety Council (1977)

UM-77-D0893

DRUGS AND DRIVING--WHERE DO WE GO FROM HERE? A.S. Curry. Technical Aspects of Road Safety. n67 p3.G-3.G.4. (June 1977)

UM-75-D0724

DRUGS AND DRIVING: A RESEARCH REVIEW. K.B. Joscelyn; R.P Maickel (Nov 1975)

UM-75-A0011

DRUGS AND DRIVING: A SELECTED BIBLIOGRAPHY. K.B. Joscelyn; R.P. Maickel (Oct 1975)

UM-78-A0019

DRUGS AND DRIVING: A SELECTED BIBLIOGRAPHY. SUPPLEMENT ONE. K.B. Joscelyn; A.C. Donelson (Jan 1978)

UM-74-A0012

DRUGS AND EMPLOYMENT: NONMEDICAL USE OF DRUGS IN OCCUPATIONAL AND INDUSTRIAL SETTINGS. P. Ferguson; T. Lennox; D.J. Lettieri, eds., NIDA Research Issues 1 (Nov 1974)

UM-77-L0115

DRUGS AND HEALTH. F.A. Whitlock. Journal of Drug Issues. v7 n4 p397-403 (Fall 1977)

UM-78-D0913

DRUGS AND HIGHWAY SAFETY: RESEARCH ISSUES AND INFORMATION NEEDS. K.B. Joscelyn; A.C. Donelson. Proceedings of the AAAM (22nd) and The International Association for Accident and Traffic Medicine (VII) Ann Arbor, Michgian, 10-14 July 1978. D.F. Huelke, ed., v1 p268-92. Morton Grove, Illinois: American Association for Automotive Medicine (1978)

UM-77-D0905

DRUGS AND THEIR EFFECTS ON DRIVING PERFORMANCE. D. Valentine; M.S. Williams; R.K. Young (May 1977)

UM-74-B0016

DRUGS AND THE ELDERLY. R.H. Davis; W.K. Smith, eds., Los Angeles: University of Southern California Press (1974)

UM-76-D0720

DRUGS AND US. G. Milner. Alcoholics and Drug Dependent Person's Services. Victoria, Australia (1976)

UM-76-D0808

DRUGS AS DISCRIMINATIVE EVENTS IN HUMANS. J.L. Altman; J.M. Albert; S.L. Milstein; I. Greenberg. Psychopharmacology Communications, v2 n4 p327-30 (1976)

UM-75-D0822

DRUGS FOR EMOTIONAL DISORDERS. CURRENT PROBLEMS. L.E. Hollister. Journal of the American Medical Association, v234 n9 p942-7 (1 Dec 1975)

UM-71-D0864

DRUGS OF ABUSE: AN INTRODUCTION TO THEIR ACTIONS AND POTENTIAL HAZARDS. S. Irwin. Journal of Psychedelic Drugs, v3 n2 p5-15 (Spring 1971)

UM-71-A0010

DRUGS OF ABUSE: BIBLIOGRAPHY. Fluorescence News, v6 n3 p11-12 (Dec 1971)

UM-77-E0056

DYNAMICS OF DRUG USE. J.H. Rollins; R.H. Holden. Journal of Drug Education, v7 n3 p231-6 (1977-78)

UM-71-F0006

EDITORIAL. S.F. Hulbert. Behavioral Research in Highway Safety, v2 n1 p3-4 (Spring 1971)

UM-76-D0806

EEG AND BEHAVIORAL EFFECTS OF DELTA-9-TETRAHYDROCANNABINOL IN COMBINATION WITH STIMULANT DRUGS IN RABBITS. P. Consroe; B. Jones; H. Laird. Psychopharmacology, v50 p47-52 (1976)

UM-76-D0703

EFFECT OF ACTIVE METABOLITES OF CHLORDIAZEPOXIDE AND DIAZEPAM, ALONE OR IN COMBINATION WITH ALCOHOL, ON PSYCHOMOTOR SKILLS RELATED TO DRIVING. E.S. Palva; M. Linnoila; M.J. Mattila. Modern Problems in Pharmacopsychiatry, v11 p79-84 (1976)

UM-78-D0967

EFFECT OF CANNABIS ON DRIVING. G. Mendleson. Medical Journal of Australia, v1 n7 p391-2 (8 Apr 1978)

UM-76-D0790

EFFECT OF CHLORPROMAZINE OR SULPIRIDE AND ALCOHOL ON PSYCHOMOTOR SKILLS RELATED TO DRIVING. T. Seppala. Archives Internationales de Pharmacodynamie et de Therapie, v223 n2 p311-23 (Oct 1976)

UM-76-D0867

EFFECT OF MARIHUANA AND ALCOHOL ON VISUAL SEARCH PERFORMANCE. FINAL REPORT. H.A. Moskowitz; K. Ziedman; S. Sharma (Oct 1976)

UM-74-D0957

EFFECT OF TRICYLIC ANTIDEPRESSANTS AND ALCOHOL ON PSYCHOMOTOR SKILLS RELATED TO DRIVING. T. Seppala; M. Linnoila; E. Elonen; M.J. Mattila; M. Maki. Clinical Pharmacology and Therapeutics, v17 n5 p515-22 (May 1975)

UM-72-D0902

EFFECTS OF ALCOHOL AND DRUGS ON DRIVING BEHAVIORS. M. Buttiglieri; A.J. Brunse; H.W. Case. Human Factors in Highway Traffic Safety Research. T.W. Forbes, ed., p303-30, New York: John Wiley and Sons (1972)

UM-76-D0834

EFFECTS OF CANNABIS AND ALCOHOL ON AUTOMOBILE DRIVING AND PSYCHOMOTOR TRACKING, R.W. Hansteen; R.D. Miller; L. Lonero; L.D. Reid; B. Jones. Annal of the New York Academy of Sciences, v282 p240-56 (1976)

UM-73-D0766

EFFECTS OF CARBON MONOXIDE ON DRIVING SKILLS. G.R. Wright; P. Randell; R.J. Shephard. Proceedings of the Scientific Session of the 10th Annual Meeting of Traffic Injury Foundation of Canada, p67-76, Traffic Injury Foundation of Canada (1973)

UM-77-D0800

EFFECTS OF CERTAIN BENZODIAZEPINE DERIVATIVES ON DISORGANIZATION OF THOUGHT AS MANIFESTED IN SPEECH. L.A. Gottschalk. Current Therapeutic Research. v21 n2 p192-206 (Feb 1977)

UM-69-D0934

EFFECTS OF CHRONIC EXPOSURE TO LOW LEVELS OF CARBON MONOXIDE ON HUMAN HEALTH, BEHAVIOR, AND PERFORMANCE. Washington, D.C.: National Academy of Sciences, National Academy of Engineering (1969)

UM-76-D0918

EFFECTS OF CO ON VIGILANCE PERFORMANCE--EFFECTS OF LOW LEVEL CARBON MONOXIDE ON DIVIDED ATTENTION, PITCH DISCRIMINATION, AND THE AUDITORY EVOKED POTENTIAL. V.R. Putz; B.L. Johnson; J.V. Setzer (Nov 1976)

UM-72-D0941

EFFECTS OF DRUGS AND ALCOHOL ON DRIVER PERFORMANCE. FINAL REPORT. H.W. Case; S.F. Hulbert (May 1972)

UM-79-D0706

EFFECTS OF DRUGS ON DRIVING: DRIVING SIMULATOR TESTS OF DIAZEPAM AND SECOBARBITAL. H. Ziedman; A. Smiley; H. Moskowitz. Compass for Technology. Proceedings of the Human Factors Society, 23rd Annual Meeting, C.K. Bensel, ed., p259-62, Santa Monica, Ca.: Human Factors Society (1979)

UM-70-D0910

EFFECTS OF DRUGS ON PERCEPTION IN MAN. S. Malitz; M. Kanzler. Perception and Its Disorders. Proceedings of the Association for Research in Nervous and Mental Disease, December 6-7, 1968, New York, p35-53, Baltimore: Williams and Wilkins Co. (1970)

UM-77-D0845

EFFECTS OF ETHANOL AND TOBACCO ON DIVIDED ATTENTION. G. Leigh; J.E. Tong; J.A. Campbell. Journal of Studies on Alcohol, v38 n7 p1233-9 (Jul 1977)

UM-77-D0841

EFFECTS OF MARIHUANA ON REACTION TIME AND SHORT-TERM MEMORY IN HUMAN VOLUNTEERS, A.M. Rossi; J.C. Kuehnle; J.H. Mendelson, Pharmacology, Biochemistry and Behavior, v6 n1 p73-7 (Jan 1977)

UM-74-D0916

EFFECTS OF MARIJUANA ON AGGRESSION AND RISK ACCEPTANCE IN AN AUTOMOTIVE SIMULATOR, A.E. Dott, Clinical Toxicology, v7 n3 p289 (1974)

UM-77-D0876

EFFECTS OF MARIJUANA ON HUMAN REACTION TIME AND MOTOR CONTROL, T.O. Kvalseth, Perceptual and Motor Skills, v45 n3 pt1 p935-9 (Dec 1977)

UM-79-D0722

EFFECTS OF MODERATE LEVELS OF DIAZEPAM AND ALCOHOL ON TWO-LANE PASSING PERFORMANCE, R. Williams; D. Attwood; R. Frecker, Proceedings of the 12th Annual Meeting, Human Factors Association of Canada, Bracebridge, Ontario, September 6-8 1979, p17.1-17.4, Downsview, Ontario: Road Safety Unit, Transport Canada (1979)

UM-74-D0936

EFFECTS OF NOXIOUS GASES ON DRIVER PERFORMANCE, T.H. Rockwell; R.L. Wick; K.N. Balasubramanian (Oct 1974)

UM-78-D0946

EFFECTS OF SET ON SUBJECT'S INTERPRETATION OF PLACEBO MARIHUANA EFFECTS, H.W. Smith, Social Science and Medicine, v12 n2a p107-9 (Mar 1978)

UM-77-D0836

EFFECTS OF THREE KINDS OF HYPOXIAS ON VIGILANCE PERFORMANCE, C.L. Christensen; J.A. Gliner; S.M. Horvath; J.A. Wagner, Aviation Space and Environmental Medicine, v48 n6 p491-6 (Jun 1977)

UM-77-D0872

EFFECTS OF WINE CONGENERS ON RATS' BEHAVIOR, S.A. Golder; W.H. Tedford; W.E. Flynn; E.R. Biehl, Journal of Studies on Alcohol, v38 n1 p25-9 (1977)

UM-76-L0093

EFFICACY OF LAW ENFORCEMENT PROCEDURES CONCERNING ALCOHOL, DRUGS, AND DRIVING, R.F. Borkenstein, Modern Problems of Pharmacopsychiatry, v11 p1-10 (1976)

UM-74-M0237

ELECTRON CAPTURE DETECTION IN GAS CHROMATOGRAPHY, E.D. Pellizzari, Journal of Chromatography, v98 p323-61 (1974)

UM-76-D0823

ENVIRONMENTAL FACTORS INVOLVED IN THE DEVELOPMENT OF TOLERANCE TO BEHAVIORAL EFFECTS OF DELTA-9-TETRAHYDROCANNABINOL, M.N. Branch (Aug 1976)

UM-75-D0726

EPIDEMIOLOGIC ISSUES ABOUT ALCOHOL, OTHER DRUGS, AND HIGHWAY SAFETY, J.A. Waller, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p3-11, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-73-E0073

EPIDEMIOLOGICAL ASPECTS OF ALCOHOL IN DRIVER CRASHES AND CITATIONS, P.M. Hurst, Journal of Safety Research, v5 n3 p130-48 (Sep 1973)

UM-77-E0004

EPIDEMIOLOGICO-STATISTICAL PROBLEMS IN CONNECTION WITH THE IDENTIFICATION OF THE EFFECTS OF DRUGS ON TRAFFIC SAFETY, B. Friedel, 7th International Conference on Alcohol, Drugs, and Traffic Safety, Melbourne, Australia (Jan 1977)

UM-74-E0001

EPIDEMIOLOGY OF ACUTE DRUG INTOXICATIONS: PATIENT CHARACTERISTICS, DRUGS, AND MEDICAL COMPLICATIONS, R.B. Stewart; M. Forgnone; F.E. May; J. Forbes; L.E. Cluff, Clinical Toxicology, v7 n5 p513-30 (1974)

UM-76-D0960

EPILEPSY AND DRIVING, K.S. Millingen, Proceedings of the Australian Association of Neurologists, v13 p67-72 (1976)

UM-75-D0994

EPILEPSY AND DRIVING, Drug and Therapeutics Bulletin, v13 n8 p31-2 (1975)

UM-64-F0028

ERRORS IN DRIVER RISK-TAKING, P.M. Hurst, Report Number 2, Division of Highway Studies Institute for Research, State College, Pennsylvania, (Jun 1964)

UM-70-C0016

ESTIMATING THE EFFECTIVENESS OF BLOOD ALCOHOL LIMITS, P.M. Hurst, Behavioral Research in Highway Safety, v1 p87-99 (Summer 1970)

UM-74-D0953

ESTUDO DUPLO-CEGO DE NOVA ASSOCIACAO QUIMIOTERAPICA NA CEFALEIA DE TENSAO, C.S. Borges; J.M.B. de Lima, Folha Medico, v68 n4 p371-6 (1974)

UM-76-D0966

ET TILFAELDE AF AKUT KARISOPRODOLFORGIFTNING. SYMPTOMKOMPLEKS OG METABOLISERING [A CASE OF ACUTE INTOXICATION WITH CARISOPRODOL. SYMPTOMS AND METABOLISM], I. Brandslund; N.A. Klitgaard; O. Kristensen, Ugeskrift for Laeger, v138 n5 p281-3 (1976)

UM-75-D0741

ETHANOL AND DIAZEPAM AS CAUSATIVE AGENTS IN ROAD TRAFFIC ACCIDENTS, O. Bo; J.F.W. Haffner; O. Langard; J.H. Trumpy; J.E. Bredesen; P.K.M. Lunde, Proceedings of the 6th International Conference on Alcohol, Drugs and Traffic Safety, S. Israelstam; S. Lambert, eds., p439-48, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-76-C0003

EVALUATION METHODOLOGIES FOR TRAFFIC SAFETY PROGRAMS, V.S. Ellingstad; D.P. Westra, Human Factors, v18 n4 p313-26 (Aug 1976)

UM-77-F0009

EVALUATION OF LABORATORY METHODS FOR THE STUDY OF DRIVER BEHAVIOR: RELATIONS BETWEEN SIMULATOR AND STREET PERFORMANCE, D.S. Edwards; C.P. Hahn; E.A. Fleishman, Journal of Applied Psychology, v62 n5 p559-66 (1977)

UM-76-D0923

EVALUATION OF THE PSYCHOTROPIC EFFECT OF ETIFOXINE THROUGH PURSUIT ROTOR PERFORMANCE AND GSR, R. Corsico; J. Moizeszowicz; L. Bursuck; E. Rovaro, Psychopharmacologia, v45 n3 p301-3 (1976)

UM-77-E0071

EXPERIMENTAL HEROIN USERS: AN EPIDEMIOLOGIC AND PSYCHOSOCIAL APPROACH, D.B. Graeven; W. Folmer, American Journal of Drug and Alcohol Abuse, v4 n3 p365-75 (1977)

UM-68-D0976

EXPERIMENTAL STUDIES OF MARIHUANA, L.D. Clark; E.N. Nakashima, American Journal of Psychiatry, v125 n3 p379-84 (Sep 1968)

UM-75-D0952

EXPERIMENTALPSYCHOLOGISCHE UNTERSUCHUNG DER WIRKUNG EINER HEXOBENDIN-ETAMIVAN-ETOFYLLIN-KOMBINATION [EXPERIMENTAL PSYCHOLOGICAL STUDY OF THE EFFECT OF A COMBINATION OF HEXOBENDINE, ETAMIVAN, AND ETOFYLLINE], E. Klebel, Arzneimittel Forschung, v25 n5 p831-6 (1975)

UM-74-D0986

EXPERIMENTELLE. UNTERSUCHUNGEN ZUR FAHRTUCHTIGKEIT NACH EINNAHME EINES BROMHALTIGEN SCHLAFMITTELS SOWIE NACH GLEICHZEITIGEM ALKOHOLGENUSS [TRAFFIC SAFETY AFTER INGESTION OF A BROMINE CONTAINING HYPNOTIC WITH OR WITHOUT CONCOMITANT ALCOHOL INTAKE], R. Helmer; H. Wegner; I. Krafft, Blutalkohol, v11 n6 p385-91 (1974)

UM-77-L0092

EXPERIMENTS ON HUMANS: WHERE TO DRAW THE LINE? P. London, Psychology Today, v11 n6 p20,23 (Nov 1977)

UM-79-D0709

EYE MOVEMENTS AND SKILLS PERFORMANCE MEASURES UNDER ALCOHOL IN A DRIVING SIMULATOR, H. Moskowitz; K. Ziedman, Compass for Technology. Proceedings of the Human Factors Society, 23rd Annual Meeting, C.K. Bensel, ed., p389-93, Santa Monica, Ca.: Human Factors Society (1979)

UM-76-P0012

FACTORS AFFECTING DRUG BINDING IN PLASMA OF ELDERLY PATIENTS, S. Wallace; B. Whiting; J. Runcie, British Journal of Clinical Pharmacology, v3 p327-30 (1976)

UM-78-C0012

FEASIBILITY OF DESIGNATING MEDICAL EXAMINERS FOR INTERSTATE COMMERCIAL DRIVERS, L.N. Hames; E. Petrucelli, Proceedings of the AAAM (22nd) and the International Association for Accident and Traffic Medicine (VII) Ann Arbor, Michigan, 10-14 July 1978,

D.F. Huelke, ed., v2 p107-24, Morton Grove, Illinois: American Association for Automotive Medicine (1978)

UM-76-D0763

FITS AND FITNESS TO DRIVE, British Medical Journal, n6020 p1235-6 (22 May 1976)

UM-71-M0206

FLUOROMETRIC PROCEDURES FOR ILLICIT DRUG DETECTION, R.A. Passwater, Fluorescence News, v6 n3 p8-11 (Dec 1971)

UM-75-M0266

FLUOROMETRIC SCREENING METHOD FOR DETECTING BENZODIAZEPINES IN BLOOD AND URINE, J.C. Valentour; J.R. Monforte; B. Lorenzo; I. Sunshine, Clinical Chemistry, v21 n13 p1976-9 (1975)

UM-77-P0025

FORENSIC TOXICOLOGY OF SOME DEATHS ASSOCIATED WITH THE COMBINED USE OF PROPOXYPHENE AND ACETAMINOPHEN (PARACETAMOL), A.E. Robinson; H. Sattar; M. Phil; R.D. McDowall; A.T. Holder; R. Powell, Journal of Forensic Sciences, v22 n4 p708-17 (Oct 1977)

UM-75-M0283

GAS CHROMATOGRAPHIC-MASS FRAGMENTOGRAPHIC DETERMINATION OF "STEADY-STATE" PLASMA LEVELS OF IMIPRAMINE AND DESIPRAMINE IN CHRONICALLY TREATED PATIENTS, G. Belvedere; L. Burti; A. Frigerio; C. Pantarotto, Journal of Chromatography, v111 p313-21 (1975)

UM-72-M0202

GAS CHROMATOGRAPHY-MASS SPECTROSCOPY INTERFACIAL SYSTEMS, C.F. Simpson, CRC Critical Reviews in Analytical Chemistry, v3 iss1 p1-40 (Sep 1972)

UM-75-M0269

GAS-CHROMATOGRAPHIC ANALYSIS FOR COCAINE IN HUMAN PLASMA, WITH USE OF A NITROGEN DETECTOR, P.I. Jatlow; D.N. Bailey, Clinical Chemistry, v21 n13 p1918-21 (1975)

UM-75-M0267

GAS-CHROMATOGRAPHIC MEASUREMENT OF CODEINE AND NORCODEINE IN HUMAN PLASMA, M.K. Brunson; J.F. Nash, Clinical Chemistry, v21 n13 p1956-60 (1975)

UM-74-M0270

GAS-CHROMATOGRAPHIC SIMULTANEOUS ANALYSIS FOR GLUTETHIMIDE AND AN ACTIVE HYDROXYLATED METABOLITE IN TISSUES, PLASMA, AND URINE, A.R. Hansen; L.J. Fischer, Clinical Chemistry, v20 n2 p236-42 (1974)

UM-76-M0244

GAS-LIQUID CHROMATOGRAPHIC DETERMINATION OF PERAZINE, THIORIDAZINE AND THIORIDAZINE METABOLITES IN HUMAN PLASMA, F.A.J. Vanderheeren; D.J.C.J. Theunis; M.T. Rosseel, Journal of Chromatography, v120 p123-8 (1976)

UM-73-M0215

GC/MS DATA SYSTEM, F.W. Karasek, Research/Development, v24 n10 p40,42-7 (Oct 1973)

UM-75-D0900

GENERAL ASPECTS OF DRUG INTERACTIONS IN PSYCHOPHARMACOLOGY, D.G. Grahame-Smith, Drug Interactions, D.G. Grahame-Smith, ed., p147-57, Baltimore: University Park Press (1975)

UM-77-C0017

GENERAL DETERRENCE AND POLICE ENFORCEMENT: EFFECTIVE COUNTERMEASURES AGAINST DRINKING AND DRIVING, P.K. Ennis, Journal of Safety Research, v9 n1 p15-25 (Mar 1977)

UM-75-D0899

GENETIC AND ENVIRONMENTAL FACTORS AFFECTING DRUG INTERACTIONS IN MAN, E.S. Vesell, Drug Interactions, D.G. Grahame-Smith, ed., p119-43, Baltimore: University Park Press (1975)

UM-78-D0920

HAUFIGKEIT POSITIVER DIAZEPAM-BEFUNDE IN BLUTPROBEN ALKOHOLISIERTER VERKEHRSTEILNEHMER [OCCURRENCE OF DIAZEPAM IN BLOOD SAMPLES OF DRIVERS UNDER THE INFLUENCE OF ALCOHOL], H.-P. Gelbke; H.J. Schlicht; G. Schmidt, Zeitschrift Fur Rechtsmedizin, v80 n4 p319-28 (1978)

UM-78-C0011

HEALTH CHECKS OF MOTOR VEHICLE OPERATORS, R. Andreasson, Proceedings of the AAAM (22nd) and the International Association for Accident and Traffic Medicine (VII) Ann Arbor, Michigan, 10-14 July 1978, D. F. Huelke, ed., v2 p92-106, Morton Grove, Illinois: American Association for Automotive Medicine (1978)

UM-76-E0030

HEROIN ABUSE TRENDS IN LOS ANGELES COUNTY BETWEEN 1960 AND 1975, F.S. Tennant; J. Ruckle, Journal of Psychedelic Drugs, v8 n4 p291-8 (Oct-Dec 1976)

UM-75-M0203

HIGH RESOLUTION LIQUID CHROMATOGRAPHY, H. Veening, CRC Critical Reviews in Analytical Chemistry, v5 iss2 p165-200 (Jul 1975)

UM-76-M0252

HIGH-PRESSURE LIQUID CHROMATOGRAPHY OF CANNABIS. QUANTITATIVE ANALYSIS OF ACIDIC AND NEUTRAL CANNABINOIDS, R.N. Smith; C.G. Vaughan, Journal of Chromatography, v129 p347-54 (1976)

UM-78-E0041

HIGHLIGHTS FROM THE NATIONAL SURVEY ON DRUG ABUSE: 1977, J.D. Miller; I.H. Cisin; A.V. Harrell (Jan 1978)

UM-77-E0043

HIGHLIGHTS FROM: DRUG USE AMONG AMERICAN HIGH SCHOOL STUDENTS 1975-1977, L.D. Johnston; J.G. Bachman; P.M. O'Malley (1977)

UM-75-D08'

HOMERGIC INTERACTIONS, ISOBOLS AND DRUG CONCENTRATIONS IN BLOOD, S.H. Curry, Drug Interactions, D.G. Grahame-Smith, ed., p87-99, Baltimore: University Park Press (1

UM-78-F0027

HUMAN AND BAYESIAN INFORMATION PROCESSING DURING PROBABILISTIC INFERENCE TASKS, T.O. Kvalseth, IEEE Transactions on Systems, Man, and Cybernetics, vSMC-8 n3 p224-9 (Mar 1978)

UM-78-D0884

HYPNOTIC DRUG THERAPY, S. Cohen; M.J. Blutt, Drug Abuse and Alcoholism Review, v1 n2 p1,3-8 (Mar-Apr 1978)

UM-76-M0257

IDENTIFICATION OF DRUGS USING A GAS CHROMATOGRAPHY-MASS SPECTROMETRY SYSTEM EQUIPPED WITH ELECTRON IMPACT-CHEMICAL IONIZATION AND ELECTRON IMPACT-FIELD IONIZATION-FIELD DESORPTION COMBINATION SOURCES, A. Zune; P. Dobberstein; K.H. Maurer; U. Rapp, Journal of Chromatography, v122 p365-71 (1976)

UM-77-M0273

IDENTIFICATION OF DRUGS, DRUG METABOLITES, AND OTHER COMPOUNDS IN URINE BY PERMETHYLATION AND GAS-PHASE ANALYSIS, R.M. Thompson, Research Communications in Chemical Pathology and Pharmacology, v16 n1 p145-54 (Jan 1977)

UM-75-M0209

IMMUNOASSAYS FOR THE DETECTION OF DRUGS IN DRIVERS, R.B. Forney; I. Sunshine, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p613-7, Toronto, Canada: Addiction Research Foundation of Ontario (1975)

UM-77-L0087

IMPAIRED DRIVING AND PUBLIC POLICY: AN EVALUATION OF PROPOSED COUNTERMEASURES, R.G. Ferrence; P.C. Whitehead, Blutalkohol, v14 n2 p106-17 (Mar 1977)

UM-79-P0046

IMPLANTABLE DRUG-DELIVERY SYSTEMS, P.J. Blackshear, Scientific American, v241 n6 p66-73 (Dec 1979)

UM-76-M0253

IMPORTANCE OF ASSAY SPECIFICITY FOR PLASMA PROTEIN BINDING DETERMINATIONS, A. Yacobi; G. Levy, Journal of Pharmacokinetics and Biopharmaceutics, v3 n6 p439-41 (1975)

UM-76-P0008

INDUSTRY'S ROLE IN BIOAVAILABILITY, M. Weiner, Journal of Clinical Pharmacology, v16 n10 pt1-2 p550-3 (Oct 1976)

UM-77-D0962

INFLUENCE OF ETHYL ALCOHOL IN MODERATE LEVELS ON THE ABILITY TO STEER A FIXED BASE SHADOWGRAPH DRIVING SIMULATOR, A.B. Dott; R.K. McKelvey, Human Factors, v19 n3 p295-300 (Jun 1977)

UM-76-M0254

INTERACTIONS BETWEEN DRUGS AND SALIVA-STIMULATING PARAFILM AND THEIR IMPLICATIONS IN MEASUREMENTS OF SALIVA DRUG LEVELS, K. Chang; W.L. Chiou, Research Communications in Chemical Pathology and Pharmacology, v13 n2 p357-60 (Feb 1976)

UM-76-D0704

INTERACTIONS OF CNS DRUGS--HYPNOTICS AND SEDATIVES, S.R. Brown; E.A. Hartshorn, Drug Intelligence and Clinical Pharmacy, v10 n10 p570-87 (Oct 1976)

UM-75-D0743

INTERACTIONS OF SOME STREET DRUGS, B.B. Coldwell; B.H. Thomas; K. Baily, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p453-60, Addiction Research Foundation of Ontario, Toronto, Canada. (1975)

UM-77-D0837

INTOXICATION CAUSED BY INTERACTION OF CHLORAMPHENICOL AND PHENYTOIN, J.Q. Rose; H.K. Choi; J.J. Schentag; W.R. Kinkel; W.J. Jusko, Journal of the American Medical Association, v237 n24 p2630-1 (13 Jun 1977)

UM-72-D0811

INTRODUCTION: GENETIC AND ENVIRONMENTAL FACTORS AFFECTING DRUG RESPONSE IN MAN, E.S. Vesell, Federation Proceedings, v31 n4 p1253-69 (Jul-Aug 1972)

UM-75-M0241

INVESTIGATION OF DIRECT THIN-LAYER CHROMATOGRAPHY-MASS SPECTROMETRY AS A DRUG ANALYSIS TECHNIQUE, G.J. Down; S.A. Gwyn, Journal of Chromatography, v103 p208-10 (1975)

UM-75-D0747

INVOLVEMENT OF ALCOHOL, CARBON MONOXIDE AND OTHER DRUGS IN TRAFFIC FATALITIES, R.F. Turk; A.J. McBay; P. Hudson; M.M. Bullaboy, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p597-611, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-76-M0261

ION-PAIR PARTITION CHROMATOGRAPHY IN THE ANALYSIS OF DRUGS AND BIOGENIC SUBSTANCES IN PLASMA AND URINE, B.-A. Persson; P.-O. Lagerstrom, Journal of Chromatography, v122 p305-16 (1976)

UM-75-M0259

ISOLATION OF DRUGS WITH MACRORETICULAR RESINS. DETERMINATION OF PHENTERMINE IN BLOOD, W. Vycudilik, Journal of Chromatography, v111 p439-42 (1975)

UM-73-P0019

KINETICS OF DRUG-DRUG INTERACTIONS, M. Rowland; S.B. Matin, Journal of Pharmacokinetics and Biopharmaceutics, v1 n6 p553-67 (Dec 1973)

UM-77-F0011

LABORATORY AND FIELD ANALYSES OF DECISIONS INVOLVING RISK, E.B. Ebbesen; S. Parker; V.J. Konecni, Journal of Experimental Psychology: Human Perception and Performance, v3 n4 p576-89 (1977)

UM-77-D0883

LABORATORY INVESTIGATION OF EFFECT OF ACUTE DOSES OF NOMIFENSINE ON A SIMULATED ASPECT OF NIGHT-TIME CAR DRIVING PERFORMANCE, I. Hindmarch, British Journal of Clinical Pharmacology, v4 supp2 p175s-178s (1977)

UM-77-D0875

LACK OF EFFECTS OF CARBON MONOXIDE ON HUMAN VIGILANCE, V.A. Benignus; D.A. Otto; J.D. Prah; G. Benignus, Perceptual and Motor Skills, v45 n3 pt1 p1007-14 (Dec 1977)

UM-77-D0852

LACK OF IMPAIRMENT IN SKILLS RELATED TO DRIVING AFTER INTRAMUSCULAR ADMINISTRATION OF PRILOCAINE OR MEPIVACAINE, K. Korttila, Acta anaesthesiologica scandinavica, v21 n1 p31-6 (1977)

UM-72-E0023

LEGITIMATE AND ILLEGITIMATE DISTRIBUTION OF AMPHETAMINES AND BARBITURATES, D.E. Smith; D.R. Wesson, Journal of Psychedelic Drugs, v5 n2 p177-81 (Winter 1972)

UM-75-D0705

LOCUS OF CONTROL, SENSATION SEEKING, AND DRUG AND ALCOHOL USE IN COLLEGE STUDENTS, B. Segal; P.F. Merenda, Drug Forum, v4 n4 p349-369 (1975)

UM-70-D0863

LONG LASTING EFFECTS OF LSD ON NORMALS, W. McGlothlin; S. Cohen; M.S. McGlothlin, Journal of Psychedelic Drugs, v3 n1 p20-31 (Sep 1970)

UM-77-D0803

MALE AND FEMALE CAR DRIVERS. DIFFERENCES OBSERVED IN ACCIDENTS, V.J. Storie, Crowthorne, United Kingdom: Department of the Environment and Department of Transport (1977)

UM-77-D0932

MANAGEMENT OF THE DISULFIRAM-ALCOHOL REACTION, R.M. Elenbaas, American Journal of Hospital Pharmacy, v34 n8 p827-30 (Aug 1977)

UM-77-F0020

MANIPULATING THE CONDITIONS OF TRAINING IN TIME-SHARING PERFORMANCE, D. Gopher, R.A. North, Human Factors, v19 n6 p583-93 (Dec 1977)

UM-77-D0833

MARIHUANA AND DRIVING HAZARDS, G. Milner, The Medical Journal of Australia, v1 n7 p208-11 (12 Feb 1977)

UM-79-D0959

MARIHUANA AND HEALTH. SEVENTH ANNUAL REPORT TO THE U.S. CONGRESS FROM THE SECRETARY OF HEALTH, EDUCATION AND WELFARE 1977, R.C. Petersen, Rockville, Md.: National Institute on Drug Abuse (1979)

UM-77-D0870

MARIHUANA AND HEALTH. SIXTH ANNUAL REPORT TO THE U.S. CONGRESS FROM THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE, 1976. (1977)

UM-76-D0805

MARIHUANA AND HUMAN PHYSICAL ACTIVITY, T.F. Babor; J.H. Mendelson; J.C. Kuehnle, Psychopharmacology, v50 p11-19 (1976)

UM-75-D0785

MARIHUANA AND SETTING, L.E. Hollister; J.E. Overall; M.L. Gerber, Archives of General Psychiatry, v32 p798-801 (Jun 1975)

UM-77-D0874

MARIHUANA RESEARCH FINDINGS: 1976, NIDA Research Monograph 14, R.C. Petersen, ed. (Jul 1977)

UM-76-D0769

MARIHUANA SMOKING AND SIMULATED FLYING PERFORMANCE, J.D. Blaine; M.P. Meacham; D.S. Janowsky; M. Schoor; L.P. Bozzetti, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v1 p445-7, New York: Raven Press (1976)

UM-75-D0821

MARIHUANA: CAN IT HURT YOU? H. Kolansky; W.T. Moore, Journal of the American Medical Association, v232 n9 p923-4 (2 Jun 1975)

UM-77-D0828

MARIHUANA: CURRENT ASSESSMENT, A.J. McBay, Journal of Forensic Sciences, v22 n3 p493-9 (Jul 1977)

UM-77-D0892

MARIJUANA AND MEMORY IMPAIRMENT: EFFECT ON FREE RECALL AND RECOGNITION MEMORY, L.L. Miller; D. McFarland; T.L. Cornett; D. Brightwell, Pharmacology Biochemistry and Behavior, v7 n2 p99-103 (Aug 1977)

UM-74-D0975

MARIJUANA: CNS DEPRESSANT OR EXCITANT? S.Y. Hill; D.W. Goodwin; R. Schwin; B. Powell, American Journal of Psychiatry, v131 n3 p313-15 (Mar 1974)

UM-75-D0781

MARIJUANA-PRODUCED IMPAIRMENTS IN COORDINATION: EXPERIENCED AND NONEXPERIENCED SUBJECTS, S.L. Milstein; K. MacCannell; G. Karr; S. Clark, The Journal of Nervous and Mental Disease, v161 n1 p26-31 (1975)

UM-75-L0089

MARKETING AND DISTRIBUTING HEROIN: SOME SOCIOLOGICAL OBSERVATIONS, L.J. Redlinger, Journal of Psychedelic Drugs, v7 n4 p331-53 (Oct-Dec 1975)

UM-75-D0734

MASS ARRESTS FOR IMPAIRED DRIVING MAY NOT PREVENT TRAFFIC DEATHS, R. Zylman, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p225-37, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-75-D0716

MASS MEDIA AND DRUG ABUSE PREVENTION IN THE UNITED STATES, J.H. Langer, Drug Forum, v4 n4 p279-87 (1975)

UM-76-M0249

MEASUREMENT OF DIPHENYLHYDANTOIN IN 0.1-ML PLASMA SAMPLES: GAS CHROMATOGRAPHY AND RADIOIMMUNOASSAY COMPARED, M.L. Orme; O. Borga; C.E. Cook; F. Sjoqvist, Clinical Chemistry, v22 n2 p246-9 (1976)

UM-77-F0001

MEASURING THE DRIVING TASK THROUGH VISUALS, J.A. Beno, Journal of Traffic Safety Education, v24 n4 p11,25 (Jul 1977)

UM-77-D0830

MEDAZEPAM AND THE DRIVING ABILITY OF ANXIOUS PATIENTS, N.C. Moore, Psychopharmacology, v52 n1 p103-6 (23 Mar 1977)

UM-73-D0721

MEDICAL IMPAIRMENT TO DRIVING, J.A. Waller, Springfield, Ill.: Thomas (1973)

UM-77-L0096

MEDICAL REPORTING OF DRIVERS WITH EMOTIONAL PROBLEMS, J.L. Weygandt, American Association for Automotive Medicine. 21st Conference Proceedings, D.F. Huelke, ed., p86-100, Morton Grove, Illinois: AAAM (1977)

UM-74-D0965

MEDICAMENTS ET CONDUITE AUTOMOBILE: ETAT DU PROBLEME [DRUGS AND DRIVING: RELEVANCE OF THE PROBLEM TODAY], J. Crespy, Le Travail Humain, v37 n1 p1-22 (1974)

UM-75-D0714

MEDICOLEGAL PROBLEMS IN DETERMINING CAUSE OF DEATH IN MOTOR VEHICLE ACCIDENTS, J.A. Perper; C.H. Wecht, Forensic Science, v6 n3 p241-247 (Dec 1975)

UM-77-D0901

MEDIKAMENTE UND FAHRVERHALTEN [DRUGS AND DRIVING BEHAVIOR], P. Kielholz; V. Hobi, Therapeutische Umschau/Revue Therapeutique, v34 n11 p803-12 (Nov 1977)

UM-75-D0948

MENTAL ILLNESS AND SIMULATED DRIVING: BEFORE AND DURING TREATMENT, P. Bech, Pharmakopsychiatrie Neuro-Psychopharmakologie, v8 n4 p143-50 (1975)

UM-74-L0090

METHADONE AND THE CULTURE OF ADDICTION, I.H. Soloway, Journal of Psychedelic Drugs, v6 n1 p91-9 (Jan-Mar 1974)

UM-75-P0016

METHADONE PLASMA LEVELS IN MAINTENANCE PATIENTS: THE EFFECT OF DOSE OMISSION, K. Verebely; H. Kutt, Research Communications in Chemical Pathology and Pharmacology, v11 n3 p373-86 (Jul 1975)

UM-75-E0006

METHAQUALONE ABUSERS: A PRELIMINARY SURVEY OF COLLEGE STUDENTS, G.E. Kochansky; T.S. Hemenway III; C. Salzman; R.I. Shader, Diseases of the Nervous System, v36 p348-51 (Jul 1975)

UM-72-D0859

METHAQUALONE: JUST ANOTHER DOWNER. D.R. Wesson; D.E. Smith. Journal of Psychedelic Drugs. v5 n2 p167-9 (Winter 1972)

UM-74-E0003

METHODS OF STUDYING PREVALENCE AND INCIDENCE OF DRUG ABUSE. N. Bejerot; C. Maurice-Bejerot. Scandinavian Journal of Social Medicine. v2 p99-104 (1974)

UM-74-D0858

METHYLENEDIOXYAMPHETAMINE (MDA): SUBJECTIVE EFFECTS. I.S. Turek; R.A. Soskin; A.A. Kurland. Journal of Psychedelic Drugs. v6 n1 p7-14 (Jan-Mar 1974)

UM-74-M0200

MODERN IONIZATION TECHNIQUES IN MASS SPECTROMETRY. G.W.A. Milne; M.J. Lacey. CRC Critical Reviews in Analytical Chemistry. v4 iss1 p45-104 (Jul 1974)

UM-75-M0234

MODERN TECHNIQUES IN TLC. J.G. Kirchner. Journal of Chromatographic Science. v13 p558-63 (Dec 1975)

UM-76-D0791

MODIFICATION BY DIAZEPAM OR THIORIDAZINE OF THE PSYCHOMOTOR SKILLS RELATED TO DRIVING: A SUBACUTE TRIAL IN NEUROTIC OUT-PATIENTS. I. Saario; M. Linnoila; M.J. Mattila. British Journal of Clinical Pharmacology. v3 n5 p843-8 (Oct 1976)

UM-71-E0015

MOOD-MODIFYING DRUGS PRESCRIBED IN A CANADIAN CITY: HIDDEN PROBLEMS. R. Cooperstock; M. Sims. American Journal of Public Health. v61 n5 p1007-16 (May 1971)

UM-78-D0929

MOTIVATION LEVELS AND THE MARIHUANA HIGH. R.O. Pihl; H. Sigal. Journal of Abnormal Psychology. v87 n2 p280-5 (1978)

UM-78-L0101

MOTOR VEHICLE LAW REVIEW: DIFFERING "DUE PROCESS" REQUIREMENTS. J.P. Hennessee. AAMVA Bulletin. v43 n1-2 p8-9 (Jan-Feb 1978)

UM-76-D0997

NARCOTIC ANTAGONISTS: NALTREXONE. PROGRESS REPORT. D. Julius; P. Renault, eds. (Sep 1976)

UM-76-D0995

NARCOTIC ANTAGONISTS: THE SEARCH FOR LONG-ACTING PREPARATIONS. R.E. Willette, ed., NIDA Research Monograph 4 (Jan 1976)

UM-75-D0717

NARCOTISM VERSUS ALCOHOLISM: CROSSOVER OR OVER-STATEMENT? J. Scher; K. Smith; S. Kim. p1-12. National Drug Abuse Conference. 4-7 April, 1975 New Orleans, Louisiana (1975)

UM-78-E0042

NATIONAL SURVEY ON DRUG ABUSE: 1977. A NATIONWIDE STUDY--YOUTH, YOUNG ADULTS, AND OLDER ADULTS. VOLUME I: MAIN FINDINGS, H.I. Abelson; P.M. Fishburne; I.H. Cisin (1978)

UM-78-D0927

NEUE ERKENNTNISSE ZUR LEISTUNGSFAHIGKEIT DES KRAFTFAHRERS, ZU IHREN GRENZEN UND ZU IHRER VERMINDERUNG DURCH MEDIKAMENTE UND ALKOHOL [NEW CONCEPTS REGARDING THE PERFORMANCE OF A DRIVER, ITS LIMITATIONS AND DECREASE CAUSED BY MEDICINES AND ALCOHOL], W. Muller-Limmroth; H. Schneble, Blutalkohol, v15 n4 p226-40 (July 1978)

UM-75-D0854

NEUROPSYCHOLOGICAL MEASUREMENT OF DRUG EFFECTS: POLYDRUG RESEARCH, K.M. Adams; P.M. Rennick; K.G. Schoof; J.F. Keegan, Journal of Psychedelic Drugs, v7 n2 p151-60 (Apr-Jun 1975)

UM-77-E0013

NIDA SERVICES RESEARCH REPORT: A STUDY OF LEGAL DRUG USE BY OLDER AMERICANS, D. Guttmann, Washington, D.C.: U.S. Government Printing Office (May 1977)

UM-72-D0862

NITROUS OXIDE: IT'S A GAS, E.J. Lynn; R.G. Walter; L.A. Harris; R. Dendy; M. James, Journal of Psychedelic Drugs, v5 n1 p1-7 (Fall 1972)

UM-76-E0032

NONMEDICAL USE OF PSYCHOACTIVE SUBSTANCES, PART I: MAIN FINDINGS, H.I. Abelson; P.M. Fishburne, Princeton, New Jersey: Response Analysis Corporation (Sep 1976)

UM-76-P0003

NORTRIPTYLINE AND 10-HYDROXYNORTRIPTYLINE PLASMA CONCENTRATIONS, V.E. Ziegler; T.A. Fuller; J.T. Biggs, Journal of Pharmacy and Pharmacology, v28 p849-50 (1976)

UM-76-D0802

NORTRIPTYLINE PLASMA LEVELS AND THERAPEUTIC RESPONSE, V.E. Ziegler; P.J. Clayton; J.R. Taylor; B.T. Co; J.T. Biggs, Clinical Pharmacology and Therapeutics, v20 n4 p458-63 (1976)

UM-71-D0865

NUTMEG AS A PSYCHOACTIVE DRUG, A.T. Weil, Journal of Psychedelic Drugs, v3 n2 p72-80 (Spring 1971)

UM-77-D0937

ON THE INFLUENCE OF MOBILETTENON THE EFFECT OF ALCOHOL IN THE HUMAN, SECOND COMMUNICATION: INFLUENCE ON THE EFFICIENCY UNDER ALCOHOL STRESS, H.J. Mallach; G. Raff; R. Kraemer, International Journal of Clinical Pharmacology, v15 n12 p576-80 (Dec 1977)

UM-79-D0707

ON THE ROAD DETECTION OF DRIVING WHILE INTOXICATED, D.H. Harris, Compass for Technology. Proceedings of the Human Factors Society, 23rd Annual Meeting, C.K. Bensel, ed., p263-6, Santa Monica, Ca.: Human Factors Society (1979)

UM-74-D0964

ON THE STUDY OF PERSONALITY FACTORS IN RESEARCH ON DRIVING BEHAVIOR, E.I. Signori; R.G. Bowman, Perceptual and Motor Skills, v38 p1067-76 (1974)

UM-78-D0925

OPERATING ROOM NURSES' PSYCHOMOTOR AND DRIVING SKILLS AFTER OCCUPATIONAL EXPOSURE TO HALOTHANE AND NITROUS OXIDE, K. Korttila; P. Pfaffli; M. Linnoila; E. Blomgren; H. Hanninen; S. Hakkinen, Acta anaesthesiologia scandinavica, v22 n1 p33-9 (1978)

UM-77-E0038

PAIR-MATCHING--A REAPPRAISAL OF A POPULAR TECHNIQUE, S.M. McKinlay, Biometrics, v33 n4 p725-35 (Dec 1977)

UM-76-P0004

PATHOPHYSIOLOGICAL AND DISEASE-INDUCED CHANGES IN DRUG DISTRIBUTION VOLUME: PHARMACOKINETIC IMPLICATIONS, U. Klotz, Clinical Pharmacokinetics, v1 p204-18 (1976)

UM-75-D0728

PATTERNS OF DRUG ABUSE AND THEIR RELATIONSHIP TO TRAFFIC ACCIDENTS, B.M. Kapur, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p69-72, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-77-E0048

PATTERNS OF DRUG ABUSE: RELATIONSHIPS WITH ETHNICITY, SENSATION SEEKING, AND ANXIETY, E. Kaestner; L. Rosen; P. Appel, Journal of Consulting and Clinical Psychology, v45 n3 p462-8 (1977)

UM-78-E0061

PATTERNS OF NEW DRUG DETECTION IN THE DRUG ABUSE WARNING NETWORK, R.L. Retka, British Journal of Addiction, v73 n2 p155-65 (Jun 1978)

UM-76-L0103

PENALTY FOR THE POSSESSION OF MARIJUANA: AN ANALYSIS OF SOME OF ITS CONCOMITANTS, R.B. Stuart; K. Guire; M. Krell, Contemporary Drug Problems, v5 n4 p553-63 (Winter 1976)

UM-76-E0018

PERSONALITY FACTORS IN HIGHWAY ACCIDENTS, F.L. McGuire, Human Factors, v18 n5 p433-42 (1976)

UM-77-L0099

PHARMACEUTICAL AND LEGAL RESTRICTIONS ON A DRUG ANALYSIS PROGRAM, E.R. Sinnett; J. Leslie, Professional Psychology, v8 n2 p170-7 (May 1977)

UM-76-P0002

PHARMACOKINETIC ENGINEERING APPROACH TO DRUG DELIVERY SYSTEM DESIGN AND THE OPTIMIZATION OF DRUG EFFECTS, V.F. Smolen, IEEE Proceedings of the International Conference on Cybernetics and Society, Nov. 1-3, 1976, Washington, D.C., p340-56 (1976)

UM-76-P0024

PHARMACOKINETIC MODEL FOR SIMULTANEOUS DETERMINATION OF DRUG LEVELS IN ORGANS AND TISSUES. C.N. Chen; J.D. Andrade. Journal of the Pharmaceutical Sciences. v65 n5 p717-24 (May 1976)

UM-76-P0022

PHARMACOKINETICS IN THE ELDERLY. J. Crooks; K. O'Malley; I.H. Stevenson. Clinical Pharmacokinetics. v1 p280-96 (1976)

UM-76-D0807

PHARMACOLOGY OF TRICYCLIC ANTIDEPRESSANTS. A REVIEW. G.V. Rossi. American Journal of Pharmacy. v148 n2 p37-45 (Mar-Apr 1976)

UM-72-D0861

PHENCYCLIDINE [PCP]: ANOTHER ILLICIT PSYCHEDELIC DRUG. A. Reed; A.W. Kane. Journal of Psychedelic Drugs. v5 n1 p8-12 (Fall 1972)

UM-75-D0718

PHYSICIAN REPORTING OF DRIVER IMPAIRMENT. SEARCHING FOR ANSWERS. L.N. Hames. Journal of the American Medical Association. v234 n10 p1027-28 (8 Dec 1975)

UM-72-P0010

PHYSIOLOGICAL AND PHARMACOKINETIC COMPLEXITIES IN BIOAVAILABILITY TESTING. S. Riegelman. Pharmacology. v8 p118-41 (1972)

UM-75-P0013

PHYSIOLOGICAL DISPOSITION OF CAFFEINE. A.W. Burg. Drug Metabolism Reviews. v4 n2 p199-228 (1975)

UM-78-L0111

PLACEMENT OF PHENCYCLIDINE IN SCHEDULE II. Federal Register. v43 n17 p3359-60 (25 Jan 1978)

UM-78-L0113

PLACEMENT OF PREPARATIONS CONTAINING DIFENOXIN IN COMBINATION WITH ATROPINE SULFATE INTO SCHEDULES IV AND V. Federal Register. v43 n167 p38382-4 (28 Aug 1978)

UM-78-L0112

PLACEMENT OF 1-PHENYLCYCLOHEXYLAMINE AND 1-PIPERIDINOCYCLOHEXANE-CARBONITRILE. IMMEDIATE PRECURSORS OF PHENCYCLIDINE. IN SCHEDULE II. Federal Register. v43 n96 p21324-5 (17 May 1978)

UM-74-M0240

PLASMA AND CEREBROSPINAL FLUID CONCENTRATIONS OF PENTAZOCINE IN PATIENTS: ASSAY BY MASS FRAGMENTOGRAPHY. S. Agurell; L.O. Boreus; E. Gordon; J.E. Lindgren; M. Ehrnebo; U. Lonroth. Journal of Pharmacy and Pharmacology. v26 p1-8 (1974)

UM-76-P0020

PLASMA AND TISSUE PROTEIN BINDING OF DRUGS IN PHARMACOKINETICS. W.J. Jusko; M. Gretch. Drug Metabolism Reviews. v5 n1 p43-140 (1976)

UM-74-D0974

PLASMA CONCENTRATIONS AND EFFECTS OF METHAQUALONE AFTER SINGLE AND MULTIPLE ORAL DOSES IN MAN, G. Alvan; O. Ericsson; S. Levander; J.-E. Lindgren, European Journal of Clinical Pharmacology, v7 n6 p449-54 (1974)

UM-76-P0033

PLASMA CONCENTRATIONS OF ANTIEPILEPTIC DRUGS--CLINICAL IMPORTANCE, P. Tridon; M. Weber; R. Khodjet El Khil; A.M. Batt; G. Siest, Drug Interference and Drug Measurement in Clinical Chemistry, G. Seist; D.S. Young, eds., p164-9, Third International Colloquium on Prospective Biology, Pont-a-Mousson, 6-10 Oct. 1975. Basel, Switzerland: S. Karger AG (1976)

UM-76-P0034

PLASMA DIGOXIN AND DIGITOXIN LEVELS AS THERAPEUTIC GUIDES, E. Albengres-Moineau; J.P. Tillement, Drug Interference and Drug Measurement in Clinical Chemistry, G. Seist; D.S. Young, eds., p175-81, Third International Colloquium on Prospective Biology, Pont-a-Mousson 6-10 Oct. 1975. Basel, Switzerland: S. Karger AG (1976)

UM-75-D0798

PLASMA LEVELS OF DIAZEPAM AND MOOD RATINGS, M.M. Ghoneim; S.P. Mewaldt; J. Ambre, Anesthesia and Analgesia... Current Researches, v54 n2 p173-77 (Mar-Apr 1975)

UM-78-P0037

POSTMORTALE ALKOHOLKONZENTRATIONEN I. DIE ALKOHOLKONZENTRATIONEN IM BLUT UND IN DER GLASKORPERFLUSSIGKEIT [POST-MORTEM ALCOHOL CONCENTRATIONS I. THE ALCOHOL CONCENTRATIONS IN THE BLOOD AND VITREOUS HUMOR], H.-P. Gelbke; P. Lesch; B. Spiegelhalder; G. Schmidt, Blutalkohol, v15 n1 p1-10 (Jan 1978)

UM-78-P0039

POSTMORTALE ALKOHOLKONZENTRATIONEN III DIE ALKOHOLKONZENTRATIONEN IM LIQUOR CEREBROSPINALIS UND IN DER GLASKORPERFLUSSIGKEIT [POST-MORTEM ALCOHOL CONCENTRATIONS III. THE CONCENTRATION OF ALCOHOL IN THE CEREBRO-SPINAL FLUID AND VITREOUS HUMOR], H.-P. Gelbke; P. Lesch; G. Schmidt, Blutalkohol, v15 n2 p115-24 (Mar 1978)

UM-78-P0038

POSTMORTALE ALKOHOLKONZENTRATIONEN II. DIE ALKOHOLKONZENTRATIONEN IM BLUT UND LIQUOR CEREBROSPINALIS [POST-MORTEM ALCOHOL CONCENTRATIONS II. THE ALCOHOL CONCENTRATIONS IN THE BLOOD AND CEREBRO-SPINAL FLUID], H.-P. Gelbke; P. Lesch; B. Spiegelhalder; G. Schmidt, Blutalkohol, v15 n1 p11-17 (Jan 1978)

UM-76-D0701

PRACTICAL ASPECTS OF THE ROUTINE MEASUREMENT OF ALCOHOL AND DRUGS IN DRIVERS, A. Alha; R. Honkanen; M. Karlsson; K. Laiho; M. Linnoila; I. Lukkari, Modern Problems in Pharmacopsychiatry, v11 p42-45 (1976)

UM-75-D0969

PRESCRIPTION DRUG LABELING REGARDING POTENTIAL DRIVING HAZARD, J.L. Weygandt, Journal of Traffic Medicine, v3 n3 p51 (1975)

UM-77-D0856

PREVALENCE OF DRUGS AMONG DRIVERS ARRESTED FOR DRINKING AND DRIVING IN FINLAND, A.R. Alha; M. Karlsson; M. Linnoila; I. Lukkari, Zeitschrift fur Rechtsmedizin, v79 n3 p225-34 (18 Apr 1977)

UM-77-E0054

PREVALENCE, SOURCES AND USES OF TRANQUILIZERS AMONG COLLEGE STUDENTS. R.A. Kleinknecht; J. Smith-Scott. Journal of Drug Education, v7 n3 p249-57 (1977)

UM-76-M0247

PRIMIDONE ANALYSES: CORRELATION OF GAS-CHROMATOGRAPHIC ASSAY WITH ENZYME IMMUNOASSAY. L. Sun; E.R. Walwick, Clinical Chemistry, v22 n6 p901-2 (1976)

UM-71-F0008

PROBLEM DEFINITION: THE DRIVING TASK IN THE SYSTEM CONTEXT. M. Blumenthal, Behavioral Research in Highway Safety, v2 n1 p43-52 (Spring 1971)

UM-73-P0030

PRODUCTION AND PRESENTATION OF REFERENCE VALUES. R. Dybkaer. Reference Values in Human Chemistry. Effects of Analytical and Individual Variations. Food Intake. Drugs and Toxics. G. Seist, ed. p2-12. 2nd International Colloquium "Automatisation and Prospective Biology" Pont-a-Mousson, 10-14 Oct. 1972. Basel: S. Karger A.G. (1973)

UM-77-M0274

PROFICIENCY TESTING IN FORENSIC TOXICOLOGY. K.L. McCloskey; B.S. Finkle, Journal of Forensic Sciences, v22 n4 p675-8 (Oct 1977)

UM-75-M0233

PROGRAMMED MULTIPLE DEVELOPMENT. BRIEF REVIEW AND STUDY OF EXTENDED PROGRAMS. J.A. Perry, Journal of Chromatography, v113 p267-82 (1975)

UM-75-M0272

PROGRAMMED MULTIPLE DEVELOPMENT IN THIN LAYER CHROMATOGRAPHY. J.A. Perry; T.H. Jupille; L.J. Glunz, Separation and Purification Methods, v4 n1 p97-165 (1975)

UM-76-M0258

PROGRESS TOWARDS A COMPREHENSIVE PLASMA ASSAY FOR THE TRICYCLIC AND TETRACYCLIC ANTIDEPRESSANTS. L.A. Gifford, Postgraduate Medical Journal, v52 suppl 3 p69-71 (1976)

UM-75-M0225

PROPOXYPHENE AND NORPROPOXYPHENE CONCENTRATIONS IN BLOOD AND TISSUES IN CASES OF FATAL OVERDOSE. A.J. McBay, Clinical Chemistry, v22 n8 p1319-21 (Aug 1976)

UM-74-D0857

PROPOXYPHENE NAPSYLATE (DARVON N(R)): A NEW INDICATION FOR A DRUG? J.R. Cooper; J.R. Silvio, Journal of Psychedelic Drugs, v6 n4 p415-20 (Oct-Dec 1974)

UM-76-D0749

PROPRANOLOL AND SKILLED HUMAN PERFORMANCE. A.A Landauer; L.B. Jellett; J. Kirk, Pharmacology, Biochemistry, and Behavior, v4 n3 p283-7 (1976)

UM-73-D0765

PROSPECTIVE STUDIES OF TRAFFIC INJURIES IN RELATION TO MEDICAL CONDITIONS OF DRIVERS: METHODOLOGY AND PROGRESS REPORT. F.D.K. Liddell, Proceedings of the Scientific Session

of the 10th Annual Meeting of Traffic Research Foundation of Canada, p35-41. Traffic Injury Research Foundation of Canada (1973)

UM-77-E0055

PSEUDOEPIDEMICS OF HEROIN ADDICTION. A. Richman; H. Abbey. Drug and Alcohol Dependence, v2 n4 p221-37 (1977)

UM-77-F0024

PSYCHOLOGICAL PROCESSES IN SUSTAINED ATTENTION. J.S. Warm. Vigilance: Theory, Operational Performance, and Physiological Correlates. R.R. Mackie, ed., p623-44. New York: Plenum Press (1977)

UM-77-E0037

PSYCHOLOGICAL, SOCIAL AND COGNITIVE CHARACTERISTICS OF HIGH-RISK DRIVERS: A PILOT STUDY. R.E. Mayer; J.R. Treat. Accident Analysis and Prevention, v9 n1 p1-8 (Mar 1977)

UM-74-D0956

PSYCHOMOTOR PERFORMANCE DURING INSULIN-INDUCED HYPOGLYCEMIA. B.A. Fraser; L. Buck; J.B.R. McKendry. Canadian Medical Association Journal, v110 n5 p513-16 (2 Mar 1974)

UM-78-D0973

PSYCHOMOTOR SKILLS IN DEPRESSED OUT-PATIENTS TREATED WITH L-TRYPTOPHAN, DOXEPIN, OR CHLORIMIPRAMINE. T. Seppala; M. Linnoila; M.J. Mattila. Annals of Clinical Research, v10 p214-21 (1978)

UM-75-D0784

PSYCHOMOTOR SKILLS RELATED TO DRIVING AFTER INTRAMUSCULAR ADMINISTRATION OF DIAZEPAM AND MEPERIDINE. K. Korttila; M. Linnoila. Anesthesiology, v42 n6 p685-91 (Jun 1975)

UM-74-D0779

PSYCHOMOTOR TEST PERFORMANCE WITH A FENFLURAMINE-AMPHETAMINE COMBINATION. C.C. Brown; D.R. McAllister; I. Turek. Journal of Clinical Pharmacology, p369-76 (Jul 1974)

UM-76-D0881

PSYCHOPHYSISCHE LEISTUNGSMINDERUNG NACH AMBULANTEN ANASTHESIEN UND NOTWENDIGE BETREUUNGSMASSNAHMEN. L. Lieb. Zeitschrift fur Arztliche Fortbildung, v70 n21 p1097-1104 (1 Nov 1976)

UM-78-P0044

PSYCHOTOMIMETIC PHENALKYLAMINES AS SEROTONIN AGONISTS: AN SAR ANALYSIS. L.B. Kier; R.A. Glennon. Life Sciences, v22 n18 p1589-94 (8 May 1978)

UM-77-D0869

PSYCHOTROPIC DRUGS AND ROAD ACCIDENTS. R.P. Snaith; I. Hindmarch; V.F. Standing. British Medical Journal, v2 n6081 p263 (23 Jul 1977)

UM-75-D0752

PUBLIC INFORMATION PROGRAMS RELATED TO ALCOHOL, DRUGS, AND TRAFFIC SAFETY. J.W. Swinehart. Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety. S. Israelstam; S. Lambert, eds., p799-811. Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-77-C0010

PUBLIC SERVICE RADIO: DEVELOPMENT AND EVALUATION OF A CAMPAIGN. M.S. Goodstadt; R. Kronitz, Journal of Drug Education, v7 n2 p149-61 (1977)

UM-77-E0059

PURCHASES OF HYPNOTICS, SEDATIVES AND MINOR TRANQUILLIZERS AMONG 2,566 INDIVIDUALS IN THE COUNTY OF JAMTLAND, SWEDEN. A SIX-YEAR FOLLOW-UP. G. Boethius; B. Westerholm, Acta psychiatrica scandinavica, v56 p147-59 (1977)

UM-75-M0211

QUALITY CONTROL IN A TOXICOLOGY LABORATORY, B.M. Kapur; L. McLaughlin, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p627-33, Toronto, Canada: Addiction Research Foundation of Ontario (1975)

UM-77-M0280

QUALITY CONTROL IN CLINICAL CHEMISTRY, T.P. Whitehead, New York: John Wiley and Sons (1977)

UM-76-D0814

QUANTITATIVE CHARACTERIZATION OF THC AND ETHANOL INTERACTION. B. Esplin; R. Capek, Research Communications in Chemical Pathology and Pharmacology, v15 n1 p199-202 (Sep 1976)

UM-74-M0239

QUANTITATIVE DETERMINATION OF CLONAZEPAM AND ITS METABOLITES IN HUMAN PLASMA BY GAS CHROMATOGRAPHY, J. Naestoft; N.-E. Larsen, Journal of Chromatography, v93 p113-22 (1974)

UM-77-M0282

QUANTITATIVE DETERMINATION OF AMITRIPTYLINE AND ITS PRINCIPAL METABOLITE, NORTRIPTYLINE, BY GLC-CHEMICAL IONIZATION MASS SPECTROMETRY, W.A. Garland, Journal of Pharmaceutical Sciences, v66 n1 p77-81 (Jan 1977)

UM-77-F0021

QUANTITATIVE SUBJECTIVE ASSESSMENTS ARE ALMOST ALWAYS BIASED, SOMETIMES COMPLETELY MISLEADING, E.C. Poulton, British Journal of Psychology, v68 pt 4 p409-25 (Nov 1977)

UM-76-M0246

RADIOIMMUNOASSAY, H.G. Eckert, Angewandte Chemie, International Edition in English, v15 n9 p525-33 (Sept 1976)

UM-75-M0235

RADIOIMMUNOASSAY OF DRUGS SUBJECT TO ABUSE: CRITICAL EVALUATION OF URINARY MORPHINE-BARBITURATE, MORPHINE, BARBITURATE, AND AMPHETAMINE ASSAYS, S.J. Mule; E. Whitlock; D. Jukofsky, Clinical Chemistry, v21 n1 p81-6 (1975)

UM-77-M0289

RADIOIMMUNOASSAY OF HYDROMORPHONE IN PLASMA, I.L. Honigberg; J.T. Stewart; W.J. Brown; H.W. Jun; T.E. Needham; J.J. Vallner, Journal of Analytical Toxicology, v1 p70-2 (Mar-Apr 1977)

UM-74-MO229

RAPID COMPUTERIZED IDENTIFICATION OF COMPOUNDS IN COMPLEX BIOLOGICAL MIXTURES BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY. C.C. Sweeley; N.D. Young; J.F. Holland; S.C. Gates. Journal of Chromatography. v99 p507-17 (1974)

UM-76-MO256

RAPID DETECTION OF SOME BASIC DRUGS BY THIN-LAYER CHROMATOGRAPHY. J.C. Hudson; W.P. Rice. Journal of Chromatography. v117 p449-54 (1976)

UM-78-MO287

RECENT ADVANCES IN AUTOMATION OF HPLC. H. Kern; K. Imhof. American Laboratory. v10 n2 p131-9 (Feb 1978)

UM-75-MO201

RECENT DEVELOPMENTS IN IONIZATION PROCESSES RELATED TO ANALYTICAL METHODS IN MASS SPECTROMETRY. S.R. Smith. CRC Critical Reviews in Analytical Chemistry. v5 iss3 p243-65 (Oct 1975)

UM-77-EO058

RECORDING OF DRUG PRESCRIPTIONS IN THE COUNTY OF JAMTLAND, SWEDEN. I. METHODOLOGICAL ASPECTS. G. Boethius; F. Wiman. European Journal of Clinical Pharmacology. v12 p31-5 (1977)

UM-75-DO782

RECOVERY AND SKILLS RELATED TO DRIVING AFTER INTRAVENOUS SEDATION: DOSE-RESPONSE RELATIONSHIP WITH DIAZEPAM. K. Korttila; M. Linnoila. British Journal of Anaesthesia. v47 p457-63 (1975)

UM-77-DO789

RECOVERY, PSYCHOMOTOR SKILLS, AND SIMULATED DRIVING AFTER BRIEF INHALATIONAL ANESTHESIA WITH HALOTHANE OR ENFLURANE COMBINED WITH NITROUS OXIDE AND OXYGEN. K. Korttila; T. Tammisto; P. Ertama; P. Pfaffli; E. Blomgren; S. Hakkinen. Anesthesiology. v46 n1 p20-7 (Jan 1977)

UM-78-LO104

REGULATION--WONDERLAND REVISTED. W.C. Wescoe. MRI Quarterly. p14-19, Kansas City, Mo.: Midwest Research Institute (Summer 1978)

UM-76-DO700

RELATION BETWEEN DRUG-INDUCED CENTRAL NERVOUS SYSTEM EFFECTS AND PLASMA LEVELS OF DIAZEPAM IN MAN. J. Orr; P. Dussault; C. Chappel; L. Goldberg; G. Reggiani. Modern Problems in Pharmacopsychiatry. v11 p57-67 (1976)

UM-76-DO950

RELATION OF EEG TO BLOOD LEVELS OF PSYCHOACTIVE DRUGS. M. Fink; P. Irwin. Pharmacokinetics of Psychoactive Drugs: Blood Levels and Clinical Response. L.A. Gottschalk; S. Merlis, eds., p243-50, New York: Spectrum Publications (1976)

UM-76-DO804

RELATIONSHIP BETWEEN ANTIDEPRESSANT EFFECT AND PLASMA LEVEL OF NORTRIPTYLINE CLINICAL STUDIES. P. Kragh-Sorensen; C.E. Hansen; P.C. Baastrup; E.F. Hvidberg. Pharmakopsychiatrie Neuro-Psychopharmakologie. v9 n1 p27-32 (Jan 1976)

UM-76-D0990

RELATIVE FAHRUNTUCHTIGKEIT AUS MEDIZINISCHER SICHT [RELATIVE DRIVING INABILITY FROM THE MEDICAL VIEWPOINT], D. Metter, Blutalkohol, v13 n4 p241-9 (Jul 1976)

UM-70-M0214

RELATIVITY OF MASS SPECTRA, F.W. Karasek, Research/Development, v21 n11 p55-8 (Nov 1970)

UM-75-M0208

RELIABILITY AND SIGNIFICANCE OF RESULTS OF ALCOHOL AND DRUG ANALYSES, A.S. Curry, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p469-81, Toronto, Canada: Addiction Research Foundation of Ontario (1975)

UM-75-D0725

REPORT OF AN INTERNATIONAL SYMPOSIUM ON DRUGS AND DRIVING, K.B. Joscelyn; R.P. Maickel (Apr 1975)

UM-78-L0106

REPORT OF THE LIAISON TASK PANEL ON PSYCHOACTIVE DRUG USE/MISUSE, Task Panel Reports Submitted to the President's Commission on Mental Health, v4 p2104-40 (Feb 1978)

UM-78-D0942

REPORT OF THE SUBCOMMITTEE ON HUMAN FACTORS OF THE NATIONAL SAFETY COUNCIL'S COMMITTEE ON ALCOHOL AND DRUGS, R.B. Forney, Traffic Conference of the National Safety Congress, 4-5 Oct. 1978, Chicago, Illinois (1978)

UM-77-L0088

RESEARCH INVOLVING HUMAN SUBJECTS: AN EMPIRICAL REPORT ON HUMAN SUBJECT REVIEW COMMITTEES, B.H. Gray; R.A. Cooke; A.S. Tannenbaum; D.H. McColloch, American Sociological Association Annual Meeting, Chicago, Illinois, 7 Sep 1977 (1977)

UM-73-D0764

RESEARCH ON DRUGS AND DRIVING, M. MacConaill; G. Ling, Proceedings of the Scientific Session of the 10th Annual Meeting of Traffic Injury Research Foundation of Canada, p11-14A, Traffic Injury Research Foundation of Canada (1973)

UM-77-D0999

RESEARCH ON SMOKING BEHAVIOR, M.E. Jarvik; J.W. Cullen; E.R. Gritz; T.M. Vogt; L.J. West, eds., NIDA Research Monograph 17 (Dec 1977)

UM-76-D0792

RESIDUAL EFFECTS AND SKILLS RELATED TO DRIVING AFTER A SINGLE ORAL ADMINISTRATION OF DIAZEPAM, MEDAZEPAM OR LORAZEPAM, T. Seppala; K. Korttila; S. Hakkinen; M. Linnoila, British Journal of Clinical Pharmacology, v3 n5 p831-41 (Oct 1976)

UM-77-F0014

RESPONSE TIMES TO STIMULI OF INCREASING COMPLEXITY AS A FUNCTION OF AGEING, T.C. Jordon; P.M.A. Rabbitt, British Journal of Psychology, v68 p189-201 (1977)

UM-76-D0832

REVERSAL OF ETHANOL INTOXICATION IN HUMANS: AN ASSESSMENT OF THE EFFICACY OF PROPRANOLOL, R.L. Alkana; E.S. Parker; H.B. Cohen; H. Birch; E.P. Noble, Psychopharmacology, v51 p29-37 (1976)

UM-77-D0938

REVERSAL OF ETHANOL INTOXICATION IN HUMANS: AN ASSESSMENT OF THE EFFICACY OF L-DOPA, AMINOPHYLLINE, AND EPHEDRINE, R.L. Alkana; E.S. Parker; H.B. Cohen; H. Birch; E.P. Noble, Psychopharmacology, v55 n3 p203-12 (1977)

UM-77-D0998

REVIEW OF INHALANTS: EUPHORIA TO DYSFUNCTION, C.W. Sharp; M.L. Brehm, eds., NIDA Research Monograph 15 (Oct 1977)

UM-78-D0907

REVIEW OF EFFECTS OF ALCOHOL AND OTHER LICIT DRUGS ON DRIVING-RELATED PERFORMANCE, P.A. Howat; R.G. Mortimer, People on the Move. Proceedings of the Human Factors Society 22nd Annual Meeting, E.J. Baise; J.M. Miller, eds., p564-72, Santa Monica, Ca.: Human Factors Society (1978)

UM-76-E0060

RISK-TAKING AND DRUG DEPENDENCE, G. Booth; M. Gossop, British Journal of Addiction, v71 n3 p269-74 (1976)

UM-77-D0887

ROAD ACCIDENTS--THEIR CAUSE AND PREVENTION, WITH PARTICULAR REFERENCE TO RHODESIA. PART II. THE INFLUENCE OF DRUGS OTHER THAN ALCOHOL ON CAUSATION OF ROAD ACCIDENTS, M.M.M. Hayes, The Central African Journal of Medicine, v23 n5 p101-3 (May 1977)

UM-75-D0727

ROADSIDE SURVEYS, DEMOGRAPHICS AND BAC'S OF DRIVERS, R.B. Voas, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p21-31, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-76-D0888

ROLE OF EXPERIENCE IN ACQUISITION AND LOSS OF TOLERANCE TO THE EFFECT OF DELTA-9-THC ON SPACED RESPONDING, F.J. Manning, Pharmacology Biochemistry and Behavior, v5 n3 p269-73 (Sep 1976)

UM-78-M0288

ROUTINE ANALYSIS OF DRUGS OF ABUSE BY GC/IR, R. Saferstein; J.J. Manura, American Laboratory, v10 n2 p125-9 (Feb 1978)

UM-76-D0996

RX: 3X/WEEK LAAM: ALTERNATIVE TO METHADONE, J.D. Blaine; P.F. Renault, eds., NIDA Research Monograph 8 (Jul 1976)

UM-72-M0221

SCREENING FOR DRUG ABUSE: THE RAPID DIAGNOSIS OF DRUGS OF ABUSE IN THE HOSPITAL EMERGENCY ROOM, D. Sohn; J. Simon; S. Sohn, Legal Medicine Annual: 1972, C.H. Wecht, ed., p107-19, New York: Appleton-Century-Crofts (1972)

UM-77-F0018

SECONDARY TASK MEASUREMENT OF WORKLOAD AS A FUNCTION OF SIMULATED VEHICLE DYNAMICS AND DRIVING CONDITIONS, W.W. Wierwille; J.C. Gutmann; T.G. Hicks; W.H. Muto, Human Factors, v19 n6 p557-65 (Dec 1977)

UM-75-E0020

SELECTIVE DESCRIPTIVE CHARACTERISTICS OF POLYDRUG ABUSERS, M.W. Kirby; G.J. Berry, Journal of Psychedelic Drugs, v7 n2 p161-7 (Apr-Jun 1975)

UM-77-D0831

SELF-REPORTED ALCOHOL AND AMPHETAMINE USAGE BY LONG-DISTANCE, HEAVY-VEHICLE DRIVERS IN NEW SOUTH WALES, D.R. Nix-James, 7th International Conference on Alcohol, Drugs, and Traffic Safety, Melbourne, Australia (25 Jan 1977)

UM-78-P0042

SERUM DIGOXIN AND EMPIRIC METHODS IN IDENTIFICATION OF DIGITOXICITY, S. Waldorff; J. Buch, Clinical Pharmacology and Therapeutics, v23 n1 p19-24 (Jan 1978)

UM-76-D0767

SHORT-TERM NEUROPSYCHOPHARMACOLOGICAL EFFECTS OF MARIHUANA SMOKING IN EXPERIENCED MALE USERS, E.F. Domino; P. Rennick; J.H. Pearl, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v1 p393-412, New York: Raven Press (1976)

UM-76-M0286

SIMULTANEOUS DETERMINATION OF MEPERIDINE AND NORMEPERIDINE IN BIOFLUIDS, H.H. Szeto; C.E. Inturrisi, Journal of Chromatography, v125 p503-10 (1976)

UM-74-D0783

SKILLS RELATED TO DRIVING AFTER INTRAVENOUS DIAZEPAM, FLUNITRAZEPAM OR DROPERIDOL, K. Korttila; M. Linnoila, British Journal of Anaesthesia, v46 p961-9 (1974)

UM-74-E0010

SMOKING AND DRUG CONSUMPTION IN WHITE, BLACK, AND ORIENTAL MEN AND WOMEN, C.C. Seltzer, G.D. Friedman; A.B. Siegelaub, American Journal of Public Health, v64 n5 p466-73 (May 1974)

UM-76-F0003

SOCIAL INTERACTION PATTERNS IN DRIVER BEHAVIOR: AN INTRODUCTORY REVIEW, G.J.S. Wilde, Human Factors, v18 n5 p477-92 (Oct 1976)

UM-72-L0091

SOCIAL PROBLEMS--ALCOHOL AND MARIJUANA, D.A. Rockwell, Journal of Psychedelic Drugs, v5 n1 p49-55 (Fall 1972)

UM-77-D0853

SOME EFFECTS OF SLEEP DEPRIVATION ON TRACKING PERFORMANCE IN STATIC AND DYNAMIC ENVIRONMENTS, W.E. Collins, Journal of Applied Psychology, v62 n5 p567-73 (1977)

UM-77-E0017

SOUR NOTES FROM THE VINTAGE YEARS: SUBSTANCE ABUSE AMONG THE ELDERLY, J. Dobbie, Addictions, v24 n3 p58-75 (Fall 1977)

UM-72-A0017

STASH LIBRARY BIBLIOGRAPHIC SEARCH: METHAQUALONE, S.J. Christenson, Journal of Psychedelic Drugs, v5 n2 p205-11 (Winter 1972)

UM-76-E0009

STATUS OF DRUG QUALITY IN THE STREET-DRUG MARKET--AN UPDATE, J.K. Brown; M.H. Malone, Clinical Toxicology, v9 n2 p145-68 (1976)

UM-74-D0985

STRASSENVERKEHRSDELINQUENZ IM ZUSAMMENHANG MIT DROGENMISSBRAUCH [STREET TRAFFIC DELINQUENCY AND MISUSE OF DRUGS], A. Kreuzer, Blutalkohol, v11 n5 (1974)

UM-74-M0278

STREET DRUG ANALYSIS AND COMMUNITY BASED DRUG PROGRAMS, D.E. Smith, Journal of Psychedelic Drugs, v6 n2 p153-9 (Apr-Jun 1974)

UM-78-E0040

STREET DRUGS 1977: CHANGING PATTERNS OF RECREATIONAL USE, R.K. Siegal, Drug Abuse and Alcoholism Review, v1 n1 p1,3-13 (Jan/Feb 1978)

UM-77-E0039

STREET-DRUGS IN THE UNITED STATES: SIMILARITIES AND DIFFERENCES. AN UPDATE, J.K. Brown; D. Eskes, First International Action Conference on Substance Abuse, 9-13 Nov 1977, Phoenix, Arizona (1977)

UM-75-E0021

STREETWISE AND NONSTREETWISE POLYDRUG TYPOLOGY: MYTH OR REALITY, D.R. Wesson; D.E. Smith; S.E. Lerner, Journal of Psychedelic Drugs, v7 n2 p121-34 (Apr-Jun 1975)

UM-75-E0064

STRESS-SEEKING AND HALLUCINOGENIC DRUG USAGE, R.A. Bogg, Canadian Journal of Public Health, v66 n5 p369-73 (Oct 1975)

UM-77-D0866

STUDIES MEASURE DRUG, ALCOHOL EFFECTS ON DRIVING, Status Report, v12 n17 09-10 (30 Nov 1977)

UM-77-D0849

STUDIES ON THE RELATION BETWEEN CARBOXYHEMOGLOBIN CONCENTRATION AND TOXICITY, L.R. Goldbaum; T. Orellano; E. Dergal, Aviation, Space, and Environmental Medicine, v48 n10 p969-70 (Oct 1977)

UM-74-M0250

STUDIES ON THE USE OF XAD-2 RESIN FOR DETECTION OF ABUSED DRUGS IN URINE, M.P. Kullberg; C.W. Gorodetzky, Clinical Chemistry, v20 n2 p177-83 (1974)

UM-77-L0094

SUBJECTS' RIGHTS, FREEDOM OF INQUIRY, AND THE FUTURE OF RESEARCH IN THE ADDICTIONS, R.E. Meyer, American Journal of Psychology, v134 n8 p899-903 (Aug 1977)

UM-78-E0057

SUBSTANCE ABUSE AMONG MICHIGAN'S SENIOR CITIZENS: CURRENT ISSUES AND FUTURE DIRECTIONS, Lansing, Michigan: Michigan Office of Services to the Aging (Aug 1978)

UM-69-A0018

SUPPLEMENTAL BIBLIOGRAPHY ON STIMULANTS, Journal of Psychedelic Drugs, v2 n2 p108-12 (Spring 1969)

UM-74-E0012

SURVEY OF ADOLESCENT DRUG USE, IV PATTERNS OF DRUG USE, M. Weitman; R.O. Scheble; K.G. Johnson, American Journal of Public Health, v64 n5 p417-26 (May 1974)

UM-76-M0262

SYSTEMATIC IDENTIFICATION OF DRUGS OF ABUSE II: TLC, A.N. Masoud, Journal of Pharmaceutical Sciences, v65 n11 p1585-9 (Nov 1976)

UM-77-E0046

TEMPORAL PATTERNS OF THE USE OF NON-PRESCRIBED DRUGS, E.R. Sinnett; J.B. Morris, Perceptual and Motor Skills, v45 n3 pt2 p1239-45 (Dec 1977)

UM-76-D0770

THE ACUTE EFFECTS OF VARIOUS CANNABIS SUBSTANCES ON COGNITIVE, PERCEPTUAL, AND MOTOR PERFORMANCE IN VERY LONG-TERM HASHISH USERS, R.L. Dornbush; A. Kokkevi, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v1 p421-7, New York: Raven Press (1976)

UM-72-D0895

THE ADVERSE EFFECTS OF COMMONLY USED SYSTEMIC DRUGS ON THE HUMAN EYE--PART II, H.I. Silverman, American Journal of Optometry and Archives of the American Academy of Optometry, v49 n1 p335-62 (Apr 1972)

UM-71-D0894

THE ADVERSE EFFECTS OF COMMONLY USED SYSTEMIC DRUGS ON THE HUMAN EYE, H.I. Silverman; R.A. Walsh, American Journal of Optometry and Physiological Optics, v48 n1 p51-79 (Jan 1971)

UM-79-D0708

THE BEHAVIORAL ASPECTS OF SMOKING, NIDA Research Monograph 26, N.A. Krasnegor, ed., Rockville, Md.: National Institute on Drug Abuse (1979)

UM-75-A0013

THE BENZODIAZEPINES--PATTERNS OF USE. AN ANNOTATED BIBLIOGRAPHY, C.E. Weise; S.F. Price, Addiction Research Foundation of Ontario, Canada (1975)

UM-77-E0068

THE CLIENT-ORIENTED DATA ACQUISITION PROCESS (CODAP-77), E.N. Siguel; W.H. Spillane, American Journal of Drug and Alcohol Abuse, v4 n2 p201-21 (1977)

UM-75-D0897

THE CLINICAL SIGNIFICANCE AND IMPORTANCE OF DRUG INTERACTIONS, J. Crooks; I.H. Stevenson; A.M.M. Shepherd; D.C. Moir, Drug Interactions, D.G. Grahame-Smith, ed., p3-13, Baltimore: University Park Press (1975)

UM-75-D0740

THE COMBINED EFFECTS OF ALCOHOL AND COMMON PSYCHOACTIVE DRUGS: II. FIELD STUDIES WITH AN INSTRUMENTED AUTOMOBILE, A. Smiley; A.E. LeBlanc; I.W. French; R. Burford, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p433-8, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-78-D0944

THE DANGERS OF MIXING ALCOHOL AND DRUGS, Business Week Personal Business Supplement, n2556 p200-1,204 (16 Oct 1978)

UM-76-M0213

THE DETECTION OF DRUGS IN BIOLOGICAL FLUIDS, A.E. Robinson, Medicine, Science, and the Law, v16 n2 p91-4 (Apr 1976)

UM-74-M0236

THE DETERMINATION OF DRUGS IN BIOLOGIC SPECIMENS: A REVIEW, J.E. Wallace; K. Blum; J.M. Singh, Drug Addiction, J.M. Singh; H. Lal, eds., v4 p175-92, New York: Stratton Intercontinental (1974)

UM-75-M0227

THE DEVELOPMENT OF GAS CHROMATOGRAPHY, L.S. Ettre, Journal of Chromatography, v112 p1-26 (1975)

UM-77-D0878

THE DISCRIMINATION OF MARIJUANA INTOXICATION, R.O. Pihl; P. Hickcox; L. Costa, Journal of Clinical Psychology, v33 n3 p908-11 (Jul 1977)

UM-77-D0928

THE DISRUPTION OF MARIJUANA INTOXICATION, R.O. Pihl; P. Spiers; D. Shea, Psychopharmacology, v52 p227-30 (1977)

UM-77-E0027

THE DOWNER HEARINGS: A CURRENT PERSPECTIVE ON THE POLITICS OF BARBITURATES IN AMERICA, D.R. Wesson; D.E. Smith, Journal of Psychedelic Drugs, v5 n1 p45-8 (Fall 1972)

UM-75-L0085

THE DRINKING DRIVER AND THE LAW: LEGAL COUNTERMEASURES IN THE PREVENTION OF ALCOHOL-RELATED ROAD TRAFFIC ACCIDENTS, J.D.J. Havard, Research Advances in Alcohol and Drug Problems, R.J. Gibbins; Y. Israel; H. Kalant; et al., eds., v2 p123-45, New York: John Wiley and Sons (1975)

UM-75-P0015

THE EFFECT OF AGE ON PLASMA LEVELS OF PROPRANOLOL AND PRACTOLOL IN MAN, C.M. Castleden; C.M. Kaye; R.L. Parsons, British Journal of Clinical Pharmacology, v2 p303-6 (1975)

UM-76-D0970

THE EFFECT OF ALCOHOL ON DRIVING SKILLS AND REACTION TIMES, H.T. Zwahlen, Journal of Occupational Accidents, v1 n1 p21-38 (Jul 1976)

UM-75-D0780

THE EFFECT OF CAFFEINE ON HUMAN PERFORMANCE, ALONE AND IN COMBINATION WITH ETHANOL, H.M. Franks; H. Hagedorn; V.R. Hensley; W.J. Hensley; G.A. Starmer, Psychopharmacologia, v45 p177-81 (1975)

UM-75-D0983

THE EFFECT OF DIAZEPAM AND FENTANYL ON MENTAL, PSYCHOMOTOR AND ELECTROENCEPHALOGRAPHIC FUNCTIONS AND THEIR RATE OF RECOVERY, M.M Ghoneim; S.P. Mewaldt; J.W. Thatcher, Psychopharmacolgia, v44 n1 p61-6 (1975)

UM-71-D0993

THE EFFECT OF FLUPHENAZINE IN PSYCHOLOGICALLY NORMAL VOLUNTEERS: SOME TEMPORAL, PERFORMANCE, AND BIOCHEMICAL RELATIONSHIPS, D.J. Safer; R.P. Allen, Biological Psychiatry, v3 n3 p237-49 (1971)

UM-75-D0777

THE EFFECT OF GRANDAXIN ON LORRY DRIVERS, J. Gerevich; K. Bolla; K. Toth; J. Sebo, Therapia Hungarica, v23 n4 p143-6 (1975)

UM-77-D0891

THE EFFECT OF MENTAL SET AND STATES OF CONSCIOUSNESS ON VIGILANCE DECREMENT: A SYSTEMATIC EXPLORATION, R. Ware; R.A. Baker, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p603-16, New York: Plenum Press (1977)

UM-77-D0788

THE EFFECT OF SMOKING ON RISK-TAKING IN A SIMULATED PASSING TASK, T.R. Schori; B.W. Jones, Human Factors, v19 n1 p37-45 (Feb 1977)

UM-75-P0001

THE EFFECT OF WATER ON THE ABSORPTION OF DRUGS FROM THE GASTRO-INTESTINAL TRACT, G. Williams; J.L. Maddocks, British Journal of Clinical Pharmacology, v2 p543-6 (1975)

UM-78-D0919

THE EFFECTS OF A NEW ANTIDEPRESSANT, ORG GB (MIANSERIN HCL) ON PERFORMANCE RELATED TO DRIVING, K.J. Hofner, Clinical Therapeutics, v1 n4 p280-4 (1978)

UM-76-D0850

THE EFFECTS OF ALCOHOL AND DELTA-9-TETRAHYDROCANNABINOL ON HUMAN PHYSICAL AGRESSION, S.P. Taylor; R.M. Vardaris; A.B. Rawtich; C.B. Gammon; J.W. Cranston; A.I. Lubetkin, Aggressive Behavior, v2 p153-61 (1976)

UM-77-D0842

THE EFFECTS OF ALCOHOL AND VALIUM, SINGLY AND IN COMBINATION UPON DRIVING-RELATED SKILLS PERFORMANCE, H. Moskowitz; M. Burns, American Association for Automotive Medicine. 21st Conference. Proceedings, D.F. Huelke, ed., p226-40, AAAM (1977)

UM-78-D0939

THE EFFECTS OF ALTITUDE AND TWO DECONGESTANT-ANTIHISTAMINE PREPARATIONS ON PHYSIOLOGICAL FUNCTIONS AND PERFORMANCE, E.A. Higgins; W.D. Chiles; J.M. McKenzie; A.E. Jennings; G.E. Funkhouser; S.R. Mullen, Oklahoma City: Civil Aeromedical Institute (Apr 1978)

UM-73-D0776

THE EFFECTS OF DELTA-9-THC ON SIMULATED DRIVING PERFORMANCE, D. Ladewig; V. Hobi, Psychopharmacology, Sexual Disorders, and Drug Abuse, T.A. Ban, ed., p693-8, Amsterdam: North Holland Publishing Co. (1973)

UM-78-D0984

THE EFFECTS OF HIGH DOSES OF OXPRENOLOL AND OF PROPRANOLOL ON PURSUIT ROTOR PERFORMANCE, REACTION TIME AND CRITICAL FLICKER FREQUENCY, C.W. Ogle; P. Turner; H. Markomihelakis, Psychopharmacologia, v46 n3 p295-9 (1976)

UM-75-D0835

THE EFFECTS OF SMOKING MARIHUANA ON PHYSICAL PERFORMANCE, R.D. Steadward; M. Singh, Medicine and Science in Sports, v7 n4 p309-11 (Winter 1975)

UM-75-D0903

THE EFFECTS OF SMOKING ON PERIPHERAL MOVEMENT DETECTION. ANNUAL REPORT, C.R. Scoughton; N.W. Heimstra (August 1975)

UM-75-D0904

THE EFFECTS OF SMOKING ON TIME ESTIMATION PERFORMANCE. ANNUAL REPORT, S.T. Breidenbach; J.L. Arnold; N.W. Heimstra (Sep 1975)

UM-76-D0922

THE EFFECTS OF THE SUB-CHRONIC ADMINISTRATION OF AN ANTIHISTAMINE, CLEMASTINE, ON TESTS OF CAR DRIVING ABILITY AND PSYCHOMOTOR PERFORMANCE, I. Hindmarch, Current Medical Research and Opinion, v4 n3 p197-206 (1976)

UM-77-D0794

THE EFFECTS OF TWO ANTIDEPRESSANTS, IMIPRAMINE AND VILOXAZINE, UPON DRIVING PERFORMANCE, A.B. Clayton; P.G. Harvey; T.A. Betts, Proceedings of the 7th International Conference on Alcohol, Drugs, and Traffic Safety, Melbourne, Australia, p1-12 (Jan 1977)

UM-77-D0909

THE EFFECTS OF TWO ANTIDEPRESSANTS, IMIPRAMINE AND VILOXAZINE, UPON DRIVING PERFORMANCE, A.B. Clayton; P.G. Harvey; T.A. Betts, Psychopharmacology, v55 n1 p9-12 (1977)

UM-77-D0890

THE EFFECTS OF VARIOUS CONDITIONS ON SUBJECTIVE STATES AND CRITICAL FLICKER FREQUENCY, E. Grandjean; P. Baschera; E. Martin; A. Weber, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p331-9, New York: Plenum Press (1977)

UM-77-E0005

THE EPIDEMIOLOGY OF DRUG ABUSE: CURRENT ISSUES, L. Richards; L.B. Blevens, eds., NIDA Research Monograph 10, Washington, D.C.: U.S. Government Printing Office (Mar 1977)

UM-77-A0021

THE ETHICAL PHARMACEUTICAL INDUSTRY AND SOME OF ITS ECONOMIC ASPECTS. AN ANNOTATED BIBLIOGRAPHY. D.C. Sevigny, Bibliographic Series No. 13, R.J. Hall, ed., Toronto, Canada: Addiction Research Foundation of Ontario (1977)

UM-77-E0051

THE EVOLUTION OF NON-MEDICAL OPIATE USE IN CANADA--PART I 1870-1929, R. Solomon; T. Madison, Drug Forum, v5 n3 p237-65 (1976-77)

UM-77-E0052

THE EVOLUTION OF NON-MEDICAL OPIATE USE IN CANADA--PART II 1930-1970, R. Solomon, Drug Forum, v6 n1 p1-25 (1977-78)

UM-75-E0022

THE FEDERAL POLYDRUG ABUSE PROJECT: INITIAL REPORT, J. Benvenuto; P.G. Bourne, Journal of Psychedelic Drugs, v7 n2 p115-20 (Apr-Jun 1975)

UM-78-D0812

THE IDENTIFICATION OF LSD-LIKE HALLUCINOGENS USING THE CHRONIC SPINAL DOG, W.R. Martin; D.B. Vaupel; M. Nozaki; L.D. Bright, Drug and Alcohol Dependence, v3 n2 p113-23 (Mar 1978)

UM-73-P0018

THE IMPORTANCE OF TISSUE DISTRIBUTION IN PHARMACOKINETICS, J.R. Gillette, Journal of Pharmacokinetics and Biopharmaceutics, v1 n6 p497-520 (Dec 1973)

UM-77-D0926

THE INCIDENCE OF CANNABINOIDS IN FATALLY INJURED DRIVERS: AN INVESTIGATION BY RADIOIMMUNOASSAY AND HIGH PRESSURE LIQUID CHROMATOGRAPHY, J.D. Teale; J.M. Clough; L.J. King; V. Marks; P.L. Williams; A.C. Moffat, Journal of the Forensic Science Society, v17 n2-3 p177-83 (1977)

UM-77-F0023

THE INFLUENCE OF PERSONALITY AND AGE ON THE RELATIONSHIP BETWEEN VIGILANCE PERFORMANCE AND AROUSAL LEVEL, C.M. Stroh, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p617-22, New York: Plenum Press (1977)

UM-77-D0877

THE INFLUENCE OF TOBACCO SMOKING ON THE ACUTE-ALCOHOL AND POST-ALCOHOL STAGE, K. Andersson; C. Hollstedt; A.L. Myrsten; A. Neri, Blutalkohol, v14 n6 p366-80 (Nov 1977)

UM-75-D0744

THE INTERACTION OF ALCOHOL AND DELTA 9-TETRAHYDROCANNABINOL IN MAN: EFFECTS ON PSYCHOMOTOR SKILLS RELATED TO DRIVING, H.M. Franks; G.A. Starmer; G.B. Chesher; D.M. Jackson; V.R. Hensley; W.J. Hensley, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p461-6, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-73-M0238

THE MEASUREMENT OF CANNABINOLS IN THE BLOOD BY GAS CHROMATOGRAPHY, N.K. McCallum, Journal of Chromatographic Science, v11 p509-11 (Oct 1973)

UM-77-E0047

THE NATIONAL ACCIDENT SAMPLING SYSTEM--A STATUS REPORT, C.J. Kahane, J.C. Fell; R.A. Smith, American Association for Automotive Medicine. 21st Conference. Proceedings. D.F. Huelke, ed., p412-34, Morton Grove, Illinois: A.A.A.M. (1977)

UM-73-C0006

THE ORGANIZATION OF THE UNITED NATIONS TO DEAL WITH DRUG ABUSE. J.J. Cohrssen. Washington, D.C.: The Drug Abuse Council, Inc. (Jun 1973)

UM-75-D0736

THE PHARMACOKINETIC COMPONENT OF DRUG EFFECTS ON DRIVING SKILLS, E.M. Sellers. Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety. S. Israelstam; S. Lambert, eds., p271-93, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-75-B0010

THE PHARMACOLOGICAL BASIS OF THERAPEUTICS, FIFTH EDITION, L.S. Goodman; A. Gilman, eds., New York: Macmillan Publishing Company, Inc. (1975)

UM-59-F0036

THE PHARMACOLOGY OF PLACEBOS, S. Wolf, Pharmacological Reviews, v11 n4 p689-704 (Dec 1959)

UM-78-F0035

THE PLACEBO DILEMMA, L. Schindel, European Journal of Clinical Pharmacology, v13 n3 p231-5 (31 May 1978)

UM-78-D0933

THE PREDICTION OF NEUROPSYCHOLOGICAL IMPAIRMENT IN POLYDRUG ABUSERS, A.S. Carlin; F.F. Stauss; K.M. Adams; I. Grant, Addictive Behaviors, v3 p5-12 (1978)

UM-75-D0732

THE PREVALENCE OF DRUGS IN FATALLY INJURED DRIVERS, E.J. Woodhouse, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p147-58, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-77-D0945

THE PROFILE OF THE SUSPECT DRUNK-IN-CHARGE DRIVER IN THE BELFAST AREA, W.A. Eakins; D. Faloon, Ulster Medical Journal, v46 n1 p32-7 (1977)

UM-77-D0963

THE PSYCHOMOTOR EFFECTS OF ATENOLOL AND OTHER ANTIHYPERTENSIVE AGENTS, A.B. Clayton; P.G. Harvey; T.A. Betts, Postgraduate Medical Journal, v53 supp 3 p157-61 (1977)

UM-75-D0733

THE RELATIONSHIP BETWEEN SELF-REPORTED DRUNKEN DRIVING, ALCOHOL CONSUMPTION, AND PERSONALITY VARIABLES AMONG NORWEGIAN STUDENTS, O. Irgens-Jensen, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p159-68, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-76-D0817

THE RELATIONSHIP OF PHARMACOKINETICS TO PHARMACOLOGICAL ACTIVITY: MORPHINE, METHADONE AND NALOXONE, B.A. Berkowitz, Clinical Pharmacokinetics, v1 p219-30 (1976)

UM-67-D0753

THE RELEVANCE OF LABORATORY STUDIES TO PRACTICAL SITUATIONS, A. Chapanis, Ergonomics, v10 n5 p557-77 (1967)

UM-78-D0908

THE RELIABILITY OF DRIVER PERFORMANCE--TEST RELIABILITY OR DRIVER STABILITY? M.H. Jones (Nov. 1978)

UM-77-L0108

THE RELUCTANCE TO COMBINE, D.J. Ottenberg, American Journal of Drug and Alcohol Abuse, v4 n3 p279-91 (1977)

UM-74-D0786

THE RESIDUAL EFFECTS OF N-DESMETHYLDIAZEPAM IN PATIENTS, M. Tansella; C. Zimmermann-Tansella; M.H. Lader, Psychopharmacologia, v38 p81-90 (1974)

UM-74-D0935

THE ROLE OF ATMOSPHERIC CARBON MONOXIDE IN VEHICLE ACCIDENTS, I. Yabroff; E. Myers; V. Fend; N. David; M. Robertson; R. Wright; R. Braun, Menlo Park, Ca.: Stanford Research Institute (1974)

UM-77-D0759

THE ROLE OF DIAZEPAM IN POSTMORTEM MEDICOLEGAL INVESTIGATION, B. S. Finkle, K. L. McCloskey, Salt Lake City, Utah: University of Utan Center for Human Toxicology (November 1977)

UM-76-M0205

THE SECRETION OF METHADONE AND ITS MAJOR METABOLITE IN THE GASTRIC JUICE OF HUMANS: COMPARISONS WITH BLOOD AND SALIVARY CONCENTRATIONS, R.K. Lynn; G.D. Olsen; R.M. Leger; W.P. Gordon; R.G. Smith; N. Gerber, Drug Metabolism and Disposition, v4 n5 p504-9 (Sep/Oct 1976)

UM-75-D0819

THE SERUM LEVEL APPROACH TO INDIVIDUALIZATION OF DRUG DOSAGE, J. Koch-Weser, European Journal of Clinical Pharmacology v9 p1-8 (1975)

UM-76-D0797

THE SIGNIFICANCE OF DRUG INTERACTIONS IN THE EVALUATION OF PSYCHOTROPIC DRUGS, R.A. Braithwaite, British Journal of Clinical Pharmacology, Suppl. p29-34 (1976)

UM-77-M0279

THE TOOLS OF BIOCHEMISTRY, T.G. Cooper, New York: John Wiley and Sons (1977)

UM-77-MO245

THE USE OF BUFFERED CELITE COLUMNS IN DRUG EXTRACTION TECHNIQUES AND THEIR PROPOSED APPLICATION IN FORENSIC TOXICOLOGY. L.P. Hackett; L.J. Dusci, Journal of Forensic Sciences. v22 n2 p376-82 (Apr 1977)

UM-72-LO102

THE USE OF HUMAN SUBJECTS IN HUMAN FACTORS RESEARCH. J.M. Miller; T.H. Rockwell, Human Factors. v14 n1 p35-40 (Feb 1972)

UM-76-CO002

THE USE OF INTERMEDIATE CRITERIA FOR EVALUATING THE EFFECTIVENESS OF ACCIDENT COUNTERMEASURES. J.E. Shaoul. Human Factors. v18 n6 p575-86 (Dec 1976)

UM-76-PO023

THE UTILITY OF PHARMACOKINETICS TO THE PHARMACEUTICAL INDUSTRY. R.L. Nelson. Journal of Clinical Pharmacology. v16 n10 pts 1-2 p565-9 (Oct 1976)

UM-78-EO062

THE VALIDITY OF REPORTED DRUG USE: THE RANDOMIZED RESPONSE TECHNIQUE. M.S. Goodstadt; G. Cook; V. Gruson. The International Journal of the Addictions. v13 n3 p359-67 (Apr 1978)

UM-76-FO013

THE YOUNG DRIVER PARADOX. R.A. Warren; H.M. Simpson. Ottawa, Ontario; Traffic Research Foundation of Canada (Sep 1976)

UM-76-DO772

THE 30-DAY TRIP--CLINICAL STUDIES OF CANNABIS TOLERANCE AND DEPENDENCE. R.T. Jones; N. Benowitz. The Pharmacology of Marihuana. M.C. Braude; S. Szara, eds., v2 p627-42. New York: Raven Press (1976)

UM-76-PO005

THEORETICAL AND COMPUTATIONAL BASIS FOR DRUG BIOAVAILABILITY DETERMINATIONS USING PHARMACOLOGICAL DATA. I. GENERAL CONSIDERATIONS AND PROCEDURES. V.F. Smolen. Journal of Pharmacokinetics and Biopharmaceutics. v4 n4 p337-53 (1976)

UM-76-PO006

THEORETICAL AND COMPUTATIONAL BASIS FOR DRUG BIOAVAILABILITY DETERMINATIONS USING PHARMACOLOGICAL DATA. II. DRUG INPUT RESPONSE RELATIONSHIPS. V.F. Smolen. Journal of Pharmacokinetics and Biopharmaceutics. v4 n4 p355-75 (1976)

UM-75-MO220

THERAPEUTIC AND TOXIC CONCENTRATIONS OF MORE THAN 100 TOXICOLOGICALLY SIGNIFICANT DRUGS IN BLOOD, PLASMA, OR SERUM: A TABULATION. R.C. Baselt; J.A. Wright; R.H. Cravey. Clinical Chemistry. v21 n1 p44-62 (Jan 1975)

UM-75-MO268

THIN-LAYER CHROMATOGRAPHIC METHOD FOR DETERMINING CARBAMAZEPINE AND TWO OF ITS METABOLITES IN SERUM. H.K.L. Hundt; E.C. Clark. Journal of Chromatography. v107 p149-5 (1975)

UM-78-D0930

TIME COURSE EFFECTS OF MARIJUANA AND ETHANOL ON EVENT-RELATED POTENTIALS. B.S. Kopell; W.T. Roth; J.R. Tinklenberg, Psychopharmacology, v56 n1 p15-20 (31 Jan 1978)

UM-76-D0757

TOBACCO SMOKING AND NICOTINE DEPENDENCE. M.A.H. Russell, Research Advances in Alcohol and Drug Problems, R.J. Gibbins, et al., v3 p1-47, New York: John Wiley and Sons (1976)

UM-77-D0844

TOBACCO SMOKING, PERSONALITY AND SEX FACTORS IN AUDITORY VIGILANCE PERFORMANCE. J.E. Tong; G. Leigh; J. Campbell; D. Smith, The British Journal of Psychology, v68 pt3 p365-70 (Aug 1977)

UM-76-F0012

TOTAL IMPAIRMENT RISK FACTORS, R.A. Warren, Ottawa, Ontario: Traffic Injury Research Foundation of Canada (Jul 1976)

UM-74-E0007

TOWARD AN EXISTENTIAL THEORY OF DRUG DEPENDENCE. G. Greaves, The Journal of Nervous and Mental Disease, v159 n1 p263-74 (1974)

UM-77-E0067

TOWARD CLASSIFYING PSYCHOACTIVE CHEMICAL USE, J.R. Weinberg, American Journal of Drug and Alcohol Abuse, v4 n1 p77-90 (1977)

UM-78-E0053

TOXICOLOGY TEST-ORDERING PATTERNS IN A LARGE URBAN GENERAL HOSPITAL DURING FIVE YEARS: AN UPDATE, C.B. Walberg; V.A. Pantlik; G.D. Lundberg, Clinical Chemistry, v24 n3 p507-11 (Mar 1978)

UM-58-F0032

TRAFFIC ACCIDENTS AND DRIVER CHARACTERISTICS: A STATISTICAL AND PSYCHOLOGICAL STUDY, S. Hakkinen, Otaniemi, Finland: Institute of Technology (1958)

UM-76-F0016

TRAFFIC ACCIDENTS AND PSYCHOMOTOR TEST PERFORMANCE. A FOLLOW-UP STUDY, S. Hakkinen, Modern Problems in Pharmacopsychiatry, v11 p51-6 (1976)

UM-69-E0028

TRAFFIC IN AMPHETAMINES: PATTERNS OF ILLEGAL MANUFACTURE AND DISTRIBUTION, R.C. Smith, Journal of Psychedelic Drugs, v2 n2 p20-4 (Spring 1969)

UM-77-C0009

TREATMENT FOR DRUG ABUSERS IN THE UNITED STATES, S.L. Nightingale, Addictive Diseases: an International Journal, v3 n1 p11-20 (1977)

UM-76-D0816

TREATMENT OF DEPRESSION WITH TRICYCLIC DRUGS--PHARMACOKINETIC AND PHARMACODYNAMIC ASPECTS, M. Asberg, Pharmakopsychiatrie Neuro-Psychopharmakologie, v9 n1 p18-26 (Jan 1976)

UM-74-E0049

TRENDS IN DRUG USE AMONG METROPOLITAN TORONTO HIGH SCHOOL STUDENTS: 1968-1974, R.G. Smart; D. Fejer; D. Smith; W.J. White, Toronto, Canada: Addiction Research Foundation of Ontario (1974)

UM-77-F0026

TRI-LEVEL STUDY OF THE CAUSES OF TRAFFIC ACCIDENTS: AN OVERVIEW OF FINAL RESULTS, J.R. Treat, American Association for Automotive Medicine, 21st Conference, Proceedings, D.F. Huelke, ed., p391-403, Morton Grove, Illinois: AAAM (1977)

UM-76-D0762

TWO WEEKS' TREATMENT WITH CHLORPROMAZINE, THIORIDAZINE, SULPIRIDE, OR BROMAZEPAM: ACTIONS AND INTERACTIONS WITH ALCOHOL ON PSYCHOMOTOR SKILLS RELATED TO DRIVING, T. Seppala; I. Saario, M.J. Mattila, Modern Problems in Pharmacopsychiatry, v11 p85-90 (1976)

UM-78-D0758

UBER DEN ALKOHOLGEHALT IN TONICA, ELIXIEREN UND ROBORANTIEN [THE ETHANOL-CONTENT IN TONICS, ELIXIRS AND ROBORANTS], H. Althoff; H. Kellner, Blutalkohol, v15 n5 p363-9 (Sep 1978)

UM-77-D0991

UNTERSUCHUNGEN UBER DEN KOMBINATIONSEFFEKT ALKOHOL-FENETYLLIN (CAPTAGON) AUF EINIGE REFLEXMECHANISMEN DES MENSHEN [COMBINED EFFECT OF ALCOHOL AND FENETYLLINE ON REFLEX MECHANISMS IN MAN], Blutalkohol, v14 n1 p19-46 (1977)

UM-74-M0264

USE OF CHARCOAL TO CONCENTRATE DRUGS FROM URINE BEFORE DRUG ANALYSIS, J.M. Meola; M. Vanko, Clinical Chemistry, v20 n2 p184-7 (1974)

UM-76-M0248

USE OF GAS CHROMATOGRAPHY AND MASS SPECTROMETRY TO ANALYZE UNDERIVATIZED VOLATILE HUMAN OR ANIMAL CONSTITUENTS OF CLINICAL INTEREST, I.R. Politzer; B.J. Dowty; J.L. Laseter, Clinical Chemistry, v22 n11 p1775-88 (1976)

UM-77-D0889

VALIDATION OF A BEHAVIOR ANALYSIS METHODOLOGY: VARIATION OF VIGILANCE IN NIGHT DRIVING AS A FUNCTION OF THE RATE OF CARBOXYHEMOGLOBIN, E.J. Caille; J.L. Bassano, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p59-71, New York: Plenum Press (1977)

UM-75-D0737

VALIDITY OF DRIVING SIMULATOR STUDIES FOR PREDICTING DRUG EFFECTS IN REAL DRIVING SITUATIONS, H. Moskowitz, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p295-303 (1975)

UM-77-L0098

VALUE FOUNDATIONS FOR DRUG USE, R.M. Veatch, Journal of Drug Issues, v7 n3 p253-62 (Sum 1977)

UM-76-P0031

VALUE OF THE DETERMINATION OF DRUGS AND METABOLITES IN BIOLOGICAL FLUIDS IN PHARMACOLOGY AND THERAPY, G. Olive, Drug Interference and Drug Measurement in Clinical Chemistry, G. Seist, D.S. Young, eds., p146-52, Third International Colloquium on Prospective Biology, Pont-a-Mousson, 6-10 Oct 1975 Basel, Switzerland: S. Karger A.G. (1976)

UM-77-F0015

VEHICLE CONTROL AND DRIVING EXPERIENCE A PSYCHOPHYSIOLOGICAL APPROACH, M. Helander, Zeitschrift fur Verkehrssicherheit, v23 n1 p6-11 (1977)

UM-74-D0951

VESTIBULAR AND OPTOKINETIC RESPONSES TO DIAZEPAM AND ALCOHOL, Z. Bochenek; R. Makowiecka, Acta Medica Polanda, v15 n3 p117-26 (1974)

UM-76-D0750

VIGILANCE AND SIMULATED NIGHT DRIVING, J Boadle, Ergonomics, v19 n2 p217-25 (1976)

UM-76-F0010

VISUAL ACUITY AND HIGHWAY ACCIDENTS, H.W. Hofstetter, Journal of the American Optometric Association, v47 n7 p887-93 (Jul 1976)

UM-77-D0880

VISUAL MASKING AND CARBON MONOXIDE TOXICITY, S.M. Luria, Perceptual and Motor Skills, v44 n1 (Feb 1977)

UM-64-D0972

WEITERE UNTERSUCHUNGEN ZUR FRAGE DER STRASSENVERKEHRS-TUCHTIGKEIT NACH PROPANIDID-NARKOSEN, P Rittmeyer, Anaesthesiology and Resuscitation, n4 p298-301 (Jan 1964)

UM-75-M0281

WESTERN MICHIGAN DRUG ANALYSIS PROGRAM, D.J McCoy; W.D. Meester, Substance Abuse Scientific Forum Research Report, Lansing: Michigan Department of Public Health (14 Oct 1975)

UM-75-L0114

WHITE PAPER ON DRUG ABUSE, Washington, D.C.: U.S. Government Printing Office (1975)

UM-76-P0035

WHY MEASURE DRUGS AND THEIR METABOLITES? G. Olive; J. DeGraeve; C. Heusghem, Drug Interference and Drug Measurement in Clinical Chemistry, G. Seist; D.S. Young, eds., p198-207, Third International Colloquium on Prospective Biology, Pont-a-Mousson, 6-10 Oct. 1975. Basel, Switzerland: S. Karger AG (1976)

UM-75-D0748

"WILL THE REAL DRUGGED DRIVER PLEASE STAND UP?" AN ANALYTICAL TOXICOLOGY ASSESSMENT OF DRUGS AND DRIVING, B.S. Finkle, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p607-611, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

UM-74-A0016

WOMEN AND DRUG USE: AN ANNOTATED BIBLIOGRAPHY, S.J. Christenson; A.Q. Swanson, Journal of Psychedelic Drugs, v6 n4 p371-414 (Oct-Dec 1974)

UM-76-D0989

ZUM BEGRIFF DER "SICHEREN FUHRUNG" VON WASSERFAHRZEUGEN UND IHRE "BEHINDERUNG" DURCH ALKOTOLEINFLUSS [DEFINITION OF "SAFE STEERING" OF VESSELS AND ITS "IMPAIRMENT" BY THE INFLUENCE OF ALCOHOL], R. Helmer; K. Peters, Blutalkohol, v13 n1 p39-44 (1976)

UM-77-P0027

ZUM NACHWEIS THERAPEUTISCHER KONZENTRATIONEN CHLORMETHIAZOL IM BLUT [THERAPEUTIC CONCENTRATIONS OF CHLORMETHIAZOL IN BLOOD AND THEIR DETECTION], R. Iffland, Zeitschrift fur Rechtsmedizin, v80 p27-33 (1977)

UM-74-D0978

ZUM PROBLEM DES PASSIVRAUCHENS: II. UNTERSUCHUNGEN UBER DEN KOHLENMONOXIDGEHALT DER LUFT IM KRAFTFAHRZEUG DURCH DAS RAUCHEN VON ZIGARETTEN [THE PROBLEM OF PASSIVE SMOKING: II. INVESTIGATIONS OF CO LEVEL IN THE AUTOMOBILE AFTER CIGARETTE SMOKING], H.-P. Harke; W. Liedl; D. Denker, Internationales Archive Fur Arbeitsmedizin, v33 n3 p207-20 (1974)

UM-74-D0979

ZUM PROBLEM DES PASSIVRAUCHENS: III. UBER DEN EINFLUSS DES RAUCHENS AUF DIE CO-KONZENTRATION IM KRAFTFAHRZEUG BEI FAHRTEN IM STADTGEBIET [THE PROBLEM OR PASSIVE SMOKING: III. THE INFLUENCE OF SMOKING ON THE CO CONCENTRATION IN DRIVING AUTOMOBILES], H.-P. Harke; H. Peters, Internationales Archive Fur Arbeitsmedizin, v33 n3 p221-9 (1974)

UM-75-D0981

ZUR THERAPIE DER DEPRESSIONEN MIT PSYCHOPHARMAKA [THE THERAPY OF THE DEPRESSIVE SYNDROME WITH ANTIDEPRESSANTS], J. Fleischhauer, Therapeutische Umschau/Revue Therapeutique, v32 n8 p507-14 (1975)

UM-76-C0015

ZUR VEREINHEITLICHUNG DER PROMILLEGRENZEN: PRO UND CONTRA [SIMPLIFICATION OF BLOOD ALCOHOL LIMITS: ARGUMENTS FOR AND AGAINST], H. Schneble, Blutalkohol, v13 n5 p297-304 (Sep 1976)

DRUGS AND DRIVING:

A SELECTED BIBLIOGRAPHY

SUPPLEMENT TWO

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DRUGS AND DRIVING:

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APPENDIX D

ABSTRACT INDEX

UM-71-A0010

DRUGS OF ABUSE: BIBLIOGRAPHY, Fluorescence News, v6 n3 p11-12 (Dec 1971)

This bibliography lists about forty selected nonannotated references dealing with the fluorometric determination of those drugs with the highest incidence of addiction, abuse, or hallucinating usage. Drugs for which literature is cited include amphetamines, barbiturates, cocaine, codeine, ethanol, lysergic acid diethylamide, mescaline, methadone, morphine, heroin, opium, and quinine. References are listed alphabetically by title in each drug category. (HSRI)

KEYWORDS: Compilation.

UM-75-A0011

DRUGS AND DRIVING: A SELECTED BIBLIOGRAPHY, K.B. Joscelyn; R.P. Maickel (Oct 1975)

A selected bibliography on drugs (other than alcohol alone) and driving is presented. Appendices contain a topical index, a title index, an author index, and abstracts of over six hundred articles. Scientific, technical, and selected general literature dealing with the effects of drugs on driving behavior is included. Literature that presents drug effects on behavior related to driving is also included. Materials that present legal constraints on drug and driving research and countermeasure programs are listed. (AA)

178 pages

National Highway Traffic Safety Administration DOT-HS-4-00994

KEYWORDS: Compilation.

UM-74-A0012

DRUGS AND EMPLOYMENT: NONMEDICAL USE OF DRUGS IN OCCUPATIONAL AND INDUSTRIAL SETTINGS, P. Ferguson; T. Lennox; D.J. Lettieri, eds., NIDA Research Issues 1 (Nov 1974)

Presented here are summaries of the major research findings dealing with the nonmedical use of drugs in occupational and industrial settings. This volume is intended especially for the researcher who lacks the time to scan all current information published in his area of interest. The predominant focus is on empirical research findings and major theoretical approaches published between January 1958 and January 1974 in the English language.

The articles summarized are classified into six parts: (1) overviews and issues; (2) drug use in specific professions, particularly medicine, sports, and aviation; (3) surveys of drug use in companies; (4) surveys of drug use among addicts; (5) drug use in the labor force; and (6) treatment programs.

Each summary is formulated and detailed to provide the reader with the purpose, methodology, findings, and conclusions of the original study. (HSRI)

U.S. Department of Health, Education, and Welfare publication no. (ADM) 76-183

KEYWORDS: Compilation. Review: Drug Use.

UM-75-A0013

THE BENZODIAZEPINES--PATTERNS OF USE. AN ANNOTATED BIBLIOGRAPHY, C.E. Weise; S.F. Price, Addiction Research Foundation of Ontario, Canada (1975)

This annotated bibliography of over two hundred references has been compiled to facilitate access to materials written about the patterns of use of the benzodiazepines. The range of literature includes all major epidemiological surveys, prescription data studies, literature reviews, letters-to-the-editor, and commentaries which have appeared in the English language since 1960. Drug surveys emphasizing primarily illicit drug use are found in the appendices as are articles referring to minor tranquilizers.

Items are arranged alphabetically by senior author. The references include the usual bibliographic data as well as index terms and an accession (microfiche) number. An alphabetical key word listing permits the user to select the terms which are relevant to his needs. The author index lists alphabetically the name of each author represented in the bibliography followed by citation numbers. (HSRI)

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics). Compilation.

UM-69-A0014

CARBON MONOXIDE: EXPECTED LEVELS AND THEIR EFFECTS ON AUTOMOBILE DRIVERS (Mar 1969)

This bibliography consists of ninety-four citations dealing with the effects of increased CO levels on the performance of highway vehicle drivers and occupants. Material was also included on the existing or expected levels of CO in highway vehicles and along the highway itself. The citations are annotated and listed in alphabetical order by title. Journal articles and monographs are included.

Highway Safety Research Information Center, HSRI, The University of Michigan, Ann Arbor

KEYWORDS: Gases: carbon monoxide. Compilation.

UM-76-A0015

COCA AND COCAINE: A BIBLIOGRAPHY, M. Schatzman; A. Sabbadini; L. Forti, Journal of Psychedelic Drugs, v8 n2 p95-128 (Apr-Jun 1976)

Anyone wishing to study scientifically how an illicit psychoactive drug affects its users faces many hurdles, both practical and ethical. This has resulted in a scarcity of literature dealing with the experience of cocaine users. Virtually no one today is familiar with the large body of literature on cocaine, probably because little of the literature is recent, nearly all having been published between the early 1880s and the mid-1940s. This bibliography attempts to gather reports of users and observers of coca and cocaine, both past and present.

The bibliography is divided into two sections, "coca" and "cocaine". Some of cocaine's effects are similar to those of coca, but many are sufficiently different to warrant separate discussions. Nearly forty annotated references and about ninety nonannotated references deal with coca. About forty-five annotated references and well over one hundred nonannotated references deal with cocaine. The annotated references reflect particularly influential viewpoints or important clinical or experimental data in the literature. Sociology, psychology, and clinical features are emphasized more than the pharmacology and biochemistry of coca and cocaine On certain controversial issues the views of authors with differing opinions are presented.The bibliography is arranged alphabetically by author. (HSRI)

KEYWORDS: Local Anesthetics: coca. cocaine. Stimulants: coca. cocaine. Compilation.

UM-74-A0016

WOMEN AND DRUG USE: AN ANNOTATED BIBLIOGRAPHY, S.J. Christenson; A.Q. Swanson, Journal of Psychedelic Drugs, v6 n4 p371-414 (Oct-Dec 1974)

Despite the high drug usage rate among women throughout history, the literature dealing specifically with women and drug use has been curiously scant until the last two decades. With the advent of the women's movement, however, more attention is being paid to what women are doing in all areas, including pharmaceutical drug abuse and treatment. This selected bibliography attempts to gather significant references published from 1937 to 1974 dealing with drug usage by women. One hundred fifty-four annotated references have been collected and categorized into the following classifications: women and alcohol; women and psychotherapeutic drug use; women and narcotics; women and smoking; women and treatment; and women and drug advertising. Within each category references are listed alphabetically by author.

The introduction to the bibliography summarizes major findings of some works included. (HSRI)

KEYWORDS: Compilation.

UM-72-A0017

STASH LIBRARY BIBLIOGRAPHIC SEARCH: METHAQUALONE, S.J. Christenson, Journal of Psychedelic Drugs, v5 n2 p205-11 (Winter 1972)

Over 150 citations to literature concerned with methaqualone are provided here. Most are journal articles published from 1970 to 1972. They are arranged alphabetically by author Both experimental and epidemiological studies on human and animal subjects are included. References on other quinazolinones are also included. This bibliography is a result of a computer search. (HSRI)

KEYWORDS: Nonbarbiturates: methaqualone. Compilation.

UM-69-A0018

SUPPLEMENTAL BIBLIOGRAPHY ON STIMULANTS, Journal of Psychedelic Drugs, v2 n2 p108-12 (Spring 1969)

Over 170 nonannotated references dealing with stimulants are included in this bibliography. Publications listed deal with both the physiological and the psychological effects of stimulants in humans. This bibliography, arranged alphabetically by author, is a supplement to an earlier bibliography on the same subject. (HSRI)

KEYWORDS: Stimulants. Compilation.

UM-78-A0019

DRUGS AND DRIVING: A SELECTED BIBLIOGRAPHY. SUPPLEMENT ONE, K.B. Joscelyn; A.C. Donelson (Jan 1978)

This report presents a first supplement to Drugs and Driving:A Selected Biblliography, a bibliography of literature dealing with the relationship between drug use (other than alcohol alone) and highway safety. This supplement both updates the parent volume and expands coverage in certain research areas related to the field of drugs and highway safety. In particular, literature pertaining to drug usage patterns and drug analytical methodology has been included. A detailed description of the literature scope and document selection process is provided. The bibliography consists of four appendices, including a topical index, an author index, a title index, and abstracts of nearly 400 articles. A revised topical index was developed to improve user access to document abstracts. Within the topical index are cross-referenced lists of drugs by name and by usage. (AAM)

127 pages

National Highway Traffic Safety Administration, technical report, DOT HS-7-015 30

KEYWORDS: Compilation.

UM-77-A0020

BIBLIOGRAPHY, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p751-814, New York: Plenum Press (1977)

Presented here is a bibliography on the theory, operational performance, and physiological correlates of vigilance, listing over nine hundred publications on the subject. A wide range of subjects is discussed including the effects of sleep deprivation on driving skills, the effects of noise intensity on visual performance, and personality and physiological correlates of a performance decrement on monotonous tasks. These nonannotated references are listed alphabetically by author. (HSRI)

KEYWORDS: Compilation.

UM-77-A0021

THE ETHICAL PHARMACEUTICAL INDUSTRY AND SOME OF ITS ECONOMIC ASPECTS. AN ANNOTATED BIBLIOGRAPHY. D.C. Sevigny. Bibliographic Series No. 13. R.J. Hall, ed., Toronto, Canada: Addiction Research Foundation of Ontario (1977)

This bibliography provides a means of access to a collection of literature on the economic aspects of the ethical pharmaceutical industry. Books, journal articles, research studies, government hearings and reports, prescription data studies, individual case studies, and articles in popular magazines published in the English language between 1938 and 1976 are included. Some topics included are the international trade in pharmaceuticals and the balance of payments; industrial relations; the controversy surrounding the use of brand names and generic names; and public regulation and control of drugs. Excluded are studies concerning the proprietory ("patented") or over-the-counter drug industry and the illicit drug trade.

Items are arranged alphabetically by senior author. All citations include an annotation. Following the citation section of the bibliography a list of nonannotated citations is provided for items of related interest. An author index and subject index are provided. Two hundred forty-nine annotated citations are listed, with over five hundred nonannotated citations. (HSRI)

521 pages

KEYWORDS: Compilation.

UM-76-B0008

ASSAYS OF DRUGS AND OTHER TRACE COMPOUNDS IN BIOLOGICAL FLUIDS. Methodological Developments in Biochemistry, v5, E. Reid, ed., Amsterdam: North-Holland Publishing Company (1976)

Presented here is a collection of articles written by experts in the field concerning the assay of drugs and other trace compounds in biological fluids. The articles have been classified into four sections: (1) advances in instrumental techniques; (2) general analytical strategy; (3) sample preparation; and (4) analytical case histories.

The purpose of this book is to serve not only as an instructional text, but also as a desk guidebook in pharmaceutical and clinical laboratories that can supply methods of reliable microdeterminations on body-fluid samples. Some of the specific topics discussed are: luminescense assay of drugs; affinity methods for drug assay; solvent extraction; niflumic acid in plasma and urine; microbiological assay of cephradine in blood and urine; and radioenzymatic assay techniques for aminoglycosides. (HSRI)

KEYWORDS: Compilation.

UM-76-B0009

DRUG MISUSE...HUMAN ABUSE OF THERAPEUTICS, FIFTH EDITION. H.I. Green; M.H. Levy, eds., New York: Marcel Dekker, Inc. (1976)

This book attempts to synthesize the most up-to-date and basic information available for dangerous drugs, particularly drugs of misuse. Information found in the book comes mainly from experts in the field; however, present and former drug users were also interviewed, and these interviews are included.

This book was designed to be read and referred to primarily by parents and to be used as a guide for those who teach and counsel students; therefore the authors attempt to use easily understood rather than technical language. Each chapter deals with a major drug group such as alcohol, tranquilizers, and hallucinogens. At the end of each chapter is found a series of questions and answers that clarify and expand the narrative. General information is summarized in several tables in the appendices. References are limited. (HSRI)

566 pages 58 refs

KEYWORDS: Review.

UM-75-B0010

THE PHARMACOLOGICAL BASIS OF THERAPEUTICS, FIFTH EDITION, L.S. Goodman; A. Gilman, eds., New York: Macmillan Publishing Company, Inc. (1975)

This book has become a world-renowned textbook of pharmacology, toxicology, and therapeutics. The book has three primary objectives: (1) to correlate pharmacology with related medical sciences; (2) to interpret the actions and uses of drugs from the viewpoint of important advances in medicine; and (3) to emphasize the applications of pharmacodynamics to therapeutics.

The book is organized into drug classes. The basic principles of pharmacokinetics are discussed separately as they relate to all drugs. Applied principles are presented for individual agents when altered biochemical disposition or impaired execution requires changes in dosage regimens. In several cases the appropriate data are summarized in tabular form

Newly approved drugs are fully discussed as well as those that are still in the developmental stage but show considerable promise as future therapeutic agents. Other substances discussed include prostaglandins, hypothalamic regulatory hormones, and cyclic AMP. This textbook is helpful for students of medicine, dentistry, pharmacy, the veterinary sciences, pharmacology, anesthesiology, toxicology, and various medical specialties. (HSRI)

1704 pages

KEYWORDS: Review: Drug Concentration-Effect Relationships. Review: Drug Effects.

UM-72-B0011

ANALYTICAL PROFILES OF DRUG SUBSTANCES V1, K. Florey, ed., New York: Academic Press (1972)

Although the official compendia define a drug substance as to identity, purity, strength, and quality, they normally do not provide other physical or chemical data, nor do they list methods of synthesis or pathways of physical or biological degradation and metabolism. This series attempts to make available this supplemental information for important drug substances in the official compendia, and is revised and updated at suitable intervals.

Volume I provides analytical profiles for acetohexamide, chlordiazepoxide, chlordiazepoxide hydrochloride, cycloserine, cyclothiazide, diazepam, erythromycin estolate, halothane, levarterenol bitartrate, meperidine hydrochloride, meprobamate, nortriptyline hydrochloride, potassium phenoxymethyl penicillin, propoxyphene hydrochloride, sodium cephalothin, sodium secobarbital, triamcinolone diacetate, vinblastine sulfate, and vincristine sulfate. (HSRI)

365 pages 81 refs

KEYWORDS: Adrenals: triamcinolone. Analgesics and Antipyretics: propoxyphene. Antidepressants: nortriptyline. Antineoplastic Agents: vinblastine sulfate, vincristine sulfate. Antituberculars: cycloserine. Barbiturates: secobarbital. Cephalosporins: cephalothin. Diuretics: cyclothiazide. General Anesthetics: halothane. Hypotensive (Antihypertensive) Agents: cyclothiazide. Minor Tranquilizers (Anti-Anxiety and Ataractics): chlordiazepoxide, diazepam, meprobamate. Muscle Relaxants (Central): diazepam. Neurochemicals, Neurotransmitters, and Neurohormones: levarterenol. Opiates and Related Agents: pethidine. Oral Hypoglycemics: acetohexamide. Other Antibiotics: erythromycin. Penicillins: penicillin V potassium. Sympathomimetic (Adrenergic) Agents: levarterenol. Compilation.

UM-73-B0012

ANALYTICAL PROFILES OF DRUG SUBSTANCES V2, K. Florey, ed., New York: Academic Press (1973)

This volume is the second in a series of volumes which provides information for important drugs concerning their identity, purity, strength, and quality, as well as other physical or chemical data. Also discussed are methods of synthesis and pathways of physical or biological degradation and metabolism. These analytical profiles are revised and updated at suitable intervals.

blood alcohol content should not be punished. This would not, however, make ineffectual the law requiring abstainence from alcohol before driving. (JAM)

4 refs German

KEYWORDS: Countermeasure Concepts.

UM-70-C0016

ESTIMATING THE EFFECTIVENESS OF BLOOD ALCOHOL LIMITS, P.M. Hurst, Behavioral Research in Highway Safety, v1 p87-99 (Summer 1970)

Reported here is a study in which a Bayesian analysis of relative hazard was applied to the data from four controlled field studies (Grand Rapids, Evanston, Toronto, and Manhattan)of alcohol and highway crashes. Relative reductions in crashes, injuries, and fatalities were then computed as functions of hypothetical variations in the enforced legal limit for blood alcohol concentration (BAC) assuming (1) a causal relationship between BAC and relative crash probability, and (2) a simple deterrent effect from enforcement.

Results show that BAC in the low to medium range tended to produce less relative hazard in those populations where driving at such levels was more common. The hypothesis that alcohol plays an increased role in more severe crashes was also examined. The analysis revealed such a differential effect only within the very high BAC range (0.10% to 0.15%).

Implications for research, legislation, and enforcement are also discussed. It was concluded that greater emphasis should be given to enforcement practices than to enacting more stringent BAC limits. The putative reciprocal relationship between stringency and enforcement-acceptance should be further investigated, since the decrease in crash injuries from reducing a limit would apparently be reversed by even a small decrement in the rigor of its enforcement. The increase in hazard from even a few very drunk drivers who escape detection would seem to offset the reduction afforded by deterring a large number who are slightly to moderately impaired. (JAM)

11 refs

KEYWORDS: Countermeasure Development, Testing, and Evaluation.

UM-77-C0017

GENERAL DETERRENCE AND POLICE ENFORCEMENT: EFFECTIVE COUNTERMEASURES AGAINST DRINKING AND DRIVING, P.K. Ennis, Journal of Safety Research, v9 n1 p15-25 (Mar 1977)

This paper reviews the literature concerned with attempts to deter drinking while driving. With the widespread prevalence of impaired driving, it is imperative that large-scale countermeasures be considered that are directed to the entire potential drinking and driving population. Public understanding and support of DWI laws and more efficient police enforcement of these laws--two conditions necessary for deterrence effectiveness--are considered. The concepts of objective and subjective estimations of apprehension risk are also disussed. Finally, a number of studies are reviewed discussing the relation between police enforcement and general deterrence of certain driver behavior, including impaired driving. From these studies the need for determining research priorities is clearly evident. Well-designed studies are needed to determine the impact of various enforcement practices such as roadside breath testing on drinking and driving. The extent to which the enforcement rate must be increased to achieve general deterrence has yet to be determined. (JA)

38 refs

KEYWORDS: Countermeasure Concepts.

UM-76-D0700

RELATION BETWEEN DRUG-INDUCED CENTRAL NERVOUS SYSTEM EFFECTS AND PLASMA LEVELS OF DIAZEPAM IN MAN, J. Orr; P. Dussault; C. Chappel; L. Goldberg; G. Reggiani, Modern Problems in Pharmacopsychiatry, v11 p57-67 (1976)

Pharmacodynamic effects and plasma levels of diazepam were studied in fifteen healthy male volunteers at different dose levels. The aims of the present study were the

following: (1) to follow the time-course of diazepam-induced impairment of selected CNS functions in relation to plasma levels; (2) to compare over time the CNS effects of three different dose levels of diazepam versus placebo in relation to drug plasma levels; and (3) to devise a technique for comparing possible differences in efficacy, reliability, and validity of different types of CNS-based tests. The emphasis was on test sensitivity to small changes in drug plasma levels.

Responses to diazepam were quantified with instruments measuring body sway (statometry) and psychomotor performance (stressalyser tests). For subjects given either 10 or 20 mg of diazepam there was a clear impairment in standing steadiness. The time of greatest impairment coincided with the time when peak plasma concentrations of the drug were reached. The stressalyser data showed that subjects under the influence of diazepam took longer to react to stimuli and moved more slowly during the acquisition of the new target as the dose plasma concentrations of the drug increased. This suggests that although diazepam impairs motor function, correct decision generation is unaffected at doses of up to 30 mg of diazepam. (HSRI)

11 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam*. Muscle Relaxants (Central): diazepam*. Drug Concentration-Effect Study: Driving Skill Impairment. Experimentation: Dose-Effect Study. Psychomotor Tests.

UM-76-D0701

PRACTICAL ASPECTS OF THE ROUTINE MEASUREMENT OF ALCOHOL AND DRUGS IN DRIVERS, A. Alha; R. Honkanen; M. Karlsson; K. Laiho; M. Linnoila; I. Lukkari, Modern Problems in Pharmacopsychiatry, v11 p42-45 (1976)

This study examined the suitability of the quantitative measurement of alcohol in expired air for indicating blood alcohol concentrations (BAC). Parallel estimations of the BAC were made from breath air by using the ASD instrument, which measures electronic oxidation, and from blood samples by means of the Widmark and ADH methods (alcohol dehydrogenase).

The test results showed that if the BAC was 1.5 mg/ml or more (up to 2.87 mg/ml), the breath content as measured by the ASD instrument in nearly every case underestimated BAC. On the other hand, for BACs of less than 0.5 mg/ml, the ASD tended to overestimate the blood alcohol level.

The authors suggest that a small part of the discrepancy could be attributed to the biological effect of alcohol, which might alter the ventilation perfusion ratio in the lungs. The greatest proportion of this discrepancy, however, is due to the inaccuracy of the ASD instrument. The authors urge the development of an accurate, efficient, and rapid technique to measure the level of alcohol and drugs in body fluids. Only when such techniques are developed can meaningful evaluations of alcohol and drug levels be made and satisfactory legislation measures be developed. (AAM)

5 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol)* Minor Tranquilizers (Anti-Anxiety and Ataractics). Epidemiologic Research: Drug Concentrations in Body Fluids. Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-76-D0702

CHARACTERISTICS OF DRIVING IN RELATION TO THE DRUG AND ALCOHOL USE OF FINNISH OUTPATIENTS, M. Maki; M. Linnoila, Modern Problems in Pharmacopsychiatry, v11 p11-21 (1976)

This study was conducted among three specific patient groups generally receiving drugs for prolonged periods of time. A questionnaire was administered to 765 rheumatic arthritic, 715 tubercular, and 1050 psychiatric outpatients, as well as to 587 control subjects. Its purpose was to determine the driving habits of chronically ill outpatients, the use of drugs and alcohol among outpatients, and the relationship between alcohol, drug use, and driving.

The results of the study show that very few rheumatic and psychiatric patients held driving licenses in contrast to the tubercular group, which held as many driving licenses as the control group. The annual driving exposure of the rheumatic arthritic and psychiatric patients was also low compared to the other groups.

Experimentation: Acute Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Dose-Effect Study.

UM-79-D0707

ON THE ROAD DETECTION OF DRIVING WHILE INTOXICATED, D.H. Harris, Compass for Technology. Proceedings of the Human Factors Society, 23rd Annual Meeting, C.K. Bensel, ed., p263-6, Santa Monica, Ca.: Human Factors Society (1979)

An on-the-road study of DWI detection was conducted to determine the relative discriminability and frequency of occurrence of visual detection cues under conditions typically encountered by patrol officers. Visual cues were identified and procedures were developed to enhance on-the-road detection of driving while intoxicated. Trained observers accompanied police officers on patrol and recorded a total of 643 instances of driving behavior and vehicle actions that deviated from normal. In each instance the police officer stopped the vehicle and measured the BAC of the driver with a portable breath tester. In addition to cue descriptions and BAC level, the observer recorded driver characteristics and the circumstances and conditions under which the stop was made. These DWI arrest reports were analyzed and visual cues indicative of impaired driving were ordered by frequency level of impairment, association with other cues, and discriminability value.

A set of twenty-three visual cues that accounted for 92% of the cue occurrences in the study was used to develop a DWI detection guide to facilitate on-the-road detection of DWI by police officers. Mathematical computations on the numerical values placed on each visual cue were developed to provide an estimate of degree impairment. This guide is currently being evaluated in a field study involving ten law enforcement agencies. (HSRI)

9 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Countermeasure Development, Testing, and Evaluation. Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-79-D0708

THE BEHAVIORAL ASPECTS OF SMOKING, NIDA Research Monograph 26, N.A. Krasnegor, ed., Rockville, Md.: National Institute on Drug Abuse (1979)

This monograph is a reprinting of Part II of the 1979 Report of the Surgeon General on Smoking and Health. The five papers comprising the volume constitute a significant document for behavioral scientists and others with special interest in this field. They provide a compact summary of current biological, behavioral, and psychosocial research on cigarette smoking behavior. The following specific topics are addressed: (1) biological influences on cigarette smoking; (2) behavioral factors in the establishment, maintenance, and cessation of smoking; (3) psychosocial detriments and prevention strategies for smoking in children and adolescents; (4) psychosocial influences on cigarette smoking; and (5) modification of smoking behavior. In addition, an introductory chapter provides an overview of cigarette smoking from an applied behavior analysis perspective: reviews what is known concerning withdrawal, relapse, and abstinence; and suggests new directions for research. (HSRI)

869 refs

National Institute on Drug Abuse, DHEW Publication no. (ADM) 79-882

KEYWORDS: Ganglionic Blocking and Stimulating Agents: nicotine. Stimulants: nicotine. Compilation.

UM-79-D0709

EYE MOVEMENTS AND SKILLS PERFORMANCE MEASURES UNDER ALCOHOL IN A DRIVING SIMULATOR, H. Moskowitz; K. Ziedman, Compass for Technology. Proceedings of the Human Factors Society, 23rd Annual Meeting, C.K. Bensel, ed., p389-93, Santa Monica, Ca.: Human Factors Society (1979)

This study is one of a series of studies designed to clarify the nature of the alcohol-induced impairment in behavior that results in increased accident probability. Emphasis in this study was on alcohol effects on perceptual and information processing behavior as measured by a driving simulator test.

Twenty-five male subjects in two groups (n's = 13 and 14) drove for fifteen minutes on a simulator presenting a rural roadway scene. Subjects were required to maintain a constant heading angle, a constant speed, and to search for and respond appropriately to route signs. The two groups differed in training, the familiar group receiving training on the same route and signs in the experimental runs, the unfamiliar group being trained on different roadways and signs. After training, subjects attended three experimental runs under alcohol treatments producing mean blood alcohol concentrations of 0 (placebo), .085%, and .125%.

Results showed large increases in dwell (fixation) and pursuit durations, indicating an increase in the time necessary to process information under alcohol. Alcohol also produced a large increase in very long duration fixations of over one second, which appeared to be nonproductive "gazing." The frequency of fixation decreased as the duration increased under alcohol. The effect of alcohol on the time to read the route signs was a joint function of the alcohol level, the amount of information in the sign, and the familiarity with the sign. There was a greater increase in fixation duration for reading the route sign under alcohol for the unfamiliar group compared to the familiar group. Alcohol also increased speed and steering control errors. (JAM)

13 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Driving Simulator. Experimentation: Acute Dosage Study. Experimentation: Dose-Effect Study. Tests of Sensory Function.

UM-76-D0710

ABUSE OF MEDICINES. A REPORT BY A WORKING PARTY 1975, COUNCIL OF EUROPE, EUROPEAN PUBLIC HEALTH COMMUNITY. PART I. SELF MEDICATION. Drug Intelligence and Clinical Pharmacology, v10 n1 p16-33 (Jan 1976)

This article, authored by a panel of medical experts from Belgium, West Germany, Ireland, Italy, Norway, Sweden, and Switzerland, is the first in a series that reports the results of a study of the causes and effects of the abuse of medicine in the United States and several European countries. The report also recommends measures for preventing this abuse.

The report begins with discussion of general aspects of self-medication such as the historical development of self-medication, attitudes towards self-medication, and its general acceptance in society. The extent, development, nature, and role of self-medication is compared on the international level. Several reports on drug abuse in specific countries are cited.

The study also discusses the seriousness of drug abuse in the area of self-medication, especially the pharmacological, toxicological, and social consequences of abuse. Also examined are the roles of the physician, government authorities, manufacturers, public advertising, and the pharmacist in preventing abuse through awareness of patient self-medication and patient education. The study concludes that these parties are responsible for abuses in self-medication, and that their responsibilities and duties can and must be defined if the abuse of medicine is to decrease. (HSRI)

Working Party on the Abuse of Medicaments

29 refs

KEYWORDS: Epidemiology: National Survey of Drug Use Patterns.

UM-76-D0711

ABUSE OF MEDICINES. A REPORT BY A WORKING PARTY 1975, COUNCIL OF EUROPE, EUROPEAN PUBLIC HEALTH COMMUNITY. PART TWO. PRESCRIPTION MEDICINES. Drug Intelligence and Clinical Pharmacology, v10 n2 p94-110 (Feb 1976)

This report examines the abuse of prescription medicines. The abuse of prescription medicines is dealt with in four sections: (1) abuse by the prescriber; (2) abuse by the patient; (3) abuse by the manufacturer; and (4) abuse at distribution level. Underprescribing, overprescribing, multiple prescribing, and incorrect prescribing are common patterns of abuse by prescribers. Any of these problems may be due to lack of knowledge of drug therapy or to errors in the writing of a prescription. Causes of abuse on the part of physicians may be the excessively heavy workload of the physician, overtreatment, patient pressures, commercial pressures on the physician, and patient

expectations of optional medical treatment including prescribed medicine. Several suggestions for correcting abuse stemming from the practices of physicians are discussed.

Several types of abuse of prescription drugs by the patient are possible. He may fail to take a prescribed medicine as intended either deliberately or innocently. He may be consulting more than one physician at a time and fail to inform each physician of the medicines he is already taking. He may combine prescription treatment with self-medication or use prescribed medicines for nontherapeutic purposes. He may attempt self-medication with prescription drugs or attempt suicide or deliberate self-injury.

Abuses of prescription medicine by manufacturers are primarily economical. Over-use, waste, and unjustifiably high prices are common. In view of possible criticism, neither the individual physician nor a health fund will readily dare to economize by selecting a cheaper medicine if the possibility exists that a more expensive product will be more effective or safer, as is commonly suggested by the manufacturer.

Abuse of prescription medicine at the distribution level includes abuse by the pharmacist as an individual, involvement of the pharmacist in abuse by other parties, and failure by the pharmacist to meet the standards demanded by his profession.

Solutions to abuse on each level are discussed at length. (HSRI)

Working Party on the Abuse of Medicaments

30 refs

KEYWORDS: Review; Drug Use.

UM-76-D0712

ABUSE OF MEDICINES. A REPORT BY A WORKING PARTY 1975, COUNCIL OF EUROPE, EUROPEAN PUBLIC HEALTH COMMUNITY. PART THREE. GENERAL RECOMMENDATIONS, Drug Intelligence and Clinical Pharmacy, v10 n3 p172-178 (Mar 1976)

In this article, the third part of a report by a panel of medical experts, general recommendations for decreasing the abuse of medicines are presented. They recommend that impartial bodies be charged with the control, assessment, and approval for sale of medicines entering the market and with reviewing the advisability of their continued sale. International studies, regulations, and economic policies should be made with respect to the pharmaceutical industry. Recommendations are also made for medicines intended for sale to the general public for use in self-medication, for prescription medicines, for the act of prescribing medicines, for the patient, and for the distributor or pharmacist.

Attached to the report are several appendices. Appendix A deals with cautions applicable to the use of medicines by the public. It contains a list of rules intended to be followed as general principles in dealing with all types of medicine, both over-the-counter and prescribed medicines.

Appendix B contains a table that illustrates the medicine control functions to be executed by official bodies.

Appendix C describes a universal, systematic model of medicines in society. The model interrelates the roles of the control system, the production system, the distribution system, the social security system, the recording system, professional journals, work environment, basic and postgraduate training of the physician, socioeconomic factors, the health care system, the physician, the patient, and the pharmaceutical industry. (HSRI)

Working Party on the Abuse of Medicaments

0 refs

KEYWORDS: Countermeasure Concepts.

UM-75-D0713

A STUDY OF ACHIEVEMENT MOTIVATION AND FRUSTRATION IN GLUE SNIFFERS, G.L. Schmidt, Drug Forum, v4 n4 p331-348 (1975)

This paper traces the development of the recreational use of inhalable anesthetics and reports the results of a study investigating motivation in glue sniffers. Nitrous oxide, which was synthesized in 1776, was the first of these substances. Soon after, ether, chloroform , and trichloroethylene were made available, and were used not only for medicinal purposes, but for recreational intoxication. In the late 1950s glue sniffing became popular, and various methods of administration were practiced by users to obtain a high similar to alcohol intoxication.

Glue sniffing is most often found among ethnic minority young males who are very poor achievers, who come from broken homes in high delinquency areas, and who have an average of seven to eight siblings.

An empirical study was designed to test the hypothesis that glue sniffers experience more fear of failure and lower achievement motivation than their more normal peers. This study attempted to compare the responses given by glue sniffers and nonglue sniffers in a game situation involving goal-setting and response to success and failure. These variables were measured in a ring toss game and in a ball and maze game in which the experimenter deliberately frustrated the subjects. Thirty-eight boys between the ages of 12 and 17 from two institutions for juvenile delinquents were interviewed for their past history of glue sniffing. Nineteen had sniffed glue previously, the others had not. Each subject participated in the ring toss game and the maze game. Outward manifestations of frustrations were measured and analyzed as were game scores.

The results of this study showed that, contrary to the hypothesis, there are no differences in the achievement motivation and frustration of the two groups. The authors conclude that no one test can adequately examine why some individuals use drugs. (HSRI)

21 refs

KEYWORDS: Other Toxicants. Volatile Solvents. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-75-D0714

MEDICOLEGAL PROBLEMS IN DETERMINING CAUSE OF DEATH IN MOTOR VEHICLE ACCIDENTS, J.A. Perper; C.H. Wecht, Forensic Science, v6 n3 p241-247 (Dec 1975)

Major problems and pitfalls in establishing medical and legal causation of traffic fatalities are reviewed here. Autopsy findings, immediate circumstances of death, explicit and implicit intent of the victim, and psychologic characteristics of the victim are all elements that must be considered in determining medical and legal causes of death.

The forging of the causation chain between the autopsy findings and the traffic associated death is only partly determined by the type, location pattern, and severity of the injuries. The chronologic age of the pathologic process in relation to the postaccident survival is also very important. Problems also exist in cases of delayed traffic death in determining the relationship between the terminal cause of death and the original trauma. These problems increase considerably with the lengthening of the postaccident survival period. The most common causes of these problems are delayed symptomology, intervening medical treatment, and intervening trauma. Incorrect determination of the cause of traffic death may result from faulty reconstruction of accident, incomplete gross autopsy, misinterpretation of patterns of injury, incomplete microscopic examination, improper aging of injuries, and incomplete toxicological examination.

In conclusion, the determination and evaluation of causality in vehicular traffic deaths is a very complex process, requiring special skills. Proper determination of medicolegal cause is crucial to the financial, legal, and medical interests of many individuals and social groups. (HSRI)

18 refs

KEYWORDS: Other Sociolegal Study.

UM-76-D0715

AUTO MAN, J.J. Neen, Road and Track, v28 n4 p92-5 (Dec 1976)

The body image each driver has of himself plays a vital part in the way he behaves as a driver. The driver often sees the automobile as part of himself and becomes psychologically integrated with his car. The "skin" of the car defines a new body image for the driver, a new boundary between him and the world, and he will treat his car as he treats his body.

When an individual misperceives some part of himself and his car, special problems emerge. Alcoholics do this constantly. Alcohol, taken in sufficient quantities, is a depressant that shrinks the body image and induces depersonalization. The drunk driver, with his smaller, nimbler, more compact body, feels he can drive better. Statistics bear this out. The majority of accidents involving heavy drinkers are caused by their underestimating the size of their vehicles. In addition, drunk drivers are more aggressive and care less about what happens to their cars. The author believes the problem of car accidents is a behavioral problem that will not be solved by legislation, safety experts, or passenger restraint devices. (HSRI)

0 refs

KEYWORDS: Countermeasure Concepts.

UM-75-DO716

MASS MEDIA AND DRUG ABUSE PREVENTION IN THE UNITED STATES. J.H. Langer. Drug Forum. v4 n4 p279-87 (1975)

Mass communication has been recognized both as a partial cause of widespread misinformation on drugs and as a means of disseminating useful information. However, difficulties are great in using mass communication for rapid dissemination of drug abuse prevention messages. Newspapers, periodicals, motion pictures, educational films, pamphlets, and radio and television broadcasting are often inaccurate and misleading to the point of sometimes encouraging illicit drug use. Other problems arise in demographic variables, target groups, source credibility, message appropriateness, technical limitations, and accessibility.

Effective, planned use of commercial mass communication for drug abuse prevention requires greater control than presently exists. Given present limitations, a large scale, organized, long-term educational effort via the United States commercial communication system seems unlikely. Newscasters, writers, and broadcast program producers must be forced to exercise greater responsibility for the content of their messages.

The UNESCO Final Report Meeting of Specialists on Methodologies for Evaluation of Mass Media Programs for Prevention of Drug Abuse is appended, providing a succinct and comprehensive overview of methodology for evaluating mass media messages. (HSRI)

0 refs

KEYWORDS: Countermeasure Concepts.

UM-75-DO717

NARCOTISM VERSUS ALCOHOLISM: CROSSOVER OR OVER-STATEMENT? J. Scher; K. Smith; S. Kim, p1-12, National Drug Abuse Conference, 4-7 April, 1975 New Orleans, Louisiana (1975)

A group ofpatients seen at the Methadone Maintenance Institute clinic in Chicago during a three-year period was studied in an effort to evaluate the relationship between misuse of alcohol and involvement in narcotic addiction. The sample was composed of 469 males and 159 females, and was thought to be representative of the general population. Surveys and questionnaires were used on several occasions.

Drinking was found to be facilitated by a number of factors, including a familial history of drinking; a broken home; marital problems; financial problems; pressures of work or achievement; and efforts to self-treat an underlying psychiatric condition, to suppress anger, and to facilitate social interaction. Drinking in United States society seems primarily a social phenomenon, and one essentially leisure-related. Among heavy drinkers and alcoholics, drinking is more of an alienated (and alienating) behavior, and is not necessarily limited to leisure time.

The authors believe that there is not necessarily an inevitable cross between alcohol and narcotic addiction. It would seem that a number of patients can be maintained on methadone successfully without utilizing a great number of other drugs to any serious

extent. It also appears that a number of patients can successfully detoxify without substituting alcoholism for the addictive process. Much of this depends upon the general orientation of the patient, his personal direction, his security, and his sense of achievement, whether or not he continues to be maintained on methadone.

It is primarily other factors, not that of narcotic addiction alone, that determine or promote the development of alcoholism. Thus, from these observations, the serious interaction between these two agents is minimal. Only long-term studies will clarify the true relationship between addictions to alcohol and narcotics. The authors caution against clinical approaches that attempt to treat alcoholics and narcotic addicts together. (AAM)

11 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Opiates and Related Agents. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-75-D0718

PHYSICIAN REPORTING OF DRIVER IMPAIRMENT. SEARCHING FOR ANSWERS, L.N. Hames, Jounal of the American Medical Association, v234 n10 p1027-28 (8 Dec 1975)

This brief article discusses the debate in the medical profession concerning compulsory reporting of physical, mental, or visual conditions that might significantly affect driver performance. The medical profession has always had serious objections to anything that interferes with the confidentiality of medical records and with the physician-patient relationship. The medical profession also objects to acting as a policing agency. They fear that such a system may cause patients to conceal information or avoid treatment. Legal consequences and pragmatic considerations also discourage support by the medical profession.

However, a number of other arguments in support of reporting have been advanced. Reporting is not only an efficient means of gathering valuable information on the relationship between medical conditions and safe driving, but the threat of exposure can motivate patients to stick more closely to their medical regimen. The lives and safety of innocent victims killed or maimed by medically impaired drivers who might have been uncovered through physician reporting are at least as important as the privacy of drivers. Finally, reporting provides physicians with an unusual opportunity to counsel drivers concerning their medical conditions.

No agreement has yet been reached on the problem of reporting driver impairment. It will be difficult to find a solution acceptable to physicians, licensing personnel, attorneys, legislators, and the general public. (HSRI)

0 refs

KEYWORDS: Countermeasure Concepts. Countermeasure Development, Testing, and Evaluation.

UM-76-D0719

DRUGS (OTHER THAN OR IN ADDITION TO ALCOHOL) AND DRIVING, Toxicology Section, American Academy of Forensic Sciences, 20 Feb 1976, Washington,D.C. (1976)

Data were collected with a comprehensive form on more than two hundred traffic violation cases in California between May 1973 and December 1975 in order to study the issue of drugs and driving. The data showed that the presence of psychoactive drugs other than or in addition to alcohol in persons with driving behavior problems is common in California. Impaired balance and coordination, slurred speech, and staggering were observed in drivers in whose blood such drugs are found. Driving behavior problems such as weaving, careless driving, and accidents were often reported for these groups. The typical person in this study driving with psychoactive drugs in him and experiencing a driving problem is a white male under the age of thirty.

The psychoactive drugs most often involved in a driving behavior problem in this study were various barbiturates, diazepam, methaqualone, chlordiazepoxide, meprobamate, and ethchlorvynol. The presence of a detectable psychoactive drug is statistically associated with accidents at a highly significant range in comparison with a control group. The addition of alcohol to another psychoactive drug appears to increase significantly the likelihood of a fatal accident. In general, the correlation of blood levels of the various drugs and driving behavior problems, including accidents and fatalities, is not yet possible. (HSRI)

California Association of Toxicologists

0 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): chlordiazepoxide, diazepam*, meprobamate. Muscle Relaxants (Central): diazepam*. Nonbarbiturates: ethchlorvynol, methaqualone. Epidemiologic Research: Drug Concentrations in Body Fluids. Epidemiology: Analysis of Driver Body Fluids for Drugs. Epidemiology: Record-Based Survey.

UM-76-D0720

DRUGS AND US, G. Milner, Alcoholics and Drug Dependent Person's Services, Victoria, Australia (1976)

This booklet provides an overview of drug and alcohol abuse in Australia. It appeals to the public, the government, and law enforcement agencies to take action against inappropriate drug use. The large increase in the use of drugs in Australia is of great concern. Many statistics on the abuse of drugs by different age groups are provided not only for Australia, but for other countries as well. Of special concern is the use of drugs while driving.

The Victorian Alcoholics and Drug Dependent Person Services are discussed in detail. These services are being developed as a new and uniquely important focus for all State responses to individual and community problems associated with the use of alcohol and other drugs. Four distinct, specialized centers coordinated from a central office provide treatment, rehabilitation, research, training, and prevention programs. The goals of this program range from total or partial abstinence from alcohol and drug use to client and staff rehabilitation.

The high costs of alcohol and drugs are discussed in terms of traffic accidents, absenteeism, deteriorated work quality, family problems, and psychological problems. Advice is provided as to what to do when a friend or member of the family uses drugs. A strong appeal is made for drug and alcohol education on all levels of the community. Broad community action must stem from all influences on the community--officials, politicians, physicians, the judiciary, and teachers. (HSRI)

0 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drug Use.

UM-73-D0721

MEDICAL IMPAIRMENT TO DRIVING, J.A. Waller, Springfield, Ill.: Thomas (1973)

The purpose of this book is to promote the interests of highway safety through the regulation of drivers with medical handicaps while simultaneously imposing as small a burden as possible on the driver, his family, and his community. Particular consideration is given to administrative problems as they affect driver licensing personnel, health departments, physicians, courts, police departments, and other persons or agencies involved in reporting and regulation processes. The discussion focuses on those underlying pathological processes which are of greatest concern to the physician, as well as the specific manifestations pertinent to operation of a motor vehicle which present problems for driver licensing authorities.

The first four chapters of the book are concerned with basic philosophy and methods of driver licensing. They also include a survey of current knowledge about medical conditions and highway crashes, a discussion of identifying drivers with medical handicaps, and an evaluation of medical impairment to driving. Specific medical conditions including epilepsy, cardiovascular diseases, diabetes mellitus, alcoholism and problem drinking, mental illness, and drug use and addiction, as well as factors associated with youth and aging, are examined. Brief discussions of such miscellaneous conditions as reduced vision, reduced hearing, narcolepsy, and obesity are also presented.

Regarding the drug-driving problem, there is only theoretical information suggesting that certain drugs might adversely affect driving ability in therapeutic doses. In general, studies on therapeutic drugs do not support the contention that the use of drugs other than alcohol seriously reduces driving ability. However, neither do they reject the argument that in some instances the use of a drug may contribute to the occurrence of a crash.

The one drug group (other than alcohol) proven to be associated with an increase in crash risk is amphetamines. Persons who are addicted to amphetamines, speed, and benzydrine should not be licensed. Marijuana, although it brings about brief lapses of attention and sometimes causes difficulty in depth and time perception, lessens the propensity to take risks. Furthermore, most marijuana users are occasional, light users of marijuana. However, the person who uses marijuana daily or several times a week should be evaluated regarding underlying personality problems, use of other drugs, and especially flashbacks from use of LSD or related hallucinogens. Heavy users sometimes have marked slowing of thought processes; these persons should not drive for about a year after they stop using drugs and should have medical progress reports twice yearly thereafter. (HSRI)

95 pages 93 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Hallucinogens and Related Agents: lysergic acid diethylamide (LSD). Nonbarbiturates: ethanol (ethyl alcohol). Stimulants. Review: Drugs and Highway Safety.

UM-79-D0722

EFFECTS OF MODERATE LEVELS OF DIAZEPAM AND ALCOHOL ON TWO-LANE PASSING PERFORMANCE, R. Williams; D. Attwood; R. Frecker, Proceedings of the 12th Annual Meeting, Human Factors Association of Canada, Bracebridge, Ontario. September 6-8 1979, p17.1-17.4, Downsview, Ontario: Road Safety Unit, Transport Canada (1979)

This study investigates the effects of a moderate level of blood alcohol or a moderate dose of diazepam on a closed course task which simulated a two-lane passing maneuver. Subjects were eight male experienced drivers between the ages of 21 and 32 years. Each subject drove under each of the following four drug conditions as determined by a modified Latin square design: 10 mg diazepam, orally; placebo capsule; alcohol to produce a blood alcohol concentration of 800 to 1,000 mg/l; and placebo beverage. Subjects were tested 110 minutes after drug administration for passing distance and estimation of safety margin.

Analysis of the data collected indicates that there was a difference in safety gaps over drug treatments, the safety gap for diazepam being much lower than those for alcohol and placebo. No difference was observed in mean safety gap scores between alcohol and placebo treatments.

These results suggest that the judgments required to successfully complete a two-lane pass are detrimentally affected by a moderate dose of diazepam, but not by a moderate dose of alcohol. Under the effects of a 10 mg dose of diazepam, subjects acted in a much more risky manner, many times estimating passing distances to be safe which in reality would have resulted in a crash or required evasive action. In view of recent research suggesting that diazepam slows the information processing components of the task, a risky pass may be due to the delay in the decision-making and response components of the task.

It is concluded that since so many drivers consume diazepam, it is possible that the drug is overrepresented in passing-related accidents. (HSRI)

11 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam*. Muscle Relaxants (Central): diazepam*. Nonbarbiturates: ethanol (ethyl alcohol). Closed Course Driving. Experimentation: Acute Dosage Study. Experimentation: Comparison of Different Drugs.

UM-76-D0723

DRUG UTILIZATION REVIEW: CURRENT STATUS AND RELATIONSHIP TO ASSURING QUALITY MEDICAL CARE, J.E. Knoben, Drug Intelligence and Clinical Pharmacy, v10 n4 p222-8 (Apr 1976)

Drug use is expected to increase in the years ahead, thereby fostering the use of cost control and quality assurance mechanisms in the form of drug utilization peer review. An overview of the current status of drug utilization review is presented, and an examination is made in terms of the relationship of drug utilization review to assuring quality medical care.

For the most part, existing drug utilization review systems are centrally based. They retrospectively screen drug claims "by exception", using quantity standards of

appropriateness. The primary deficiency of current programs is the relative lack of "quality measures". Quality assurance requires the integration of drug utilization review and review by other ancillary services into the overall medical care review process. In order to do this, the methods systems by which evaluation of drug therapy is carried out both in outpatient and inpatient settings must be documented and categorized. Secondly, there is a need to analyze and assess the impact of such systems. Thirdly, model drug utilization programs (manual and automated) need to be identified and demonstrated. Guidelines must be established to implement these programs. Finally, new approaches to drug utilization review need to be designed, tested, and evaluated. (JAM)

48 refs

KEYWORDS: Review: Drug Use.

UM-75-D0724

DRUGS AND DRIVING: A RESEARCH REVIEW, K.B. Joscelyn; R.P Maickel (Nov 1975)

This study reviewed existing research literature on drug use (other than alcohol) and highway safety. The objective of the study was to ascertain the "state of the art" of research and to define areas of the drug and driving problem that require further research. The study also sought to identify, insofar as present knowledge permits, countermeasures that could be implemented in the immediate future.

Some of the topics discussed are understanding drug effects, including the pharmacological action of drugs, drug interaction, side effects, and residual effects; drug usage in the United States; detection and measurement of drugs; the measurement of drug effects; legal and ethical constraints; experimental studies; and epidemiological studies.

The authors conclude that large-scale countermeasure programs focused on the drug and driving program do not appear warranted at this time. Future studies must examine drug usage patterns of the driving population, concentrations of specific drugs in accident populations believed to be involved in crash causation, and the nature and extent of existing countermeasure efforts focused on drugs and driving. (HSL)

101 pages 170 refs

National Highway Traffic Safety Administration DOT-HS-4-00994

KEYWORDS: Review: Drugs and Highway Safety.

UM-75-D0725

REPORT OF AN INTERNATIONAL SYMPOSIUM ON DRUGS AND DRIVING, K.B. Joscelyn; R.P. Maickel (Apr 1975)

This report presents the proceedings of a Symposium on Drugs (other than alcohol) and Driving. Speakers' papers and work session summaries are included. Major topics include an overview of the problem; risk identification; drug measurement in biological materials; measurement of drug effects on driver behavior; legal and practical constraints on drug and driving research; and recommendations for future research and countermeasures.

The report summarizes the discussions of thirty leading researchers and practitioners who met to review existing research findings about the drug and driving problem. On the basis of current knowledge suggestions for research efforts and countermeasure actions are made.

It is concluded that it is impossible to determine the degree of involvement of a drug or drugs in causing motor vehicle accidents. One can infer, however, that there is a likelihood that drugs are involved in a causative role in motor vehicle accidents. This inference is supported by a wide variety of data from epidemiological studies and from both animal and human testing. (HSL)

232 pages 181 refs

National Highway Traffic Safety Administration DOT-HS-4-00994

KEYWORDS: Review: Drugs and Highway Safety.

UM-75-D0726

EPIDEMIOLOGIC ISSUES ABOUT ALCOHOL, OTHER DRUGS, AND HIGHWAY SAFETY, J.A. Waller, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p3-11. Addiction Research Foundation of Ontario, Toronto, Canada (1975)

Epidemiologic principles and their applications to analysis of highway safety problems related to the use of alcohol and other drugs are discussed. One problem area is the need to set priorities for research and action. A model of frequency and quantity of deviance has been proposed to provide a guide to the effect of a drug on traffic safety. This model states that the more frequently a drug is used in the highway setting, the more often it is likely to be a problem. The more impairing the effect of the drug, either because of its inherent nature or because of the usual amount consumed, the more likely there is to be a problem. Based on this model, only alcohol, marijuana, and tobacco can be identified as being of potentially major importance to highway safety at this time and on this continent. Alcohol appears to contribute to the hazard of the other two drugs.

Any epidemiologic study must consider both the factors which may affect the occurrence of the problem and the perceptions of the extent of the problem. Varying definitions of a highway fatality, failure of studies to include environmental and other variables that may interact with alcohol and other drugs, evaluation studies which do not use a two by twodesign, and data that contain large numbers of false negatives and false positives have created a large body of literature having data that are of unknown comparability. Research on the role of marijuana usage in traffic safety indicates that the effects of marijuana are less impairing than the effects of alcohol and that there are not enough crashes or near crashes which can be attributed to the effects ofthis drug to result in excessive risk at this time. The combined use of alcohol and marijuana, however, greatly increases crash risk. (HSL)

25 refs

KEYWORDS: Review: Survey Methodology.

UM-75-D0727

ROADSIDE SURVEYS, DEMOGRAPHICS AND BAC'S OF DRIVERS, R.B. Voas, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p21-31, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

Roadside surveys, demographic information, and data on the blood alcohol concentrations (BACs) of drivers can all be used to assess the effectiveness of programs designed to reduce the role of alcohol in traffic safety problems. The Alcohol Safety Action Project (ASAP) in Washtenaw County, Michigan conducted a roadside survey in which drivers were asked to agree to be interviewed, to give a breath sample for BAC analysis, or both. Of those who gave a full interview, only 6% were above 0.10% BAC, while of the group who gave a sample but no interview, 22% were at 0.10% BAC or greater. ASAP roadside survey data indicate that the reported origin and destination of the trip is significantly related to the BAC of the driver; there appears to be no significant relationship between the absence or number of passengers and the driver's BAC; drivers aged 21 through 55 are most likely to have some alcohol and are significantly more likely to have illegal BAC's than other drivers; men are less likely to be alcohol free and more likely to be over the illegal limit than are women; single people show the largest proportion of alcohol free drivers and the smallest proportion of illegal BAC's; there is some slight evidence that low income, lower socioeconomic status groups are more likely to be on the road with significant BAC's and are less likely to be alcohol free than are upper socioeconomic status groups; there is no apparent difference in the use of safety belts between drinking and nondrinking drivers; and individuals with no accidents in the past three years were more likely to be using alcohol. Analysis of data collected through roadside surveys atASAP sites indicates that ASAP programs have resulted in a slight but significant reduction in the proportion of drivers with BAC's above 0.05%. (HSL)

7 refs

KEYWORDS: Review: Survey Methodology.

UM-75-D0728

PATTERNS OF DRUG ABUSE AND THEIR RELATIONSHIP TO TRAFFIC ACCIDENTS, B.M. Kapur, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p69-72, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

Presented here is a review of the literature concerning patterns of drug abuse and their relationship to traffic accidents. Most drugs seen in cases presented in the emergency rooms of hospitals and those involved in traffic accidents are very similar. Most of these drugs originate as over-the-counter and prescription drugs. A study conducted in 1968 which used both a questionnaire and a chemical analysis on body fluids of people involved in traffic accidents showed that 705 of the 3,409 drinking drivers had engaged in some concurrent drug usage. Although at least 107 different types of drugs were named, the following categories accounted for about half of the sample: tranquilizers, analgesics, and antipyretics, sedatives and hypnotics, and analgesic narcotics. Analysis of the body fluids of emergency room patients suspected of drug involvement by the Clinical Laboratory of the Addiction Research Foundation in Toronto, Ontario, Canada, over a nine-month period from October 1972 through June 1973 showed that 938 of the 1,560 cases studied were positive for one or more drugs, including ethanol.

The use of a questionnaire type survey has been shown to be very conservative in that few of the drugs used are reported. It is suggested that a comprehensive drug screening must be performed on every person suspected of being an overdose case and in every traffic accident victim suspected of drug use. By monitoring the overdose scene in the local hospital, a minimum comprehensive list of drugs could be drawn up. This would allow a more thorough investigation and would save time so that the difficult cases could be handled by more sophisticated instrumentation, such as gas chromatography, mass spectrometry, and computer techniques. (HSL)

9 refs

KEYWORDS: Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-75-D0729

ALCOHOL, DRUGS, AND CARBON MONOXIDE IN TRAFFIC FATALITIES IN PUERTO RICO, S. Kaye, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p85-92, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

Reported here is a study done on over 500 traffic fatalities in Puerto Rico. Traffic fatalities are the largest single cause of death due to accidents in Puerto Rico, and alcohol is the major influencing factor in these fatalities, either through cases of driving while intoxicated or walking while intoxicated. Of the 577 traffic deaths in 1973, 508 cases were submitted for measurement of blood alcohol concentration (BAC) and for screening for common depressant drugs and carbon monoxide following autopsy. The 508 traffic fatalities which were studied were separated into the following categories: pedestrians, passengers, drivers, sex, age, occupation, day of the week, and hour of the day.

Pedestrians accounted for 37% of the traffic fatalities, while passengers and drivers each accounted for about 25%. Sunday was found to be the day with the most fatalities, and 243 of the 508 fatalities occurred on the weekend. Of the 386 cases in which BAC was determined, only 44% showed positive alcohol content, of which 97% were males. About 39% of the alcohol positive cases were drivers., Thirty percent of the pedestrians were alcohol positive cases. Sunday accounted for the largest number of positive alcohol cases, followed closely by Saturday; together these two days accounted for 52.9% of the alcohol positive cases. The largest number of male positive alcohol cases fell into the 20 to 30 age group. Men were found to account for about 80% of the alcohol positive cases. Only three of the fatalities tested positive for depressant drugs; all three had used phenobarbital and tested negative for alcohol. Twenty-two cases were found to have 5% carboxyhemoglobin concentrations in their blood, of which thirteen also had BACs of 0.05% or more. Of the forty-six male fatalities between the ages of 15 and 20, nine were positive for alcohol, six of whom were drivers. None of the fourteen females in this age group tested positive for alcohol. (HSL)

22 refs

KEYWORDS: Gases: carbon monoxide. Nonbarbiturates: ethanol (ethyl alcohol). Opiates and Related Agents. Sedatives and Hypnotic Agents. Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-75-D0730

ALCOHOL, MARIJUANA AND OTHER DRUG PATTERNS AMONG OPERATORS INVOLVED IN FATAL MOTOR VEHICLE ACCIDENTS, R.S. Sterling-Smith, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p93-105, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

Reported here is an investigation of three hundred motor vehicle accidents involving a fatality in the Boston metropolitan area over a thirty-month period. The major focus of the study was on the historical and focal human factor variables associated with the operator of the vehicle judged to have been most responsible for the crash. The primary method of investigation was a personal interview with any survivors, with peers, and with a professional, as well as with surviving operators. Three hund red variables were collected for the most responsible operator. Fifty-two percent of the operators considered most responsible were known to have been under the influence of some drug at the time of the collision. About 46% of the operators were influenced to some degree by alcohol, 16% had been smoking marijuana, and 8% had been using some street drug. Some combination of these drugs was used by 16% of the operators. A Risk Taking Behavior Scale (RTBS) was developed to identify the relative degree of risk-taking behavior in drivers to determine if there might be some risky behaviors typical of certain groups of motor vehicle operators which could be used to assist in the early identification of the high risk driver. The application of the RTBS to a group of alcohol influenced drivers (Group A) and to a group of operators without known alcohol influence (Group B) showed that the drivers in Group A presented a weighted risk score of 7.0 as compared to a score of 5.4 for Group B.

Of the operators considered most responsible for accidents, 45% were known to have smoked marijuana with some frequency. Sixteen percent were known to have been involved in accidents after they had been smoking marijuana.

It is concluded that items in the RTBS, variables associated with antisocial behavior, and problems correlated with previous social errors resulting from alcohol use distinguish the alcohol influenced driver from other drivers and can therefore be used to identify in advance the drinking driver likely to become involved in a fatal accident as the most responsible operator. (HSL)

0 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Nonbarbiturates: ethanol (ethyl alcohol). Epidemiology: Record-Based Survey. Epidemiology: Self-Reported Drug Use by Drivers.

UM-75-D0731

ALCOHOL, DRUGS, AND DRIVING: RELATIVE PRIORITIES FOR BASIC AND APPLIED RESEARCH, M.W. Perrine, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p107-28, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

In October 1972, the National Highway Traffic Safety Administration sponsored the Vermont Symposium on Alcohol, Drugs, and Driving which was designed to assess the status of present knowledge and to consider relative priorities for both basic and applied research in those areas germane to its theme. The thirty-five invited participants attending the symposium were asked to attend eight sessions identifying particular topics of relevance within selected areas of concern and then to rate keywords discussed during the session. The following four separate rating tasks were required: rate present knowledge on a fifteen-point scale ranging from no knowledge to total knowledge; assign a priority for basic research in terms of informational yield on a seven-point scale; assign a priority for applied research in traffic safety on a seven-point scale; and rate the respondent's own qualifications for judging the specific area on a seven-point scale.

The areas selected as having the highest priority for research in the area of basic research on alcohol were alcohol influences on basic neurophysical activities, on psychological processes, and in combination with other conditions of the organism. These same categories were given highest priority for basic research on drugs and for applied research on drugs and alcohol. Highest priority for applied research on epidemiology of drugs in highway safety was given to the incidence and prevalence studies necessary in the exploratory stage of investigating a new problem. Highest priority on epidemiological aspects of alcohol in highway safety was given to the interaction between alcohol and drugs, as well as to the study of individual differences in drug effects. It was concluded that more incidence and prevalence studies are

necessary before drug countermeasure programs can be undertaken. High priority alcohol countermeasure research choices included enforcement by police surveillance and rehabilitation by behavior modification. Titles, chairmen/reviewers, and rated keyword topics for the eight sessions of the symposium are listed. (HSL)

14 refs

KEYWORDS: Review: Drugs and Highway Safety.

UM-75-D0732

THE PREVALENCE OF DRUGS IN FATALLY INJURED DRIVERS, E.J. Woodhouse, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p147-58, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

The National Highway Traffic Safety Administration is currently sponsoring programs to determine the frequency with which various drugs are found in fatally injured drivers. This paper describes and analyzes these programs. Specimens of blood, urine, and bile, and alcohol swabs from the fingers and oronasal area were collected from 710 fatally injured drivers between December 1971 and September 1973. The blood was analyzed for drugs, including alcohol; the urine and bile were analyzed for drugs, excluding alcohol; and the alcohol swabs were analyzed for marijuana.

The following observations were made: the only drug significantly overinvolved in the case of drivers at fault in the accidents was alcohol; alcohol was the only drug over-involved in single vehicle crashes; alcohol was the only drug upon which time of day was a significant influence; geographical region was not a significant factor for any response; age was a significant factor only with respect to alcohol; sex was a factor with respect to alcohol and nicotine usage; and the season of the year was found to be a factor with all responses except alcohol and nicotine, with marijuana being a spring and summer drug and aspirin being associated with winter.

It is concluded that alcohol was by far the most dangerous drug examined in the study. The drug groups tranquilizers, antihistamines, and stimulants did not furnish a large enough sample to be stratified meaningfully, although results of the study indicate that males were overrepresented among users of tranquilizers and antihistamines, and that young people were overrepresented among those who used stimulants. Fully detailed results of the drug findings are tabulated. (HSL)

0 refs

KEYWORDS: Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-75-D0733

THE RELATIONSHIP BETWEEN SELF-REPORTED DRUNKEN DRIVING, ALCOHOL CONSUMPTION, AND PERSONALITY VARIABLES AMONG NORWEGIAN STUDENTS, O. Irgens-Jensen, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p159-68, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

A questionnaire dealing with drunken driving and personality variables was circulated among a representative sample of students at the University of Oslo, Norway in 1969. The 1,066 respondents represented 78% of the sample. Of the 251 students who admitted to having driven at least once with an alcohol concentration in excess of the statutory limit, only two admitted having been arrested for drunken driving. Among the 21% of the men and 7% of the women respondents who said they had drunk as much as 7 liters of pure alcohol during the last year, almost 50% had driven with an alcohol concentration in excess of the legal limit. For both men and women, a greater correlation was found between drunken driving and drinking frequency than between drunken driving and quantities of alcoholic beverages usually drunk at one time. Self-reported drunken driving which had very rarely led to an accident or come to the attention of the police showed a definite correlation with the general consumption of alcohol and with signs of potential drinking problems and tendencies towards aggressive conduct when intoxicated. No correlation was found between drunken driving and a person's neuroticism index. A definite relationship was noted between drunken driving and aggressiveness, an inability to control impulses, and an inability to plan ahead. There was a clear relationship between drunken driving and suicidal impulses and sexual problems for women, but not for men.

The personality traits that predispose women to drunken driving appear to differ from those that so predispose men. Self-reported drunken driving for both men and women was found to correlate with a criminality index based on self-reported criminal offences such as vandalism, robbery, all kinds of thefts, smuggling, and illegal hunting and fishing. A clear correlation between drunken driving and smoking exists for both men and women. (HSL)

9 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Epidemiology: Self-Reported Drug Use by Drivers. Personality and Drug Effects.

UM-75-D0734

MASS ARRESTS FOR IMPAIRED DRIVING MAY NOT PREVENT TRAFFIC DEATHS, R. Zylman, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p225-37, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

This paper attempts to determine why, in spite of sophisticated countermeasure programs and massive numbers of arrests for alcohol related offenses, the problem of the impaired or intoxicated drivers continues to be the major factor in all traffic deaths in the United States. A review of the literature reveals that the role of alcohol as a causal factor in fatal traffic accidents is poorly defined; the level at which alcohol becomes a statistically significant factor in fatal accidents has not been determined; present beliefs about drinking and driving crashes and programs to alleviate the problem are based on incomplete and biased data; and the proportion of all traffic deaths in the United States that may be related to alcohol in some causal fashion is closer to 30% than the 50% generally purported. There is evidence that different countermeasures may be needed for fatal crashes than for collisions in general. Although alcoholics and youth represent special problems, it is only among a minority of those groups that the problem is concentrated. It is suggested that those who are killed while drunk are different in significant ways from those convicted of driving while intoxicated. Mass arrests for driving while intoxicated have proven ineffective. It is suggested that there is a need to identify a larger group of high risk drivers whose deviant behavior leads to crash involvement with or without alcohol and among whom some use alcohol as a triggering device. Rather than the high risk alcohol abusers being a subgroup of all drivers, the alcohol abusers who are involved in violent crashes should be considered a subgroup of a much larger population of high risk drivers.

This perspective of the fatal crash problem should not only aid in the identification of high risk drinking drivers, but also the high risk nondrinking drivers. In this manner the 70% of all traffic deaths not related to alcohol could be combated as well as the 30% that may be related to alcohol in some causal fashion. Real progress can be expected only after the problem is more clearly defined and countermeasures specifically applied. (HSLM)

26 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Countermeasure Concepts.

UM-75-D0735

DRUG EFFECTS ON EMOTIONS: RELEVANCE TO DRIVING ACCIDENTS, M. Frankenhaeuser, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p259-70, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

This paper reviews laboratory experiments that indicate how driving behavior is affected by low and high arousal levels induced by different aspects of the driver's environment, by alcohol and other drugs, and by drug-environment interactions. Safe driving requires a medium arousal. At low levels, driving performance is characterized by inattention and emotional unresponsiveness, and at high levels by disorganization and impulsiveness. Centrally acting drugs, stimulants, and depressants are powerful determinants of arousal level, and drug effects may either enhance or reduce effects of concomitant environmental influences. The largest deviation from an optimal arousal level is likely to occur when a monotonous situation is combined with the action of a depressant drug. Stimulant drugs may counteract the decreased wakefulness induced by a monotonous situation, and a stressful environment may counteract the effects of a sedative drug.

The effects of drugs on driving behavior are only partly determined by the pharmacological properties of the drug. The driver's cognitive appraisal both of his own state and of the external situation will guide his choices and decisions. Personality factors and other constitutional characteristics interact with situational factors in determining the response. Among emotional factors, fear reduction is an important component in risk taking behavior. Alcohol intoxication increases the probability that a driver will make bold, risky decisions when faced with complex choices. Fear reduction may also be manifested as aggressive behavior. Increased risk taking is often the cause of traffic accidents. The outstanding characteristic of the problem of drugs, alcohol, emotions, and driving is truly its immense complexity. (HSL)

20 refs

KEYWORDS: Review: Drug Effects. Review: Drugs and Highway Safety.

UM-75-D0736

THE PHARMACOKINETIC COMPONENT OF DRUG EFFECTS ON DRIVING SKILLS. E.M. Sellers, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p271-93, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

This paper reviews the literature concerning the pharmacokinetics of drug effects that might impair driving skills. Although many studies of the effects of drugs on driving skills attempt to determine if a specific dose of a drug has some predictable influence in a particular driving related task, there is overwhelming evidence in the literature that serum concentrations are better predictors of therapeutic effect or toxicity than dose for many drugs. Among the factors that can alter the relation of drug dose and serum concentration are the bioavailability of the dosage form administered; the completeness or rate of absorption by the kidney or in the bile; and binding of drug to tissue or serum proteins. There are marked interindividual differences in each of these due to genetic factors, coexisting disease, and the concurrent administration of other drugs.

A study of the interaction of diphenhydramine and alcohol on a coordination test and selected driving time shows that the intersubject variation in performance increases with increased doses. The misconceptions that serum concentrations measurements are not helpful is due to the lack of sophistication in measurement of psychoactive drug effects and application of pharmacokinetic analysis. The vast majority of studies of drug effects on driving skills has failed to include concurrent measurements of plasma drug concentrations, resulting in literature which is confusing, contradictory, and often uninterpretable. Although widespread intelligent application and appropriate interpretation of serum concentration measurements of psychoactive drugs in driving skill studies will be difficult and expensive, it is a prerequisite for establishing the scientific facts necessary to the generation of useful statements concerning the influence of drugs on driving. (HSL)

51 refs

KEYWORDS: Review: Drug Concentration-Effect Relationships.

UM-75-D0737

VALIDITY OF DRIVING SIMULATOR STUDIES FOR PREDICTING DRUG EFFECTS IN REAL DRIVING SITUATIONS. H. Moskowitz. Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p295-303 (1975)

This paper reviews the current state of the art in simulator technology. Studies concerning difficulties in construction, purpose, and evaluation of simulators are reviewed.

Driver simulator studies are a form of laboratory examination of the effects of a drug on some aspect of driving. Difficulties in constructing the ideal simulator include the inability to confidently enumerate all the behavior demands of driving and the limitations of existing technology. Simulators may be either programmed, in which case the driver's reaction to the visual scene has no effect upon the presentation, or unprogrammed, in which case the presentation changes in response to the driver's behavior. No simulator samples all stimulus inputs and demand characteristics of driving. A drug might be potentially detrimental to some behavior mechanism not required in the simulator.

It is concluded that there is considerable reliability in the sense of agreement among simulator studies when the emphasis of the analysis is on the psychological function affected by the drug, rather than on the response variable in which the particular psychological function is exhibited. In order to examine the issue of validity or relevance of the results in the simulator, it is necessary to first isolate the behavioral functions that are being affected by the drugs. The results of simulator studies on the effects of alcohol agree on the nature of the impairment in accidents. (HSLM)

26 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Behavioral Research Methodology.

UM-75-D0738

COMPUTER-ELECTRONYSTAGMOGRAPHY: A USEFUL TOOL IN EVALUATING INFLUENCE OF PSYCHOPHARMACOLOGICAL DRUGS ON TRAFFIC SAFETY, J.C. Aschoff; W. Becker; D. Weinert, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p319-27, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

Experiments were conducted to determine the accuracy, velocity duration, and reaction time of saccadic eye movements in subjects administered either diazepam or sulpiride. Sulpiride, it has been claimed, does not interact with the patient's alertness in spite of its neuroleptic and thymoleptic action. In a short-term experiment, saccadic eye movements were measured and recorded in the late afternoon following a medication with four 100 mg doses of sulpiride, a regimen started the previous evening. The tests were repeated one week later with five persons receiving 5 mg diazepam and the other five receiving 10 mg diazepam. In the long-term experiment, five subjects were each tested four times, two times without any drug, once after three doses 5 mg diazepam daily for one week, and once after a daily administration of three doses of 100 mg sulpiride for one week.

Eye movements were recorded by means of the bitemporal electro-oculogram and fed into a PDP-12 laboratory computer. Subjects were seated facing a TV screen in which a single light spot was displayed. The subjects were instructed to fixate on the target and to track target jumps as fast and accurately as possible. In each experiment 512 eye movements were recorded and analyzed. The computer measured the following parameters for each saccadic reaction: latency between target jump and onset of the saccade; amplitude of the saccade; and maximum velocity of the eye movement.

No significant difference was found between the short-term and long-term experiments. Diazepam always produced a significant reduction of saccadic velocity as well as an increased saccadic duration and standard deviation. Sulpiride produced only a slight change. Psychomotor performance under the influence of sulpiride was found to either match or exceed the performance in the two normal tests, while diazepam caused a marked hypometria resulting in a standard deviation three times higher than under normal conditions.

The authors suggest that the measurement and analysis of angular velocity, accuracy, and saccadic reaction times of eye movements be used as test procedures in evaluating psychotropic and other drugs for their potential risk to traffic safety. (HSL)

8 refs

KEYWORDS: Major Tranquilizers (Antipsychotics and Neuroleptics): sulpiride. Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Experimentation: Comparison of Different Drugs. Tests of Sensory Function.

UM-75-D0739

ALCOHOL, DRUGS, AND DRIVING BEHAVIOR IN SWITZERLAND, P. Kielholz, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p395-7, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

A series of tests concerning the effect of alcohol on traffic accidents was conducted in fourteen hospitals located in seven different parts of Switzerland by the Swiss Commission Against Alcoholism. Of a total of 1,030 hospitalized persons injured in traffic accidents, 35.2% were found to be under the influence of alcohol at the time of the accident, and 21.1% of the whole sample had blood alcohol concentrations above the

legal limit. The highest percentage of road accident victims who were under the influence of alcohol was found among bicyclists and motorcyclists, followed by motorists. The investigation showed that the ratio of alcohol to medication in road accident victims was 8 to 1.

The main danger of the psychotropic drugs is not so much their own effects, but their intensifying effect on alcohol. While doubling the therapeutic dose of a tranquilizer does not cause a significant increase of severe driving faults, severe faults are clearly increased by the combined effect of alcohol and drugs. Psychotropic drugs generally have an impairing effect only during the first ten days to two weeks of treatment, following which driving ability can often be improved. The chief danger of the psychoactive drugs comes from the potentiating effect of alcohol on the drug. (HSL)

3 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol)*. Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-75-D0740

THE COMBINED EFFECTS OF ALCOHOL AND COMMON PSYCHOACTIVE DRUGS: II, FIELD STUDIES WITH AN INSTRUMENTED AUTOMOBILE, A. Smiley; A.E. LeBlanc; I.W. French; R. Burford, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p433-8, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

This experiment attempted to describe changes in driver behavior under various drug conditions. The changes in driving behavior which occurred under the following drug conditions were examined: placebo; alcohol at the 0.06% level; alcohol at the 0.06% level in combination with diphenhydramine; alcohol at the 0.06% level in combination with diazepam; and alcohol at the 0.06% level in combination with marijuana. The eight subjects, six males and two females ranging in age from 19 to 27, each having at least two years driving experience, drove a car instrumented to measure various driving parameters under various drug conditions. The instrumentation included: a potentiometer attached to the steering wheel to measure steering wheel position; a wheel counter operated by a light-interrupting mechanism in the right rear wheel to measure distance; a real time clock; and a secondary task peripheral light situated on the dash of the car and extinguished by means of a foot pedal. Analogue data were converted to digital form and then stored along with other digital data in a minicomputer located in the trunk.

While driving over a twenty-five mile test course, the following measures of driver performance were made: steering amplitude and frequency in the 60 mph region and in the 25 mph region; speed and speed variation in both the 60 and 25 mph zones; reaction time to the peripheral light on the dash, which appeared about every twelve seconds and was to be extinguished as soon as it appeared; the number of pylons knocked down; and the distance between the front tires and the white line adjacent to the traffic signals.

The results of the experiment show that alcohol alone and in combination with other drugs affects driving performance in different ways. The measures which most clearly differentiated between drug conditions were steering movement and average velocity. (HSL)

5 refs

KEYWORDS: Antihistamine Agents: diphenhydramine. Cannabis Sativa L. and Related Agents: marijuana. Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Nonbarbiturates: diphenhydramine. ethanol (ethyl alcohol). Driving Simulator. Experimentation: Study of Combined Effects of Drugs.

UM-75-D0741

ETHANOL AND DIAZEPAM AS CAUSATIVE AGENTS IN ROAD TRAFFIC ACCIDENTS, O. Bo; J.F.W. Haffner; O. Langard; J.H. Trumpy; J.E. Bredesen; P.K.M. Lunde, Proceedings of the 6th International Conference on Alcohol, Drugs and Traffic Safety, S. Israelstam; S. Lambert, eds., p439-48, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

Presented here is a summary of a study attempting to determine the occurrence and amount of preaccident ethanol and diazepam consumption as verified by blood or plasma analysis among 74 hospitalized accident involved drivers during 1973 in Oslo, Norway. Of these drivers, 69 were male and 5 female. In addition, 204 nonaccident drivers attending routine medical check-ups were tested for blood ethanol and plasma diazepam.

Although there was a marked preponderance of young drivers in the accident group (72% were 30 years old or less), no obvious age group differences were seen among the accident involved drivers with regard to occurrence of detectable blood ethanol or plasma diazepam. A total of forty-six drivers in the accident group were found to have detectable amounts of ethanol or diazepam, or both, in their blood. Ethanol alone was found in thirty-one patients, with twenty-six of these having alcohol concentrations exceeding the legal threshold value. Diazepam alone was found in seven patients, with four of these having plasma concentrations exceeding the upper limit of adopted therapeutic range and with six having concentrations considered sufficiently high to impair their driving ability. The combination of diazepam and ethanol was found in eight of the accident involved drivers, with all of these having alcohol concentrations exceeding the legal limit.

It is suggested that these data indicate that alcohol and diazepam, either alone or in combination, may have been a causative factor in 54% of the seventy-four traffic accidents involved in this study. No significant difference was found between motorcycle drivers and drivers of cars with regard to the use of ethanol, diazepam, or both prior to the accident. Only 2.0% of the reference group in this study showed blood ethanol plasma diazepam concentrations sufficiently high to impair driving ability (HSLM)

29 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam*. Muscle Relaxants (Central): diazepam*. Nonbarbiturates: ethanol (ethyl alcohol)*. Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-75-D0742

DRUG AFTER EFFECTS AND TRAFFIC SAFETY, A.E. LeBlanc; A. Wilson, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p449-52, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

The effects of alcohol and other drugs on behavior that persist after the drug has been eliminated from the body and the role of these aftereffects in traffic accidents are discussed. Drugs may produce three main disturbances that persist after the drug has disappeared from the body: (1) the withdrawal phenomenon, which varies from chemically important to barely detectable by sophisticated technology; (2) aftereffects involving flashbacks, which may occur with LSD and other hallucinogenics; and (3) more permanent brain damage, which may vary in intensity from dramatic brain shrinkage to an "amotivational syndrome". This last category of disturbances may also result from the insidious effects of environmental and industrial chemicals. An education program for clinicians, manufacturers, and the public might increase the awareness that the period of risk in drug use extends beyond the duration of the presence of drugs in the body and that behavior should be governed accordingly. It is suggested that some consideration should be given as to whether the chronic drug or alcohol user should be denied the right to drive at all or at least have that right restricted in some way. (HSL)

24 refs

KEYWORDS: Review: Drugs and Highway Safety.

UM-75-D0743

INTERACTIONS OF SOME STREET DRUGS, B.B. Coldwell; B.H. Thomas; K. Baily, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p453-60, Addiction Research Foundation of Ontario, Toronto, Canada. (1975)

The interactions of ethanol and barbiturates (thiopental, pentobarbital, amobarbital, phenobarbital, and barbital) were investigated using male albino rats of the Wistar strain. Ethanol (15% w/v) and barbiturates were administered simultaneously by the intraperitoneal route to overnight-fasted albino male rats. The 24-hour LD50 values of the barbiturates were determined at ethanol doses of 0,2,3, and 4g/kg.The effect of ethanol (3g/kg) on barbiturate sleeping time was also investigated. The rats were used to test the effects of ethanol on the pharmacokinetics of diazepam and on the metabolisms of isoniazid and tetrahydrocannabinol, as well as to study the effects of cannabinoids on the in vivo metabolism of pentobarbital.

These investigations indicate that the metabolism of many drugs may be altered by the presence of ethanol, leading to an enhancement of the pharmacological effects and the

increased likelihood of toxic reactions. The studies with animals suggest that the reduced rate of the clearance of some drugs from blood when ethanol is present is most likely due to inhibition of drug metabolism by ethanol. This inhibition leads to higher brain levels of the drug and enhanced effects on the target organs such as the central nervous system. Investigations of the in vivo interaction of marijuana components with pentobarbital indicate that noneuphoric effects, due to cannabinoids other than tetrahydrocannabinol, might also lead to impairment of central nervous function. (HSL)

16 refs

KEYWORDS: Anticonvulsants (Anti-Epileptics): phenobarbital*. Barbiturates: amobarbital*, barbital, pentobarbital*, phenobarbital*. General Anesthetics: thiopental*. Nonbarbiturates: ethanol (ethyl alcohol)*. Animal Research. Experimentation: Study of Combined Effects of Drugs. Physiological Testing.

UM-75-D0744

THE INTERACTION OF ALCOHOL AND DELTA 9- TETRAHYDROCANNABINOL IN MAN: EFFECTS ON PSYCHOMOTOR SKILLS RELATED TO DRIVING. H.M. Franks; G.A. Starmer; G.B. Chesher; D.M. Jackson; V.R. Hensley; W.J. Hensley. Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p461-6, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

The effects of a single moderate dose of delta-9- tetrahydrocannabinol (THC) on the impairment induced by a similarly moderate dose of ethanol was investigated using twelve healthy, paid, student volunteers (eight males and four females) between the ages of 18 and 29 years. Subjects (all with previous cannabis experience) were tested under each of the following conditions: ethanol plus THC; ethanol plus THC placebo; THC plus ethanol placebo; and THC placebo plus ethanol placebo. The tests administered measured standing steadiness, manual dexterity, numerical reasoning, perceptual speed, and simple and complex reaction times.

The group which received both ethanol and THC had higher blood alcohol levels than that receiving ethanol alone, with the difference being significant forty minutes after consumption. At the dose level employed (0.54 grams per kilogram body weight), ethanol alone did not induce significant decrements in performance of any of the tests. The THC dosage (about 10 milligrams per 70 kilograms body weight) was also without significant effect in most of the tests, although there was a slight increase in the number of errors made in the perceptual speed and Vienna Determination Apparatus tests. The combination of THC and ethanol did produce changes in several of the tests which were significantly different from both the placebo group results and the results from groups receiving either drug alone. The combination produced an increase in errors, but not in performance, in the numerical reasoning and perceptual speed tests and also on the Vienna Determination Apparatus. The test results indicate that an interaction between ethanol and THC exists and that this interaction is at least additive. (HSL)

7 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Nonbarbiturates: ethanol (ethyl alcohol). Experimentation: Study of Combined Effects of Drugs. Psychomotor Tests.

UM-76-D0745

ALCOHOL AND HIGHWAY CRASHES: CLOSING THE GAP BETWEEN EPIDEMIOLOGY AND EXPERIMENTATION. M.W. Perrine. Modern Problems in Pharmacopsychiatry, v11 p22-41 (1976)

The author believes a great gap exists between experimentation and epidemiology similar tothe gap between explanation and description. Selected for this study was one combination variable that lends itself readily to analysis: reaction time and braking performance. A review of the literature concerning this variable examined alcohol influences upon reaction time as investigated in laboratory, simulator, and instrumented car experiments as well as alconol influences upon braking performance in instrumented car experiments and in field studies involving nonobtrusive measures.

On the basis of the findings from the review, the author concludes (1) that alcohol increases reaction time appreciably more in driving situations than in laboratory experiments; and (2) that consistent alcohol impairment of the qualitative aspects of braking performance is manifest in driving situations. The braking performance of motorists and subjects at high BACs is abrupt, lacking in smoothness, and less controlled than that of sober motorists or the same subjects with no alcohol. Alcohol

was also found to impair response implementation of the final stage of the information-processing sequence.

It was concluded that high BACs both increase the time necessary to begin applying the brakes and reduce the degree of control in the actual use of the brakes during the course of stopping, two factors which together probably are responsible for a large percentage of highway crashes. (HSRI)

40 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Behavioral Research Methodology. Review: Survey Methodology.

UM-75-D0746

ASPECTS OF DRUG ANALYSES IN RELATION TO ROAD TRAFFIC LEGISLATION AND SUPERVISION, R. Bonnichsen, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p495-508, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

Methods used to deal with alcohol and drugs in relation to traffic safety in Sweden are discussed. Sweden has had legislation concerning drinking and driving since 1923. It is now a criminal liability to drive under the influence of alcohol or other intoxicants if a blood alcohol concentration (BAC) or other drug concentration is sufficiently high that the operator is judged to be incapable of safe driving. In Sweden, doctors are obliged to inform patients about the possible traffic risks resulting from the medications they prescribe. If a person is injured and brought to a hospital, police can ask for a blood sample only if they suspect that the driver is drunk or intoxicated by drugs. Before a prosecutor can obtain a conviction, it must be proved that the driving behavior concerned was somehow a hazard to traffic and that the operator took some substance that made him unfit for driving. Evidence presented by a doctor in court is probably more important than drug analysis. Blood samples are not analyzed for other drugs if a reasonably high BAC is found.

It is suggested that research be conducted on the effect of alcohol and drugs separately and in combination using persons with a high tolerance to both. The dangers of alcohol and other drugs with respect to traffic safety should be taught in schools and in driver education courses.

Motor vehicle, injury, fatality, sampling, and detected drug use statistics for Sweden are presented. (HSL)

2 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Countermeasure Development, Testing, and Evaluation. Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-75-D0747

INVOLVEMENT OF ALCOHOL, CARBON MONOXIDE AND OTHER DRUGS IN TRAFFIC FATALITIES, R.F. Turk; A.J. McBay; P. Hudson; M.M. Bullaboy, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p597-611, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

The results of a three-year study of the involvement of drugs and carbon monoxide in automobile operators and pedestrians killed in six counties of North Carolina are discussed. Blood, liver, and urine samples from a total of 251 fatalities were examined for the presence of drugs and carbon monoxide.

The major drug detected in the 171 samples from drivers involved in car crashes was ethyl alcohol; in cases where another drug was involved, alcohol was also usually present. Microscopic examinations of the livers of 63 of the 72 driver-victims of single-car crashes showed that 29 had changes highly indicative of chronic alcohol abuse, with an additional 5 of the 63 showing equivocal results. Ethyl alcohol was also the drug most frequently found in the operator-victims of multiple-car accidents. In this group, drugs alone and in conjunction with alcohol were also found. The livers of 43 of the 99 drivers in this group showed changes indicative of chronic alcohol abuse.

Alcohol alone was detected in the blood of half of the sixty-two pedestrian fatalities. Another 8% had other drugs alone or in combination with alcohol. Of the pedestrians, twenty-five had liver changes suggestive of chronic alcohol abuse.

Significant amounts of carbon monoxide were found in the blood of three crash fatalities. The blood samples of the pedestrians had a higher positive mean alcohol concentration than that of the single-car operators or that of the multiple-car crash operators. Alcohol was found in blood samples from 92% of the operators in single-car crashes, 82% of the operators in multiple-car crashes, and 86% of the pedestrian fatalities. Drugs other than alcohol most frequently encountered were the sedative hypnotics, the analgesics, the antiepileptic drug diphenylhydantoin, the antiarrhythmic drug quinidine, and quinine. (HSL)

21 refs

KEYWORDS: Analgesics and Antipyretics: phenacetin*. propoxyphene*. salicylate*. Anti-Arrhythmia Agents: quinidine sulfate*. Anticonvulsants (Anti-Epileptics): phenobarbital*. Barbiturates: amobarbital*. phenobarbital*. secobarbital*. Gases: carbon monoxide. Nonbarbiturates: ethanol (ethyl alcohol)*. Plasmodicides: quinine. Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-75-D0748

"WILL THE REAL DRUGGED DRIVER PLEASE STAND UP?" AN ANALYTICAL TOXICOLOGY ASSESSMENT OF DRUGS AND DRIVING. B.S. Finkle, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p607-611, Addiction Research Foundation of Ontario, Toronto, Canada (1975)

Presented here is a discussion of the issues surrounding legislation and countermeasures to deal effectively with the drugged driver. Although the laboratory tools and the social justification are now available to study and identify drugged drivers, it is suggested that the time, labor, and money necessary for such a program cannot be justified in terms of possible benefits to future traffic safety. Much of the known drug use problem occurs in drinking drivers, and a great variety of commonly prescribed and over-the-counter drugs in combination with alcohol do potentially constitute a major traffic safety problem. However, a broad research study involving comprehensive toxicological analysis of biological samples from drivers from selected demographic areas of the country is needed to realistically determine if a significant problem exists.

Problems such as sample choice, analytical difficulties, and preliminary inferences from the analytical results, as well as pharmacological and physiological qualifications and complexities, render interpretation of data concerning the influence of drugs in any strict scientific sense impractical. Other problems include the importance of dosage; the time interval between dose and sample; the pharmacodynamics of the drug; and the subject's possible tolerance, hypersensitivity, and metabolism. It is suggested that the major need in the area of control of the use of drugs by drivers is for the general driving public to recognize the risks associated with uncontrolled drug use, particularly in conjunction with alcohol, so that they have a basis for personal decision as to whether they should drive or not. (HSLM)

8 refs

KEYWORDS: Countermeasure Concepts.

UM-76-D0749

PROPRANOLOL AND SKILLED HUMAN PERFORMANCE, A.A. Landauer; L.B. Jellett; J. Kirk, Pharmacology, Biochemistry, and Behavior, v4 n3 p283-7 (1976)

This study was designed to investigate the effects of repeated doses of propranolol on various behavioral parameters. In a double-blind crossover experiment eighteen young men received on one occasion six doses of 40 mg propranolol and on the other, placebo. Medication was given at six-hour intervals. One hour after the last capsule was ingested subjects were measured with various physiological and behavioral tests which tested letter substitution ability, kinetic visual acuity, serial reaction time, dot tracking, and steadiness. Subjects were also assessed on a Martin Driving Simulator and a choice reaction time apparatus.

At the conclusion of testing mean plasma propranolol concentration was 67.6 ng/ml. Propranolol significantly reduced systolic blood pressure and heart rate. The only behavioral measure affected significantly by medication was the choice reaction time test in which there was a slight increase in the variance of the response time.

These results suggest that motor performance is mildly affected by repeated doses of propranolol. The significant increase in the variance of response time denotes that subjects are at times slower in making some movements. This performance irregularity can be disabling since the subject is unaware when it occurs and is therefore unable to compensate for it. (HSRI)

18 refs

KEYWORDS: Anti-Anginal Agents: propranolol*. Anti-Arrhythmia Agents: propranolol*. Hypotensive (Antihypertensive) Agents: propranolol*. Driving Simulator. Experimentation: Acute Dosage Study. Physiological Testing. Psychomotor Tests.

UM-76-D0750

VIGILANCE AND SIMULATED NIGHT DRIVING. J. Boadle, Ergonomics, v19 n2 p217-225 (1976)

This paper describes an investigation of the relationships between vigilance, performance on a simulated driving task, and physiological measures of arousal. The nineteen male subjects for this study were mainly senior undergraduate students or postgraduate students whose average age was 23.4 years and who had on the average 5.1 years of driving experience. The subjects, after being connected to a polygraph, drove in nighttime conditions for two hours. They were instructed to follow another car in front of them whose tailights they could see. Average pulse and respiration rates per minute were determined for five recording periods. Both showed a steep decline between the start of the two-hour run and the second sample, taken after a half an hour. Respiration rates tended to remain stable for the rest of the time. Changes in performance on the vigilance task were like those frequently reported for vigilance tasks carried out alone, but changes characteristic of vigilance tasks with divided attention were not found. A marked decline in physiological arousal was not directly related to changes in either the vigilance test or driving performance. It is suggested that a curvilinear relationship best explains the data, where both high and low arousal may lead to poor performance. (JAM)

20 refs

KEYWORDS: Crash Investigation.

UM-71-D0751

AN ACCIDENT-BASED ANALYSIS OF ROAD-USER ERRORS. A.B. Clayton, Journal of Safety Research, v4 n2 p69-74 (Jun 1972)

An on-the-scene study of 210 road accidents in Worcestershire, England was carried out by an interdisciplinary team in order to investigate the roles of the driver and environmental and vehicle factors in accident causation. Each hour of the day between 8:00 a.m. and midnight and each day of the week were sampled with equal frequency to obtain a representative sample. The team visited the accident scene and made follow up visits to the hospital and repair garages to obtain further data.

Of the 348 road users, 206 (59.2%) were considered to have committed errors that contributed to accident causation. Two errors accounted for over half the known errors committed. These were failure to look (28.5%) and excessive speed with regard to the conditions (25.3%). Basic differences were found in the causal factors associated with the various types of errors including age of the driver, driving experience, and environmental restrictions.

The results of this study suggest that accidents should be regarded not as a homogeneous body of events, but rather as a collection of events with widely differing causes. The types of road-user errors committed, the characteristics of the individuals involved, and the underlying causative processes appear so diverse as to suggest that the term "accident" is too general and is without psychological significance. In terms of predicting accident liability from psychological test scores, the low correlation in past studies may be due to the heterogeneous nature of the criterion variables rather than to any inherent inadequacy of the test. (AAM)

16 refs

KEYWORDS: Crash Investigation.

UM-75-D0752

PUBLIC INFORMATION PROGRAMS RELATED TO ALCOHOL, DRUGS, AND TRAFFIC SAFETY, J.W. Swinehart, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p799-811, Addiction Research Foundationof Ontario, Toronto, Canada (1975)

Reviewed here are public information programs related to alcohol, drugs, and traffic safety. Until recently, the target audience of these programs has been the consumer who, it is assumed, will be in a position to choose whether to drive while in an impaired condition. In recent years, however, many campaigns have moved beyond attempts to inform or persuade a particular target audience and have focused instead on informal influence agents such as friends, relatives, and party hosts who are in a position to control a person's access to alcohol or drugs, to a car, or to both. These persons can exert influence before a violation or an accident occurs.

Programs directed at the general public are usually designed to increase awareness of the problem or to solicit support for control measures. Other programs may be directed exclusively at young people, minority groups, employers, or other select audiences. Themes used in public information campaigns include: conveyance of information; utilization of some form of threat, such as loss of life or arrest; invocation of normative values, such as the value of knowing personal limits; or appeal to concern for the common good.

Although the ultimate objective of campaigns in this field is a reduction of injuries or fatalities on the highway, most campaigns focus on such intermediate objectives as appropriate changes in beliefs or attitudes and institutional or organizational changes. Most campaigns on drinking and driving have not been evaluated in any systematic way; as a result, it is not possible to provide definitive conclusions regarding the relative effectiveness of the appeals used in these campaigns. (HSLM)

0 refs

KEYWORDS: Countermeasure Demonstration and Implementation, Countermeasure Development, Testing, and Evaluation.

UM-67-D0753

THE RELEVANCE OF LABORATORY STUDIES TO PRACTICAL SITUATIONS, A. Chapanis, Ergonomics, v10 n5 p557-77 (1967)

This paper explores the difficulties inherent in generalizing from laboratory experiments to the solution of real-world problems. By their very nature laboratory experiments are, at best, only rough and approximate models of any real-life situation. First, of all the possible independent variables that influence behavior in any practical situation, a laboratory experiment selects only a few for testing. As a result, hidden or unsuspected interactions in real life may easily nullify, or even reverse, conclusions arrived at in the laboratory. Second, variables always change when they are brought into the laboratory. Third, the effect of controlling extraneous or irrelevant variables in the laboratory is to increase the precision of an experiment but at the risk of discovering effects so small that they are of no practical importance. Fourth, the dependent variables (or criteria) used in laboratory experiments are variables of convenience. Rarely are they selected for their relevance to some practical situation. Last, the methods used to present variables in the laboratory are sometimes artificial and unrealistic. The safest and most honest conclusion to draw from all these considerations is that one should generalize with extreme caution from the results of laboratory experiments to the solution of practical problems. (AAM)

21 refs

KEYWORDS: Review; Behavioral Research Methodology.

UM-76-D0754

CANNABIS AND EXPERIMENTAL STUDIES OF DRIVING SKILLS, H. Moskowitz, Research Advances in Alcohol and Drug Problems, R.J. Gibbins; et al., v3 p283-95, New York: John Wiley and Sons (1976)

This article reviews experimental studies investigating possible impairment of behavioral mechanisms involved in driving due to use of marijuana.

Several investigators have attempted to obtain a gross estimate of possible marijuana induced impairment by placing subjects who were under the influence of marijuana in cars and having them drive either in closed courses or in traffic. These studies report the strongest trend towards declines in performance to be in the categories of judgment and concentration. No evidence for a differential effect on performance as a function of sex, driving experience, or previous driving experience under marijuana was found.

In studies conducted on simulators strong evidence for impairment of perceptual performance was found. Risk-taking, however, appears to decrease. Results of laboratory tests, field car studies, and simulator studies indicate that both tracking and perceptual functions are impaired by marijuana. The degree of impairment found for the perceptual functions appears greater proportionately than that found for the tracking function.

While it is impossible to derive from these studies an estimate of the increased probability of accidents as a function of dosage, the only prudent conclusion based on the available evidence is that marijuana will increase the probability of driving accidents.

The editors of Research Advances in Alcohol and Drug Problems are R.J. Gibbins; Y. Israel; H. Kalant; R.E. Popham; W. Schmidt; R.G. Smart (HSRI)

30 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Nonbarbiturates: ethanol (ethyl alcohol). Review: Drug Effects.

UM-75-D0755

ACUTE EFFECTS OF ETHANOL AND OPIATES ON THE NERVOUS SYSTEM, E. Eidelberg. Research Advances in Alcohol and Drug Problems, R.J. Gibbins; et al., v2

147-76, New York: John Wiley and Sons (1975)

This article reviews literature concerning the effects of alcohol and opiate narcotics upon the nervous system. Overwhelming evidence is found to support the conclusion that alcohol and opiate narcotics act upon many sites in the nervous system. The overt clinical or behavioral changes they produce reflect the involvement of multiple functional systems. The differences in the time course of acute effects and the development of tolerance and dependence probably reflect this heterogeneity of sites and mechanisms of action. For the identification of an "opiate receptor", it may be necessary to prove that the same receptor substance is present at multiple sites in the central nervous system before one can postulate that the same cellular mechanisms are involved everywhere, even within the same species. For example, oculomotor and equilibrium disturbances during morphine intoxication are probably due to its actions on the cerebello-vestibular system; morphine's effects on thermoregulation probably involve the hypothalamus in some important way. But other effects of the opiates are less obviously attributable to specific systems.

The editors of Research Advances in Alcohol and Drug Problems are R.J. Gibbins; Y. Israel; H. Kalant; R.E. Popham; W. Schmidt; R.G. Smart (AA)

154 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Opiates and Related Agents. Review: Drug Effects.

UM-76-D0756

CAFFEINE AS A DRUG OF ABUSE, R.M. Gilbert, Research Advances in Alcohol and Drug Problems, R.J. Gibbins; et al., v3 p49-176, New York: John Wiley and Sons (1976)

A thorough review of the literature concerning caffeine's use, abuse, pharmacology toxicology, behavioral effects, and therapeutic uses is presented. Caffeine has been directly implicated in few human fatalities. Existing evidence suggests, however, that there is considerable risk to the health of an adult who ingests 600 mg of caffeine or more per day. Such consumption of caffeine is associated with certain kinds of heart disease, ulcers of the stomach and duodenum, and carcinomas, especially of the kidneys and urinary tract. Consumers of large amounts of caffeine may be more susceptible to headaches, insomia, difficulty in and dysphoria upon waking, and a constellation of symptoms that may be indistinguishable from anxiety.

In relation to highway safety, although caffeine in moderate amounts may be beneficial to the driver in that it may increase wakefulness and alertness, large amounts of caffeine may cause him to be tremorous and nervous. It is concluded that more people may be at risk in North America because of caffeine beverages than because of consumption of alcoholic beverages. It follows that consideration should be given to restriction of caffeine-containing beverage consumption as a public health measure.

The editors of Research Advances in Alcohol and Drug Problems are R.J. Gibbins; Y. Israel; H. Kalant; R.E. Popham; W. Schmidt; R.G. Smart (HSRI)

420 refs

KEYWORDS: Stimulants: caffeine. Review: Drug Effects.

UM-76-D0757

TOBACCO SMOKING AND NICOTINE DEPENDENCE, M.A.H. Russell, Research Advances in Alcohol and Drug Problems, R.J. Gibbins, et al., v3 p1-47, New York: John Wiley and Sons (1976)

Presented here is evidence from recent literature supporting the view that nicotine has a central role in the generation of cigarette dependence. The absorption, metabolism, excretion, and pharmacologic effects of nicotine are considered, with special emphasis on aspects relevant to its dependence-producing potency. There seems little doubt, in view of the evidence, that pharmacologic factors play a dominant role in the maintenance of smoking and that most people smoke because they are dependent on nicotine. Furthermore, nicotine dependence is not always psychological. One experiment showed that when nicotine was added to intravenous saline infusion, subjects (unaware of the nicotine) smoked 27% less cigarettes. The subjects took fewer puffs and discarded their cigarettes earlier. Many cigarette smokers fulfill the criteria for physical dependence, namely tolerance and physical withdrawal effects.

Some smokers, however, are not simply dependent on nicotine so much as they are dependent on the inhalation-bolus form of intake. The puff-by-puff bolus nicotine peaks provided by inhaled cigarette smoking not only produce higher brain nicotine levels and a more intense effect, but also substantially increase the number of reinforcements. The magnitude and number of reinforcements are important variables in the strengthening of operant behavior. The time interval between the response and the reinforcement is another important variable and this too is maximized by inhaling tobacco smoking.

The author suggests that it is the intermittent puff-by-puff, high-nicotine bolus that reaches the brain within seconds of inhaling that makes cigarette smoking one of the most addictive of all addictive behaviors.

The editors of Research Advances in Alcohol and Drug Problems are R.J. Gibbins; Y. Israel; H. Kalant; R.E. Popham; W. Schmidt; R.G. Smart (HSRI)

150 refs

KEYWORDS: Ganglionic Blocking and Stimulating Agents: nicotine*. Stimulants: nicotine*. Review: Drug Effects.

UM-78-D0758

UBER DEN ALKOHOLGEHALT IN TONICA, ELIXIEREN UND ROBORANTIEN [THE ETHANOL-CONTENT IN TONICS, ELIXIRS AND ROBORANTS], H. Althoff; H. Kellner, Blutalkohol, v15 n5 p363-9 (Sep 1978)

The alcoholic strengths of several elixirs, tonics, and roborants were measured. It was found that a great number of these medications showed a considerable alcoholic content. The medico-legal consequences are discussed.

The authors suggest that all producers of such preparations, which can be bought without prescription, draw attention to the alcohol content and the possible alcoholic influence with its effects. (EM)

10 refs German

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Experimentation: Other Single-Drug Study.

UM-77-D0759

THE ROLE OF DIAZEPAM IN POSTMORTEM MEDICOLEGAL INVESTIGATION, B. S. Finkle, K. L. McCloskey, Salt Lake City, Utah: University of Utah Center for Human Toxicology (November 1977)

Diazepam has become in recent years the most frequently prescribed single drug. As a beginning toward establishing the potential toxic significance of this drug, the Center for Human Toxicology in Salt Lake City conducted a retrospective survey and study of postmortem medicolegal cases involving diazepam in the United States and Canada. This report is the result of the survey and reports what is current investigative practice and what forensic scientists at the study sites currently view as significant.

Between August and November 1976, twenty-four medical examiners or coroner offices across the United States and three in Canada were studied. Personnel at each location were interviewed to determine the frequency with which diazepam was encountered at the site, the investigative approaches used in the different types of diazepam-associated deaths, and the current and past analytical methods employed. Following the interviews, 1,239 individual case files of deaths involving diazepam over the previous four to five years were examined and specific information recorded.

Results of the study permitted several major conclusions to be drawn. (1) In general, the role and occurrence of diazepam in postmortem toxicology appears to be primarily in multiple drug combination deaths, and the number of fatalities resulting from diazepam toxicity alone is nearly negligible. (2) Of the 912 drug combination deaths, 346 cases had ethyl alcohol demonstrated analytically, but only 51 (5.6%) of these had diazepam and ethyl alcohol as the only agents responsible for death. (3) Of the 1,239 cases, manner of death was classified as suicide in 422 cases (34.1%); accident in 364 (29.4%); undetermined in 345 (27.8%); natural in 88 (7.1%); and homicide in 20 (1.6%). (HSRI)

201 pages 24 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam*. Muscle Relaxants (Central): diazepam*. Nonbarbiturates: ethanol (ethyl alcohol)*. Epidemiologic Research: Drug Concentrations in Body Fluids. Epidemiology: Analysis of Driver Body Fluids for Drugs. Epidemiology: National Survey of Drug Use Patterns.

UM-74-D0760

CLINICAL PHARMACOLOGY OF MARIHUANA, L.E. Hollister, Research Advances in Alcohol and Drug Problems, R.J. Gibbins; et al., v1 p243-66, New York: John Wiley and Sons (1974)

Several papers concerning the clinical pharmacology of marijuana are discussed. Human experimentation with marijuana has been limited by a number of factors including legal and regulatory constraints; problems in dosing due to the rapid and inconsistent deterioration of THC following chemical synthesis; problems in selecting subjects; and difficulties in maintaining blind controls. However, enough research has now been done to provide a solid foundation of research.

The constituents, metabolites, and homologs of marijuana are discussed along with their pharmacokinetics. Clinical syndromes and the effects of marijuana on the cardiovascular system, the eyes, and neuromuscular system are also discussed.

Psychological tests are reviewed in detail. Most cognitive functions are impaired by marijuana, but many variables such as dose, environment, and user's personality influence the results. Perceptual alteration is often found in the form of a distortion in time sense. Motor tests seem to be most sensitive to deterioration under the influence of the drug, perhaps representing the summation of mental impairment as well as motor incoordination.

Also examined are therapeutic uses of the drug. One of the most plausible uses of marijuana is as a hypnotic drug. It has also been suggested as an analgesic, an antidepressant, an appetite stimulant, an antihypertensive, an anticonvulsant, and for withdrawal from other drugs. It is concluded that in view of the adverse effects of marijuana, more research must be done before marijuana is used therapeutically.

The editors of Research Advances in Alcohol and Drug Problems are R.J. Gibbins; Y. Israel; H. Kalant; R.E. Popham, W. Schmidt; R.G. Smart (HSRI)

73 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol*. Review: Drug Concentration-Effect Relationships. Review: Drug Effects.

UM-75-D0761

DRUG INTERACTIONS; THE EFFECTS OF ALCOHOL AND MEPROBAMATE APPLIED SINGLY AND JOINTLY IN HUMAN SUBJECTS. Journal of Studies on Alcohol. J.A. Carpenter. Suppl. 7 p1-193 (Nov 1975)

This supplement reports research on the effects of alcohol and meprobramate, illustrating some of the general problems in measuring human responses and the joint action of drugs. The purpose of this study was twofold: (1) to develop mathematical models of joint action and to obtain data to test the models; and (2) to study the action of alcohol and meprobamate in human subjects.

Theoretical considerations and a literature review of the effects of alcohol and meprobamate applied singly and jointly in human subjects are presented by way of introduction. Also described is a series of five experiments in which doses of up to 1.20 g alcohol per kg body weight and up to 30 mg meprobamate per kg were administered to 158 men between 21 and 49 years of age. Blood meprobamate concentration and blood alcohol concentration were measured, and five behavioral measures were obtained. It was concluded from these experiments that prolonged administration of meprobamate has an ameliorating effect on alcohol-produced changes in behavior and that a single dose increases the absorption of alcohol.

Also described is another experiment in which the relations between the levels of alcohol and meprobamate in the blood and performance on a visual-motor coordination tracking task were analyzed by a general system of mathematical models. The derivation of these models is described, and special emphasis is placed on the design of future experiments. (AAM)

301 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): meprobamate. Nonbarbiturates: ethanol (ethyl alcohol)*. Experimentation: Acute Dosage Study. Experimentation: Chronic Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Dose-Effect Study. Experimentation: Study of Combined Effects of Drugs. Psychomotor Tests. Review: Drug Concentration-Effect Relationships. Review: Drug Effects. Tests of Sensory Function.

UM-76-D0762

TWO WEEKS' TREATMENT WITH CHLORPROMAZINE, THIORIDAZINE, SULPIRIDE, OR BROMAZEPAM: ACTIONS AND INTERACTIONS WITH ALCOHOL ON PSYCHOMOTOR SKILLS RELATED TO DRIVING. T. Seppala; I. Saario; M.J. Mattila. Modern Problems in Pharmacopsychiatry. v11 p85-90 (1976)

Subacute effects of chlorpromazine, thioridazine, sulpiride, and bromazepam on psychomotor skills alone or in combination with alcohol were tested against a placeo in two double-blind crossover trials with thirty-seven healthy male students. The drugs were given in capsules three times daily for two weeks each. Psychomotor performance (choice reaction, coordination, and attention) was measured on the seventh and fourteenth days of treatment. At each session the subjects swallowed a capsule together with .05 g/kg of alcohol or placebo drink. Measurements were done 30, 90, and 150 minutes thereafter. The subjects each participated in a choice reaction test, two coordination tests, an attention test, and a flicker fusion test.

Thioridazine in combination with alcohol had no major effect on skills while chlorpromazine used in combination with alcohol resulted in impaired reactive and coordinative skills. After chlorpromazine plus alcohol the subjects were unable to compensate for their coordination mistakes by slow driving. The interaction of sulpiride with alcohol was mild whereas bromazepam and alcohol strongly impaired coordination and divided attention. The results suggest that low doses of neuroleptics impair psychomotor skills less than benzodiazepines do, but therapeutically equipotent doses must be assessed in order to apply the results in practical situations. (AAM)

2 refs

KEYWORDS: Anti-Emetics: chlorpromazine. Major Tranquilizers (Antipsychotics and Neuroleptics): chlorpromazine, sulpiride, thioridazine. Minor Tranquilizers (Anti-Anxiety and Ataractics): bromazepam. Nonbarbiturates: ethanol (ethyl alcohol).

Experimentation: Chronic Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Study of Combined Effects of Drugs. Psychomotor Tests.

UM-76-D0763

FITS AND FITNESS TO DRIVE, British Medical Journal, n6020 p1235-6 (22 May 1976)

This article reviews regulations concerning the epileptic driver, especially as they apply to physicians who must assess and advise patients on the effects of any disability on driving. If an applicant for a driving license is suffering from epilepsy, the law requires the application to be refused. The exception to this rule is epilepsy which is controlled by drugs. However, diagnosis of epilepsy and determination of whether the person should drive are usually not so straightforward. Some of the problems involved are: Was it a fit? Were there exceptional circumstances? Is there a continuing liability to recurrent attacks? Can the patient's statements denying attacks for a sufficient period of time be relied upon and do the relatives confirm them? Is treatment being taken as prescribed? These questions are discussed.

The author concludes that it is possible that the present regulations, which demand freedom from fits for three years before licensure, could be cut to two years without added risk or reduction of road safety. (HSRI)

5 refs

KEYWORDS: Countermeasure Concepts. Other Sociolegal Study.

UM-73-D0764

RESEARCH ON DRUGS AND DRIVING, M. MacConaill; G. Ling, Proceedings of the Scientific Session of the 10th Annual Meeting of Traffic Injury Research Foundation of Canada, p11-14A, Traffic Injury Research Foundation of Canada (1973)

A broad overview of the drug and driving problem is presented. Special concern is shown for the compound methaqualone, sold as Quaalude(R) in the United States and in combination with diphenhydramine, as Mandrax(R) in Canada. The acute effects of this drug, especially when used in conjunction with alcohol, include a marked ataxia resulting in impaired performance during the postacute phase.

Research on drugs and driving poses difficulties due to a number of methodological reasons. Because the rate of absorption of psychotropic drugs can be erratic, and because drug metabolism often is complex, blood levels of a given drug often have little relation to the total drug effect. To relate blood levels to drug concentrations at sites of action within the central nervous system is also difficult.

Another problem is the question of what behavior to measure. A drug may affect vigilance, judgment, or performance, all of which may be difficult to measure objectively and meaningfully in a laboratory setting.

The effects of multiple drug use are also of concern. Additive effects and more complex interactions often appear. Even more serious is the problem of the combined effects of alcohol and hypnotics such as barbiturates and methaqualone where initial effects are extremely pronounced. Dangers also arise during the recovery phase, when functions are recovering, but may still be subnormal.

The demonstration that drugs can impair driving ability and increase accident risk depends on obtaining consistent behavioral results with adequate experimental models of driving performance. (HSRI)

0 refs

KEYWORDS: Nonbarbiturates: methaqualone. Sedatives and Hypnotic Agents: Mandrax(R) (methaqualone + diphenhydramine). Review: Drugs and Highway Safety.

UM-73-D0765

PROSPECTIVE STUDIES OF TRAFFIC INJURIES IN RELATION TO MEDICAL CONDITIONS OF DRIVERS: METHODOLOGY AND PROGRESS REPORT, F.D.K. Liddell, Proceedings of the Scientific Session ofthe 10th Annual Meeting of Traffic Research Foundation of Canada, p35-41, Traffic Injury Research Foundation of Canada (1973)

Presented here is a preliminary report of a project designed to (1) determine medical and related factors affecting traffic injury; and (2) to obtain from official records details of all accidents suffered by drivers in the representative sample, which included 2,713 drivers in the greater Montreal area. In order to obtain this information, driving records of all subjects were examined and a telephone interview was administered which inquired about potential contraindications to driving such as migraines, physical defects, and use of tranquilizers and other medicaments.

The following information about the drivers in the sample was reported: 4.7% of the drivers had been warned about physical strain; 21.4% had been admitted to hospitals in the previous year; 8.0% took tranquilizers; 29.2% took medications prescribed by a physician; 18.7% took other types of medications; 23.4% rarely drove after taking alcohol; and 9.7% occasionally drove after taking alcohol. (HSRI)

0 refs

KEYWORDS: Epidemiology: Record-Based Survey. Epidemiology: Self-Reported Drug Use by Drivers.

UM-73-D0766

EFFECTS OF CARBON MONOXIDE ON DRIVING SKILLS, G. Wright; P. Randell; R.J. Shephard, Proceedings of the Scientific Session of the 10th Annual Meeting of Traffic Injury Foundation of Canada, p67-76, Traffic Injury Foundation of Canada (1973)

The effects of a moderate dose of carbon monoxide upon driving skills were examined in a double-blind experiment in which 80 ml of pure carbon monoxide or an equivalent volume of air was administered to fifty adults, both smoking and nonsmoking. With the rebreathing method of administration, blood COHb levels increased by an average of 3.4% in those receiving carbon monoxide. Six selected tests of driving skills (brake reaction time, night vision, glare vision, glare recovery, hand steadiness, and depth perception) showed small and individually insignificant deterioration in the group receiving carbon monoxide. Grouping data in a nonparametric form, there was a significant difference ($p < 0.005$) in the performances of experimental and control subjects. During operation of a driving simulator, the group exposed to carbon monoxide showed a highly significant deficit in skills related to careful driving habits ($p < 0.005$). Since a 3.4% increase of COHb is sufficient to affect the skills associated with safe driving, there may be need for a revision of the permitted industrial level of CO (50 ppm for eight hours), as well as for new legislation governing smoking in public places. (AAM)

17 refs

KEYWORDS: Gases: carbon monoxide*. Experimentation: Dose-Effect Study. Psychomotor Tests. Tests of Sensory Function.

UM-76-D0767

SHORT-TERM NEUROPSYCHOPHARMACOLOGICAL EFFECTS OF MARIHUANA SMOKING IN EXPERIENCED MALE USERS, E.F. Domino; P. Rennick; J.H. Pearl, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v1 p393-412, New York: Raven Press (1976)

The effects of smoking up to four 300 mg marijuana cigarettes containing either 0%, 1.5%, or 2.9% delta-9-THC in different sessions were determined on various physiological, subjective, neuropsychological, and cognitive behaviors. A total of twelve experienced male marijuana users were selected from a larger group of adult volunteers on the basis that they were physically healthy and mentally normal with the exception of marijuana use for at least the previous year.

Dose-effect related changes were observed within 20 minutes after smoking. The most significant alterations were observed after 2.9% delta-9-THC-containing marijuana including decreased clear thinking, increased dizziness, decreased palpebral fissures, increased heart rate, and slightly elevated systolic and diastolic blood pressure. Marijuana smoking led to a dose-related impairment of various concept formation and usage tasks including letter series, work grouping, closure speed, conceptual clustering, memory, and an embedded figures test. Performance on Size-Weight illusion, Lucchin s Water Jar, Lucchin's Hidden Word, and an anagram test were uneffected. Color naming time and color naming error were significantly increased ($p < 0.01$) compared with 0% delta-9-THC smoking, while finger tapping speed improved initially ($p < 0.05$). Discriminant reaction time, 2-flash fusion threshold, and flicker-fusion threshold were not altered significantly. In most cases, only the differences between 0% and 2.9%

delta-9-THC marijuana smoking were statistically significant. It is concluded that on most behavioral tasks the subjects showed either no change or an impairment. (AA)

23 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Experimentation: Acute Dosage Study. Experimentation: Dose-Effect Study. Psychological Testing. Psychomotor Tests. Tests of Sensory Function.

UM-76-D0768

ATTENTION, LEARNING AND SPEED IN PSYCHOMOTOR PERFORMANCE AFTER MARIHUANA SMOKING, L. Vachon; A. Sulkowski, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v1 p449-52, New York: Raven Press (1976)

These two studies attempted to clarify the effects of marijuana on attention, memory, and psychomotor speed. Volunteers smoked marijuana (25 mg delta-9-THC) or placebo. In addition to a psychological battery and several physiological measurements, the Continuous Performance Test (CPT) and the Automated Digit Symbol Substitution Test (ADSST) were administered. Results showed ADSST performance to be significantly affected by marijuana whereas the CPT results did not indicate any substantial decrement in attention after this dosage.

The second study attempted to replicate the first study, with the addition of a test to determine whether recent memory impairment and psychomotor slowdown are significant factors in observed changes in performance. Tested were six healthy, experienced volunteers who either smoked marijuana cigarettes (17 mg delta-9-THC) or performed under the control (no drug) condition. Marijuana was found to significantly affect ADSST performance, but the matching test performance was practically not affected.

The authors conclude from these results that although attention, memory, and psychomotor speed are not affected by marijuana, the central processing of relevant stored information is more difficult after administration of this drug. (HSRI)

12 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Experimentation: Acute Dosage Study. Experimentation: Dose-Effect Study. Psychological Testing. Psychomotor Tests.

UM-76-D0769

MARIHUANA SMOKING AND SIMULATED FLYING PERFORMANCE, J.D. Blaine; M.P. Meacham; D.S. Janowsky; M. Schoor; L.P Bozzetti, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v1 p445-7, New York: Raven Press (1976)

The effects of marijuana intoxication on the ability of ten certificated pilots to operate a general aviation instrument flight simulator were studied. All ten subjects had smoked marijuana for several years, seven of the ten smoking marijuana several times per week, the remaining three smoking twice a week or less. A randomized, double-blind crossover design was used in which either 0.09 mg delta-9-tetrahydrocannabinol or a matched placebo was smoked in a pipe over a ten-minute period. Flying performance was evaluated thirty minutes following consumption of the test substances. In six subjects performance was evaluated two, four, and six hours after smoking in maneuvers typically encountered during instrument flight.

The entire pilot group demonstrated during their intoxicated runs a statistically significant increase in major errors, defined as those which if committed in actual flight situations would take the airplane outside of its designated air space with potentially dire consequences. Similarly, there was a statistically significant increase in minor errors. None of the pilots performed better during acute marijuana intoxication.

Data was also obtained from six subjects tested over a six-hour period after smoking in order to elucidate the time course of the deterioration in flying performance observed after thirty minutes. Placebo performance was relatively consistent over the six-hour period, suggesting that neither learning nor fatigue significantly affected flying performance. However, significant deterioration in flying ability appeared for at least two hours in experienced pilots who had smoked marijuana. Acute marijuana intoxication appears incompatible with safe aircraft operation. (HSRI)

0 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Driving Simulator. Experimentation: Acute Dosage Study. Psychomotor Tests.

UM-76-D0770

THE ACUTE EFFECTS OF VARIOUS CANNABIS SUBSTANCES ON COGNITIVE, PERCEPTUAL, AND MOTOR PERFORMANCE IN VERY LONG-TERM HASHISH USERS, R.L. Dornbush; A. Kokkevi, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v1 p421-7, New York: Raven Press (1976)

This study reports the results of a systematic investigation of the acute effects of various cannabis preparations on the cognitive, perceptual, and motor abilities of long-term users.

Twenty Greek subjects whose mean age was 43.05 years and whose mean number of years of marijuana use was 25.80 received five different cannabis preparations: (1) 3g American marijuana equivalent to about 80 mg of delta-9-THC; (2) 4g Greek hashish equivalent to 180 mg of delta-9-THC; (3) 2g Greek hashish equivalent to 90 mg of delta-9-THC; (4) 3g marijuana placebo; and (5) 100 mg delta-THC infused on tobacco. The testing took place on five days. The postsmoking recording period extended for two hours. During this time the psychological test battery was administered at thirty and seventy minutes postsmoking. The following tasks were presented to the subjects during each test period: digit span, serial sevens, star tracing, barrage de signe, and time estimation.

Although the quantities of delta-9-THC administered to Greek subjects were larger than have been reported in experimental world literature, test findings were similar to previous findings. Simple memory tasks (such as digit span) frequently were not affected by marijuana, whereas more complex tasks such as digit symbol substitution and serial sevens were impaired. To further clarify the comparability of Greek and American subjects, it would be desirable to administer to Greek subjects the smaller doses employed in American experiments. (HSRI)

11 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. hashish. Experimentation: Chronic Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Dose-Effect Study. Psychological Testing. Psychomotor Tests.

UM-76-D0771

A MODEL OF MARIHUANA'S COGNITIVE EFFECTS, J.R. Tinklenberg; C.F. Darley, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v1 p429-39, New York: Raven Press (1976)

Although users' reports and data from experimental tasks provide clear evidence that cannabis has some effects on memory processes, some seemingly contradictory findings have emphasized the necessity to more precisely identify which processes are affected and which are not. In this paper recent results from several studies utilizing free-recall memory tasks have been interpreted in terms of a model of human memory that allows the effect of cannabis on memory to be more explicitly defined.

In this model the activity of the memory system is viewed as involving a flow of information, largely directed by subject-initiated control processes, between three basic structural components: a very short-term sensory register, a limited-capacity short-term store or working memory, and a large, permanent long-term store.

The nature of the cannabis-induced deficit in human memory is described in terms of this memory model. A major contribution of the present model is that it not only explains measurable cognitive effects of cannabis, but also certain characteristics of the perceptual and subjective effects of the drug. (HSRI)

52 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Review: Drug Effects.

UM-76-D0772

THE 30-DAY TRIP--CLINICAL STUDIES OF CANNABIS TOLERANCE AND DEPENDENCE, R.T. Jones; N. Benowitz, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v2 p627-42, New York: Raven Press (1976)

This study was designed to measure the tolerance and dependence of cannabis in man. Twelve normal male volunteers ranging in age from 22 to 27 years, all of whom were experienced cannabis users, were hospitalized for a thirty-day period. Delta-9-THC was administered orally in capsules at a beginning dosage of 70 mg/24 hour period. The level was increased daily up to a maximum 210 mg/day dose on the eleventh day through the sixteenth day after which a placebo was given.

A broad array of behavioral, subjective, physiologic, and biochemical measures was obtained prior to, during, and following the period of THC administration. A moderate and pleasant degree of intoxication characterized the first few days of 70 mg doses THC. However, when the total dose was rapidly increased to 140 or 210 mg, a sedated, lethargic, and sluggish state followed which was generally described as unpleasant. Clinical signs included nystagmus, ataxia, and postural dizziness.

Within six hours after the THC use was abruptly stopped, some subjects reported a sense of "inner unrest." By twelve hours after the last dose of THC, increased activity, irritability, insomnia, and restlessness were reported. Many subjects compared some of the symptoms to an influenza-like state. Symptom intensity peaked between twenty-four to thirty-six hours and markedly diminished at ninety-six hours after the last dose of THC. Sleep EEG changes were marked. A few subjects reported subjective impressions of disturbed sleep for weeks after termination of the study. No one, however, had a psychotic, paranoid, "psychedelic", or marked anxiety reaction.

If one defines dependence as an altered biological state associated with the consumption of a drug so that its use must be continued to prevent the development of specific signs and symptoms on withdrawal, these subjects gave evidence of developing physical dependence. The specificity, intensity, and consistency of such changes in the withdrawal state, of course, depend on the dose and frequency of administration of the drug. This study suggests that there is a need for high dosages in order to fully examine the effects of any drug. (HSRI)

27 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Clinical Study. Experimentation: Chronic Dosage Study. Experimentation: Dose-Effect Study. Physiological Testing. Psychological Testing. Psychomotor Tests. Self-Evaluation of Drug Effects by Subjects. Tests of Sensory Function.

UM-76-D0773

ACUTE AND SUBACUTE BEHAVIORAL AND PHARMACOLOGICAL INTERACTIONS OF DELTA-9-TETRAHYDROCANNABINOL WITH OTHER DRUGS, G.T. Pryor, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v2 p543-54, New York: Raven Press (1976)

This report describes methodology for studying acute and subacute interactions between delta-9-THC and other drugs and summarizes some of the behavioral and pharmacological results obtained with thirteen test drugs. Male rats 55 to 60 days of age and weighing 140 to 160 g were placed in escape-avoidance chambers and were given three daily 60-trial sessions to learn to avoid the foot shock by pulling a pole. Thirteen different drugs were administered by different vehicles in different dosages: phenobarbital, methaqualone, phencyclidine, chlordiazepoxide, caffeine, cocaine, methamphetamine, desmethylimipramine, diphenylhydantoin, lysergic acid diethylamide, nicotine, aspirin, and tolbutamide.

Two major conclusions emerge from these data. The first conclusion is that the depressant effects of delta-9-THC predominated when this drug was given with another drug. If the drug given with delta-9-THC had depressant properties of its own, then the result was a mutual potentiation of the depressant properties of both delta-9-THC and the other drug (even at doses of the other drug that were pharmacologically inactive alone). On the other hand, if the other drug had predominantly stimulant properties, then these were antagonized by delta-9-THC. There was no evidence that any of the thirteen drugs were able to offset the depressant properties of delta-9-THC.

The second conclusion is that tolerance to either delta-9-THC or the interacting drug can modify this depressant effect. This occurred most frequently when animals were subacutely pretreated with delta-9-THC. On the other hand, the effects of subacute pretreatment with the test drugs were less general. Thus, it appears that the interactions of delta-9-THC with other drugs will generally depend to some extent on the

history of previous drug administration and on specific cumulative effects of the interactive drugs. (HSRI)

7 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Animal Research. Experimentation: Study of Combined Effects of Drugs.

UM-76-D0774

A BEHAVIORAL MODEL OF MARIHUANA TOLERANCE, D.P. Ferraro, The Pharmacology of Marihuana, M.C. Braude; S. Szara, eds., v2 p475-86, New York: Raven Press (1976)

Despite the productivity of behavioral pharmacology research on the cannabinoids, very little is known about the behavioral mechanisms of action for these compounds. In this paper the behavioral model of marijuana tolerance is discussed. There are three primary assumptions underlying this model. The first is that learned responses are under the control both of antecedent discriminative stimuli, which set the occasion for the response to be emitted, and of consequent reinforcing stimuli, which determine the probability of response occurrence. The second assumption is that the administration of a behaviorally effective dose of marijuana can alter behavior so as to produce an adverse change in the relationships between the behavior and the discriminative and reinforcing stimuli. Thirdly, it is importantly assumed that if adverse changes in the behavior-environment relationships are initially produced by marijuana, then under repeated exposure to the drug compensating responses will be acquired which tend over time to reestablish the original behavior-environment relationships.

Several predictions regarding the development of marijuana tolerance in learned behavior situations follow directly from this model: (1) Behavioral tolerance to marijuana is more likely to develop if the drug initially produces adverse effects on behavior-environment relationships. (2) Behavioral tolerance to marijuana is more likely to develop if the occurrence of tolerance does not itself produce adverse effects on behavior-environment relationships. (3) Behavioral tolerance to marijuana is more likely to develop under simple than under complex behavioral tasks. (4) Behavioral tolerance to marijuana is more likely to develop if the opportunity to respond under the influence of marijuana is present. (HSRI)

40 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Review: Behavioral Research Methodology. Review: Drug Effects.

UM-73-D0775

CANNABIS AND ALCOHOL: EFFECTS ON SIMULATED CAR DRIVING AND PSYCHOLOGICAL TESTS. CORRELATION WITH URINARY METABOLITES, O.J. Rafaelsen; P. Bech; J. Christiansen; L. Rafaelsen, Psychopharmacology, Sexual Disorders, and Drug Abuse, T.A. Ban, ed., p689-91, Amsterdam: North Holland Publishing Co. (1973)

Eight male subjects between the ages of 21 and 29 in good physical and psychic health participated in a double-blind study of the effect of cannabis and alcohol on driving performance in a car simulator and in a series of psychological tests. Subjects received each of the following treatments over a three-month period: placebo; cannabis baked into small brown cakes in amounts of 200, 300, or 400 mg of a resin containing 4% delta-9-THC; or alcohol (70g) leading to blood alcohol concentrations of approximately 100 mg/100 ml one hour after ingestion.

In the simulated car driving test, both cannabis and alcohol influenced average brake time and start time. The subjects' estimations of time and distance showed a much stronger effect from cannabis than from alcohol. The effects of cannabis were more marked on subjective than on objective estimations.

Memory and concentration tests showed that the effects of cannabis and of alcohol on cognitive functions were qualitatively alike although quantitative differences were found in some tests. Dose-response effects of cannabis were seen on behavioral and phenomenological aspects. Therefore, cannabis has pronounced effects on skills and judgments essential for driving. A comparison of the results of the mood questionnaire and the objective rating showed a marked agreement between subjects and experiments as to quality of intoxication for alcohol; however, there was less agreement for marijuana intoxication.

It is to be concluded that cannabis and alcohol produce two different kinds of intoxication. (HSRI)

0 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Nonbarbiturates: ethanol (ethyl alcohol). Driving Simulator. Experimentation: Acute Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Dose-Effect Study. Psychological Testing.

UM-73-D0776

THE EFFECTS OF DELTA-9-THC ON SIMULATED DRIVING PERFORMANCE, D. Ladewig; V. Hobi, Psychopharmacology, Sexual Disorders, and Drug Abuse, T.A. Ban, ed., p693-8, Amsterdam: North Holland Publishing Co. (1973)

Fifty-four healthy subjects of both sexes without previous experience with cannabis were examined in a double-blind study. Inactive placebo or 350, 500, or 450 micrograms/kg delta-9-THC were administered in identical capsules. Four testing sessions were held: before administration; one hour after administration; four hours after; and eighteen to twenty-two hours after. The investigation included measurement of sublingual temperature, a self-reassessment scale, a scale for somatical complaints, a personality inventory, a subjective report, and a battery of tests measuring some parameters of driving capacity. The battery consisted of a series of performance and perception tests including two tapping tests, a tracking apparatus task, a compensation device task, a figure field test, and the Exner-Spiral test.

Results showed significant differences between the subjects receiving placebo and those receiving THC, regardless of dosage. In the tapping test, which measured stress, a decrement in nearly every test session was evident. Likewise, in the tracking test, the THC group was affected negatively in complex situations which dealt with multiple stimuli. A prolonged reaction time was found along with an increased number of reaction errors. In the Exner-spiral test no significant differences were found between the performances of the placebo and THC group. However, in using a compensation device in which the subject was required to balance a ball, the THC group displayed retardation, less control, and a less steady performance when compared to the placebo group. (HSRI)

7 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Driving Simulator. Experimentation: Acute Dosage Study. Experimentation: Dose-Effect Study. Psychological Testing. Psychomotor Tests. Self-Evaluation of Drug Effects by Subjects.

UM-75-D0777

THE EFFECT OF GRANDAXIN ON LORRY DRIVERS, J. Gerevich; K. Bolla; K. Toth; J. Sebo, Therapia Hungarica, v23 n4 p143-6 (1975)

Most of the literature concerning drugs and driving deals with the deleterious effect of drugs. Very little literature, however, deals with the symptom-relieving effects of drugs, though such effects could increase the safety of road users with medical conditions.

The effects of Grandaxin(R) (tofizopam) have been investigated in a study with a double-blind cross-over design. Experimental subjects were sixty-one experienced male professional drivers between the ages of nineteen and twenty-five. Either 50 mg tofizopam or placebo was administered in identical form in three daily tablets for two ten-day periods. Each subject then drove a truck in the presence of an escort who evaluated the driver's performance. The concentration ability and alertness of drivers were controlled by Bourdon's test and a counting down test. The results were statistically evaluated.

These values suggests that Grandaxin(R) influences beneficially the safe driving skill of motor drivers and increases their concentration ability and alertness. Tofizopam does not impair the alertness and concentration ability and does not prolong reaction time. Although it has no muscle relaxant effect, it is likely to relieve anxiety and difficulties in judgment due to nervous tension, both of which are responsible for a great number of accidents. (AAM)

31 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): tofizopam. Clinical Study. Experimentation: Chronic Dosage Study. Open Road Driving. Psychological Testing. Self-Evaluation of Drug Effects by Subjects.

UM-74-D0778

ARZNEIMITTEL AND VERKEHRSSICHERHEIT [DRUGS AND TRAFFIC SAFETY], H. Lewrenz, Zeitschrift fur Allgemeinmediza, v50 n17 p787-91 (20 Jun 1974)

The effects and side effects of certain drugs, including hallucinogenic agents and substances that lead to dependence and endanger safety in road traffic, are discussed. Physicians are encouraged to keep in mind the particular dangers of therapeutic drugs when advising patients. Recommendations concerning the prescribing of drugs and their possible effects on driving ability are made. Several drug classes are discussed with reference to traffic safety. (HSRI)

0 refs German

KEYWORDS: Review: Drugs and Highway Safety.

UM-74-D0779

PSYCHOMOTOR TEST PERFORMANCE WITH A FENFLURAMINE-AMPHETAMINE COMBINATION, C.C. Brown; D.R. McAllister; I. Turek, Journal of Clinical Pharmacology, p369-76 (Jul 1974)

This study tested the hypotheses that: (1) amphetamine increases speed and decreases accuracy of most psychophysiological test performances; (2) fenfluramine decreases scores on such performances; and (3) a combination of the two drugs will produce performances lying between these two extremes. Twenty-four normal, nonobese subjects, twelve male and twelve female, were administered a battery of ten psychomotor tests on five consecutive days. Tests included tapping rate, critical flicker fusion reaction time, digit symbol test, card sorting, crossout tests, salivary output, and time estimation. Subjects were tested before drug administration and at 45, 90, 150, and 210 minutes after. Four treatments were used: 10 mg dextroamphetamine, 30 mg fenfluramine, a combination of the two doses, and a placebo.

Findings revealed significant differences on six out of the ten tests, usually between dextroamphetamine and placebo. In most cases these differences were due to the differences between the dextroamphetamine-induced increases in speed or quantity of performance. Fenfluramine alone did not significantly differ from placebo on any test. The combination of drugs produced performance similar to that of dextroamphetamine alone. (AAM)

10 refs

KEYWORDS: Anorectic (Appetite Control) Agents: dextroamphetamine. fenfluramine. Stimulants: dextroamphetamine. Sympathomimetic (Adrenergic) Agents: dextroamphetamine. fenfluramine. Experimentation: Study of Combined Effects of Drugs. Psychological Testing. Psychomotor Tests.

UM-75-D0780

THE EFFECT OF CAFFEINE ON HUMAN PERFORMANCE, ALONE AND IN COMBINATION WITH ETHANOL, H.M. Franks; H. Hagedorn; V R. Hensley; W.J. Hensley; G.A. Starmer, Psychopharmacologia, v45 p177-81 (1975)

The effect of caffeine (300 mg/70 kg) on cognitive, perceptual, and motor functions was investigated both alone and in combination with ethanol (0.75 g/kg) in sixty-eight healthy student volunteers of both sexes between the ages of 20 and 28 years.

Before testing a Braun cannula was inserted into a forearm vein of each subject and 10 ml of blood was withdrawn. The test battery was then administered which consisted of standing steadiness, simple and complex reaction time,manual dexterity, numerical reasoning, perceptual speed, and verbal fluency before drug treatment. Subjects were then given beverages consisting of ethanol and caffeine; ethanol and caffeine placebo; ethanol placebo and caffeine; or ethanol placebo and caffeine placebo. Twenty minutes after drinking, the test battery was repeated and at the midpoint of the sequence 10 ml of venous blood was again withdrawn. This procedure was repeated twice at hourly intervals.

A peak plasma ethanol concentration of 92 ± 4 mg/100 ml occurred at forty minutes; the concentration of ethanol was not modified by caffeine. Caffeine did not antagonize the ethanol-induced decrement in performance except in reaction time tests. Caffeine did significantly antagonize the ethanol induced increase in simple auditory, simple visual, and complex reaction time. Caffeine alone tended to reduce simple auditory and complex reaction time, but had no effect on simple visual reaction time. Caffeine alone caused a significant increase in body sway at 40 minutes and a decrease in performance in the numerical reasoning test at 40 minutes.

From these results it is apparent that there is no clear pattern of antagonism of the ethanol induced performance decrements by caffeine. There may be an inherent and unsuspected danger in the consumption of an allegedly sobering cup of coffee since the driver might feel more alert, yet remain unaware of a continuing impairment of motor coordination. (JAM)

16 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol)*. Stimulants: caffeine*. Epidemiologic Research: Drug Concentrations in Body Fluids. Experimentation: Comparison of Different Drugs. Experimentation: Study of Combined Effects of Drugs. Psychological Testing. Psychomotor Tests.

UM-75-D0781

MARIJUANA-PRODUCED IMPAIRMENTS IN COORDINATION: EXPERIENCED AND NONEXPERIENCED SUBJECTS, S.L. Milstein; K. MacCannell; G. Karr; S. Clark, The Journal of Nervous and Mental Disease, v161 n1 p26-31 (1975)

The effects of marijuana and placebo on perceptual-motor coordination, motor ability, and visual perception were compared in cannabis-experienced and naive subjects. Sixteen males and females who were experienced users and sixteen males and females who had never used cannabis received 600 mg of marijuana (1.3% delta-9-THC) or placebo on two different occasions, seven days apart. Each group of sixteen subjects contained eight males and eight females selected at random on the basis of age and education from a pool of 1,500 normal volunteers in a large Canadian city. The experienced subjects ranged in age from 21 to 42 years, while naive subjects ranged in age from 25 to 59 years.

Fifteen minutes after smoking marijuana or placebo, the subjects were tested. The battery of tests included the following: perceptual motor tasks (the horizontal and vertical groove and the hand maze task); motor tasks (finger and toe tapping); a visual recognition task; and subjective measures.

Results showed that for each of the perceptual motor measures, subjects under the marijuana condition showed a postsmoking decrement in performance relative to their performance under the placebo condition. In addition to this drug effect, significant interactions between the drug and experience factor were found in the number of errors and in total contact time on the maze task, and in number of errors on the steadiness task. The experienced group almost always produced more errors. No statistically significant changes in performance were observed on either measure of motor performance or on the visual recognition task.

These data strongly support the conclusion that a moderate dose of marijuana produces an acute impairment of perceptual-motor tasks that is greater in experienced than in nonexperienced subjects and that is greater for more difficult tasks than for easier tasks. This suggests that behaviors requiring higher order integration or processing are greatly impaired by acute marijuana intoxication while simpler behaviors requiring limited processing are minimally affected. Intoxicated individuals should, therefore, avoid tasks that require good coordination or cognitive processes. (HSRI)

10 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Experimentation: Acute Dosage Study. Other Factors Influencing Drug Effects. Psychomotor Tests. Tests of Sensory Function.

UM-75-D0782

RECOVERY AND SKILLS RELATED TO DRIVING AFTER INTRAVENOUS SEDATION: DOSE-RESPONSE RELATIONSHIP WITH DIAZEPAM, K. Korttila; M. Linnoila, British Journal of Anaesthesia, v47 p457-63 (1975)

Skills related to driving including the ability to discriminate the fusion of flickering light and hand and foot propioception were measured double-blind in thirty healthy male and four female volunteers before and after three doses of diazepam in quantities of 0.15, 0.30, or 0.45 mg/kg injected at a rate of 5 mg/min. Reactive skills, coordinative skills, attention, critical fusion frequency, and drug concentrations in the serum were measured before injection and at four,six,eight, and ten-hour intervals.

No impairment of performance on any test was measurable at six hours after 0.15 mg/kg or at ten hours after 0.30 or 0.45 mg/kg of diazepam. There were large interindividual variations in serum concentrations of diazepam for each dose level. The observed increases in serum concentration of diazepam after the intake of food support the concept of an enterohepatic cycle for diazepam. It was concluded that patients should not drive or operate machinery for at least six hours after 0.15 mg/kg of intravenous diazepam or for at least ten hours after 0.30 mg/kg and 0.45 mg/kg. (JAM)

24 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam*. Muscle Relaxants (Central): diazepam*. Drug Concentrations in Body Fluids: Chronic Dose Study. Experimentation: Chronic Dosage Study. Experimentation: Dose-Effect Study. Psychological Testing. Psychomotor Tests. Tests of Sensory Function.

UM-74-D0783

SKILLS RELATED TO DRIVING AFTER INTRAVENOUS DIAZEPAM, FLUNITRAZEPAM OR DROPERIDOL, K. Korttila; M. Linnoila, British Journal of Anaesthesia, v46 p961-9 (1974)

This study attempted to provide objective data concerning impairment of driving skills in patients given diazepam, flunitrazepam, or droperidol. Skills related to driving and the ability to discriminate the fusion of flickering light were measured double-blind in sixty-two healthy student volunteers, including twelve females and fifty males. Tests were administered before and four, six, eight, and ten hours after intravenous injection of diazepam (0.3 mg/kg), flunitrazepam (0.03 mg/kg), or droperidol(5 mg) alone or in combination with pethidine (1 mg/kg) or fentanyl (0.2 mg). The doses of diazepam and flunitrazepam were halved in those subjects given pethidine but the dose of droperidol was the same with or without fentanyl.

Impairment by droperidol in almost all tests (cumulative reaction time, coordination tests, attention, and critical flicker fusion frequency) continued for up to ten hours after injection. Droperidol proved more deleterious than the benzodiazepines. Flunitrazepam impaired flicker fusion discrimination and coordination for up to ten hours. Diazepam impaired flicker fusion discrimination and coordination for up to six hours. The doses of narcotic analgesics used here did not enhance the effect of other drugs on performance in the tests used.

It is concluded that patients should not drive or operate machinery for ten hours after intravenous injections of diazepam and for twenty-four hours after flunitrazepam and droperidol. No deleterious effects of narcotic analgesics on psychomotor performances were detected in the present study. (JAM)

33 refs

KEYWORDS: Major Tranquilizers (Antipsychotics and Neuroleptics): droperidol*. Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam*. Muscle Relaxants (Central): diazepam*. Nonbarbiturates: flunitrazepam*. Drug Concentrations in Body Fluids: Acute Dose Study. Experimentation: Acute Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Study of Combined Effects of Drugs. Psychological Testing. Psychomotor Tests. Tests of Sensory Function.

UM-75-D0784

PSYCHOMOTOR SKILLS RELATED TO DRIVING AFTER INTRAMUSCULAR ADMINISTRATION OF DIAZEPAM AND MEPERIDINE, K. Korttila; M. Linnoila, Anesthesiology, v42 n6 p685-91 (Jun 1975)

Psychomotor skills related to driving and the ability to discriminate the fusion of flickering light were measured in a double-blind cross-over fashion in eleven healthy volunteers(eight men and three women) in order to provide objective data concerning the impairment of these skills after intramuscular administration of diazepam and meperidine. Testing was done before and one,three,five, and seven hours after intramuscular injection of saline solution, 10 mg diazepam, or 75 mg meperidine. Longer

term effects of meperidine were tested in five other subjects twelve and twenty-four hours after the injection.

The effects of diazepam were the most harmful to coordinative and reactive skills, which were significantly impaired for as long as five hours. Meperidine impaired reactive skills for as long as three hours and flicker-fusion discrimination and coordinative skills for as long as twelve hours. It is concluded that patients should not drive or operate machinery for at least seven hours after receiving 10 mg diazepam intramuscularly and for twenty-four hours after receiving 75 mg meperidine intramuscularly.

Diazepam administered intramuscularly is commonly used as a preanesthetic medication and is used for outpatient procedures and dentistry. Because of the possibility of syncope after intramuscular administration of meperidine and because of the prolonged impairmentof psychomotor skills the drug should not be used in ambulatory practice. (JAM)

24 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam*. Muscle Relaxants (Central): diazepam*. Opiates and Related Agents: pethidine*. Drug Concentrations in Body Fluids: Acute Dose Study. Experimentation: Acute Dosage Study. Experimentation: Comparison of Different Drugs. Psychomotor Tests. Tests of Sensory Function.

UM-75-D0785

MARIHUANA AND SETTING, L.E. Hollister; J.E. Overall; M.L Gerber, Archives of General Psychiatry, v32 p798-801 (Jun 1975)

The present study was designed to test the influence of environmental settings on the marijuana experience by using marijuana and placebo in two different environmental conditions. Twelve normal male subjects were each tested on four occasions over a two-week period. They were tested for subjective response 30, 60, 120, and 180 minutes after smoking marijuana containing 19 mg THC and placebo administered in the form of cigarettes. Two trials, one with placebo and one with active drug, were conducted in each of the two settings employed. One setting, designed to maximize the favorable aspects of drug experience, was in a private home with mystical pictures, incense, and music. The unfavorable or neutral environment consisted of austere laboratory rooms crowded with medical equipment. Two quantifiable self-report measurements, the linear euphoriant scale and the card-sort version of the Addiction Research Center Inventory (marijuana and hallucinogen scales), were the major reporting criteria.

Analyses of variance consistently demonstrated that marijuana effects are principally determined by the drug and the subject to whom it is given and that the actual conditions under which the drug is administered do not greatly alter the effects. From this one may conclude that firstly, for research purposes, studies done in a neutral environment are not likely to be misleading with regard to the pharmacological effects that marijuana produces. Secondly, marijuana is clearly a drug that can be distinguished from a placebo. Thirdly, the subjects taking marijuana determine to a major degree those drug effects that they report experiencing. (JAM)

5 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Experimentation: Chronic Dosage Study. Other Factors Influencing Drug Effects. Psychological Testing. Self-Evaluation of Drug Effects by Subjects.

UM-74-D0786

THE RESIDUAL EFFECTS OF N-DESMETHYLDIAZEPAM IN PATIENTS, M. Tansella; C. Zimmermann-Tansella; M. Lader, Psychopharmacologia, v38 p81-90 (1974)

Sixty anxious inpatients complaining of insomnia were treated with N-desmethyldiazepam (10 or 20 mg), 200 mg of amylobarbitone sodium, or placebo, in order to assess the hypnotic and residual effects of the drugs. The subjects were both male and female ranging in age from ten to sixty-three years. The hypnotic effects of these treatments were assessed by self-rating, psychiatrists' ratings, and night nurses' observations before treatment, after one night's treatment, and after a week of treatment. The residual effects of the treatment were estimated twelve hours after ingestion using a

series of cognitive and motor tasks including tests of simple auditory reaction time, card sorting, digit symbol substitution, Gibson Spiral Maze, and tapping rate.

No significant differences among treatments were found after one night. After the week of treatment, the benzodiazepine groups had achieved the best quality of self-rated sleep with fewest subjective feelings of hang-over. Some improvement in performance was found over time for all groups. However, on two motor tests, the higher dose of N-desmethyldiazepam was associated with some impairment relative to placebo.

In practical clinical terms, N-desmethyldiazepam in doses of 10 or 20 mg at night has useful effects in treating insomnia in anxious inpatients. The long plasma halflife seems to be an advantage in these circumstances. Anxiolytic effects were not detectable in the short term. Its clinical usefulness in other groups of patients and for symptoms other than insomnia needs further investigation. (JAM)

115 refs

KEYWORDS: Metabolites of Drugs and Other Agents: N-desmethyldiazepam. Minor Tranquilizers (Anti-Anxiety and Ataractics): N-desmethyldiazepam. Clinical Study. Experimentation: Chronic Dosage Study. Experimentation: Dose-Effect Study. Psychological Testing. Psychomotor Tests. Self-Evaluation of Drug Effects by Subjects.

UM-74-D0787

AMPHETAMINE EFFECTS IN MAN: PARADOXICAL DROWSINESS AND LOWERED ELECTRICAL BRAIN ACTIVITY (CNV), J.J. Tecce; J.O. Cole:, Science, v185 p451-3 (2 Aug 1974)

Twenty normal adults were given ten milligrams of dextroamphetamine in a double-blind experiment that attempted to demonstrate the effects of amphetamines on the contingent negative variation (CNV). CNV is an event-related electrical brain wave which is an indicator of alertness. Unexpectedly, the drug produced a transient state of drowsiness accompanied by lowered electrical brain activity in the first hour after administration in thirteen subjects. Drug or placebo were given in two different sessions. Eighteen runs of a simple reaction time test were performed during three hours posttreatment. Electroencephalographic recordings and vertical eye movements were recorded during this period.

During the first hour after administration, seven individuals exhibited clear behavioral alertness, verbalized feelings of excitement and euphoria, and showed elevated CNV amplitude. Thirteen subjects (65%) became drowsy and dozed off during testing. Both groups of subjects showed heightened alertness two and three hours postdrug. Therefore dextroamphetamine was found not to be a simple stimulant of the central nervous system, but also a depressant. The use of amphetamine as an antifatigue agent in sedentary situations such as sustained motor vehicle operation can produce a dangerous transient lethargy, particularly in individuals in whom CNV has a slow rise time. The doctrine of psychopharmacology which describes dextroamphetamine solely as a centrally acting stimulant requires review. (JAM)

18 refs

KEYWORDS: Anorectic (Appetite Control) Agents: dextroamphetamine. Stimulants: dextroamphetamine. Sympathomimetic (Adrenergic) Agents: dextroamphetamine. Experimentation: Acute Dosage Study. Physiological Testing. Psychomotor Tests.

UM-77-D0788

THE EFFECT OF SMOKING ON RISK-TAKING IN A SIMULATED PASSING TASK, T.R. Schori; B.W. Jones, Human Factors, v19 n1 p37-45 (Feb 1977)

Smokers are reportedly involved in traffic accidents more frequently than nonsmokers. One possible explanation offered in the literature is that smokers may take more risks (or may be less accurate at evaluating risks) than nonsmokers. To explore this possibility, forty-five college students (twenty-four males and twenty-one females) ranging in age from 18 to 29 years were required to perform a simulated car passing task--a task which, in actual driving situations, may be fraught with risk. There were fifteen subjects in each of three smoking conditions: nonsmoker, smoker deprived, and smoker. Ratios were equal for all conditions.

Performance data for the simulated car-passing test was collected for response latency, number of pass attempts, number of backout attempts, number of successful passes, number

of crashes, and the amount of time not immediately behind the lead vehicle or in a crash condition.

No significant differences were detected as a function of the smoking condition. Therefore it was concluded that nonsmokers, smokers deprived, and smokers did not differ either in their willingness to take risks or in the accuracy with which they were able to evaluate risk. (JAM)

16 refs

KEYWORDS: Driving Simulator.

UM-77-D0789

RECOVERY, PSYCHOMOTOR SKILLS, AND SIMULATED DRIVING AFTER BRIEF INHALATIONAL ANESTHESIA WITH HALOTHANE OR ENFLURANE COMBINED WITH NITROUS OXIDE AND OXYGEN, K. Korttila; T. Tammisto; P. Ertama; P. Pfaffli; E. Blomgren; S. Hakkinen, Anesthesiology, v46 n1 p20-7 (Jan 1977)

The present study was conducted to examine clinical recovery and psychomotor and driving skills after short-duration anesthesia. Recovery from anesthesia was assessed in a controlled manner in thirty-four healthy student volunteers (six of whom were female). Behavioral tests included a psychomotor test battery administered one and five hours after anesthesia, and a driving simulator used two, four, five, and seven hours after anesthesia. Subjects were anesthetized for 3.5 minutes with halothane or enflurane combined with nitrous oxide and oxygen.

Psychomotor performances remained significantly ($P<0.05$ to $P<0.001$) worse than in an unanesthetized control group for five hours after both halothane and enflurane. However, impairment of driving skills four and one-half hours after anesthesia was measurable only after halothane ($P<0.05$). It is concluded that after even brief periods of halothane or enflurane anesthesia patients should not drive or operate machinery for at least seven hours. The magnitude and durations of the residual effects of both agents on psychomotor performance were, however, less than those previously found after thiopental, methohexital, or diazepam. Anesthesia with halothane or with the enflurane, nitrous oxide, and oxygen should be preferred when brief outpatient general anesthesia is needed. (JAM)

34 refs

KEYWORDS: General Anesthetics: enflurane. halothane. Driving Simulator. Experimentation: Acute Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Study of Combined Effects of Drugs. Psychomotor Tests.

UM-76-D0790

EFFECT OF CHLORPROMAZINE OR SULPIRIDE AND ALCOHOL ON PSYCHOMOTOR SKILLS RELATED TO DRIVING, T. Seppala, Archives Internationales de Pharmacodynamie et de Therapie, v223 n2 p311-23 (Oct 1976)

A double-blind cross-over trial was conducted with twenty healthy students (eleven male and nine female) aged 19 to 25 years for the evaluation of the subacute effects of chlorpromazine (CPZ) and sulpiride in oral doses used for anxious outpatients on psychomotor skills related to driving. 10 mg CPZ was given orally for seven days and then in a dose of 20 mg t.i.d. for seven more days; sulpiride was administered in an oral dose of 50 mg t.i.d. during the entire fourteen-day period. Psychomotor performance was measured on the seventh and fourteenth days of treatment at 30, 90, and 150 minutes after the intake of 0.5 g/kg of an alcoholic or placebo drink.

After the neuroleptics alone, reaction and coordination skills, but not attention, were slightly impaired, CPZ differing significantly from the placebo on the fourteenth day. Both drugs interacted additively with alcohol. The combined administration of CPZ and alcohol led to inaccuracy, a slowing of reactions, and impaired proprioception and coordination. The combination of sulpiride and alcohol increased the error rate in the choice reaction test and impaired coordination in the coordination test driven at a free speed.

It is concluded that the psychomotor decrement that occurs after two weeks of treatment with small doses of CPZ may affect the ability to control a motor vehicle. The concurrent administration of alcohol during treatment with CPZ or sulpiride may cause some extra risk in traffic or occupational activities. (JA)

29 refs

KEYWORDS: Anti-Emetics: chlorpromazine. Major Tranquilizers (Antipsychotics and Neuroleptics): chlorpromazine. sulpiride. Nonbarbiturates: ethanol (ethyl alcohol). Experimentation: Chronic Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Study of Combined Effects of Drugs. Psychomotor Tests. Tests of Sensory Function.

UM-76-D0791

MODIFICATION BY DIAZEPAM OR THIORIDAZINE OF THE PSYCHOMOTOR SKILLS RELATED TO DRIVING: A SUBACUTE TRIAL IN NEUROTIC OUT-PATIENTS. I. Saario; M. Linnoila; M.J. Mattila, British Journal of Clinical Pharmacology, v3 n5 p843-8 (Oct 1976)

Twenty-nine female and sixteen male out-patients aged 20 to 40 years with acute neurotic anxiety were selected from a population of ambulatory patients of psychiatric clinics. The patients were divided into three groups matched for sex and age.

The psychomotor tests included tests for reactive skills, coordination skills, divided attention, proprioception, and flicker fusion. The test battery was given to each subject 30, 90, and 150 minutes after the second daily administration on the first and fourteenth days. Drug levels in plasma were measured in the acute phase and on the seventh and fourteenth days of trial.

When compared with placebo, diazepam increased the number of mistakes in reaction and coordination tests and also decreased ability to discriminate fusion of flickering light. When compared to other groups, reactive and coordinative skills were more impaired in patients treated with thioridazine, which also impaired divided attention. There are individual variations in psychomotor responses to treatment with diazepam and thioridazine, but patients should be warned of the possible deleterious effects. In this study thioridazine in the doses used impairs driving skills more than diazepam does and is subjectively less effective treatment. (JAM)

19 refs

KEYWORDS: Major Tranquilizers (Antipsychotics and Neuroleptics): thioridazine. Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Clinical Study. Experimentation: Chronic Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Dose-Effect Study. Psychomotor Tests.

UM-76-D0792

RESIDUAL EFFECTS AND SKILLS RELATED TO DRIVING AFTER A SINGLE ORAL ADMINISTRATION OF DIAZEPAM, MEDAZEPAM OR LORAZEPAM, T. Seppala; K. Korttila; S. Hakkinen; M. Linnoila, British Journal of Clinical Pharmacology, v3 n5 p831-41 (Oct 1976)

Psychomotor skills and visual functions related to driving were measured in double-blind cross-over experiments in six men and four women, all in good health. They were tested before and one, three, five, and seven hours after a single oral administration of diazepam (10 mg), medazepam (15 mg), lorazepam (2.5 mg),or placebo. The long-term effects of lorazepam were tested in seven other subjects twelve and twenty-four hours after administration. Each subject was given the choice reaction test, flicker fusion test, three tests of visual function, the Bourdon-Wiersma test, a subjective self-assessment, and tests for drug levels in serum.

Lorazepam impaired almost all the measured skills more ($p<0.05$ to 0.001) than diazepam, medazepam, or placebo. The lorazepam impairment of reactive skills and flicker fusion discrimination remained statistically significant ($P<0.05$) for as long as twelve hours. Medazepam impaired only reactive skills and flicker fusion, the latter remaining impaired ($p<0.05$) for as long as five hours after administration. The magnitude and duration of the effects of diazepam were intermediate between those of lorazepam and medazepam. Diazepam impaired perceptual speed and reactive and coordinative skills as well as flicker fusion discrimination and visual parameters related to driving. Slight impairment in driving skills was measurable for up to five hours after diazepam administration, but at seven hours results resembled those measured after the placebo.

It is concluded that patients receiving a 2.5 mg dose of lorazepam should not drive or operate machinery for twenty-four hours after drug administration. After diazepam (10 mg) or medazepam (15 mg) patients should refrain from driving or participating in skilled performances for at least five to seven hours. (JAM)

41 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam*. lorazepam*. medazepam*. Muscle Relaxants (Central): diazepam*. Drug Concentrations in Body Fluids: Acute Dose Study. Experimentation: Acute Dosage Study. Experimentation: Comparison of Different Drugs. Psychological Testing. Psychomotor Tests. Self-Evaluation of Drug Effects by Subjects. Tests of Sensory Function.

UM-75-D0793

CAUSAL CHAINS: ATTRIBUTION OF RESPONSIBILITY AS A FUNCTION OF IMMEDIATE AND PRIOR CAUSES, P. Brickman; K. Ryan; C.B. Wortman, Journal of Personality and Social Psychology, v32 n6 p1060-7 (1975)

The present study investigated the importance of causal chains in attributions of responsibility for an accident. Specifically, the experiment explored the relative importance of the immediate cause of an event versus the prior cause of the cause. Seventy-two male and seventy-two female undergraduates each read an insurance company accident report in which the immediate cause of the accident (internal or external to the driver), the prior cause of the cause (internal, external, or none specified), and the particular accident (four versions) were experimentally manipulated. One of these versions dealt with an accident in which the driver dozed off because he had either gone without sleep the night before or because his friend had given him a sleeping pill instead of a No-doze tablet. Cause of the accident may have been his dozing off and losing control of the vehicle, or the cause may have been the blow out of a tire, which blew out either because the car ran over broken glass or the driver had neglected to take care of his tires.

The majority of the subjects judged a prior cause opposite to the immediate cause to reverse the effects of the immediate cause. Internal causes were more diagnostic of the likelihood of an accident rather than more important, while in external chains prior causes were rated as more important. Since the effects of internal and external immediate causes can be cancelled by specifying opposite prior causes, it is suggested that the question of internal-external attribution has an ambiguity whose resolution depends in part on how far back in time the chain is traced. (JAM)

23 refs

KEYWORDS: Crash Investigation.

UM-77-D0794

THE EFFECTS OF TWO ANTIDEPRESSANTS, IMIPRAMINE AND VILOXAZINE, UPON DRIVING PERFORMANCE, A.B. Clayton; P.G. Harvey; T.A. Betts, Proceedings of the 7th International Conference on Alcohol, Drugs, and Traffic Safety, Melbourne, Australia, p1-12 (Jan 1977)

This study was designed to compare the effects of two antidepressants--imipramine, a tricylic compound; and viloxazine, a new nontricylic compound--upon a number of driving tasks. Forty male volunteers (18-29 years of age) were randomly allocated on a double-blind basis to one of four treatment groups: imipramine (25 mg t.d.s.); viloxazine(50 mg t.d.s.); placebo; or control (no tablets). Each drug was taken three times a day for a period of seven days. Testing was carried out on day 1, before drug administration; on day 5, two hours after the first dose; day 7, after seven doses; and day 12, after twenty-one doses. Each subject was tested for kinetic visual activity, driving ability on a simulator, ability to maneuver at low speeds, and risk taking.

The results of this study suggest that semichronic administration of clinical doses of imipramine to normal healthy males results in a deterioration in performance on a number of basic driving skills when compared to placebo or control. Imipramine appears to increase the level of risk acceptable to the individual or, conversely, to reduce normal caution. This effect was shown both in the gap acceptance task and the weaving task. If this effect were to be transferred from the simulated test situation to actual driving performance on the road, then an increase in the risk of accident-involvement would occur. Viloxazine, on the other hand, differed little from placebo and control. (HSRI)

10 refs

KEYWORDS: Antidepressants: imipramine. viloxazine. Closed Course Driving. Experimentation: Chronic Dosage Study. Experimentation: Comparison of Different Drugs. Psychological Testing. Psychomotor Tests. Tests of Sensory Function.

UM-74-D0795

DELTA-9-TETRAHYDROCANNABINOL AND SOME CNS DEPRESSANTS: EVIDENCE FOR CROSS-TOLERANCE IN THE RAT, L.M. Newman; M.P. Lutz; E.F. Domino, Archives Internationales de Pharmacodynamic et de Therapie, v207 n2 p254-9 (Feb 1974)

Presented here is evidence for the theory that the cross-tolerance seen between delta-9-THC and ethyl alcohol is also seen with pentobarbital, a well-known sedative-hypnotic. Rats trained in a one-way shock avoidance situation were made tolerant to the depressant effects of delta-9-tetrahydrocannabinol by being given the drug daily at a dosage of 20 mg/kg, i.p. Ethyl alcohol (3.2, 3.65, and 4.23 g/kg) and pentobarbital (17.8 mg/kg) did not greatly affect tolerant rats. Morphine (17.8 and 32.0 mg/kg), chlorpromazine (10.0 and 32.0 mg/kg), and pentobarbital (32.0 mg/kg) significantly depressed the behavior of tolerant and nontolerant rats in the avoidance situation.

In addition, rats were trained to press on a F12 schedule for water reinforcement. These animals also showed tolerance to delta-9-THC and cross-tolerance to 1.0 g/kg of ethyl alcohol. Larger doses of alcohol, however, completely suppressed responding and hence no cross-tolerance to delta-9-THC was observed.

It was concluded that the cross-tolerance seen is due to the drugs themselves and limited to sedative hypnotic agents in low doses. Cross-tolerance is not a function of the behavioral testing situation but the drug-test interaction may occur in the dose range where the cross-tolerance is found. (JAM)

3 refs

KEYWORDS: Anti-Emetics: chlorpromazine. Barbiturates: pentobarbital. Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Major Tranquilizers (Antipsychotics and Neuroleptics): chlorpromazine. Nonbarbiturates: ethanol (ethyl alcohol). Opiates and Related Agents: morphine. Animal Research. Experimentation: Comparison of Different Drugs.

UM-75-D0796

ALCOHOL AND ITS DRUG INTERACTIONS, F.A. Seixas, Annals of Internal Medicine, v83 p86-92 (1975)

This paper reviews recent literature dealing with drug-alcohol interactions of clinical importance. Alcohol interacts with a surprising number of commonly used drugs: antibiotics, diuretics, heavy metals, insulin, iron, puromycin C, and many others. It also interacts specifically with sedatives, opiates, phenothiazines, antidepressants, and other psychoactive drugs. Topics discussed in this paper include the absorption, metabolism, and synergistic effects of alcohol and other drugs; metabolic changes; secondary consequences of alcohol metabolism that affect the action of other drugs; interactions of alcohol and other psychoactive drugs on the central nervous system; and drug interactions with congeners found in alcoholic beverages.

In advising patients about avoiding the use of alcohol while using prescription drugs, the physician needs some indication of the amount of alcohol the patient usually drinks. The physician should determine whether impulsive drinking or chronic dependency on alcohol may interfere with a patient's compliance with his directions. The physician must also be alert to the pharmacologic differentiations among the inebriated person; the apparently sober, middle class, chronically alcohol-dependent person; the obtunded and retarded or comatose person with an overdose of alcohol; and that same person some hours later with the extreme psychomotor agitation of alcohol withdrawal. For many moderate drinkers, the knowledge that so many important drug interactions exist may encourage the physician to advise caution in all drinking whenever other drugs have been prescribed. (HSRI)

89 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drug Effects.

UM-76-D0797

THE SIGNIFICANCE OF DRUG INTERACTIONS IN THE EVALUATION OF PSYCHOTROPIC DRUGS, R.A. Braithwaite, British Journal of Clinical Pharmacology, Suppl. p29-34 (1976)

This paper discusses the problem of drug interactions, particularly in the field of psychiatric medicine. Some interactions of psychotropic preparations are clinically

important and fortunately are now well recognized by clinicians. Several of these are examined briefly.

Despite many studies, there is no complete assessment of the overall significance of drug interactions in clinical psychiatric practice. In the treatment of depression in general practice and in hospital outpatients, polypharmacy seems to be the rule rather than the exception. The overall clinical significance of these interactions in the practical treatment of complex illnesses like depression is difficult, if not impossible, to assess.

Other important factors influencing clinical response and possible drug interactions must also be considered. There is great interindividual variability in the rates of tricylic antidepressant metabolism; these differences may be determined genetically. Furthermore, a large proportion of patients may not take their medication as prescribed. Finally, those drugs which are potent inducers of hepatic microsomal enzymes may after extended use cause complications due to enhanced rates of endogenous vitamin and steroid metabolism.

In conclusion, it seems desirable that those patients who require chronic psychotropic medication should receive preparations that are not potent inducers of metabolism. Many of the complications of those interactions influencing rates of drug metabolism could be avoided easily by judicious adjustment of drug dosages and by monitoring drug plasma concentrations during therapy. (HSRI)

33 refs

KEYWORDS: Central Nervous System (CNS) Agents. Review: Drug Effects.

UM-75-D0798

PLASMA LEVELS OF DIAZEPAM AND MOOD RATINGS, M.M. Ghoneim; S.P. Mewaldt; J. Ambre, Anesthesia and Analgesia... Current Researches, v54 n2 p173-77 (Mar-Apr 1975)

This study measured the plasma levels of diazepam and desmethyldiazepam concurrently with their subjectively reported effects in order to determine whether plasma levels can be meaningfully related to various cerebral effects of the drug. Ten healthy male subjects aged 21 to 25 years received 10 and 20 mg doses of diazepam or placebo intravenously at weekly intervals. The plasma levels of the drug and its major metabolite, desmethyldiazepam, were measured and coordinated with answers to a subjective questionnaire. Venous blood samples were taken at 0.5, 1, 1.5, 3, 4, 5, and 8 hours. At 0, 0.5, 2, 6, and 8 hours after treatment a subjective rating test was given. Blood samples were taken from four subjects 24 and 48 hours after the 20 mg injection of diazepam.

After initial rapid decline of the diazepam level, the level and shape of the remaining part of individual plasma curves showed considerable variance. Increases in diazepam levels were minute. Desmethyldiazepam could be measured in some volunteers as early as the 0.5 hour sample, and its concentration in plasma rose throughout the sampling period. Contrary to some previous reports, none of the volunteers reported drowsiness after leaving the laboratory approximately nine hours after injection. There was a significant correlation between the plasma level of diazepam and the mood of some subjects who reported drowsiness, fuzziness, mental slowness, weakness, clumsiness, and laziness. No correlation was found with sedative effects and such other types of feelings as happiness, aggression, boredom, and withdrawal. The authors conclude that there is no reason for undue concern regarding mental depression following discharge from outpatient clinics. (JAM)

11 refs

KEYWORDS: Metabolites of Drugs and Other Agents: N-desmethyldiazepam*. Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam*. N-desmethyldiazepam*. Muscle Relaxants (Central): diazepam*. Drug Concentration-Effect Study: Driving Skill Impairment. Drug Concentrations in Body Fluids: Acute Dose Study. Experimentation: Comparison of Different Drugs. Experimentation: Dose-Effect Study. Self-Evaluation of Drug Effects by Subjects.

UM-74-D0799

DRUG CONCENTRATIONS IN THE PLASMA AS AN INDEX OF PHARMACOLOGIC EFFECT, D. Perrier; M. Gibaldi, Journal of Clinical Pharmacology, v14 n8-9 p415-7 (Aug-Sep 1974)

Discussed here is the relationship existing between the elimination and distribution of drugs which confers upon the body the characteristics of a multicompartment system. Under certain conditions, a change in elimination results in a significant change in drug distribution. If a drug elicits its pharmacologic effect in a body compartment which is kinetically distinct from the plasma, one would anticipate a shift in the effect-versus-log plasma drug concentration relationship for population groups which eliminate drugs rapidly or slowly. For drugs where a change in distribution may accompany a change in elimination, one cannot use plasma drug concentrations alone after a single dose for judging the degree of effect in a given patient. An example of this phenomenon is briefly discussed. Rapid metabolizers of propranolol were found to be more sensitive to propranolol than were slow metabolizers. The authors conclude that this apparent increase in sensitivity to propranolol can be attributed to a difference in distribution which may accompany the observed difference in propranol elimination between two different populations. (AAM)

7 refs

KEYWORDS: Review: Drug Concentration-Effect Relationships.

UM-77-D0800

EFFECTS OF CERTAIN BENZODIAZEPINE DERIVATIVES ON DISORGANIZATION OF THOUGHT AS MANIFESTED IN SPEECH, L.A. Gottschalk, Current Therapeutic Research, v21 n2 p192-206 (Feb 1977)

Typescripts of tape-recorded five-minute samples were obtained before and thirty to three hundred minutes after the administration of single doses of chlordiazepoxide (25 mg orally); lorazepam (3 and 5 mg intramuscularly, and 2 and 5 mg intravenously); trizolam (0.25-2.0 mg orally); flurazepam (30 mg orally); and four weeks after chronic daily doses of diazepam (15 mg orally each day) and lorazepam (3 mg orally each day). Subjects were twenty-six paid volunteer inmates whose average age was 31.4 years. All had been medication free for at least four weeks. They were asked to speak for five minutes about any interesting or dramatic personal experience. The typescripts were scored blindly for form and content changes in cognitive-intellectual function.

All of the benzodiazepine derivatives under all conditions and doses were associated with adverse cognitive effects. Observations included words or remarks that were not understandable or audible as well as incomplete sentences, clauses, and phrases.

Also studied were the effects of a single oral dose of chlordiazepoxide (25 mg) on cognitive function in eighteen chronically anxious patients. Chlordiazepoxide increased the verbal signs of cognitive dysfunction most in the eleven patients whose peak chlordiazepoxide blood levels were 0.70 micrograms per ml or above. Similarly, adverse effects were observed four weeks after chronic daily oral doses of diazepam or lorazepam.

It has been shown elsewhere that the benzodiazepines at the dosage levels employed in this study can produce significant decreases in anxiety and hostility in the content of speech. Whether these antianxiety or antihostility effects are a result of the cognitive disturbance produced by benzodiazepines or are just a concomitant with no causal relationship cannot be ascertained from this data. The present findings, however, imply that the effects of a single dose of benzodiazepine should not be taken lightly. (JAM)

24 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): chlordiazepoxide, diazepam, lorazepam. Muscle Relaxants (Central): diazepam. Nonbarbiturates: flurazepam, triazolam. Clinical Study. Drug Concentration-Effect Study: Clinical Research. Experimentation: Acute Dosage Study. Experimentation: Chronic Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Dose-Effect Study. Psychological Testing.

UM-76-D0801

DISCRIMINABLE EFFECTS OF BENZODIAZEPINES, D.A. Overton, Psychopharmacology Communications, v2 n4 p339-43 (1976)

This paper investigates the discriminable effects of benzodiazepines in rats. In a shock-escape T-maze task, rats rapidly discriminate diazepam, flurazepam, and chlordiazepoxide from no drug. The discriminable effects of these benzodiazepines were

not completely interchangeable with those of barbiturate anesthetics. The dose-response curves for diazepam asymptoted over the range 15 to 100 mg/kg intraperitoneally whereas dose-response curves for flurazepam and chlordiazepoxide were more linear.

Quantitatively, the benzodiazepines are rapidly discriminated, and this suggests that their state dependency effects should be demonstrable in human subjects. However, rapid discrimination is only observed with doses high enough to induce ataxia. By extrapolation, state dependency will only be produced in human subjects by intoxicating doses. (AAM)

6 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): chlordiazepoxide. diazepam. Muscle Relaxants (Central): diazepam. Nonbarbiturates: flurazepam. Animal Research. Experimentation: Comparison of Different Drugs. Experimentation: Dose-Effect Study.

UM-76-D0802

NORTRIPTYLINE PLASMA LEVELS AND THERAPEUTIC RESPONSE, V.E. Ziegler; P.J. Clayton; J.R. Taylor; B.T. Co; J.T. Biggs, Clinical Pharmacology and Therapeutics, v20 n4 p458-63 (1976)

This study attempted to determine an optimal plasma nortriptyline level for treatment of depression. Eighteen depressed outpatients were treated for six weeks with a mean daily dose of 121 mg of nortriptyline. The mean plasma level was 138 ng/ml during treatment. Therapeutic response was monitored by the Zung Self-Rating Depression Scale and the Hamilton Depression Scale administered by two psychiatrists blind to the tricyclic antidepressant used, dose, and plasma level achieved.

Eight patients recovered (Hamilton < 6) by the fourth week and twelve by the sixth week. During the steady state period (weeks four to six), there was a positive correlation between the weekly Hamilton scores and the weekly nortriptyline levels ($p < 0.01$). The nine patients with mean plasma levels between 50 and 139 ng/ml had a better therapeutic response after six weeks measured by percent recovered ($p<0.005$), Zung score($p<0.05$), and Hamilton score ($p<0.025$) than the nine patients with mean plasma levels between 140 and 260 ng/ml. These results support previous findings that the antidepressant effects of nortriptyline deteriorate at higher plasma concentrations. (JAM)

16 refs

KEYWORDS: Antidepressants: nortriptyline*. Clinical Study. Drug Concentration-Effect Study: Clinical Research. Drug Concentrations in Body Fluids: Chronic Dose Study. Experimentation: Chronic Dosage Study. Experimentation: Dose-Effect Study. Psychological Testing.

TRRL Lab. Rep. 761 UM-77-D0803

MALE AND FEMALE CAR DRIVERS: DIFFERENCES OBSERVED IN ACCIDENTS, V.J. Storie (1977)

A study was made of 2,654 car drivers involved in accidents in order to determine driver characteristics of both sexes and the kind of human errors committed. Between March 1970 and February 1974 an 'on the spot' accident investigation team attended the scene of 2,130 road traffic accidents in a 240 square kcm region in South East Berkshire. Photographs were taken, extensive notes were made, and first hand interviews with the road users were obtained.

The analysis showed some significant differences between sexes in the type of accidents and the sort of errors committed. Basically, however, there was little difference in the proportion of males and females who were regarded at fault; the figure being approximately 60% of drivers for both sexes. Proportionately, females had nearly twice (25%) as many errors relating to skill as men did, probably because they tended to drive fewer miles than men. Men and women had an equal chance of being involved in an accident as the result of errors due to manner of execution. Women lacked sufficient care in their manner of driving, often failing to look prior to executing a maneuver. Men drove too fast and were inclined to overtake improperly.

One-third of the drivers at fault were judged to be impaired. The presence of alcohol was the greatest single impairment factor and was associated with male drivers. Women tended to take more drugs than men and were more likely to be affected by emotional worries or distress.

Proportionately, women were involved in more accidents than men when making turning maneuvers, whereas men were involved more in the type of accidents associated with driving too fast on bends. Alcohol played a prominent part in single vehicle accidents as did driving too fast.

This study shows that men and women drive quite differently and exhibit different characteristics leading to human errors of a different nature. These differences have implications for planning driver education programs. It might be possible to counter the lack of experience in women by placing more emphasis on skilled maneuvering and on the need for absolute concentration. Likewise the effects of speed, risk taking, and impairment should be emphasized more strongly for male drivers. (AAM)

21 pages 9 refs

Department of the Environment and Department of Transport, Crowthorne, United Kingdom

KEYWORDS: Crash Investigation.

UM-76-D0804

RELATIONSHIP BETWEEN ANTIDEPRESSANT EFFECT AND PLASMA LEVEL OF NORTRIPTYLINE CLINICAL STUDIES, P. Kragh-Sorensen; C.E. Hansen; P.C. Baastrup; E.F. Hvidberg, Pharmakopsychiatrie Neuro-Psychopharmakologie, v9 n1 p27-32 (Jan 1976)

This report presents strong evidence that nortriptyline inhibits its own antidepressive effect at high but nontoxic plasma levels in patients suffering from endogenous depression. In an investigation conducted in the State Mental Hospital, Glostrup, patients admitted for endogenous depression were assigned at random to one of two groups. One group (A) was adjusted to a nortriptyline plasma level below 150 ng/ml; the other group (B) was adjusted to a plasma concentration above 180 ng/ml. After one week on placebo the degree of depression was reassessed. After four weeks of nortriptyline treatment, the majority of patients in the high level group was still depressed. When statistics are applied to these data, findings demonstrate that high plasma levels of nortriptyline are significantly associated with poor therapeutic efficacy. Based on these results and other studies, the authors conclude that strong evidence exists for a recommended therapeutic plasma range of 50-150 ng/ml for nortriptyline.

In situations where plasma levels of nortriptyline cannot be determined, a reasonable strategy is to use a standard dosage of 150 mg nortriptyline daily. On this dosage, about 65% of the patients will achieve therapeutic levels. If the patient does not respond within the period of time that is usually required for therapeutic effects (three to four weeks), the dose should be lowered, since nearly 30% of the patients will have excessive levels.

Whether a relationship between the plasma concentration and therapeutic effect will hold for other tricyclic antidepressants remains to be investigated. Significant pharmacological differences among the various antidepressant drugs make apriori comparisons among these drugs very problematical. (HSRI)

17 refs

KEYWORDS: Antidepressants: nortriptyline*. Experimentation: Chronic Dosage Study. Experimentation: Dose-Effect Study.

UM-76-D0805

MARIHUANA AND HUMAN PHYSICAL ACTIVITY, T.F. Babor; J.H. Mendelson; J. Kuehnle, Psychopharmacology, v50 p11-19 (1976)

This study was designed to examine the effect of acute and repeated marijuana ingestion on human physical activity. Adult male volunteers with a prior history of either moderate (N=12) or heavy (N=14) marijuana use were systematically observed before, during, and after a twenty-one-day period of free access to 1g marijuana cigarettes containing 2% delta-9 THC. A matched sample of casual alcohol drinkers (N=11) served as a control group. Sleep and other behaviors were observed hourly to obtain a representative sample of daily activity. A full battery of assessments was performed daily to evaluate biochemical, physiological, behavioral, and social concomitants of marijuana or alcohol use. Subjects were free to determine the dosage, setting, and frequency of marijuana use as well as the social context in which they smoked. They could also choose from a variety of activities including sleep, work, and recreation before, during, and after marijuana intoxication.

On the average, moderate users consumed 2.6 (± 0.90) cigarettes per day and burned 83% (± 11%) of each cigarette. Heavy users smoked more than twice this number daily (5.7± 1.7), consuming more than 92% (± 8%) of each cigarette. Activity level was found to be significantly lower within an hour after marijuana smoking for both moderate and heavy users.

The "same day" correlational analysis revealed no tendency for daily or waking activity to decrease as a function of greater marijuana consumption. In fact, heavy users slept less on days following heavier consumption, as well as during the entire period of marijuana availability. The findings suggest a dose related reaction to heavy marijuana use which disappears following the cessation of regular use. However, changes in activity following a single dose of marijuana may be related more to the social circumstances of its use than to its pharmacological action. (JAM)

30 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Experimentation: Acute Dosage Study. Experimentation: Chronic Dosage Study. Other Factors Influencing Drug Effects. Physiological Testing. Psychological Testing.

UM-76-D0806

EEG AND BEHAVIORAL EFFECTS OF DELTA-9-TETRAHYDROCANNABINOL IN COMBINATION WITH STIMULANT DRUGS IN RABBITS. P. Consroe; B. Jones; H. Laird. Psychopharmacology, v50 p47-52 (1976)

Rabbit EEG and behavior have been found to be quite sensitive to the effects of THC alone and in combination with methamphetamine as well as to the complex interaction of THC - amphetamine combinations. This study compares the effects of cocaine (1 mg/kg), apomorphine (1 mg/kg), and caffeine (12.5 mg/kg) with methamphetamine on the quantified EEG and on behavioral actions of THC in albino New Zealand rabbits weighing between 3.0 and 4.0 kg. Recording electrodes and jugular catheters were implanted in the subjects who could move freely in a sound attenuated chamber equipped with a one-way window for behavioral observation.

Cortical and hippocampal alterations produced by THC were antagonized by methamphetamine, codeine, and caffeine, but only briefly by apomorphine. Postural and activity behaviors were reversed by methamphetamine and caffeine but only briefly by cocaine and apomorphine. Additionally, stereotypy resulted from the combination of THC with methamphetamine, cocaine, and apomorphine. These data indicate that the effects of THC were antagonized by stimulant drugs, of which caffeine was the most effective. However, novel toxicity also resulted from the interaction of THC with catecholaminergic drugs. Depending on the behavior parameter, dose, and species tested, antagonism or potentiation may result. (JA)

35 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Emetics: apomorphine. Local Anesthetics: cocaine. Opiates and Related Agents: apomorphine. Stimulants: caffeine. cocaine. methamphetamine. Stimulants. Animal Research. Experimentation: Study of Combined Effects of Drugs. Physiological Testing.

UM-76-D0807

PHARMACOLOGY OF TRICYCLIC ANTIDEPRESSANTS. A REVIEW. G V. Rossi. American Journal of Pharmacy, v148 n2 p37-45 (Mar-Apr 1976)

A review of the pharmacology of tricyclic antidepressants is presented. The chemistry of various tricyclic antidepressants--including imipramine, amitriptyline, nortriptyline, doxepin, and protriptyline--is discussed. Absorption and metabolism of these drugs are examined, and a table of dose ranges for tricyclic antidepressants is presented.

Greater clinical efficacy and a lower incidence of serious toxic reactions, compared to monoamine oxidase inhibitors, explain the preeminence of tricyclic compounds in the treatment of depressive illness. Nevertheless, they are potent and potentially hazardous drugs whose use should be attended by critical observation and control. In patients with narrow-angle glaucoma, tricyclic antidepressants may possess significant antimuscarinic or atropine-like activity, which manifests as mydriasis and cycloplegia with blurring of vision and possibly increased ocular pressure. In some patients tricyclic drug therapy may result in weakness, drowsiness, fatigue, and further

depression of mood. In other individuals the behavioral response may be characterized by increased tension, restlessness, insomnia, confusion, and agitation.

Most literature on tricyclic antidepressants and monamine oxidase inhibitors warns against their concurrent use. Severe reactions, sometimes leading to death, have occurred in patients receiving both types of antidepressant drugs. Because of the extended residual action of monoamine oxidase inhibitors it is generally recommended that therapy with these drugs be discontinued at least fourteen days prior to initiating treatment with tricyclic antidepressants. The combination of tricyclic antidepressants and alcohol may result in unexpectedly severe central nervous system depression. (HSRI)

34 refs

KEYWORDS: Antidepressants: amitriptyline, doxepin, imipramine, nortriptyline, protriptyline. Antidepressants. Review: Drug Effects.

UM-76-D0808

DRUGS AS DISCRIMINATIVE EVENTS IN HUMANS, J.L. Altman; J.M. Albert; S.L. Milstein; I. Greenberg, Psychopharmacology Communications, v2 n4 p327-30 (1976)

A tabular outline of literature dealing with drugs as discriminable events in humans is presented. Table I describes experiments in which subjects attempted to identify either the class of substance received (e.g. stimulant, depressant, etc.) or the actual drug itself (e.g. morphine, nitrous oxide, etc.). Table II reviews studies examining the ability of subjects to recall material associated with a drug (or nondrug) state when subsequently tested under the same or different drug conditions. (AA)

29 refs

KEYWORDS: Compilation.

UM-65-D0809

CONTRIBUTION OF HEREDITARY FACTORS TO THE RESPONSE TO DRUGS, W. Kalow, Federation Proceedings, v24 p1259-73 (Nov-Dec 1965)

Pharmacogenetic work in man has rapidly progressed in the past few years. This article reviews some of the progress made in pharmacogenetics. Enzyme induction in bacteria and in mammalian liver microsomes is compared. Genetic variants of serum cholinesterase in man and phenotypes of succinylcholine sensitive patients are also examined. Examples are cited which suggest that all kinds of drug effects are potentially subject to genetic variation. Present knowledge is too incomplete to determine whether drug effects or metabolic pathways that differ between species will tend particularly to vary within one species. It is likely that a difference of susceptibility of people to a drug may be caused by multifactorial inheritance. In such cases one could never hope to point to a single enzyme as the causative factor in the degree of individual susceptibility to a drug. Most routine assessments of the potency of drugs at present are based on the assumption that susceptibility in an investigated population of humans or animals is normally distributed. Since a normal distribution is assumed to exist, any bimodality caused by effects of single genes is likely to be overlooked. The remedy here may come in remembering hereditary susceptibilities, and from increased care in the investigation of individuals. (HSRI)

27 refs

KEYWORDS: Review.

UM-77-D0810

ACUTE SYSTEMATIC EFFECTS OF COCAINE IN MAN: A CONTROLLED STUDY BY INTRANASAL AND INTRAVENOUS ROUTES, R.B. Resnick; R.S. Kestenbaum; L.K. Schwartz, Science, v195 p696-8 (18 Feb 1977)

Reported here are the dose-response and time-course curves for physiologic and subjective effects of cocaine in man. Nineteen healthy volunteers between 21 and 42 years of age who had a history of frequent and regular use of cocaine during the preceding six months were given placebo and 10 and 25 mg of cocaine hydrochloride intravenously and intranasally. Five of the subjects were also given 100 mg of cocaine intranasally. By the intranasal route, 10 mg of cocaine produced no change different

from that produced by placebo. 25 mg of cocaine produced minimal changes in systolic blood pressure and 100 mg produced significant changes in heart rate and in the systolic and diastolic blood pressures. By the intravenous route, all doses produced significant changes in heart rate and systolic blood pressure. Compared to placebo, the 100 mg dose given intranasally and all of the doses given intravenously produced significant dose-related physiologic and subjective responses.

A direct relation between physiologic and subjective effects was shown; it was not, however, consistent for all subjects. More experienced cocaine users rated subjective effects lower than others who had equally large physiologic changes. The most frequent spontaneous report of subjects was "I feel more relaxed." This remark is surprising in light of the amphetamine-like properties of the drug. The onset of these effects occurred within two minutes after cocaine administration and peaked within five to ten minutes when given intravenously and within fifteen to twenty minutes when given intranasally. (JAM)

10 refs

KEYWORDS: Local Anesthetics: cocaine. Stimulants: cocaine. Experimentation: Dose-Effect Study. Physiological Testing. Self-Evaluation of Drug Effects by Subjects.

UM-72-D0811

INTRODUCTION: GENETIC AND ENVIRONMENTAL FACTORS AFFECTING DRUG RESPONSE IN MAN, E.S. Vesell, Federation Proceedings, v31 n4 p1253-69 (Jul-Aug 1972)

Presented here is a review of the literature dealing with genetic and environmental factors affecting drug response in man. Progress in pharmacogenetics has occurred recently as a result of intensive investigation of approximately ten inborn errors of metabolism affecting enzymes that biotransform drugs in man. Most of these mutations are transmitted as single factors. Study of the large variations among individuals in rates of metabolism of many commonly used drugs is a relatively new area of research in pharmacogenetics; these variations are primarily under genetic control, negligibly influenced by environmental factors in most normal individuals not receiving drugs chronically, and appear to be transmitted as polygenetically controlled traits.

Another area of current interest in pharmacogenetics concerns large individual differences in response to chronic administration of agents that induce or inhibit hepatic microsomal drug-metabolizing enzymes. (JA)

59 refs

KEYWORDS: Review.

UM-78-D0812

THE IDENTIFICATION OF LSD-LIKE HALLUCINOGENS USING THE CHRONIC SPINAL DOG, W.R. Martin; D.B. Vaupel; M. Nozaki; L.D. Bright, Drug and Alcohol Dependence, v3 n2 p113-23 (Mar 1978)

The purpose of this paper is to summarize studies of a variety of LSD-like hallucinogens and substituted B-phenethylamines. The effects of several indoleamines and phenethylamines were studied in the chronic spinal dog and compared with LSD and amphetamine. In the nontolerant chronic spinal dog, their effects on a variety of physiologic and behavioral functions were measured in untreated dogs as well as dogs treated with certain antagonists. The effects of the antagonists phenoxybenzamine and cyproheptadine on various physiologic parameters were studied for all drugs. For some indoleamines and phenethylamines, the effects of chlorpromazine and pimozide were also studied. Indoleamines and phenethylamines in the LSD tolerant chronic spinal dog and their anorexigenic effects in the intact dog were also studied.

The results of these studies indicate that psilocin, mescaline, dimethyltriptamine, and tryptamine are LSD-like drugs. DOM, DOB, DMA, and TMA are predominantly LSD-like drugs but do have some amphetamine-like actions. PMA and PEA are predominanantly amphetamine-like drugs with some LSD-like activity. MMDA and MDA have a more complicated pharmacology, showing properties that resemble LSD and amphetamine; however, they have other actions that are not shared by either LSD or amphetamine, suggesting that they have yet other modes of action. (JA)

7 refs

KEYWORDS: Ganglionic Blocking and Stimulating Agents: 2,5-dimethoxy-4-methylamphetamine (DOM) (STP). Hallucinogens and Related Agents: lysergic acid diethylamide (LSD), mescaline, methylenedioxyamphetamine (MDA), phenethylamine (PEA), psilocin, N,N-dimethyltryptamine (DMT), 2,5-dimethoxy-4-bromoamphetamine (DOB), 2,5-dimethoxy-4-methylamphetamine (DOM) (STP), 3,4,5-trimethoxyamphetamine, 4-methoxyamphetamine (PMA), 5-methoxy-3,4-methylenedioxyamphetamine (MMDA). Stimulants: amphetamine. Unclassified Agents: tryptamine. Animal Research. Experimentation: Comparison of Different Drugs. Physiological Testing.

UM-77-D0813

DRUG-PRODUCED CHANGES IN HUMAN SOCIAL BEHAVIOR: FACILITATION BY D-AMPHETAMINE, R.R. Griffiths; M. Stitzer; K. Corker; G. Bigelow; I. Liebson, Pharmacology Biochemistry and Behavior, v7 n4 p365-72 (1977)

The effects of oral d-amphetamine (5-30) mg on human social and verbal behavior were studied using repeated observations within subjects under double-blind conditions. In the first experiment socializing and standing were measured during daily six-hour sessions using a time-sampling observation procedure in a residential research ward. D-amphetamine increased socializing in all three subjects studied, but increased standing in only one of the subjects.

In the second experiment throat microphones and voice-operated relays were used to measure automatically quantitative aspects of dyadic verbal interactions during one-hour daily sessions. Total speaking time showed dose-related increases in five of the seven subjects receiving d-amphetamine. Adjective checklist self-report scores indicating stimulant drug effects were as sensitive and reliable as the speaking parameter in measuring the effects of d-amphetamine in these subjects. Speaking time also increased in two of the eight partners who received placebo when the subjects with whom they were paired received d-amphetamine. This represents a socially mediated indirect drug effect. Adjective checklist scores of the partners receiving placebo were not changed when the paired subjects received d-amphetamine.

The authors conclude that these studies suggest new methodologies for examining drug effects in humans. Whereas experimental clinical behavioral pharmacology has in the past typically relied upon subjective ratings of the drug recipients or observers, these experiments have shown that discrete and objectively measurable molecular units of human behavior are systematically related to drug administration. Naturalistic behaviors of speaking and socializing, which are relatively free of environmental constraints, are sensitive to moderate doses of d-amphetamine. These results are encouraging for future systematic research into drug effects on naturalistic molar units of human behavior including human social behavior. (JAM)

27 refs

KEYWORDS: Anorectic (Appetite Control) Agents: dextroamphetamine. Stimulants: dextroamphetamine. Sympathomimetic (Adrenergic) Agents: dextroamphetamine. Experimentation: Acute Dosage Study. Experimentation: Dose-Effect Study. Psychological Testing. Self-Evaluation of Drug Effects by Subjects.

UM-76-D0814

QUANTITATIVE CHARACTERIZATION OF THC AND ETHANOL INTERACTION, B. Esplin; R. Capek, Research Communications in Chemical Pathology and Pharmacology, v15 n1 p199-202 (Sep 1976)

The anticonvulsant activity of ethanol, delta-9-tetrahydrocannabinol, and their combination was measured in the maximal electroshock seizure test. Ethanol was injected subcutaneously into mice as a 10% w/v solution in physiological saline. The emulsion of THC in 5% of Tween 80 in physiological saline was injected intraperitoneally. THC was administered 120 minutes and ethanol 20 minutes prior to testing. The determined median anticonvulsant doses (ED 50) of drug combinations were compared with those calculated on the assumption of additivity of doses.

No significant difference was found between the determined and expected values. It appears, based upon the results of this study, that THC and ethanol interact additively. Thus, for achievement of the same effect, any fraction of the dose of one drug can be replaced by a proportionate quantity of the other. This is characteristic for "simpler similar action" and it indicates that one drug will enhance the activity of the other in doses that administered alone produce no measurable effect. (AAM)

14 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Nonbarbiturates: ethanol (ethyl alcohol). Animal Research. Experimentation: Study of Combined Effects of Drugs. Physiological Testing.

UM-76-D0815

ANALGESIA, PLASMA LEVELS, AND DOSAGE OF PROPOXYPHENE, S.D. Waife; C.M. Gruber; B.E. Rodda; J.F. Nash, International Journal of Clinical Pharmacology, v13 n3 p177-81 (1976)

This study shows that the mean plasma levels observed and the mean analgesic scores of effectiveness are dose-related for propoxyphene, an orally effective analgesic agent. Nevertheless, wide individual variations exist. Based on the pharmacokinetic characteristics of propoxyphene, it can be predicted and confirmed that equilibrium plasma levels will be achieved after about six doses when administered on a six-hour schedule. Similar predictions indicate that an initial loading dose of two to two and one-half times the maintenance dose will produce more promptly plasma levels within or close to the equilibrium levels. Although the administration of a loading dose has little therapeutic value in conditions requiring prolonged treatments, it may be of use if an immediate response is desired. (AAM)

8 refs

KEYWORDS: Analgesics and Antipyretics: propoxyphene*. Drug Concentration-Effect Study: Clinical Research. Drug Concentrations in Body Fluids: Chronic Dose Study. Experimentation: Chronic Dosage Study. Experimentation: Dose-Effect Study.

UM-76-D0816

TREATMENT OF DEPRESSION WITH TRICYCLIC DRUGS--PHARMACOKINETIC AND PHARMACODYNAMIC ASPECTS, M. Asberg, Pharmakopsychiatrie Neuro-Psychopharmakologie, v9 n1 p18-26 (Jan 1976)

A series of studies on the pharmacokinetic and pharmacodynamic properties of some tricyclic antidepressants is reviewed. During treatment with the same oral dose of these drugs patients develop widely differing plasma levels. The importance of this variability for the clinical effects has been studied in detail for the monomethylated compound nortriptyline. There is an association between side effects and high plasma levels of this drug. In endogenously depressed patients, the relationship between plasma level and effect appears to be curvilinear.

The tricyclic antidepressants differ in their capacity to inhibit transmitter uptake into noradrenalin and serotonin neurons. These differential effects are also reflected in changes in the level of transmitter metabolites in cerebrospinal fluid (CSF). CSF studies have also supported the hypothesis of a biochemical heterogeneity of the depressive syndrome. The levels of the serotonin metabolite, 5-HIAA, were biomodally distributed in CSF. In patients with a low level of 5-HIAA there was a significant correlation between the CSF metabolite level and the severity of the depression, and these patients also appeared to be more suicide prone than those with higher 5-HIAA levels. These patients seemed to be less amendable to treatment with nortriptyline. The effect of chlorimipramine treatment is presently being explored.

Although the results of routine therapy with tricyclic antidepressants are often satisfactory, there is reason to believe that if the pharmacokinetic properties of the drugs are taken into account, treatment might be more effective and also safer. The author suggests that the dosage of the drug should be adjusted to a plasma level between 50 and 150 ng/ml. At higher levels, the risk of cardiotoxicity is increased and therapeutic effect is reduced. With the aid of plasma level determinations, the appropriate dosage can be estimated as soon as a steady state level is reached, usually within a week after institution of treatment. If this is not possible, dosage adjustment will have to be based on clinical effects. (JAM)

53 refs

KEYWORDS: Antidepressants: nortriptyline*. Antidepressants. Review.

UM-76-D0817

THE RELATIONSHIP OF PHARMACOKINETICS TO PHARMACOLOGICAL ACTIVITY: MORPHINE, METHADONE AND NALOXONE, B.A. Berkowitz, Clinical Pharmacokinetics, v1 p219-30 (1976)

This review illustrates current approaches to the study of the disposition in man of the strong analgesics morphine and methadone and the narcotic antagonist naloxone. Morphine administered orally is rapidly absorbed but equally rapidly metabolized to morphine glucuronide. This contributes to the diminished oral efficacy of morphine. Following intramuscular administration morphine is very rapidly absorbed. After intravenous injection, the serum levels of morphine during the first ten minutes are higher and more variable in older patients. The half-life of morphine between twenty minutes and six hours after administration is two to three hours, and this value does not appear to be influenced by the age of the patient. Similar half-lives for morphine have been reported in normal volunteers and in anesthetized patients who received morphine. Thus, surgical anesthesia may not markedly influence morphine half-life and disposition. Based on urinary excretion data in man, accelerated morphine metabolism and excretion do not contribute to morphine tolerance.

Methadone is now widely used in the treatment of narcotic abuse. The half-life of methadone averages twenty-five hours. The prolonged retention of methadone in the plasma may be related to its extensive binding to plasma proteins. With chronic dosing, studies in both animals and man indicate an increase in the metabolism of methadone. Unlike morphine, the urinary excretion of methadone increases with acidification of the urine. Women may metabolize methadone to a greater extent than do men. With the exception of pupillary effects, the plasma levels of methadone correlate poorly with its pharmacological activity. There is a marked variation in methadone plasma levels between patients and within the same patient.

Naloxone rapidly disappears from the serum in man and the initial distribution phase has a half-life of four minutes. The half-life of naloxone in serum following distribution is sixty-four minutes. Based on animal studies, the rapid onset of the narcotic antagonist action of naloxone can be related to its rapid entry into the brain, whereas its potency stems in part from its high lipid solubility which allows a high brain concentration to be achieved. The short duration of action of naloxone may result from its rapid egress from the brain. (JA)

46 refs

KEYWORDS: Opiates and Related Agents: methadone*, morphine*, naloxone. Pharmacokinetic Factors: Drug Absorption and Distribution. Pharmacokinetic Factors: Drug Metabolism. Review.

UM-76-D0818

AN INTEGRATED APPROACH FOR THE EVALUATION OF PSYCHOTROPIC DRUGS IN MAN.I. STUDIES ON AMPHETAMINE. RELATIONSHIP BETWEEN DRUG LEVELS AND PSYCHOPHYSICAL MEASUREMENTS, P.L. Morselli; G.F. Placidi; C. Maggini; R. Gomeni; M. Guazelli; G. DeLisio; S. Standen; G. Tognoni, Psychopharmacologia, v46 p211-7 (1976)

This study reports data obtained after amphetamine administration to normal healthy volunteers in order to evaluate the possible relationships between bioavailability of amphetamine and the peripheral and central effects of the drug as well as between such effects and personality profiles. Four males and two females, 20 to 24 years of age were administered amphetamine (20 mg) either in a salt or in a cationic resinated form in two experimental sessions according to a double-blind and cross-over design. Plasma and urine specimens were collected and pulse rate, arterial blood pressure, ECG, and EEG were recorded. The attentive and motor performances were tested before drug intake and one, two, and four hours after. Personality was evaluated by means of the MMPI administered the day before and after each experimental session.

Results indicate a strong relationship between amphetamine initial rate of entry into the blood stream and the incidence of side effects and rise in arterial blood pressure. Minimal thresholds for CNS (5 ng/ml) and peripheral (20 ng/ml) effects could also be determined. It appeared also that the personality of the subject may have some bearing on both incidence of side effects and performance.

The reported data indicate that the procedure proposed in this study may be valuable for an integrated approach to study the effects of psychotropic drugs in man. (HSRI)

22 refs

KEYWORDS: Stimulants: amphetamine*. Drug Concentration-Effect Study: Driving Skill Impairment. Drug Concentrations in Body Fluids: Chronic Dose Study. Experimentation: Dose-Effect Study. Physiological Testing. Psychological Testing. Psychomotor Tests.

UM-75-D0819

THE SERUM LEVEL APPROACH TO INDIVIDUALIZATION OF DRUG DOSAGE, J. Koch-Weser, European Journal of Clinical Pharmacology v9 p1-8 (1975)

This paper reviews literature dealing with the importance of individualizing the dosage of potent drugs, especially as it relates to levels of drugs in the serum. The importance of individualizing the dosage of potent drugs in order to maximize their therapeutic effectiveness and safety is generally accepted. Whenever possible the dosage of a drug should be tested directly in each patient for the intensity of its therapeutic or toxic actions. Unfortunately, for many drugs convenient clinical yardsticks of the intensity of their pharmacologic effects are lacking. Determination of the serum concentration of such compounds can help to guide adjustment of dosage during their therapeutic use. By measuring the serum level of drugs one bypasses the largest source of individual differences in dose-effect relationships--the pharmacokinetic variation between subjects. However, the relationship between the serum concentration of a drug and the intensity of its pharmacodynamic action is influenced by many other factors which must always be considered in interpretation of serum levels. Therapeutic decisions should never be based solely on the serum concentration of a compound, nor can such measurements ever substitute for careful medical observation and judgment.

The measurement of serum levels of most drugs presents no major procedural problems. The cost at present is no greater than that of many very commonly performed diagnostic tests. Furthermore, many assays of drugs in serum readily lend themselves to automation. However, if used without appropriate clinical perspective, serum levels can be quite misleading and may lead to hazardous decisions about dosage. (JAM)

35 refs

KEYWORDS: Review: Drug Concentration-Effect Relationships.

UM-75-D0820

COCAINE, S. Cohen, Journal of the American Medical Association, v231 n1 p74-5 (6 Jan 1977)

Presented here is an overview of cocaine which discusses its history, effects, treatments, and patterns of use. Large amounts of cocaine have been smuggled into the United States since its rediscovery in the late 1960s. Cocaine use began 3,000 years ago in Peru and Bolivia where coca leaves were given by royalty as a highly valued reward for special service. By the beginning of the twentieth century, many patent medicines and soft drinks contained a small amount of cocaine. However, the Pure Food and Drug Law and the Harrison Tax Act discontinued this practice.

When injected or inhaled, cocaine produces a condition of hyperstimulation. Overalertness, euphoria, and feelings of great power dominate. Oversuspiciousness and paranoid thinking with delusions occur with prolonged use of large doses. Cocaine is very short-acting, and heavy users who want to maintain the elation must reingest the drug several times an hour. Consistent use sometimes results in depression when cocaine is discontinued. Overdoses produce tremors, convulsions with a temporal lobe seizure pattern, and delerium. Tolerance and withdrawal symptoms do not occur; therefore it is incorrect to speak of cocaine addiction. It is the craving to repeat the experience that accounts for chronic cocaine use.

The principal consumers of cocaine are multiple drug users with only small numbers using cocaine exclusively, due to its high price. (HSRI)

3 refs

KEYWORDS: Local Anesthetics: cocaine. Stimulants: cocaine. Review: Drug Effects.

UM-75-D0821

MARIHUANA: CAN IT HURT YOU? H. Kolansky; W.T. Moore, Journal of the American Medical Association, v232 n9 p923-4 (2 Jun 1975)

To date, most of the public remains uninformed about current medical findings clearly indicating substantial health hazards that result from marijuana smoking. In a study of the toxic psychological effects of cannabis use in fifty-one patients, all subjects demonstrated an early diminution in self-awareness and judgment along with slowed thinking and shorter spans in concentration and attention. There was a gradual development of "goallessness," blunted emotions, a counterfeit impression of calm and well-being, and a prevailing illusion of recently developed insight and emotional maturity. Many demonstrated difficulty in depth perception and an alteration in the sense of timing, both of which are particularly hazardous during automobile driving. In view of these findings, a systematic campaign to disseminate medical information is long overdue, particularly by governmental agencies and the news media. (HSRI)

10 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Review: Drug Effects.

UM-75-D0822

DRUGS FOR EMOTIONAL DISORDERS. CURRENT PROBLEMS, L.E. Hollister, Journal of the American Medical Association, v234 n9 p942-7 (1 Dec 1975)

Presented here is an overview of the problems involved in the prescription of drugs for treatment of emotional disorders. The practice of psychiatry, at least so far as major mental disorders are concerned, has been greatly altered by the advent of psychoactive drugs. Psychiatry is returning to a biomedical orientation, although an abyss still remains between those who embrace a psychiatry based on disturbed cerebral function and one based on psychopathology. The use of drugs in altering brain function, however, will not automatically solve all problems.

Several difficulties arise in treating psychiatric illnesses with drugs. There is rarely agreement in the diagnosis, pathogenesis, and proper clinical course for psychiatric disorders. Schizophrenia, once thought a discrete disorder, is now considered an ambiguous category. Furthermore, depressions do not represent a homogeneous group of disorders. It is difficult to detect the specific effect of antidepressives in a heterogenous group of patients, only a few of whom might show a specific response to the drug being tested. Some diseases, like anxiety states, are entirely subjective and unobservable, making antianxiety drugs the most difficult of all to evaluate. Disorders of childhood and old age are especially difficult to treat with drugs due to the differences in drug metabolism at either extreme of life. The lack of controlled trials and possible delayed adverse effects have also discouraged use of drugs in treating psychiatric disorders. (HSRI)

16 refs

KEYWORDS: Review: Drug Effects.

UM-76-D0823

ENVIRONMENTAL FACTORS INVOLVED IN THE DEVELOPMENT OF TOLERANCE TO BEHAVIORAL EFFECTS OF DELTA-9-TETRAHYDROCANNABINOL, M.N. Branch (Aug 1976)

This paper reports on a series of experiments attempting to determine both quantitative and qualitative aspects of the environment that affect the development of tolerance to behavioral effects of delta-9-tetrahydrocannabinol. Squirrel monkeys were trained under a variety of behavioral procedures and then delta-9-THC was administered daily until tolerance developed. Three classes of experiments were performed.The first group of experiments examined the role of behavioral "cost" and baseline response rates as determinants of tolerance development. Two complementary experiments in which either high or low rates were compared with moderate response rates were conducted.

In both cases administration of delta-9-THC resulted in relatively less loss of reinforcement under conditions where moderate rates prevailed than where either the high or low rates prevailed. Tolerance developed under all procedures and appeared to be unrelated to behavioral cost except in one experiment.

The second experiment dealt with task complexity. The experiment examined the interaction of repeated drug administration with the length of a complex response sequence. Testing with the shortest sequence was completed, and overall rate of output of behavior took longer to recover from repeated drug administration than did accuracy of performance.

The last experiment compared tolerance development across different motivations. Equivalent performances were established under three different motivational sets, and two doses were tested. Tolerance developed under all motivational sets, with no indication of motivation-specific effects. The author concludes that some form of tolerance to the effects of THC develops with chronic use. Also, the length and severity of withdrawal effects are dependent on the dose of the drug and on length of use. (AAM)

46 pages 41 refs

U.S. Army Medical Research and Development Command DAMD17-74-C-4085

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Animal Research. Experimentation: Chronic Dosage Study.

UM-75-D0824

CAFFEINE: PREFERENTIAL CONSUMPTION BY RATS, M.V. Vitiello; S.C. Woods, Pharmacology Biochemistry and Behavior, v3 p147-9 (1975)

This experiment explored the effect of forced daily consumption of large amounts of caffeine (analogous to that of heavy coffee drinkers) upon the subsequent intake of caffeine in a free-choice situation. Thirty-six male Long Evans rats, approximately 120 days old, were randomly divided into three experimental and three control groups. The experimental groups received an aqueous solution of caffeine (0.17,0.34, or 0.50 mg/ml) plus mocha flavoring continuously for fourteen days. This mixture was the only source of water during that interval. Control rats were given water during that same interval. All rats were then given a continuous choice among three solutions for eight days: caffeine in water, mocha flavoring in water, and water alone.

Experimental rats that had been forced to consume the largest concentration of caffeine consumed significantly more caffeine and less mocha. The control group and groups that had been forced to consume smaller amounts of caffeine had no particular preference.

From this study it appears that forced caffeine consumption is directly related to subsequent free-choice intake and that a flavor associated with the forced caffeine (mocha) is not preferred. Consumption of caffeine can lead to the development of a preference for the drug, a fact which may have implications for the use of low caffeine coffee-flavored beverages by humans. (HSRI)

11 refs

KEYWORDS: Stimulants: caffeine. Animal Research. Experimentation: Chronic Dosage Study. Experimentation: Dose-Effect Study.

UM-77-D0825

ALCOHOL, DRUGS, Prevention Routiere Internationale, n9 p1-46, International Road Safety Council (Feb 1977)

Presented here are the reports presented at the first Round Table Conference of the International Road Safety Council held in November 1976. Emphasis was on the relationships between driving, drinking, and taking medicine. Some of the topics discussed are the following: laboratory drug screening batteries that examine the interaction of alcohol with commonly prescribed drugs; factors in accidents; and the influence of centrally active drugs on psychomotor skills. Several epidemiological studies are also discussed.

The editor recommends that the first step in establishing research priorities would be an epidemiological study identifying the most dangerous, most frequently occurring factors in accidents. The second step must be a clinical study involving case studies of every accident in which the specific conditions under which the accident took place are examined, especially in terms of alcohol and medicine. (HSRI)

16 refs English-French-German

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Compilation.

UM-76-D0826

ALCOHOL AND MARIJUANA EFFECTS ON OCULAR TRACKING, M.C. Flom; B. Brown; A.J. Adams; R.T. Jones, American Journal of Optometry and Physiological Optics, v53 n12 p764-73 (Dec 1976)

This investigation compared the effects of several doses of alcohol and marijuana on both smooth and saccadic components of ocular tracking. Ten males (aged 19 to 28 years) who consumed both alcohol and marijuana regularly were instructed to visually track a small spot that moved horizontally back and forth in pendular (sinusoidal) motion across a 7.5 degree field. The frequency of spot oscillation was gradually increased from 0.5 to 3.0 HZ in forty seconds.

Subjects were given a combination of alcohol (0.5 or 1.0 ml of 95% ethanol per kg of body weight), marijuana (8 or 15 mg THC in a 0.8g marijuana cigarette), or placebo. They were tested several times from fifteen minutes to five hours after ingestion.

Eye movement recordings showed the frequency at which smooth tracking and, soon thereafter, saccadic tracking broke down. These smooth and saccadic cutoff frequencies were reduced after administration of alcohol, but not after marijuana or placebo. For low alcohol doses, smooth tracking was impaired and saccadic tracking was unaffected, much like an effect previously reported for barbiturates.

Alcohol seems to affect smooth tracking by increasing the central processing time required to generate the appropriate eye movement. It affects saccadic velocity by slightly decreasing saccadic velocity and to a greater extent by increasing latency time, part of which may be devoted to central processing. The site of action of alcohol appears to be central to both the paramedian pontine reticular formation and the flocculus of the cerebellum. (JAM)

19 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Nonbarbiturates: ethanol (ethyl alcohol)*. Experimentation: Study of Combined Effects of Drugs. Tests of Sensory Function.

UM-75-D0827

ALCOHOL AND MARIJUANA EFFECTS ON STATIC VISUAL ACUITY, A.J. Adams; B. Brown; M.C. Flom; R.T. Jones; A. Jampolsky, American Journal of Optometry and Physiologica Optics, v52 n11 p729-35 (Nov 1975)

This study investigated the effects of alcohol and marijuana on both high and low contrast visual acuity. Static visual acuity was measured at two contrast levels (12% and 49%) in ten healthy male subjects aged 18 to 28, all of whom were social drinkers and regular users of marijuana. The subjects were given one of five drug treatments in the double-blind experiment: (0.5 ml or 1.0 ml/kg body weight of 95% ethanol combined with 8 or 15 mg delta-9-THC, or placebo). Static visual acuity was measured by recording the number of times the subject could correctly press the button corresponding to the four targets flashed on a hemicylindrical screen while his head was restrained.

No statistically significant change was found in static visual acuity for any of the dose levels at any of the measurement times up to six hours following drug ingestion. This is sharply contrasted with the marked decrements in acuity which were found in the same subjects under the same drug conditions when the targets were in motion and required coordinated eye movements for their resolution. Therefore, static visual acuity, even at quite low contrast levels, is unaltered by socially used doses of alcohol and marijuana; larger, less relevant doses were not studied. (JAM)

13 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Nonbarbiturates: ethanol (ethyl alcohol). Experimentation: Study of Combined Effects of Drugs. Tests of Sensory Function.

UM-77-D0828

MARIHUANA: CURRENT ASSESSMENT, A.J. McBay, Journal of Forensic Sciences, v22 n3 p493-9 (Jul 1977)

Presented here is an assessment of various aspects of marijuana's place in society--its use, the law concerning its use, legal sanctions, detection of delta-9-THC in the body, its effect on the automobile driver, and health effects of both short- and long-term use. The purpose of this brief paper is to dispel some widely believed myths about marijuana.

In retrospect it is easily understood how marijuana became a drug to be feared. As more people have used the drug and as more research has been done, much misinformation has been dispelled. Unfortunately, there still persists an attitude that the drug must be very harmful, if not immediately, then at some time in the future. However, no well-controlled research appears to exist that tends to support claims of any permanent damage from marijuana use, either physical or mental. Overdose fatalities are practically unknown. Long-term use has not produced any substantiated problems. Present knowledge of the drug does not support the rigid sanctions imposed on those who use the drug.

The author believes that it would be advantageous to provide a more scientific basis to marijuana laws, for example, basing them on the amount of tetrahydrocannabinol. This one change would make the "multiple species" argument invalid. It would also allow the chemically trained criminalist to apply his expertise.

Now is the time to evaluate the laws concerning marijuana to see if they should be changed, particularly with respect to definition and penalties. (HSRI)

36 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Other Sociolegal Study. Review: Drug Effects.

UM-77-D0829

A REVIEW OF THE SAFETY HAZARD DUE TO POOR HEALTH, DRUGS, AND THEIR INTERACTION, F.B. Benjamin, Human Factors, v19 n2 p127-37 (Apr 1977)

This paper reviews the traffic literature discussing the interrelationship between drugs and health. Accident-involved drivers consist of two separate population groups; those involved in fatal accidents and those involved in nonfatal accidents. One of the principal characteristics of the fatal accident group is the lower accident survival rate (ASR), which is often caused by impaired health.

This review of relevant literature finds that 5% of the driving population has medical impairments to a degree that constitutes a safety hazard. Most of the impaired drivers are in the older age group. Many of their medical impairments are likely to be improved by the use of therapeutic drugs, which in turn often improves the ASR, although it may have a negative effect on driving performance. This is true especially of drugs that depress the central nervous system, leading to nonfatal daytime accidents. Drivers with trace amounts of drugs have been found to be greater safety hazards than those who have high concentrations due to the reemergence of the medical impairment which had been suppressed by heavier medication. Directions as to the advisability of using or not using therapeutic drugs before driving must be provided by the physician on a case-by-case basis.

Acute alcoholism is likely to impair driving performance, while chronic alcoholism is likely to lead to health impairment and lowered accident survival rate. Data indicate that the chances of involvement may be ten times that of a healthy driver. (JAM)

30 refs

KEYWORDS: Review: Drugs and Highway Safety.

UM-77-D0830

MEDAZEPAM AND THE DRIVING ABILITY OF ANXIOUS PATIENTS, N.C. Moore, Psychopharmacology, v52 n1 p103-6 (23 Mar 1977)

This investigation suggests that relatively low levels of medazepam do not have a marked adverse effect on driving ability. A double-blind crossover trial of medazepam was carried out in fourteen anxious male hospital patients. The mean dosage of medazepam was 16.5 mg daily. The active drug was found to be no more effective than placebo in relieving anxiety, which was rated both clinically and by the Middlesex Health Questionnaire (M.H.Q.). This may have been because the dose was relatively low for

chronically anxious hospital patients. Even this dosage, however, caused significantly higher scores on the M.H.Q. scale for depression. Pulse and blood pressure were not affected.

Braking and driving simulator tests also were not adversely affected by medazepam. In real driving conditions, those taking the drug made significantly more technical, but not dangerous, errors, in spite of the fact that patients taking medazepam face the possible hazards of drowsiness, ataxia, and released aggressive behavior. (JAM)

12 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): medazepam*. Clinical Study. Driving Simulator. Experimentation: Chronic Dosage Study. Open Road Driving. Self-Evaluation of Drug Effects by Subjects.

UM-77-D0831

SELF-REPORTED ALCOHOL AND AMPHETAMINE USAGE BY LONG-DISTANCE, HEAVY-VEHICLE DRIVERS IN NEW SOUTH WALES. D.R. Nix-James, 7th International Conference on Alcohol, Drugs, and Traffic Safety, Melbourne, Australia (25 Jan 1977)

Alcohol and amphetamine use by 615 male truck drivers aged 17 to 59 years were estimated in a survey conducted on New South Wales' roads. Drivers were questioned in twenty-to-sixty-minute interviews concerning their drugs of choice to keep them awake, how often they used such drugs, their alcohol consumption, reasons for drinking, and accident record.

Results of the survey indicated that those who use alcohol are more likely to use amphetamines. No significant relationship between alcohol use and accidents was evident but there was a significant relationship between amphetamine use and accidents. However, when the relationship between exposure time and accident frequency is taken into account, this correlation decreases.

The results indicated significant relationships between amphetamine use and number of hours worked per week, mileage, and limited recreation. Financial worry, contributing to long hours, was significantly related to both alcohol and amphetamine use. The responses to two questions related to aggression suggest that drivers using both alcohol and amphetamines may not cope well with the vicissitudes of the traffic situation.

While most truck drivers are aware of the dangers of alcohol use while driving, few believe that pep pills can contribute to hazardous driving. The author concludes that any publicity about the detrimental effects of amphetamines will have to be worded carefully to be effective against the firm conviction of many amphetamine users that the drug is essential insurance against falling asleep at the wheel. (HSRI)

17 pages 11 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Stimulants. Epidemiology: Self-Reported Drug Use by Drivers.

UM-76-D0832

REVERSAL OF ETHANOL INTOXICATION IN HUMANS: AN ASSESSMENT OF THE EFFICACY OF PROPRANOLOL. R.L. Alkana; E.S. Parker; H.B. Cohen; H. Birch; E.P. Noble, Psychopharmacology, v51 p29-37 (1976)

The effect of postethanol ingestion of a single dose of propranolol on acute intoxication was studied in thirteen healthy male volunteers. A within-subject, double-blind, crossover design was employed. Each subject participated in two experimental sessions. In each session, subjects took a battery of tests under three conditions: sober, alcohol (0.8 g/kg), and alcohol (1.1 g/kg + pill), in that order. The pill contained 40 mg propranolol in one session and placebo in the other.

Ethanol altered mood scores and significantly reduced motor coordination, memory, and divided attention performance. Propranolol significantly increased ethanol's effects on divided attention, inebriation ratings, and the electroencephalogram without significantly altering blood alcohol concentrations. There was no indication that propranolol antagonized any of ethanol's effects. These results agree with studies indicating that ethanol's effects are increased by a reduction in the functional capacity of central catecholamine systems. It is suggested that central catecholamine-stimulating drugs may reverse some of ethanol's effects.

Clinically, the present demonstration of a propranolol-induced increase in ethanol's effects has important implications. Firstly, in view of the widespread use of propranolol in the treatment of cardiac arrhythmias, the potential dangers of the concurrent use of alcoholic beverages should be pointed out to patients using propranolol. Secondly, the use of propranolol in alcoholic-withdrawal and in the reduction of anxiety and tension in alcoholics should be monitored closely, since ingestion of propranolol could increase the danger of overdose in these patients. Finally, unless future research dictates otherwise, the use of propranolol in cases of ethanol overdose should be contraindicated. (JAM)

52 refs

KEYWORDS: Anti-Anginal Agents: propranolol. Anti-Arrhythmia Agents: propranolol. Hypotensive (Antihypertensive) Agents: propranolol. Nonbarbiturates: ethanol (ethyl alcohol)*. Experimentation: Acute Dosage Study. Physiological Testing. Psychological Testing. Psychomotor Tests.

UM-77-D0833

MARIHUANA AND DRIVING HAZARDS, G. Milner, The Medical Journal of Australia, v1 n7 p208-11 (12 Feb 1977)

Recent research dealing with marijuana and its effects on driving is reviewed. Epidemiological studies indicate that cannabis use is positively associated with the road toll. In controlled laboratory studies, marijuana or its active constituent, delta-9-THC, has been shown to adversely affect perception skills, coordination, braking time, and other motor skills as well as mood and judgment. In driving studies (in both controlled areas and ordinary traffic), marijuana has been found to adversely affect driving safety.

The literature on cannabis is diffused over international journals covering a wide range of specialties. This paper draws together the evidence from twenty-two scientifically valid reports. A report on a 1975 conference on drugs and driving is described. All these studies indicate that while cannabis alone is a hazardous drug for the driver, it is particularly hazardous in combination with alcohol. At this point in time the effects of marijuana and other cannabinoids are a very real hazard in any community, especially in terms of the road toll. (JAM)

29 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Review: Drugs and Highway Safety.

UM-76-D0834

EFFECTS OF CANNABIS AND ALCOHOL ON AUTOMOBILE DRIVING AND PSYCHOMOTOR TRACKING, R.W. Hansteen; R.D. Miller; L. Lonero; L.D. Reid; B. Jones, Annal of the New York Academy of Sciences, v282 p240-56 (1976)

This project was divided into two separate but related studies. Four female and twelve males were tested in a double-blind experiment. Subjects received placebo, cigarettes containing 21 or 88 mg of delta-9-THC per kg body weight (producing average doses of 1.4 or 5.9 mg of delta-9-THC), or one dose of alcohol in a carbonated drink (producing an average blood alcohol level of 0.07%). After administration of the drugs, the subjects performed several driving maneuvers on a driving course.

In the second test twenty-two males were given one of the following: placebo; 21 or 88 mg of delta-9-THC/kg which gave average doses of 1.6 and 6.8 mg of delta-9-THC; two doses of alcohol which produced a blood alcohol level of either 0.07 or 0.03%; or the low cannabis and low alcohol doses combined. The subjects then performed simple and complex tracking tasks.

The results of the tracking study indicate that alcohol, cannabis, and their combination can result in decreased psychomotor tracking performance. The clearer and more pronounced performance decrement in complex tracking resulted from the combination of alcohol and cannabis compared to the same low doses of each drug separately. This suggests that the effects of the drugs combine on this measure. Effects of the two drugs also appeared to be additive on variables such as pulse rate and conjunctival injection but did not appear to interact on others, and were possibly antagonistic on visual imagery. The high alcohol dose resulted in an increase in choice reaction time,

in simple reaction time, in reaction time to tracking control polarity reversals, and in effective reaction delay time during continuous tracking.

The results of the driving study showed an adverse effect of the higher cannabis and alcohol doses on car handling performance. It would be premature, however, to predict from these results whether cannabis has serious effects on traffic safety. (HSRI)

28 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Nonbarbiturates: ethanol (ethyl alcohol). Closed Course Driving. Experimentation: Comparison of Different Drugs. Experimentation: Dose-Effect Study. Experimentation: Study of Combined Effects of Drugs. Physiological Testing. Psychomotor Tests. Tests of Sensory Function.

UM-75-D0835

THE EFFECTS OF SMOKING MARIHUANA ON PHYSICAL PERFORMANCE, R.D. Steadward; M. Singh, Medicine and Science in Sports, v7 n4 p309-11 (Winter 1975)

The purpose of the present investigation was to determine the effect of marijuana on physical performance as defined by six variables: heart rate, blood pressure, muscular strength, physical work capacity, forced vital capacity, and flow rate of expiration. Twenty volunteer male marijuana smokers took either 18.2 mg delta-9-THC or placebo in three experimental testing sessions.

Each subject reported to the laboratory on three different days. Day one was used in control testing sessions. Days two and three were the placebo and marijuana sessions. On day three the subject smoked marijuana if he had smoked placebo on day two, and vice versa. The test battery measures consisted of resting heart rate, resting systolic and diastolic blood pressure, grip strength, forced vital capacity and flow rate, and a submaximal bicycle ergometer test.

Results showed a significant increase in heart rate from control to marijuana and from placebo tomarijuana. After smoking marijuana, systolic and diastolic blood pressures increased significantly ($p<.05$) relative to placebo and control. A significant drop of physical work capacity occurred in the marijuana group compared to control and placebo. There were, however, no significant differences between the groups in handgrip strengths, vital capacity, or expiratory flow rate. Most subjects experienced a disturbance of consciousness and a disorder of time perception, although they themselves denied any such disturbance. (JAM)

26 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Experimentation: Acute Dosage Study. Physiological Testing.

UM-77-D0836

EFFECTS OF THREE KINDS OF HYPOXIAS ON VIGILANCE PERFORMANCE, C.L. Christensen; J.A. Gliner; S.M. Horvath; J.A. Wagner, Aviation Space and Environmental Medicine, v48 n6 p491-6 (Jun 1977)

The consequences for vigilance performance of inhaling carbon monoxide (CO) at high altitudes were examined. In addition, the effects of altitude and CO at an equivalent reduction in oxygen-carrying capacity were compared. Five male and five female volunteers between the ages of 22 and 34, all of them nonsmokers, performed a visual vigilance task under four atmosphere conditions: filtered air (21% oxygen); carbon monoxide (114 ppm CO); low oxygen (17% oxygen); and a combination of 113 ppm CO and 17% oxygen. Physiological measures included heart rate, blood pressure, and ventilation. Blood hemoglobin and CO levels were measured directly from blood samples drawn after 0, 50, and 120 minutes of exposure.

The physiological variables measured and subjective responses of subjects showed no changes attributable to atmospheric conditions. A statistically significant change in vigilance performance as measured by percentage of signals detected was found between the control (21% oxygen) and low oxygen (17% oxygen); however, performance under CO and the combination of CO and low oxygen was not different from control. The lack of deterioration in performance under the combination of CO and low oxygen suggests that the increased severity of the stress results in activation of compensatory mechanisms that counterbalance the decreased oxygen available to the tissues. (JA)

31 refs

KEYWORDS: Gases: carbon monoxide. oxygen. Experimentation: Dose-Effect Study. Physiological Testing.

UM-77-D0837

INTOXICATION CAUSED BY INTERACTION OF CHLORAMPHENICOL AND PHENYTOIN, J.Q. Rose; H.K. Choi; J.J. Schentag; W.R. Kinkel; W.J. Jusko, Journal of the American Medical Association, v237 n24 p2630-1 (13 Jun 1977)

This report describes an extremely marked interaction between chloramphenicol and phenytoin resulting in very high serum concentrations of phenytoin in a patient whose poor neurological status caused difficulty in recognizing the signs of drug intoxication. A patient with a brain tumor and seizures who was receiving maintenance doses of phenytoin was given chloramphenicol on three occasions. Her neurological status was both complicated and obscured by the reoccurrence of phenytoin intoxication. Retrospective drug analysis showed a marked elevation of serum concentration of phenytoin during the course of each chloramphenicol treatment.

The concomitant administration of chloramphenicol and phenytoin is an infrequent clinical practice. However, on occasion this antibiotic is used in patients receiving phenytoin. In view of the potential drug interaction, close attention is advised. The rate and magnitude of the interaction has been demonstrated in this patient and should serve as a reminder of the potentially severe consequences of this drug combination. (JAM)

6 refs

KEYWORDS: Anticonvulsants (Anti-Epileptics): phenytoin*. Other Antibiotics: chloramphenicol. Clinical Study. Experimentation: Study of Combined Effects of Drugs.

DOT HS-802488 UM-77-D0838

A COMPARISON OF DRUG USE IN DRIVER FATALITIES AND SIMILARLY EXPOSED DRIVERS, R.R. Blackburn; E.J. Woodhouse (Jul 1977)

A study was undertaken to determine whether or not particular drugs or drug types are overinvolved in fatal crashes. Crash information, urine, blood, and bile samples from 900 fatally injured drivers were collected by medical examiners in twenty-two areas of the country. Randomly selected living drivers were interviewed at times and places of recent fatal crashes in Dallas and Memphis. Breath, urine, and blood samples were obtained from these drivers, and quantitative tests were performed for forty-three drugs. The collection of data on fatally injured drivers took place between November 1974 and Decemember 1975.

The most commonly detected drug was the antihistamine and decongestant phenylpropanolamine, followed by phenobarbital. Nicotine was found in 64.7% of the fatally injured drivers and salicylates in 17.4%. LSD was found in 1.2% of the fatally injured drivers. In living drivers the incidence of one or more drugs was about 7.9%. About 56% of the living drivers had been smoking tobacco.

The comparisons of the relative incidence of drugs in all fatally injured drivers with those in all living drivers indicate that fatally injured drivers are significantly more likely to have been using drugs than similarly exposed living drivers.

The study reconfirmed alcohol as the drug most frequently present among drivers; it appears to play the leading role among drugs as a causative factor in fatal crashes. Alcohol usage was found to depend strongly on the time of day for both the fatally injured drivers and the living drivers. Among the fatally injured drivers, the use of antihistamines and decongestants with one or more drugs was found to be significantly related, in a negative sense, with alcohol usage. Culpability of the fatally injured drivers was not found to be related to drug use. Neither was race significantly related to drug usage. (HSRI)

0 refs

National Highway Traffic Safety Administration DOT-HS-4-00941

KEYWORDS: Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-76-D0839

ACTIONS OFNARCOTICS ON BRAIN DOPAMINE METABOLISM AND THEIR RELEVANCE FOR "PSYCHOMOTOR" EFFECTS, K. Kuschinsky, Arzneimittel-Forschung (Drug Research), v26 n4 p563-7 (1976)

This paper reviews effects of narcotic analgesics, particularly morphine, on dopamine metabolism in the corpus striatum and discusses their relation to mobility and other "psychomotor" phenomena. In rats, acute doses of morphine decrease the dopaminergic neurotransmission in the brain without blocking postsynaptic dopamine receptors. Chronic treatment of rats with morphine reverses these acute effects of morphine and induces symptoms of increased dopaminergic neurotransmisson in the brain. In mice and cats, on the other hand, acute doses of morphine apparently increase dopaminergic neurotransmission. The effects of morphine on striatal dopamine metabolism seem to be a model well suited to study opioid-specific effects on a cellular level. Furthermore, they might also be responsible for some narcotic-specific effects on behavior observed in animals and man.

In conclusion, dopaminergic mechanisms seem to play an important role in the development of both physical and psychological dependence. This might be of practical relevance for the therapy of narcotic addiction or withdrawal. (JAM)

97 refs

KEYWORDS: Opiates and Related Agents: morphine. Sympathomimetic (Adrenergic) Agents: dopamine. Opiates and Related Agents. Review: Drug Effects.

UM-76-D0840

A MOTOR VEHICLE ACCIDENT CAUSAL SYSTEM: THE HUMAN ELEMENT, J.C. Fell, Human Factors, v18 n1 p85-94 (Feb 1976)

This article proposes a causal system for motor vehicle accidents, which, from the human factors viewpoint, should provide a basis for better standardized reporting of relevant human factors involved in accidents. It should also allow for individual language differences and explanation by accident researchers. The system, or model, is based upon a cause and effect relationship: the "effect" being the primary failure or behavior which leads directly to the collision situation; the "cause" being the reasons for the failure or behavior. Effects are described as information-processing failures of four types: 1) perception; 2) comprehension; 3) decision; and 4) action failures. The reasons for these information processing failures are categorized: 1) physical or physiological failures; 2) driver conditions or states; 3) experience or exposure factors; 4) conflicting behaviors or preoccupation; and 5) risk-taking behaviors.

A causal reporting system for utilization by accident research groups is discussed in terms of primary or principal causes, severity-increasing factors, and relevant conditions. This system eliminates the single reporting of general causal factors by requiring the reporting of what the drivers did wrong given these conditions and behaviors. This system would also make more data available for analyses of multiple variables and for determining the frequency of information failures. The potential of such findings, if applied to specific countermeasures or emphasis areas in driver education courses, appears promising. Two recent studies that used similar causal systems are described and findings from them are presented. (JAM)

18 refs

KEYWORDS: Review.

UM-77-D0841

EFFECTS OF MARIHUANA ON REACTION TIME AND SHORT-TERM MEMORY IN HUMAN VOLUNTEERS, A.M. Rossi; J.C. Kuehnle; J.H. Mendelson, Pharmacology Biochemistry and Behavior, v6 n1 p73-7 (Jan 1977)

This study attempted to study the effects of marijuana on reaction time and short-term memory. It specifically attempted to test the hypothesis that subjects' marijuana-related performance on a short-term memory task will vary according to the degree of attention they devote to the experimental task. Twenty-seven adult male marijuana smokers volunteered to participate in a hospital research ward study for a thirty-one-day period. Following five days of baseline acclimatization, subjects could purchase and smoke marijuana cigarettes (each containing 1 gram of marijuana with a delta-9-THC content of 1.8 to 2.3%) on a free choice basis for a period of twenty-one consecutive

days. The marijuana smoking period was followed by a concluding five-day baseline. Measurements of simple reaction time, choice reaction time, and short-term memory were carried out during the entire study.

Analysis of variance revealed no statistically significant differences between control and marijuana performance; however, a correlational analysis showed that individual subject performances on all three tasks were significantly correlated from test session to test session during control conditions but not during marijuana smoking conditions.

A tenable inference is that marijuana-related performances on the short-term memory and choice reaction time tasks covaried as a function of the subject's ability or motivation to sustain attention to the laboratory tasks during any particular testing session. (JAM)

32 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Experimentation: Chronic Dosage Study. Psychological Testing. Psychomotor Tests.

UM-77-D0842

THE EFFECTS OF ALCOHOL AND VALIUM, SINGLY AND IN COMBINATION UPON DRIVING-RELATED SKILLS PERFORMANCE, H. Moskowitz; M. Burns, American Association for Automotive Medicine. 21st Conference. Proceedings, D.F. Huelke, ed., p226-40, AAAM (1977)

This study was undertaken to examine the effects of moderate doses of alcohol and diazepam, administered simply and in combination, on driving-related skills. Twelve male subjects, ages 21 to 42, were tested in four laboratory sessions under diazepam alone, alcohol alone, diazepam and alcohol in combination, and placebo. A dose of 0.58 gm/k alcohol was given which produces a mean expected peak blood alcohol content of .07%. The drug treatment of .033 mg diazepam/lb bodyweight (average dose of 5 mg) was given in capsule form ten minutes after the beginning of the drinking period.

BAC was measured thirty and ninety minutes after drinking. Eye movements were measured at thirty minutes, and tracking and joint tracking ability were tested between thirty and sixty minutes. Visual divided attention and visual backward masking were also measured.

Intoxication was found to increase in strength from placebo to diazepam to alcohol, reaching its greatest level under the combined treatments. For all measures the combined dose produced greater impairment. There was no evidence, however, for a nonlinear effect since the equivalent of an interaction term was statisically insignificant, suggesting that the effects of alcohol and diazepam are additive.

The results for diazepam clearly suggest that this central nervous system depressant, used alone or in combination with alcohol, will impair driving performance. Other minor tranquilizers should be evaluated for possible risk in driving, industrial, or recreational situations. (AAM)

9 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Nonbarbiturates: ethanol (ethyl alcohol). Driving Simulator. Experimentation: Acute Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Study of Combined Effects of Drugs. Tests of Sensory Function.

UM-77-D0843

BARBITURATES AND ALCOHOL IN B.C. TRAFFIC FATALITIES, H.M. Simpson; R.A. Warren; D. Collard; L. Page-Valin, American Association for Automotive Medicine. 21st Conference. Proceedings, D.F. Huelke, ed., p219-25, AAAM (1977)

This study examined coroners' records and toxicology reports for 1974 and 1975 on 721 fatally injured drivers in British Columbia. Of these, 594 who died within six hours of the crash were studied for alcohol and barbiturates. Among these victims, a high rate of testing was found, with specimens from 505 (85%) of the victims being subjected to chemical analyses. At least 46% of these drivers who died within six hours werefound to be impaired, i.e., had BACs in excess of 80 mg%. The frequency of testing for barbiturates was lower than the testing for alcohol, decreasing as positive blood alcohol levels increased. Nevertheless, a reasonably substantial number (197) of victims were screened for barbiturates in 1974 and 1975. Of these 197, only 5 were

positive. The incidence of barbiturates is comparable to what has been found in other studies, although considerable variation has been found for the frequency of positive barbiturates when urine and bile have been analyzed. (AAM)

11 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Barbiturates. Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-77-D0844

TOBACCO SMOKING, PERSONALITY AND SEX FACTORS IN AUDITORY VIGILANCE PERFORMANCE, J.E. Tong; G. Leigh; J. Campbell; D. Smith, The British Journal of Psychology, v68 pt3 p365-70 (Aug 1977)

A total of 120 university students (aged 18 to 30) comprising equal groups of male and female nonsmokers, smokers not smoking, and smokers smoking, were compared for performance on a sixty-minute auditory vigilance task. Nonsmokers consistently detected more signals throughout the test. Results showed that while nonsmokers detected fewer signals as the test progressed, smokers smoking significantly increased their number of detections. In addition to the auditory vigilance test, the subjects also completed the Eysenck Personality Inventory (EPI). There were no sex differences and no overall differences in EPI scores, although extraverted nonsmokers produced significantly higher scores than introverted nonsmokers. For smokers, the relationship was reversed.

Since the auditory vigilance task demanded constant monitoring of digits, the difference in scores between the three groups compared may be due to an attentional factor. When nicotine is injected intravenously, it is primarily accumulated in the hippocampus, an area believed to be the coordinating center for the control of attention. It may be important in future research to discover whether nicotine may not cause some temporary or perhaps relatively permanent changes in ability to sustain attention over a concentrated period of time. (JAM)

23 refs

KEYWORDS: Ganglionic Blocking and Stimulating Agents: nicotine. Stimulants: nicotine. Unclassified Agents: tobacco. Experimentation: Other Single-Drug Study. Gender and Drug Effects. Personality and Drug Effects. Psychological Testing. Tests of Sensory Function.

UM-77-D0845

EFFECTS OF ETHANOL AND TOBACCO ON DIVIDED ATTENTION, G. Leigh; J.E. Tong; J.A. Campbell, Journal of Studies on Alcohol, v38 n7 p1233-9 (Jul 1977)

The present study was designed to determine whether nicotine in tobacco smoke would counteract the deleterious effect of alcohol on a divided attention task and, if so, whether one cigarette is sufficient to modify performance. Twenty-two male university students were given 2.8 ml of alcohol per kg of body weight or placebo and were tested for auditory perception. Each subject was tested individually on consecutive days with one of four drug treatments: alcohol placebo plus no cigarettes; alcohol placebo plus cigarettes; alcohol plus no cigarettes; alcohol plus cigarettes.

The results showed that although tobacco use can confound the results of alcohol experiments, one cigarette is insufficient to affect scores significantly. To achieve significant results with critical flicker fusion threshold required that abstinence from nicotine prior to the test be combined with smoking during the test. Subjects who smoke normally before testing frequently did not demonstrate any nicotine effect when compared with controls.

In the absence of specific knowledge concerning the effects of brief tobacco deprivation on cognitive performance, it appears simpler to attribute the present results to the nicotine factor rather than to the psychological satisfaction of smoking as being the active agent in counteracting the effects of alcohol. Presumably this is due to the action of both drugs on the subcortical arousal systems. (HSRI)

15 refs

KEYWORDS: Ganglionic Blocking and Stimulating Agents: nicotine. Nonbarbiturates: ethanol (ethyl alcohol). Stimulants: nicotine. Unclassified Agents: tobacco. Experimentation: Study of Combined Effects of Drugs. Tests of Sensory Function.

UM-76-D0846

AMNESIC ACTION OF AND SKILLS RELATED TO DRIVING AFTER INTRAVENOUS FLUNITRAZEPAM, K. Korttila; M. Linnoila, Acta anaesthesiologica scandinavica, v20 p160-8 (1976)

Amnesic action, skills related to driving, and the ability to discriminate the fusion of flickering light were measured double-blind in twenty-nine healthy volunteers before and four, six, eight, and ten hours after injection with 0.02 and 0.03 mg/kg of flunitrazepam and two, four, six, and eight hours after the injection with 0.01 mg/kg of flunitrazepam.

Every subject experienced amnesia for the pinching of the abdomen after being injected with flunitrazepam. Even the smallest dose (0.01 mg/kg) caused amnesia without affecting the level of consciousness. The late effects of flunitrazepam were the most harmful to coordination. The 0.01 mg/kg dosage slightly impaired eye-hand coordination up to six hours after the injection.

It was concluded that, because the amnesic action of flunitrazepam is more effective than that of clinically comparable doses of diazepam, further clinical experiments with flunitrazepam are warranted. Its longer and more harmful effects on psychomotor performance than those of equipotent doses of diazepam suggest that doses of 0.02 mg/kg or more of flunitrazepam should be avoided in outpatient anesthesia or sedation. Patients receiving 0.01 mg/kg of flunitrazepam intravenously should not drive or operate machinery for at least six hours, and those given doses of 0.02 to 0.03 mg/kg or more should not drive for twenty-four hours after the injection. (JAM)

30 refs

KEYWORDS: Nonbarbiturates: flunitrazepam*. Experimentation: Chronic Dosage Study. Experimentation: Dose-Effect Study. Psychomotor Tests. Tests of Sensory Function.

UM-77-D0847

CHRONIC CANNABIS USE AND PSYCHOMOTOR FUNCTION, Medical Journal of Australia, v1 n7 p201-2 (12Feb 1977)

So far much public debate on the health aspects of marijuana has been misleading. Discussion has failed to focus on the immediate hazards of marijuana, despite clear evidence indicating that marijuana intoxication presents a danger.

Several foreign studies on long-term users of marijuana or hashish are reviewed in this paper. An Egyptian study found hashish users to have memory impairment for recent events, flight of ideas, and difficulty of concentration. Their work capacity was significantly impaired in quality and quantity, and a positive relation was found between duration of hashish use and opium taking.

More information should be gathered on an international basis so that the United States does not repeat the mistakes of others but , instead, learns about problems that may develop and the effectiveness of different national responses. (HSRI)

8 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Review: Drug Effects.

UM-77-D0848

DRUGS AND DRIVING, R.E. Willette, NIDA Research Monograph 11 (Mar 1977)

A critical review of the research literature concerning drugs and driving is presented. The review was conducted by a panel of nationally recognized experts on the behavioral effects of drug usage.

Illicit, prescription, and over-the-counter drugs are included in this review. Examined is literature on anesthetics, foreign tranquilizers, general and minor tranquilizers, opiates, sedatives, stimulants, hallucinogens, marijuana, and other drugs. Some alcohol studies are covered, with strong emphasis on studies of alcohol in combination with other drugs. Critical analyses concentrate on the type of performance functions tested or measured and on methodological approaches used. Techniques for the detection of drugs and other substances are also discussed. (AAM)

137 pages 141 refs

DHEW/PHS, ADAMHA DHEW Publication No. (ADM)77-432

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Anesthetics. Hallucinogens and Related Agents. Opiates and Related Agents. Sedatives and Hypnotic Agents. Stimulants. Tranquilizers. Compilation. Review: Drugs and Highway Safety.

UM-77-D0849

STUDIES ON THE RELATION BETWEEN CARBOXYHEMOGLOBIN CONCENTRATION AND TOXICITY, L.R. Goldbaum; T. Orellano; E. Dergal, Aviation, Space, and Environmental Medicine, v48 n10 p969-70 (Oct 1977)

A study was made on the effect of intraperitoneal (i.p.) injection of 100% carbon monoxide (CO) in ten dogs in order to determine the level at which toxicity occurrs. The dose varied from 20 cc/kg to 200 cc/kg.

Although elevated concentrations of COHb were obtained, no CO toxicity occurred. In as much as the combination of CO and erythrocytes after i.p. injection of CO should be similar to that after inhaling CO, the lack of toxicity cannot be explained by Drabkin's "Haldane effect" which suggests that inhaled CO forms a partial combination with iron molecules in the hemoglobin molecule that results in a molecular species that holds the remaining oxygen more tightly. It has been suggested that the absence of toxicity after i.p. injection is due to removal of dissolved CO from the blood by passage through the lungs. When CO is inhaled, however, there is significant dissolved CO in the blood leaving the lungs for other organs, especially the heart and brain. To cause toxicity, dissolved CO must be present in the blood to cross into the tissue and interfere with the combination of oxygen and cytochrome A3. The authors conclude that random COHb values may not be related to those obtained in studies of the relationship of human responses to COHb concentrations.

If elevated COHb concentrations per se do not cause toxic effects, it is questionable that COHb can be related to the classical signs and symptoms of CO poisoning. Without a knowledge of the atmospheric CO concentration inhaled, the time of exposure, and aveolar ventilation, COHb determination may be misleading. The use of COHb to indicate CO toxicity has led to contradictory reports by investigators, resulting in controversy over the effect of low COHb on human responses and on the concentration of COHb that causes death. (JAM)

5 refs

KEYWORDS: Gases: carbon monoxide. Animal Research. Experimentation: Acute Dosage Study.

UM-76-D0850

THE EFFECTS OF ALCOHOL AND DELTA-9-TETRAHYDROCANNABINOL ON HUMAN PHYSICAL AGRESSION, S.P. Taylor; R.M. Vardaris; A.B. Rawtich; C.B. Gammon; J.W. Cranston; A.I. Lubetkin, Aggressive Behavior, v2 p153-61 (1976)

The purpose of this experiment was to compare the effects of marijuana and alcohol on the expression of human aggressive behavior. Forty male undergraduates over 21 years of age were randomly assigned to one of five conditions: 1.5 oz or 0.5 oz of 100 proof ethanol per forty pounds of body weight, 0.3 mg/kg marijuana, 0.1 mg/kg marijuana, or placebo. Thirty-five minutes after ingestion, the physical aggression of each subject was measured in a test in which opportunity was given to shock increasingly provocative opponents while competing in a task involving reaction time.

The expression of physical aggression was found to be related to the quantity of alcohol ingested. The high dose of alcohol resulted in more intense aggression than the low dose. The high dose of THC, on the other hand, did not increase aggressive behavior. In fact, it tended to produce a weak suppression effect. This study provides additional evidence in support of the traditional assumption that ingestion of large quantities of alcohol increases the expression of aggressive behavior. However, marijuana consumption, in contrast to earlier reports, does not result in loss of control during intoxication or impulsive, irrational acts of violence. (HSRI)

13 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Nonbarbiturates: ethanol (ethyl alcohol). Experimentation: Comparison of Different Drugs. Experimentation: Dose-Effect Study. Psychological Testing.

UM-76-D0851

DRUGS AND DRIVING, H. Moskowitz, ed., New York: Pergamon Press (1976)

Ten papers concerning drugs and driving are presented. The first five papers review the current literature on five classes of drugs and their potential hazard to driving safety. The drug groups reviewed are amphetamines, tranquilizers, barbiturates, narcotics, and cannabis. These papers clearly indicate that, in the context of highway safety, definitive statements about the general effects of drugs can rarely be made. The papers point to the necessity for evaluating each class of drugs and their individual members. Different drugs affect disparate behavioral mechanisms. It is safe to say that at least three out of the five classes of drugs discussed are likely to lead to impairment of driving skills, namely, tranquilizers, barbiturates, and cannabis.

The following three papers are representative examples of research currently being conducted on drugs and driving. One studied licit and illicit drug use, driving patterns, and accident rates among a high school student population. Another examined accident rates as a function of types of prescription drugs used by various categories of patients. The third paper reports a study in which the impairment of behavioral skills by marijuana was measured with a driving simulator. The last two papers deal with countermeasures against intoxicated drivers. Current countermeasure programs against the drunk driver are evaluated in one paper, while the other paper points out the difficulties in both choosing effective countermeasure programs and in measuring the effectiveness of such programs. (HSRI)

79 pages

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Barbiturates. Opiates and Related Agents. Stimulants. Tranquilizers. Compilation. Review: Drugs and Highway Safety.

UM-77-D0852

LACK OF IMPAIRMENT IN SKILLS RELATED TO DRIVING AFTER INTRAMUSCULAR ADMINISTRATION OF PRILOCAINE OR MEPIVACAINE, K. Korttila, Acta anaesthesiologica scandinavica, v21 n1 p31-6 (1977)

This study attempted to measure psychomotor skills after intramuscular injection of prilocaine or mepivacaine, and to compare the drugs' effects with those of lidocaine. A saline placebo, 3 mg/kg of 2% plain prilocaine, or 3 mg/kg of 2% plain mepivacaine were injected into the deltoid muscles of ten healthy subjects whose mean age was 22 in a double-blind cross-over trial. Before and at 0.5, 1.5, and 3 hours after injection, psychomotor skills related to driving were measured, included in the battery were tests of attention, coordinative skills, reactive skills, and flicker fusion frequency. Concentrations of drugs in blood were also determined.

When compared to placebo, neither prilocaine nor mepivacaine impaired the psychomotor functions measured. Blood concentrations of prilocaine were significantly ($P<0.001$) lower than those of mepivacaine during the whole observation period. In this study, the only impairment in psychomotor performance observed was a smaller total number of responses in a divided attention test after the administration of prilocaine. The authors conclude that in comparison to lidocaine, bupivacaine, or etidocaine, which have been tested previously and found to impair psychomotor performance, mepivacaine and especially prilocaine are the anesthetic agents to be preferred when effects on the central nervous system should be avoided, as in outpatient practice. (JAM)

19 refs

KEYWORDS: Local Anesthetics: mepivacaine*. prilocaine*. Experimentation: Acute Dosage Study. Experimentation: Comparison of Different Drugs. Psychomotor Tests.

UM-77-D0853

SOME EFFECTS OF SLEEP DEPRIVATION ON TRACKING PERFORMANCE IN STATIC AND DYNAMIC ENVIRONMENTS, W.E. Collins, Journal of Applied Psychology, v62 n5 p567-73 (1977)

The influence of thirty-four and fifty-five hours of sleep deprivation on a tracking task was studied in a laboratory under both static (no motion) and dynamic (whole-body angular acceleration) conditions. Performance scores were derived from manual tracking of the localizer needle on an aircraft instrument. In each of two experiments, twenty male subjects ranging in age from 21 to 30 years were equally divided into control and

sleep-deprived groups. They were tested in an enclosed rotator in darkness with the exception of the illuminated-backing display.

Significant decrements in dynamic performance were uniformly obtained after twenty-four hours or more of sleep loss; static scores were less consistently impaired. Administration of 10 mg d-amphetamine sulphate after fifty-five hours of sleep loss reduced error for both static and dynamic tracking. Although performance at both tasks remained poorer for sleep-deprived subjects, their static tracking scores did not differ significantly from control subjects two hours after drug ingestion.

Thus, this study indicates that performance of an aviation-related task declines after a night without sleep. These negative effects become greater with increasing amounts of sleep loss and are more pervasive in motion environments. Negative effects include "blacking out" and some visual hallucinations. The study also indicates that the effect of the amphetamine used was limited. Use of the drug did not raise the level of performance of the sleep deprived group to that of the control group, particularly for dynamic as compared to static tracking. (JAM)

10 refs

KEYWORDS: Anorectic (Appetite Control) Agents: dextroamphetamine. Stimulants: dextroamphetamine. Sympathomimetic (Adrenergic) Agents: dextroamphetamine. Experimentation: Acute Dosage Study. Psychomotor Tests. Tests of Sensory Function.

UM-75-D0854

NEUROPSYCHOLOGICAL MEASUREMENT OF DRUG EFFECTS: POLYDRUG RESEARCH, K.M. Adams; P.M. Rennick; K.G. Schoof; J.F. Keegan, Journal of Psychedelic Drugs, v7 n2 p151-60 (Apr-Jun 1975)

Evidence seems to support the hypothesis that long-term ingestion of multiple drugs results in some cerebral dysfunction. In designing research paradigms to provide information about drug effects in humans, one is limited by the anamnestic nature of the subject's drug usage data. Beyond the basic problem of measuring impairment one must take into account the possibility that some impairments are selective and reversable.

This paper also describes a method for measuring these effects and their relation to standardized neuropsychological measures of hypothetical cerebral dysfunction. Drug addicts are administered on four occasions a battery of tests including color naming, word fluency, visual-motor coordination, pattern matching, digit symbol, and digit span tests. Clients are then classified into subgroups reflecting their scores on these tests and other tests. This allows therapy to be more tailored to the cognitive style of the client, and takes into account the realities of any irreversible impairment, increasing the capacity to adapt treatment to changes in the patients situation. (HSRI)

13 refs

KEYWORDS: Clinical Study. Experimentation: Other Multiple-Drug Studies. Psychological Testing.

UM-75-D0855

BRAIN DYSFUNCTION IN CHRONIC SEDATIVE USERS, L.L. Judd; I. Grant, Journal of Psychedelic Drugs, v7 n2 p143-9 (Apr-Jun 1975)

This preliminary report describes a comprehensive longitudinal study of polydrug-using subjects whose primary pattern of drug abuse was with CNS depressant drugs. An extensive testing battery was designed to elicit standardized information from a wide variety of areas including cognitive and neuropsychological functioning. Fifty polydrug users ranging in age from fourteen to fifty-four years were administered neuropsychological examinations. Their scores were compared to the scores of two other groups, medical and neurological patients.

Half of the fifty polydrug users demonstrated cerebral dysfunction. When the adaptive abilities of polydrug users were compared to those of medical and neurological patients, a continuum was found, ranging from no impairment in the medical group, through moderate impairment in polydrug users, to severe impairment among neurological patients.

Of particular interest is the finding that neuropsychological impairment may be associated with the heavy use of CNS depressant drugs. Users of CNS depressants showed marked neuropsychological deficits in concept formation, ability to abstract, nonverbal

learning, perceptual-motor coordination, accuracy of perception, and speed of motor movement. (HSRI)

15 refs

KEYWORDS: Barbiturates. Opiates and Related Agents. Sedatives and Hypnotic Agents. Clinical Study. Experimentation: Other Multiple-Drug Studies. Psychological Testing. Psychomotor Tests.

UM-77-D0856

PREVALENCE OF DRUGS AMONG DRIVERS ARRESTED FOR DRINKING AND DRIVING IN FINLAND, A.R. Alha; M. Karlsson; M. Linnoila; I. Lukkari, Zeitschrift fur Rechtsmedizin, v79 n3 p225-34 (18 Apr 1977)

A combined thin-layer and gas chromatographic system was developed for qualitative and quantitative analysis of drugs in biological samples after extraction with heptane-isoamyl alcohol in order to detect drugs that impair driving skills. Both acidic and basic extraction procedures were used. Special methods were used for the extraction and detection of psychostimulants. This method was then used to analyze blood and urine samples of two groups of drivers: (1) 100 consecutive drivers arrested for drinking and driving who reported concomitant drug usage; and (2) 100 randomly chosen drivers arrested for drinking and driving in Helsinki. Of the 100 drivers in group 1, 24 had blood alcohol levels (BALs) that were negative and 18 of the 24 had drugs in their urine samples. Seventy-six of the 100 had positive BALs and 25 of the 76 had drugs in their urine samples. Of the randomly chosen second group of 100 suspected drinking drivers, 5 had drugs in their urine samples, and 4 of these 5 had positive BALs. The benzodiazepines were the most commonly detected drugs. No stimulants were found in these subjects.

Most of the drivers tested were arrested on weekend nights. If random samples of drivers could be investigated at roadside during the daytime, the proportion of drug-using drivers might be higher: the regular use of licit drugs is more common among middle-aged and elderly people than among youths, and older drivers are seldom on the road late at night. (JAM)

26 refs

KEYWORDS: Epidemiologic Research: Drug Concentrations in Body Fluids. Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-74-D0857

PROPOXYPHENE NAPSYLATE (DARVON N(R)): A NEW INDICATION FOR A DRUG? J.R. Cooper; J.R. Silvio, Journal of Psychedelic Drugs, v6 n4 p415-20 (Oct-Dec 1974)

This article provides an informative review of propoxyphene napsylate. Topics include this drug's potential toxicity at nonrecommended doses and the rationale and justification for further scientific investigation. The authors enumerate concerns requiring further research before propoxyphene napsylate can be deemed safe and efficacious for the use of opiate dependence.

Propoxyphene HCl, when used in analgesic dosages as indicated by the manufacturers, has no significant liability for producing physical dependency. When consumed in amounts that exceed those prescribed for analgesia, however, it can produce an altered state of consciousness. If propoxyphene HCl is used frequently and for long periods of time to achieve this effect, a moderate degree of physical dependency and tolerance will develop. Cross tolerance with opiates as well as objective withdrawal symptoms have been documented.

Potential use for propoxyphene napsylate in the treatment of opiate dependence can be found in three areas of treatment: (1) as a primary agent for rapid heroin detoxification in correctional institutions and in therapeutic communities that have no access to methadone but need a detoxifying agent; (2) as a primary adjunctive agent with methadone for the detoxification of methadone maintenance patients, to sustain them both psychologically and physically as they gradually withdraw from methadone; and (3) as a maintenance agent for those patients whose dependency on opiates is moderate to minimal.

Much research, however, remains to be done on the safety and efficacy of propoxyphene napsylate. (HSRI)

25 refs

KEYWORDS: Analgesics and Antipyretics: propoxyphene. Review: Drug Effects.

UM-74-D0858

METHYLENEDIOXYAMPHETAMINE (MDA): SUBJECTIVE EFFECTS, I.S. Turek; R.A. Soskin; A.A. Kurland, Journal of Psychedelic Drugs, v6 n1 p7-14 (Jan-Mar 1974)

Ten subjects were selected to investigate the subjective effects of 75 mg methylenedioxyamphetamine (MDA). Nine had previously used LSD. Blood pressure and respiration were recorded prior to the ingestion of the drug and every hour thereafter up to the seventh hour. The digit span and digit symbol subtests were administered before the drug and every ninety minutes up to the eighth hour. Three questionnaires were used to assess the subjective effects of the drug experience: The Psychedelic Experience Questionnaire, the Subjective Drug Effect Questionnaire, and the Ludwig-Levine Modification of the Linton-Langs Questionnaire.

Interpretation of test results showed that even during peak effects of the 75 mg dose of MDA there was only a minimal loss in ability to attend, concentrate, and perform relatively complex visual-motor tasks. There was no appreciable impairment of visual perception such as often occurs with LSD or mescaline. Subjects communicated without difficulty.

MDA appears to facilitate a state of mind characterized by increased introspectiveness, heightened self-awareness, and greater intuitiveness. Its effects were associated with emotional states described as relaxation, acceptance, calmness, and serenity. Toward the end, the state of mind was described as overactive and overstimulated, resembling that produced by amphetamines.

The drug seems to reduce the need to defend or aggrandize the ego. In this state of enhanced well-being, the subject seems more able to accept and integrate concepts emanating either from the unconscious or provided by the therapist. Subjects reported that there was a loss in perception of time. Most subjects felt that they could still feel some effects twelve hours after administration. (HSRI)

21 refs

KEYWORDS: Hallucinogens and Related Agents: methylenedioxyamphetamine (MDA). Experimentation: Acute Dosage Study. Physiological Testing. Psychological Testing. Psychomotor Tests. Self-Evaluation of Drug Effects by Subjects. Tests of Sensory Function.

UM-72-D0859

METHAQUALONE: JUST ANOTHER DOWNER, D.R. Wesson; D.E. Smith, Journal of Psychedelic Drugs, v5n2 p167-9 (Winter 1972)

This paper deals with the history, causes, and implications of the widespread availability of methaqualone, a relatively new drug introduced to the United States market in 1965. Heavy advertising in medical journals by pharmaceutical manufacturers and promotion by drug salesmen emphasized that methaqualone was a nonbarbiturate hypnotic with low abuse potential and that its use was associated with a very low incidence of physical dependence. Methaqualone became widely prescribed by physicians in great part because of their belief that methaqualone was a sedative-hypnotic with none of the abuse potential of short-acting barbiturates.

Independent clinical research, however, has found that intoxication with methaqualone is similar to intoxication with barbiturates or alcohol and subjects the individual to the same risks: death by overdose, accidents due to confusion or impaired motor coordination, and escalating drug involvement to the point of addiction. Overdose with methaqualone produces coma, muscle spasm, convulsions, and hemorrhaging due to interference with blood coagulation. Withdrawal from methaqualone dependency is probably as dangerous as withdrawal from the short-acting barbiturates. The patterns of nonprescribed use of methaqualone are similar to those of oral barbiturates. The combining of methaqualone with alcohol is especially hazardous since simultaneous use of both drugs is likely to result in overdose.

The authors conclude by appealing to the Food and Drug Administration, the medical profession, and pharmaceutical companies to put more stringent controls on methaqualone. (HSRI)

14 refs

KEYWORDS: Nonbarbiturates: methaqualone. Review: Drug Effects.

UM-72-D0860

BARBITURATE TOXICITY AND THE TREATMENT OF BARBITURATE DEPENDENCE, D.R. Wesson; D.E. Smith, Journal of Psychedelic Drugs, v5 n2 p159-65 (Winter 1972)

The patterns of barbiturate intoxication, its medical consequences, and treatment of individuals physically dependent on barbiturates are examined.

Chronic intoxication involves individuals generally thirty to fifty years of age who obtain their supply of barbiturates from physicians rather than from the black market. Most are of middle to upper socioeconomic class and have no identification with the young drug-taking subculture. Episodic intoxication is seen most commonly in teenagers and young adults who ingest sufficient amounts of barbiturates orally to produce a high much like that from alcohol. The most hazardous pattern of barbiturate use is intravenous injection of barbiturates.

For the individual who has become physically dependent upon barbiturates, abruptly stopping or decreasing the daily amount taken will produce symptoms of barbiturate withdrawal which can be life threatening, requiring hospitalization.

The authors suggest that the best method of withdrawal is one in which the longer-acting phenobarbital is substituted for the short-acting barbiturate. In much the same way, longer- acting methadone is substituted for heroin in narcotic withdrawal. More stable barbiturate blood levels provide added protection against development of withdrawal symptoms and allow for the safe utilization of subintoxicating doses during withdrawal. Phenobarbital does not usually produce the disinhibition euphoria or high of short-acting barbiturates. The safety factor of phenobarbital is much greater than that of the short-acting barbiturates in that fatal doses of phenobarbital are several times the toxic dose. The dosage of phenobarbital to be given to the barbiturate-dependendent individual is calculated by substituting 30 mg of phenobarbital for each 100 mg of the short-acting barbiturates the patient reports using. Two days after switching from short-acting barbiturate to phenobarbital withdrawal is begun.

Physical withdrawal is only the first stage of successful rehabilitation of individuals who have based their lifestyle on the use of barbiturates. They must also be treated emotionally and mentally so they are able to readjust to their environment. (HSRI)

7 refs

KEYWORDS: Barbiturates. Review. Review: Drug Effects. Review: Drug Use.

UM-72-D0861

PHENCYCLIDINE [PCP]: ANOTHER ILLICIT PSYCHEDELIC DRUG, A. Reed; A.W. Kane, Journal of Psychedelic Drugs, v5 n1 p8-12 (Fall 1972)

With the increased prevalence of phencyclidine (PCP) in the illicit drug market, information about PCP is important to those who deal with the acute and chronic drug reactions. This paper attempts to set forth a picture of the drug-person interaction and the various ways PCP has been and is used.

PCP produces changes in perceptions and reality, feelings of dissociation, and a generalized change in the way the user experiences his environment. With these effects PCP can serve as a substitute for LSD and other psychedelics in the illicit drug market.

The CNS effects of PCP differ markedly with dose. At low doses the most prominent effect, generalized numbness, is similar to that of alcohol. With increasing doses, analgesia and then anesthesia are noted. Large doses can produce convulsions. Feelings of apathy and isolation as a consequence of PCP use have been frequently noted. The authors hypothesize that individuals who are already most apathetic, socially introverted, and emotionally isolated are those most likely to use and abuse drugs, particularly those drugs about which little is known. Because apathy and feelings of isolation are also characteristic of schizophrenia, some investigators have attempted to compare the performance of subjects under the influence of PCP with that of schizophrenics. One study has suggested that there may be a use for PCP in psychiatry. However, more information about its possible use in facilitating abreaction(the relieving of repressed emotions) or other psychiatric states must be produced. (HSRI)

29 refs

KEYWORDS: Hallucinogens and Related Agents: phencyclidine. Review: Drug Effects. Review: Drug Use.

UM-72-D0862

NITROUS OXIDE: IT'S A GAS. E.J. Lynn; R.G. Walter; L.A. Harris; R. Dendy; M. James. Journal of Psychedelic Drugs, v5 n1 p1-7 (Fall 1972)

The prevalence of the nonmedical use of nitrous oxide was surveyed in mid-Michigan. The study indicated that recreational use of this anesthetic gas has increased. A total of thirty-four volunteers (nineteen men and fifteen women ranging in age from 19 to 42), half of whom were drug users, self-administered pure nitrous oxide from balloons.

The methods for ingesting this drug generally used-- breathholding of pure nitrous oxide from a balloon or rebreathing--appear to be safe. The acute onset of effects (fifteen to thirty seconds) is likely related to the rapid passage of the gas by the blood in the lungs and to circulation time to the brain.

Cognitive functioning was diminished during the peak of the high but returned to normal within five minutes. There seemed to be little difference in effects on cognitive functioning in regular drug users when compared with nonusers. The deficiencies in cognitive abilities may be related both to delirium and decreased motivation. There seemed to be no adaptation to the cognitive deficits provoked by the nitrous oxide experience.

Subjective responses were similar for both drug users and nonusers, with some differences in physical sensations. Drug users seem to have after-effects for longer periods of time, which may be related more to previous experiences, personality, and expectations than to the effect of the drug.

Nitrous oxide is not without danger. Its delirium-causing effects undoubtedly impair performance. There have also been reports of individuals who suffocated by using nitrous oxide in a closed system such as an automobile. (HSRI)

15 refs

KEYWORDS: Gases: nitrous oxide. General Anesthetics: nitrous oxide. Hallucinogens and Related Agents: nitrous oxide. Epidemiology: Regional or Local Survey of Drug Use Patterns. Experimentation: Acute Dosage Study. Psychological Testing. Self-Evaluation of Drug Effects by Subjects.

UM-70-D0863

LONG LASTING EFFECTS OF LSD ON NORMALS. W. McGlothlin; S. Cohen; M.S. McGlothlin. Journal of Psychedelic Drugs, v3 n1 p20-31 (Sep 1970)

This article reports a study designed to measure personality, attitude, value, interest, and performance changes resulting from the administration of LSD to normal, healthy, male subjects who had never used LSD. Its goal was to determine whether a dramatic drug-induced experience would have a lasting effect on the individual's personality and if so, whether this effect would be influenced by the person's prior personality, motivation, and expectations.

Seventy-two male subjects (ages 21-35) participated in the main experiment. There were three treatment groups, each with twenty-four subjects. The experimental group received 200 micrograms LSD, one control group received 20 micrograms amphetamine, and the other control group received 25 micrograms LSD.

A large battery of psychological tests was administered prior to a series of three 200 mg LSD sessions, and again at intervals following the third session during a six-month period. These tests included anxiety tests; personality, attitude, and value tests; aesthetic sensitivity tests; creativity tests; and projective tests.

At sixth-month testing levels, very few significant differences could be found between the experimental and control groups. One of the most prominent results was the significant drop in the galvanic skin response to stress situations for the experimental group. Also, there was some evidence of a more introspective and passive orientation accompanied by a less defensive attitude in the experimental group.

The findings relating personality to attitude toward LSD and response to the taking of LSD are much more definite. Persons who place strong emphasis on structure and control generally have no taste for the LSD experience and tend to respond minimally if exposed. Those who respond intensely to LSD tend to prefer a more unstructured, spontaneous life, and score higher on tests of aesthetic sensitivity and imaginativeness. (AAM)

22 refs

KEYWORDS: Hallucinogens and Related Agents: lysergic acid diethylamide (LSD). Experimentation: Chronic Dosage Study. Personality and Drug Effects. Physiological Testing. Psychological Testing.

UM-71-D0864

DRUGS OF ABUSE: AN INTRODUCTION TO THEIR ACTIONS AND POTENTIAL HAZARDS, S. Irwin, Journal of Psychedelic Drugs, v3 n2 p5-15 (Spring 1971)

The purpose of this article is to provide an accurate description of various psychoactive drugs with a potential for abuse and to place their relative hazard in perspective. It also provides definitions of basic terms dealing with drug use and abuse. Ethyl alcohol, hypnotics (barbiturates and nonbarbiturates), marijuana, hallucinogens, minor tranquilizers, narcotic analgesics, tobacco, and stimulants are discussed in terms of their actions, medical uses, adverse side effects, antidotes, withdrawal symptoms, symptoms of use, and physical characteristics.

The author rates glue sniffing as having the greatest intrinsic hazard potential to the individual, followed by methamphetamine and alcohol use. He rates alcohol as the drug highest in intrinsic hazard potentials to society, followed by methamphetamine and barbiturates. Alcohol was implicated in over 50% of driving fatalities, occupied 50% of enforcement time, and used about one-third of the total police budget of the law enforcement groups questioned by the author.

The hazards of drug control legislation are also discussed. The only way to reduce the incidence of drug abuse is by an overall reduction in the per capita consumption of drugs and alcohol by the total population, and by being less tolerant of gross intoxication. The only way to reduce the hazards of drug abuse to the abuser and to society is by providing safer options for social drug use. (HSRI)

0 refs

KEYWORDS: Review: Drug Effects.

UM-71-D0865

NUTMEG AS A PSYCHOACTIVE DRUG, A.T. Weil, Journal of Psychedelic Drugs, v3 n2 p72-80 (Spring 1971)

This paper reviews the botany, history, and commerce of nutmeg and also the ways it is used to alter consciousness. The toxic properties of nutmeg have been recognized for hundreds of years, probably ever since the spice was first prescribed medicinally in large doses. Published reports of Myristica narcosis were frequent around the turn of the last century when many women took nutmeg as an emmenagogue or abortifacient. Some evidence suggests that nutmeg may have long been used as an intoxicant in certain parts of Asia. For at least the past thirty years, prisoners, jazz musicians, sailors, and others have used nutmeg as a substitute for marijuana or other drugs. They either eat or snuff it in amounts varying from one teaspoon to a whole can of ground nutmeg, and commonly experience symptoms much more like those of the familiar hallucinogens than those described in the old reports of nutmeg poisoning.

Significant numbers of students are attempting to induce hallucinations with Myristica. Because it is cheap, legal, and available, nutmeg is often the first drug experience for students, who try it once or twice but usually do not use it habitually because of unpleasant side effects.

Onset of action is commonly two to five or more hours after ingestion. Reactions to nutmeg vary from no mental changes at all to full-blown hallucinogenic experiences like those caused by marijuana or LSD. There is no apparent correlation between dose and psychoactive effect.

Ignorance of the psychoactive properties of nutmeg is unquestionably the most important factor in its limited use as a drug so far. As it is given publicity, however, its

abuse will increase and the medical profession will be forced to learn how to deal with the new situation. (AAM)

23 refs

KEYWORDS: Antiflatulents (Carminatives): myristica. Hallucinogens and Related Agents: myristica. Parasympatholytic (Cholinergic Blocking) Agents: myristica. Review: Drug Effects.

UM-77-D0866

STUDIES MEASURE DRUG, ALCOHOL EFFECTS ON DRIVING. Status Report, v12 n17 09-10 (30 Nov 1977)

Described here is a study comparing fatal crash involvement of teenagers to the proportion of teenagers who received driver education. The study found that driver education for teenagers greatly increases the number of licensed drivers, but is failing to reduce driver involvement in fatal crashes. At least 2,000 fatal crashes per year that would not otherwise occur are attributed to increased licensure of sixteen-and seventeen-year-olds because of driver education. If the age of licensure were raised to eighteen the adverse effects of driver education would be removed.

The paper also describes studies that show that moderate doses of two commonly used drugs, diazepam (Valium(R)) and diphenhydramine hydrochloride (Benadryl(R)), impair skills needed for driving, and when taken in combination with alcohol, produce even greater impairment.

Twelve male test subjects were used in each of the studies, and they were given various combinations of the specific drug, alcoholic beverages, and placebo under controlled laboratory conditions. In the diazepam experiments, the doses for a participant of average weight consisted of five milligrams of the drug and four ounces of 86 proof alcoholic beverage. For the diphenhydramine study the doses were 50 milligramsof the drug and four ounces of 86 proof alcohol. The battery of tests included a tracking task, a tracking task performed simultaneously with a visual search task, a test of information processing rate, and an examination of eye movements while performing the visual search task. Both drugs caused a decrement in test performances. These studies are significant because they deal with doses usually prescribed for two of the drugs most widely used by the general public. (HSRI)

Insurance Institute for Highway Safety

0 refs

KEYWORDS: Antihistamine Agents: diphenhydramine. Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Nonbarbiturates: diphenhydramine. Review: Drug Effects. Review: Drugs and Highway Safety.

DOT HS-802052 UM-76-D0867

EFFECT OF MARIHUANA AND ALCOHOL ON VISUAL SEARCH PERFORMANCE. FINAL REPORT. H.A. Moskowitz; K. Ziedman; S. Sharma (Oct 1976)

Two experiments were performed to determine the effects of alcohol and marijuana on visual scanning patterns in a simulated driving situation. In the first experiment twenty-seven male heavy drinkers between the ages of 21 and 57 were divided into three groups of nine defined by three blood alcohol levels: 0.0%, 0.075%, and 0.15%. The subject was to watch the traffic movie as if he were actually driving. In addition, the subject responded to important events by releasing a switch and identifying the direction of projected arrows. The effects of alcohol included significant changes in visual search behavior including increased dwell duration, decreased dwell frequency, and increased pursuit duration.

In the second experiment ten male social users of marijuana between the ages of 21 and 45 were tested under both 0 mcg and 200 mcg delta-9-tetrahydrocannabinol per kilogram bodyweight in a repeated measures design. They were tested on the same instrument as was used in the previous test. Identical procedures to the alcohol study were used except that for the final study the nature of the subsidiary task stimulus was changed to a Landolt C-ring pointing left or right and presented at a single central screen location. Marijuana was found to have no effect on visual search behavior.

The results are related to previous studies of alcohol and marijuana effects on information processing. Implications for highway safety are discussed, such as the importance of selecting response measures that are appropriately sensitive to the particular effects of a given drug. It is suggested that visual search training is a potentially fruitful area in driver education. (AAM)

166 pages 60 refs

National Highway Traffic Safety Administration DOT-HS-150-3-668

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Nonbarbiturates: ethanol (ethyl alcohol)*. Driving Simulator. Experimentation: Comparison of Different Drugs. Experimentation: Dose-Effect Study. Tests of Sensory Function.

DOT HS-802555 UM-77-D0868

COMPARISON OF ALCOHOL INVOLVEMENT IN EXPOSED AND INJURED DRIVERS. FINAL REPORT, R. Farris; T.B. Malone; M. Kirkpatrick (Sep 1977)

The primary objective of this study was to determine the relationship between alcohol and injury producing automobile accidents. Alcohol-related data collected from drivers involved in injury-producing automobile accidents were compared with the same type of data collected from drivers who were similarly exposed to accident conditions but who did not have accidents.

Collection of data involved a) interviewing and measuring the BAC of accident drivers at the scenes of accidents, in hospitals, or at police stations; and b) interviewing and measuring BACs of nonaccident drivers at the same location of each accident and at the same time of day, day of the week, and direction of travel.

The most important findings of the study were that a) drivers involved in injury-producing accidents had significantly higher BACs than drivers who were exposed to similar conditions but who were not involved in accidents; b) drivers who had high BACS were more likely to become involved in an injury-producing accident than drivers who did not have high BACs; c) drivers who were driving with a BAC$\geq$ .030 were found to be at fault more frequently in injury-producing accidents than drivers who were also involved in accidents but who had not been drinking.

Results of the study indicate that overinvolvement of alcohol exists in injury-producing automobile accidents to a highly significant degree. Efforts should be made to develop countermeasures designed to reduce the role alcohol plays in nonfatal as well as fatal automobile accidents. (AA)

123 pages

National Highway Traffic Safety Administration DOT-HS-4-0954

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol)*. Epidemiology: Analysis of Driver Body Fluids for Drugs. Epidemiology: Self-Reported Drug Use by Drivers.

UM-77-D0869

PSYCHOTROPIC DRUGS AND ROAD ACCIDENTS, R.P. Snaith; I. Hindmarch; V.F. Standing, British Medical Journal, v2 n6081 p263 (23 Jul 1977)

In this letter to the editor of the British Medical Journal the authors deplore the lack of interest in and research on the relationship between the taking of drugs and subsequent accidental injury or death. Research in this field has been too long delayed and should now be accorded priority, considering that prescriptions for sedative and hypnotic drugs number millions a year. The people to whom they are prescribed are also likely to be using alcohol; yet no requirement has been placed upon the medical profession to issue a warning of interaction effects when these drugs are prescribed. If the concealed dangers of sedative drugs were to be forcibly pointed out to patients and to doctors, then it would increase the chances that they are only prescribed for and taken by those patients who really need them. (HSRI)

4 refs

KEYWORDS: Central Nervous System (CNS) Agents. Review: Drugs and Highway Safety.

UM-77-D0870

MARIHUANA AND HEALTH. SIXTH ANNUAL REPORT TO THE U.S. CONGRESS FROM THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE. 1976. (1977)

The Annual Report has come to serve as a state of the art document, providing an update and inventory of marijuana use patterns, monitoring new research, and commenting on the status of continuing work. The Sixth Annual Report notes that if the immune response system is impaired by marijuana, the clinical consequences might include a seriously heightened susceptibility to a wide range of diseases. As of yet, however, there is no evidence that users of marijuana are more susceptible to such diseases as viral infections and cancer.

The report cites research during the past two years that suggests that cannabis might differentially affect the cell metabolism and reproduction of cancer cells in animals. One way in which this might occur is by inhibition of DNA metabolism in abnormal cells but not in normal cells. If this phenomenon also occurs in human tumors, there is the remote possibility that marijuana might serve as an anticancer agent.

Impairment of endocrine function might result in inadequate or incomplete differentiation in the fetus when a mother uses marijuana heavily during pregnancy. There has also been a recent report of decreased sperm count in otherwise normal young cannabis users.

THC shows definite promise of becoming an effective agent for the management of glaucoma. It also shows promise of reducing or eliminating nausea, vomiting, and loss of appetite in cancer patients following chemotherapy. THC may also be helpful in the control of asthma because of its ability to produce a temporary increase in the size of air passages, allowing patients to breathe more easily. The need for further research on the therapeutic effects of marijuana is urgent.

It is important to know with some precision what levels of marijuana intoxication pose threats in such areas as highway safety and the operation of potentially hazardous machinery. Since marijuana is often used in conjunction with alcohol and a wide range of over-the-counter and prescription drugs, it is also important to know under what circumstances significant interactions occur. (HSRI)

44 pages 108 refs

National Institute on Drug Abuse. DHEW publication no. (ADM) 77-443

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. marijuana. Review: Drug Effects. Review: Drug Use.

UM-77-D0871

DRUG USERS AND DRIVING BEHAVIORS, Research Issues 20, B.A. Austin; R.S. Sterling-Smith; M.A. Macari; et al., Washington, D.C.; U.S. Government Printing Office (Jun 1977)

A major factor in the American public's concern over unconventional drug use is its effect on traffic safety. This volume contains summaries of recent experimental and epidemiological research and reviews studies on the interactions between drugs and driving behaviors. The experimental studies deal with the effects of drugs on cognition, coordination, reaction time, and other psychomotor functions, all of which are believed to be related to driving performance. The experiments use both driving simulators and actual driving situations. The epidemiological studies primarily deal with investigations of drug-involved auto accidents.

A supplementary bibliography of additional readings and a set of indexes are included at the end of the summaries. Drugs discussed include alcohol, marijuana, dexamphetamine, 1-benzylpiperazine, secobarbital, methadone, and diazepam.

173 pages 163 refs

National Institute on Drug Abuse. DHEW publication no. (ADM) 78-508

KEYWORDS: Anorectic (Appetite Control) Agents: dextroamphetamine. Barbiturates: secobarbital. Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. marijuana. Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Nonbarbiturates: ethanol (ethyl alcohol)*. Opiates and Related Agents: methadone. Stimulants: dextroamphetamine. 1-benzylpiperazine. Sympathomimetic (Adrenergic) Agents: dextroamphetamine. Compilation.

UM-77-D0872

EFFECTS OF WINE CONGENERS ON RATS' BEHAVIOR, S.A. Golder; W.H. Tedford; W.E. Flynn; E.R. Biehl, Journal of Studies on Alcohol, v38 n1 p25-9 (1977)

The present study was designed to test the behavioral effects of wine residue without ethanol. The effects of the residues of dry and sweet wines were tested on the shock threshold and general activity of twenty-four male Wistar rats, each seventy days old. Each animal was given five trials after each of the three beverages--wine, residue, and water. One hour after the beverage was introduced, the animal was placed in the experimental chamber where it received a series of shocks starting at 0.10 mA and proceeding by 0.05 mA increments until the animal lifted at least two paws from the shock surface. After shock threshold was determined, the rat was removed from the chamber and put in a box for five minutes, during which time the number of times his back paws crossed a 1.9 cm. line was noted.

Results showed that shock threshold in the rat was significantly higher after wine and residue than after water. Thresholds were higher after wine than after residue, but not significantly so. There was no threshold difference between dry and sweet wine. The animals were significantly less active after both wine and residue than after water.

These results support the hypothesis that nonalcoholic residue solutions taken in moderate amounts do have an effect on rats' behavior, the effect being that of a minor tranquilizer. (AAM)

14 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Animal Research. Experimentation: Acute Dosage Study.

DOT HS-801291 UM-74-D0873

ALCOHOL, DRUGS AND YOUNG DRIVERS, R.B. Voas (May 1974)

This report reviews the literature on young driver research, reports on new research, formulates a position on the young driver problem, and makes recommendations for countermeasures and future research.

Patterns of alcohol and drug consumption by young drivers are discussed. Alcohol and tobacco are by far the most widely used drugs, although the use of marijuana has increased rapidly over the last five years to the point where currently half of all college students have tried marijuana at least once. The late teenage and early adult period, which encompasses the first eight or nine years of driving experience for most Americans, is a period when the use of drugs of all types is rapidly increasing. The young user is learning to control his behavior while under the influence of drugs, and he may fail to learn critical driving skills.

Studies on drug use in relation to driving are also reviewed; and discussions of multiple drug use and methodological problems are presented. The use of drugs by young drivers is discussed in studies of drug use by a young criminal population and by a university population in which marijuana was found not to significantly impair driving performance.

Possible countermeasures against drinking and driving by young drivers are suggested. The authors discuss limitations on drinking by age, type of liquor, amount of liquor, and place of drinking. Limitations on driving such as time of day restrictions, speed limitation, vehicle interlocks, general deterrence, specific deterrence, mass media programs, and formal educational programs are also discussed.

It is concluded that more effort must be placed in the development of effective countermeasure programs, especially in the light of evidence that suggests night recreational driving (which is highly associated with drinking-driving crashes) to be rapidly increasing among young people. (HSRI)

53 pages 66 refs

National Highway Traffic Safety Administration, DHEW publication no. (ADM)77-501

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drugs and Highway Safety.

UM-77-D0874

MARIHUANA RESEARCH FINDINGS: 1976, NIDA Research Monograph 14, R.C. Petersen, ed. (Jul 1977)

This monograph is a more detailed reference report that provides the basis for the shorter sixth edition of the Marihuana and Health Report (see D0870). While the latter was intended for a general audience, this more detailed review of each of the areas discussed is more likely to be of interest to the technically trained reader. Topics discussed are the epidemiology of marijuana use; chemistry and metabolism; toxicological and pharmacological effects; preclinical effects (unlearned and learned behavior); preclinical chronic effects; human effects; effects of marijuana on the genetic and immune systems; and the therapeutic aspects of marijuana.

The report claims that more evidence has accumulated indicating that driving ability and related skills are impaired by cannabis at doses likely to be commonly used in the United States. More cannabis users appear to drive today while intoxicated than they did in earlier years. (HSRI)

129 refs

National Institute on Drug Abuse, DHEW Publication No. (ADM)78-501

KEYWORDS: Cannabis Sativa L. and Related Agents; delta-9-tetrahydrocannabinol, marijuana. Compilation.

UM-77-D0875

LACK OF EFFECTS OF CARBON MONOXIDE ON HUMAN VIGILANCE, V.A. Benignus; D.A. Otto; J.D. Prah; G. Benignus, Perceptual and Motor Skills, v45 n3 pt1 p1007-14 (Dec 1977)

Previous publications on the effects of low levels of carbon monoxide on human vigilance performance have reported conflicting results. While several studies have found statistically reliable effects, none have gone unchallenged. This article presents a critical review of the literature and the results of a study employing fifty-two human male subjects performing a numeric monitoring task. CO levels were 0, 100, and 200 ppm which produced mean carboxyhemoglobin levels of 0.01, 4.61, and 12.62%, respectively. None of the CO exposure levels produced any effect on vigilance performance. The power of the statistical test for CO effects was shown to be quite high, even for fairly trivial possible decrements of performance. Nevertheless, even small decrements in vigilance can cause lethal accidents in some prolonged monotonous tasks. It would, therefore, be desirable to further explore CO effects with a view toward isolation of possible extraneous variables, improved experimental control, and evaluation of hypotheses about compensatory mechanisms. (JA)

20 refs

KEYWORDS: Gases; carbon monoxide. Experimentation: Acute Dosage Study. Experimentation: Dose-Effect Study. Psychological Testing. Review: Drug Effects.

UM-77-D0876

EFFECTS OF MARIJUANA ON HUMAN REACTION TIME AND MOTOR CONTROL, T.O. Kvalseth, Perceptual and Motor Skills, v45 n3 pt1 p935-9 (Dec 1977)

This report analyzes the effects of marijuana on human reaction time and on performance of motor responses involving both linear and rotary serial arm movements aimed at a target. A total of six experienced male marijuana smokers ranging in age from 21 to 24 years served as subjects. Three drug conditions were used: 0, 6.5, and 19.5 - 26.0 mg delta-9-THC. Subjects were tested about fifteen minutes after the marijuana was smoked.

The results showed that simple and complex reaction time were not significantly affected by marijuana or by the interaction between drug conditions and the amount of information transmitted during the tasks. Linear movement time was significantly reduced after smoking marijuana, while rotary movement time was not significantly affected. Interaction between drug conditions and task complexity was insignificant in the case of both linear and rotary movements. Finally, error rates for the two types of motor movements increased significantly (especially for linear movements) as the dose level increased.

This report indicates that the acute effects of marijuana in moderate doses are minimal and that significant decremental effects that have been established are related tohigher doses, task complexity, and degree of experience with the drug. (JAM)

7 refs

KEYWORDS: Experimentation: Dose-Effect Study. Psychological Testing. Psychomotor Tests.

UM-77-D0877

THE INFLUENCE OF TOBACCO SMOKING ON THE ACUTE-ALCOHOL AND POST-ALCOHOL STAGE, K. Andersson; C. Hollstedt; A.L. Myrsten; A. Neri, Blutalkohol, v14 n6 p366-80 (Nov 1977)

This investigation attempted to examine the influence of cigarette smoking on activation, performance, and mood during acute alcohol intoxication, and to study whether heavy smoking during the acute alcohol stage would modify the symptoms during the postalcohol stage. Ten healthy male smokers between the ages of 21 and 27 years with moderate alcohol and tobacco habits participated in two seventeen-hour experimental sessions: one alcohol-plus-cigarette group in which 1.43 g alcohol per kilogram of body weight was consumed with food and fifteen cigarettes were smoked, and one alcohol group with no smoking. Repeated measurements were made of blood-alcohol concentration, catecholamine excretion, and cardiovascular, behavioral, and subjective reactions.

During acute intoxication, the following effects were observed for the alcohol plus cigarette group: adrenaline excretion and heart rate were significantly higher; standing steadiness and hand steadiness were significantly more impaired; and performance in a reaction-time test as well as in an arithmetic test were significantly better than in the alcohol-no smoking group. During the postalcohol stage (eleven to seventeen hours after drinking) systolic pressure was higher; standing steadiness and hand steadiness were also significantly better in this group. However, performance in the arithmetic test was significantly impaired in the alcohol plus cigarette group as compared with values obtained in the alcohol alone group.

This study supports earlier research which found that cigarette smoking in combination with alcohol intake produced higher physiological arousal and subjective alertness during the acute alcohol phase than was obtained with alcohol alone. (AAM)

25 refs

KEYWORDS: Ganglionic Blocking and Stimulating Agents: nicotine. Nonbarbiturates: ethanol (ethyl alcohol). Stimulants: nicotine. Unclassified Agents: tobacco. Experimentation: Study of Combined Effects of Drugs. Physiological Testing. Psychological Testing. Psychomotor Tests.

UM-77-D0878

THE DISCRIMINATION OF MARIJUANA INTOXICATION, R.O. Pihl; P. Hickcox; L. Costa, Journal of Clinical Psychology, v33 n3 p908-11 (Jul 1977)

This study attempted to assess whether nonintoxicated observers can discriminate the behavior of marijuana-intoxicated subjects. It also attempted to delineate those behaviors that serve as the basis for discrimination. Twenty male and twenty female subjects between the ages of eighteen and thirty-five observed a videotape that showed four marijuana-experienced males interacting in a social setting under four different drug conditions: coltsfoot (an innocuous European plant) (.325 g); placebo; marijuana, low dose (.235 g); and marijuana,high dose (.4g). The observers attempted to discriminate the level of intoxication of the four males in each condition.

The observers accurately detected the level of intoxication in the high dose condition. While marijuana experienced users were more successful in detecting levels of intoxication, the sex of the observer did not affect the ability to detect intoxication.

The results of this study indicate that marijuana intoxication can be detected by observers, although only under high dose conditions. This study also shows that although the users report they are intoxicated at these low dosages and show significant physiological changes, there does not appear to be a discernible change in their behavior. The low dosage in this study is roughly equivalent to that used by the recreational marijuana smoker. Although limited to high dose situations, the development of behavioral indices might provide another tool for analyzing physiological and psychological states produced by marijuana intoxication. (JAM)

10 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Experimentation: Acute Dosage Study. Experimentation: Dose-Effect Study.

UM-77-D0879

DOSE-RELATED HEART-RATE, PERCEPTUAL, AND DECISIONAL CHANGES IN MAN FOLLOWING MARIHUANA SMOKING, C.F. Schaefer; C.G. Gunn, K.M. Dubowski, Perceptual and Motor Skills, v44 n1 p3-16 (Feb 1977)

Information processing was tested in twelve male subjects between the ages of 21 and 38 years after smoking marijuana containing 0, 10, or 20 mg of delta-9-tetrahydrocannabinol in three consecutive experimental sessions according to a Latin square protocol. Successful dose control was indicated both by the dose-related linear increase observed in heart rate and by preliminary assays of THC metabolites excreted in the urine. During tachistoscopic presention of varying numbers of circles, statistically significant decrements in information processing occurred as a function of THC dosage. However, adding irrelevant information (triangles) to the display of circles eliminated effects of marijuana on accuracy of counting. Complex reaction times for oddity discrimination increased significantly only after the high dose. Nonetheless, both the social and high doses inappropriately inhibited the general tendency to respond to changing stimuli during oddity discrimination. Marijuana had no effect on field-dependence as measured by the rod-and-frame test.

In summary, doses of marijuana that were sufficient to evoke strong subjective ("high") effects as well as physiological (heart rate) responses produced relatively weak, though significant, impairments in information processing. (JA)

25 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol*. Experimentation: Dose-Effect Study. Psychological Testing.

UM-77-D0880

VISUAL MASKING AND CARBON MONOXIDE TOXICITY, S.M. Luria, Perceptual and Motor Skills, v44 n1 (Feb 1977)

This paper investigates differences in susceptibility of smokers and nonsmokers to additional amounts of carbon monoxide (CO). Since smokers start with a COHb level considerably higher than that of nonsmokers it might be supposed that a given amount of additional exposure would have a greater effect on them. On the other hand, as a result of their long exposure to CO, it is possible that they have adapted to some of the physiological effects of CO and may therefore be less susceptible to further increases than nonsmokers. It appears from this study that smokers are more susceptible to the additional exposure than nonsmokers.

In this study thresholds for letters were measured in six smokers and three nonsmokers with and without a masking stimulus (presented either to the same eye as the letters or to the other eye). They were tested before and after exposure to 500 ppm carbon monoxide in air for one hour.

Identification of the unmasked letters was not decreased by CO in nonsmokers; however, identification of the masked letters significantly decreased among the smokers. The effects of the CO on binocular and interocular masking were similar. These results suggest that the first effects of CO toxicity are neither on the receptors nor central processors but on the transmission lines in between and that smokers are more susceptible than nonsmokers to short-term increases in the level of CO. For example, every smoker except one had at least one significant change in threshold. The masking phenomenon, however, does not appear to be an unusually sensitive measure of CO toxicity. There was no correlation between the number of thresholds affected and the final COHb level. (JAM)

18 refs

KEYWORDS: Gases: carbon monoxide. Experimentation: Acute Dosage Study. Tests of Sensory Function.

UM-76-D0881

PSYCHOPHYSISCHE LEISTUNGSMINDERUNG NACH AMBULANTEN ANASTHESIEN UND NOTWENDIGE BETREUUNGSMASSNAHMEN, L. Lieb, Zeitschrift fur Arztliche Fortbildung, v70 n21 p1097-1104 (1 Nov 1976)

This paper reviews the effects of general and local anesthetics on psychomotor performance. It proposes and describes five postanesthetic stages which define in sequence the stages of temporarily reduced psychophysical capacity and the subsequent return to normal. Guidelines are recommended for the management of the patient after treatment with general or local anesthetics concerning psychomotor activities such as driving. Specific drugs discussed in terms of their effects include diazepam, halothane, propanidid, procaine, lidocaine, atropine, ethanol, and caffeine. The effects of nitrous oxide, ether, and oxygen are also discussed. EMM

35 refs German

KEYWORDS: Review: Drug Effects.

UM-77-D0882

CLOBAZAM, A 1,5-BENZODIAZEPINE, AND CAR-DRIVING ABILITY, I. Hindmarch; G.W. Hanks; A.J. Hewett, British Journal of Clinical Pharmacology, v4 n5 p573-8 (Oct 1977)

Impairment of mental functioning and psychomotor performance has been demonstrated in laboratory studies of a wide range of benzodiazepine derivatives and is of considerable seriousness in view of the widespread use of these drugs among patients driving motor vehicles. Clobazam is a new 1,5-benzodiazepine which differs structurally from currently available 1,4 benzodiazepines. The drug appears to exhibit effective antianxiety activity without significant deleterious effects on psychomotor performance. The present study investigates the effects of clobazam on car driving ability and other psychomotor abilities in a double-blind crossover study. Clobazam (20 mg) or placebo was given nightly for six nights to five normal male and five normal female volunteers with a mean age of twenty-seven years. Subjective ratings of sleep and subjective and objective assessments of behavior were recorded on the morning following drug ingestion. Psychomotor performance was assessed by driving tests.

Clobazam was found to significantly improve the subjective ratings of sleep induction and the quality of induced sleep. It did not significantly impair performance in a variety of psychomotor tests and car-driving ability. There were, however, isolated cases of impaired psychomotor performance.

While it is clear that the repeated administration of clobazam does not produce adverse effects on performance in the majority of persons, there is, as yet, no way of detecting those who may be more sensitive to its action. (JAM)

26 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): clobazam. Closed Course Driving. Experimentation: Chronic Dosage Study. Psychomotor Tests. Self-Evaluation of Drug Effects by Subjects.

UM-77-D0883

LABORATORY INVESTIGATION OF EFFECT OF ACUTE DOSES OF NOMIFENSINE ON A SIMULATED ASPECT OF NIGHT-TIME CAR DRIVING PERFORMANCE, I. Hindmarch, British Journal of Clinical Pharmacology, v4 supp2 p175s-178s (1977)

Numerous reports in the literature have indicated that acute doses of psychoactive compounds cause a significant impairment of various psychomotor functions and skills, including those important in driving a motor vehicle. Recent studies have shown that the pronounced side effects of certain psychotropics are instrumental in disturbing coordination and sensory processing of information. This study reports an investigation into an aspect of car driving performance that is difficult to monitor in the real life driving situation, namely, sustained night driving.

Three male and three female volunteers with a mean age of 27.5 years received single doses of either nomifensine (100 mg), nomifensine (50 mg), or placebo at weekly intervals in a randomized double-blind crossover study. They were subjected to a simulated test of car driving at night ninety minutes after ingesting their dose. The

test lasted about ninety minutes and consisted of measuring the responses to light stimuli.

Nomifensine (100 mg) was found to reduce the latency of response significantly when compared with placebo ($P < 0.05$). Nomifensine (50 mg) had no significant effect. It is concluded that similar dose levels will not be detrimental to night-time driving or other tasks involving visual monitoring. (AAM)

12 refs

KEYWORDS: Antidepressants: nomifensine. Driving Simulator. Experimentation: Dose-Effect Study. Tests of Sensory Function.

UM-78-D0884

HYPNOTIC DRUG THERAPY, S. Cohen; M.J. Blutt, Drug Abuse and Alcoholism Review, v1 n2 p1.3-8 (Mar-Apr 1978)

This article gives a broad overview of the general class of barbiturate hypnotic/sedatives. Their lethality, medical advantages and disadvantages, national and international trends concerning their use, and possible alternatives to barbiturate hypnotic/sedatives, particularly the benzodiazepines, are discussed.

The authors believe that benzodiazepines are not the final answer to the type of insomnia requiring hypnotic medication. Still, they do represent an advance over the barbiturates just as the latter were superior to bromides, which they displaced at the beginning of this century. Benzodiazepines are safer, tolerance develops more slowly, and the withdrawal syndrome is less life threatening. In addition, the REM rebound is not as pronounced. They interfere with the metabolism of other drugs to a much lesser extent, and they depress respiratory functions less. Of real importance is the fact that benzodiazepines are poor agents for purposes of self-destruction whereas the barbiturates are lethal agents when used to commit suicide. It is hoped that present trends--the substitution of the benzodiazepines for the barbiturates, the investigation of new hypnotic/sedatives, and the decrease in the total number of prescriptions for insomnia--will continue. (HSRI)

54 refs

KEYWORDS: Anticonvulsants (Anti-Epileptics): nitrazepam. Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Nonbarbiturates: flurazepam. nitrazepam. Barbiturates. Sedatives and Hypnotic Agents. Review: Drug Effects.

UM-77-D0885

COCAINE: 1977, NIDA Research Monograph 13, R.C. Petersen; R.C. Stillman, eds., Washington, D.C.: U.S. Government Printing Office (May 1977)

The present volume represents an attempt to summarize the admittedly limited knowledge of cocaine through a series of reports by leading workers in the cocaine area. The reports range from studies of animal behavior at the preclinical level to clinical studies concerned with the problems of the street user.

A nontechnical review of present knowledge about cocaine is presented, as is a brief history of coca and cocaine. Coca use and its health implications are discussed. The chemistry of cocaine is also discussed, with particular attention given to newer analytic methods for the detection of the drug and its metabolites. The report also describes the cocaine user, styles of use, and reactions to the drug, including hallucinatory phenomena experienced by some users. Mortality connected with use is also analyzed; data suggest that cocaine use, even by "snorting", can be occasionally and unpredictably fatal. The current uses of cocaine in clinical medicine as an anesthetic possessing some uniquely desirable properties are reviewed. Finally, in a brief chapter based on a nationwide Federal drug abuse treatment monitoring system (CODAP), the characteristics of patients for whom cocaine abuse is a prominent feature are described. (HSRI)

National Institute on Drug Abuse, DHEW Publication No. (ADM)77-471

KEYWORDS: Local Anesthetics: cocaine*. Stimulants: cocaine*. Compilation.

UM-77-D0886

A PROFILE OF FATAL ACCIDENTS INVOLVING ALCOHOL, J.C. Fell, American Association for Automotive Medicine. 21st Conference. Proceedings, D.F. Huelke, ed., p197-218, AAAM (1977)

This paper reports on accident investigation research studies conducted from 1971 to 1975 in the cities of Boston, Baltimore, Oklahoma City, and Albuquerque. The specific objectives of the four studies varied somewhat, but all attempted to gather information relating alcohol involvement and other factors to fatal accidents.

An analysis of all four studies, plus some newly available data on fatal accidents, revealed several salient fatal accident characteristics associated with alcohol. Single vehicle accidents are overrepresented, and in multiple vehicle accidents the alcohol-involved vehicle is usually the striking vehicle. Most accidents tend to occur on weekends between 8:00 PM and 4:00 AM and involve older model vehicles that are probably poorly maintained. Speeding or travelling too fast for conditions is often involved.

An aggregate profile of the driver who typically was drinking and responsible for the crash appears to be a male, 20-35 years of age, who has no more than a high school education; is single, separated, or divorced; has a previous DWI arrest or two or more speeding violations; has a suspended or revoked license at the time of the crash; and is a heavy social or problem drinker.

The report suggests that the profile be utilized once the driver is brought into the system (for a DWI arrest or a second or third speeding violation) for further screening purposes and for the determination of the appropriate countermeasure action. (AAM)

16 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Crash Investigation. Epidemiology: Analysis of Driver Body Fluids for Drugs. Epidemiology: Record-Based Survey. Epidemiology: Self-Reported Drug Use by Drivers.

UM-77-D0887

ROAD ACCIDENTS--THEIR CAUSE AND PREVENTION, WITH PARTICULAR REFERENCE TO RHODESIA. PART II, THE INFLUENCE OF DRUGS OTHER THAN ALCOHOL ON CAUSATION OF ROAD ACCIDENTS, M.M.M. Hayes, The Central African Journal of Medicine, v23 n5 p101-3 (May 1977)

This paper discusses various causes of road accidents in Rhodesia. Causes discussed include drug effects on driving, mental health aberrations, speeding, environmental factors, and mechanical factors. Considerable controversy exists regarding the role played by drugs either alone or in combination with alcohol in the causation of road accidents. It is difficult to detect whether or not a driver is under the influence of many of the drugs which could reduce driving skill. The potentiation effect of drugs with alcohol often goes unnoticed as the effects of the alcohol dominate the clinical assessment. In the light of experience gleaned from surveys in Australia and California, it is likely that a significant proportion of the driving population of Rhodesia takes drugs that could diminish driving ability.

The personality of the driver is clearly as important as any other factor in causation of accidents. Alcoholics and drug addicts, psychotics, psychopaths, accident-prone individuals, hypomaniacs, and drivers taking high doses of tranquilizers tend to exhibit aggression, impulsiveness, exhibitionism, lack of social conscience, immaturity, and lack of judgment or responsibility, and should be barred from driving on the basis of their personality. (HSRI)

0 refs

KEYWORDS: Review: Drugs and Highway Safety.

UM-76-D0888

ROLE OF EXPERIENCE IN ACQUISITION AND LOSS OF TOLERANCE TO THE EFFECT OF DELTA-9-THC ON SPACED RESPONDING, F.J. Manning, Pharmacology Biochemistry and Behavior, v5 n3 p269-73 (Sep 1976)

This study attempted to investigate whether administration of THC is sufficient to develop behavioral tolerance, and whether experience increases tolerance to delta-9-THC. Albino rats were given extensive training in spaced responding, using a differential-

reinforcement of low rates (DRL) thirty-second schedule of food reinforcement (only lever presses more than thirty seconds apart were reinforced). All rats then went twelve days without behavioral testing. During this period half the rats received daily intragastric doses of THC. The rest received equal volumes of the THC vehicle. On day thirteen some rats received THC three hours before behavioral testing while others received only vehicle.

The former showed a sharp increase in lever press rate over baseline levels, but the vehicle control rats were unaffected. The rats with twelve prior THC doses were no less affected than those with no previous drug history. Continued testing resulted in recovery of baseline performances within five sessions, again with no effect of previous drug history. Similar results were obtained with doses of 4 mg/kg and 16 mg/kg, though the drug's effects were more pronounced at the higher dose. These results demonstrate that performance in the drug state can be a far more important determinant of tolerance than mere exposure to THC.

Drug administration was then suspended for one week. Rats that had become tolerant to 4 mg/kg THC were then redivided into three new groups. One group received daily doses of the vehicle and DRL sessions, a second received DRL sessions without vehicle, and one group received neither vehicle nor DRL sessions for this week. Subsequent DRL testing after THC administration showed that only the groups receiving DRL sessions in the intervening week lost their previously acquired tolerance. Experience thus appears to play an important role in loss of tolerance to THC as well as in acquisition of tolerance. (JA)

18 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Animal Research. Experimentation: Chronic Dosage Study. Experimentation: Dose-Effect Study.

UM-77-D0889

VALIDATION OF A BEHAVIOR ANALYSIS METHODOLOGY: VARIATION OF VIGILANCE IN NIGHT DRIVING AS A FUNCTION OF THE RATE OF CARBOXYHEMOGLOBIN, E.J. Caille; J.L. Bassano, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p59-71, New York: Plenum Press (1977)

This study discusses problems of consistent behavioral efficiency during a night driving test on a specially equipped vehicle. Four young adults aged twenty to thirty years, two of whom were smokers, each drove the car on four occasions: a habituation drive; driving under placebo; and two tests under carbon monoxide; (HbCO-7%) and (HbCO-11%).

Driving accuracy and cortical arousal level were objectively measured by parameters which were normalized, permitting a covariations analysis in terms of a standardized experimental situation. The normal covariations that constitute the substrate of the test are summed up as a progressive synchronization of central structures with a slowing of cardiac rhythm, defining a deterioration of operational behavior as reflected by driving and simple psychomotor activity. Hypoxia, which results from the impoverishment of the energy contribution to the organism by the substitution of carbon monoxide for oxygen, provokes a double displacement of cortical activity toward the rapid generators (neocortical desynchronization) and toward the slow generators (limbic system) which leads to the simultaneous appearance of cortical arousal and signs of cerebral distress. These divergent components may be found at the level of system covariations which characterize the analyzed situation and which are summed up, in the presence of traces of carbon monoxide, as an increase of cardiac frequency and a reduction of the frequency of cortical signal, a slowing of the deterioration of driving precision, and an aggravation of mood change during the test.

It is not certain from this research that a concentration of carbon monoxide high enough to produce a rate of carboxyhemoglobin able to reach 11% over five hours will be capable of causing a major deterioration in behavioral efficiency; this conclusion still requires further corroboration in view of the small sample of drivers studied. (AAM)

4 refs

KEYWORDS: Gases: carbon monoxide. Closed Course Driving. Experimentation: Acute Dosage Study. Experimentation: Dose-Effect Study. Physiological Testing.

UM-77-D0890

THE EFFECTS OF VARIOUS CONDITIONS ON SUBJECTIVE STATES AND CRITICAL FLICKER FREQUENCY, E. Grandjean; P. Baschera; E. Martin; A. Weber, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p331-9, New York: Plenum Press (1977)

Several studies are reported in which critical flicker frequency was found to be related to subjective feelings of activation or fatigue. Studies investigating whether a repetitive activity and a stimulating situation would have different effects on critical flicker frequency and the subjective state are also discussed. After the intake of 5 mg diazepam eight male subjects showed a marked decrease in critical flicker frequency and a significant increase of subjective reports of tiredness.

Repetitive tasks with very low mental loads induced a decrease of critical flicker frequency and a shift of subjective feelings toward fatigue, sleepiness, and a lower degree of motivation and of ability for action. Activities with moderate mental load were found to induce an increase in critical flicker frequency in the beginning, but afterwards it remained at about the same level. These activities seem to be an optimal working condition producing only small subjective and objective symptoms of fatigue.

Activities with high mental loads induce--after an initial stimulating period--a decrease of critical flicker frequency with a shift of subjective feelings toward fatigue and exhaustion. It appears that these changes reveal a state of fatigue due to an excessive demand on the central nervous system. (JAM)

0 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Review.

UM-77-D0891

THE EFFECT OF MENTAL SET AND STATES OF CONSCIOUSNESS ON VIGILANCE DECREMENT: A SYSTEMATIC EXPLORATION, R. Ware; R.A. Baker, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p603-16, New York: Plenum Press (1977)

This paper presents the results of some exploratory research testing a task-orientation or self-awareness control hypothesis. It also outlines a program of research for exploring this hypothesis.

Research has shown the human operator to be a notoriously inefficient monitor. Unless motivation is unusually high and stringent and unusual methods are employed, infrequent, aperiodic, and near-threshold signals are rarely detected. Failure to heed such cues or signals in either the natural or manmade environment could prove disastrous in hundreds of military, industrial, or everyday situations. In an effort to increase the alertness level and reduce the typical vigilance decrement, researchers have increased and decreased the signal rate, signal variability, signal intensity, and signal complexity. Both positive and negative feedback have been provided and environmental stimulation has been systematically increased, decreased, and varied in quality. In fact, nearly everything imaginable has been tried with only moderate success in increasing the level of sustained alertness.

Although a number of personality, motivational, and individual difference variables have been studied, very little research on the effect or influence of internal states--with the exception of the effects of some of the more popular drugs and narcotics--has been undertaken. Particularly noticeable by its absence is systematic research on the influence of mental set or suggestion on levels of consciousness. Little research has been done exploring the vigilance performance of subjects while in the hypnoidal state or while under the influence of posthypnoidal suggestion. It seems reasonable that if subjects can be put into, or can be helped to maintain, a state of hyperalertness, superior vigilance performance should result. In fact, some exploratory research along these lines has been carried out.

Observations of hundreds of subjects have led the author to suggest that monitoring efficiency is directly related to the subjects' task orientation, i.e., his ability to control his attentional shifts and their focus and drift. If, for example, the monitor's flights of fancy are related to or are concerned with elements or aspects of the vigilance task itself, there will be little or no decrement in the level of vigilance as the watch continues. (JA)

0 refs

KEYWORDS: Review.

UM-77-D0892

MARIJUANA AND MEMORY IMPAIRMENT: EFFECT ON FREE RECALL AND RECOGNITION MEMORY, L.L. Miller; D. McFarland; T.L. Cornett; D. Brightwell, Pharmacology Biochemistry and Behavior, v7 n2 p99-103, (Aug 1977)

The effect of marijuana on memory was evaluated by presenting two groups of seventeen male volunteers between the ages of 21 and 28, all of whom were moderate users of marijuana, with lists of repeated or nonrepeated words following administration of either a single marijuana cigarette containing 14 mg delta-9-THC or a placebo cigarette from which all THC had been extracted. Immediate free recall, final free recall, and recognition memory tests followed.

Results indicated that marijuana significantly decreased immediate and final free recall but only slightly influenced recognition memory. Rate of acquisition on the repeated lists was the same for both groups. Long-term retention of encoded information was not influenced by marijuana. Both internal and external intrusions were elevated under marijuana.

Several models of memory which might encompass these results are discussed. However, describing the actions of marijuana on the memory process in terms of any single theory of memory may prove difficult at the present time. An empirical analysis seems most appropriate with theories of memory serving as working models rather than explanatory devices. (JAM)

25 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Experimentation: Acute Dosage Study. Psychological Testing.

UM-77-D0893

DRUGS AND DRIVING--WHERE DO WE GO FROM HERE? A.S. Curry, Technical Aspects of Road Safety, n67 p3.G-3.G.4, (June 1977)

This paper discusses countermeasures for the drugs and driving problem. The author suggests that a priority research area is the combination use of small doses of alcohol with small doses of drugs. Legislation in most countries is effective in dealing with separate abuse of alcohol and drugs, but no country at present has legislation to deal effectively with normal usage of drugs combined with alcohol. The greatest risks involve those drugs whose effects are increased when combined with alcohol.

There is no simple solution to this problem. It is necessary to recognize that there will never be a spot test at the roadside to discover if the driver has been taking drugs. Nor does the technology exist for a drug detecting breath device. Society must accept the fact that the detection of a drug-taking driver will cost money. Mass spectrometers are needed in order to detect the very small quantities of drugs that may be present in the blood or urine of the driver; such machines are extremely expensive both in cost and in requirements of high power scientists. (HSRI)

0 refs

KEYWORDS: Countermeasure Concepts. Review: Drugs and Highway Safety.

UM-71-D0894

THE ADVERSE EFFECTS OF COMMONLY USED SYSTEMIC DRUGS ON THE HUMAN EYE, H.I. Silverman; R.A. Walsh, American Journal of Optometry and Physiological Optics, v48 n1 p51-79 (Jan 1971)

When examining the eye, one should be aware of the possible effects that some of the more commonly used drugs have on ocular structures. Patients should be carefully questioned to determine whether they have recently taken or are currently taking drugs, either in the prescription or in the nonprescription category.

In this paper the adverse effects of drug categories and some specific drugs are discussed. Ergot alkaloids, for instance, have been found to cause blurring of the vision. Some parasympathomimetics cause ciliary spasm, myopia, ocular pain, and impaired day vision. Prolonged use of carbromal, a CNS depressant, can lead to cataract formation which reverses upon stopping the drug. Eventually the lens clears and normal vision returns. Barbiturates can lead to a transient loss of vision, nystagmus, and paralysis of the extraocular muscles. The antiepileptic trimethadione may cause functional retinal disturbances which often do not clear until ten days after drug use ceases. Side effects include an unusual sense of brightness, hallucinatory snowstorm-like effects, photophobia, and diplopia. It is obvious driving and perception can be seriously impaired by many commmonly used drugs. (HSRI)

1 ref

KEYWORDS: Review: Drug Effects.

UM-72-D0895

THE ADVERSE EFFECTS OF COMMONLY USED SYSTEMIC DRUGS ON THE HUMAN EYE-PART II, H.I. Silverman, American Journal of Optometry and Archives of American Academy of Optometry, v49 n1 p335-62 (Apr 1972)

This paper supplements an earlier paper which discussed briefly the pharmacodynamics and adverse ocular effects of common topically and systemically administered medicinals. The present paper represents an effort to include all of the reported adverse ocular effects for drugs discussed in the literature up to June 1970.

Four tables are presented listing the adverse effects of commonly used drugs on the human eye. Table 1 is a cross reference listing of brand and generic names and major brand names in alphabetical order along with their ocular side effects. Table 2 lists ocular side effects for generic and name brand drugs. Table 3 is a pharmacological table of ocular side effects in which drugs are grouped in accordance with their major pharmacological classification, making it possible for one to quickly find a number of drugs that may induce a common side effect simply because they are pharmacologically related. Table 4 alphabetically lists ocular side effects. Under each major effect the drugs reported to induce such an effect are listed by both generic and brand names. (HSRI)

1 ref

KEYWORDS: Review: Drug Effects.

UM-75-D0896

ADVERSE EFFECTS OF COMMONLY USED SYSTEMIC DRUGS ON THE HUMAN EYE-PART III, H.I. Silverman; R.J. Harvie, American Journal of Optometry and Physiological Optics, v52 n4 p275-87(Apr 1975)

A series of four tables is presented which list the adverse effects of commonly used drugs on the human eye. The purpose of the tables is to enable the optometrist to determine with minimal delay a cause and effect relationship regarding ocular side effects of systemically used drugs. The optometrist using the tables can look up either the drug (to find the adverse effects) or the symptom (to find the drugs that might cause it). Both brand names and generic names of drugs are used.

7 refs

KEYWORDS: Review: Drug Effects.

UM-75-D0897

THE CLINICAL SIGNIFICANCE AND IMPORTANCE OF DRUG INTERACTIONS, J. Crooks; I.H. Stevenson; A.M.M. Shepherd; D.C. Moir, Drug Interactions, D.G. Grahame-Smith, ed., p3-13, Baltimore: University Park Press (1975)

Polypharmacy, the practice of prescribing more than one drug to a patient, is widespread in modern medical practice, and there has been a vast increase in the number of potential drug interactions reported. Studies have shown the average patient in the United States admitted to a hospital received fourteen drugs.

This article describes briefly some of the work carried out to establish the clinical significance and importance of certain drug interactions and to use these examples to illustrate some of the problems of methodology and interpretation of results in this field. Several principles can be derived from these studies. It was found that drug interaction data obtained from healthy human volunteers, while providing potentially useful information, should be extrapolated with caution to patients. Drug-nondrug interactions are often of greater clinical importance than drug-drug interactions, and even when the latter take place, the "noise" of the former may make them difficult to detect. Drug interactions are most profitably studied in man with the diseases for which drugs are used. This, however, is not always possible.

In the investigation of the clinical importance of drug interactions it is helpful to define, and if possible quantify, the objectives of treatment, since diminution of efficacy may be a more important drug interaction (and more difficult to detect) than increase in toxicity.

It is necessary to obtain incidence data in everyday medical practice to determine the clinical importance of a drug interaction. When drug interactions of clinical importance are identified, attention should be paid to developing the best methods of applying this knowledge in everyday medical practice.

To arrive at a proper assessment of the true clinical significance and importance of drug interaction requires more effort in the field of clinical pharmacological investigation in man, particularly in diseased man under controlled conditions. (HSRI)

28 refs

KEYWORDS: Review: Drug Effects.

UM-75-D0898

HOMERGIC INTERACTIONS, ISOBOLS AND DRUG CONCENTRATIONS IN BLOOD, S.H. Curry, Drug Interactions, D.G. Grahame-Smith, ed., p87-99, Baltimore: University Park Press (1975)

This paper discusses the importance of (1) the relation between dose and response; (2) the time course of drug action; and (3) drug concentrations in body fluids. In addition, a number of examples of interactions involving depressant drugs and ethanol are considered in an attempt to define pharmacological terms such as "synergism", "addition", "potentiation", and "antagonism". The use of these terms is fraught with difficulty when an interaction concerns two drugs with similar spectra of activity, since both drugs generally contribute to the recorded effect. Furthermore, the intensity of the effect of each drug can undergo independent modification in the interaction.

It is recommended that the use of specific terms should be reserved for systems in which all of the relevant factors are fully understood. Drug interactions in mice are discussed, particularly the interaction between central depressant drugs and alcohol. Drug interactions of alcohol with phenobarbitone, other barbiturates, glutethimide, phenothiazines, and benzodiazepines in man are also discussed. The author concludes that great care must be taken when applying conclusions from animal studies to human studies. (HSRI)

21 refs

KEYWORDS: Anticonvulsants (Anti-Epileptics): nitrazepam, phenobarbital. Barbiturates: phenobarbital. Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Nonbarbiturates: flurazepam, glutethimide*, nitrazepam. Barbiturates. Review: Drug Concentration-Effect Relationships.

UM-75-D0899

GENETIC AND ENVIRONMENTAL FACTORS AFFECTING DRUG INTERACTIONS IN MAN, E.S. Vesell, Drug Interactions, D.G. Grahame-Smith, ed., p119-43, Baltimore: University Park Press (1975)

Discussed here are the genetic and environmental factors affecting drug interactions in man. The role of genetic factors in drug interactions is extensive. In order to evaluate the role of genetic factors in drug interaction, it is necessary first to investigate genetic control of large interindividual differences in response to a single drug. Such large interindividual differences constitute a major medical problem in therapeutics since they can result in unexpected adverse drug reactions when compounds are administered alone or in combination.

In a series of studies, Caucasion twins were given single oral doses of various drugs to quantitate the genetic and environmental components of large interindividual variations in rates of drug elimination from plasma. The drugs tested were phenylbutazone (6mg/kg); antipyrine (18mg/kg); bishydroxycoumarin (4mg/kg); and ethanol; all drugs handled almost exclusively by biotransformation. Appreciable environmental contributions to individual differences in drug metabolism were expected in man on the basis of investigations in laboratory animals. However, the results of genetic studies in man on phenylbuzatazone, antipyrine, and bishydroxycoumarin indicate almost complete hereditary and negligible environmental control.

The genetic control of large variations among healthy, nonmedicated subjects has the following potentially useful implications: (1) Since rates of drug elimination are genetically rather than environmentally controlled in healthy, nonmedicated subjects, they should be highly reproducible, stable values. (2) Determination of drug-metabolizing capacity in an individual might be ascertained before chronic drug administration as a guide to adjusting dosage accordance to individual requirements, thereby helping tc reduce the frequent occurrences of toxicity or undertreatment encountered when the same dose of a drug is given to all subjects.

Other studies of environmental and hereditary factors are also discussed including use of plasma antipyrine half-lives as indications of hepatic microsmal drug-metabolizing enzyme, and environmental effects on drug action and genetic control of their expression. (HSRI)

46 refs

KEYWORDS: Analgesics and Antipyretics: antipyrine*. phenylbutazone*. Anti-Coagulants: dicumarol*. Nonbarbiturates: ethanol (ethyl alcohol). Drug Concentrations in Body Fluids: Acute Dose Study. Pharmacokinetics: Acute Dose. Review: Drug Concentration-Effect Relationships. Variables Influencing Drug Concentration Data.

UM-75-D0900

GENERAL ASPECTS OF DRUG INTERACTIONS IN PSYCHOPHARMACOLOGY, D.G. Grahame-Smith, Drug Interactions, D.G. Grahame-Smith, ed., p147-57, Baltimore: University Park Press (1975)

This paper presents a general overview of drug interactions in psychopharmacology based on a review of the literature. Because of ethical considerations, most studies of drug interactions have been carried out in animals. Some of these studies, because of their theoretical and therapeutic potential for man, are also discussed here.

The paper presents drug interactions in four categories: (1) interactions between two psychotropic drugs; (2) interactions between psychotropic and nonpsychotropic drugs; (3) experimental drug interactions; and (4) interactions of drugs with the brain, including both the elderly brain and the young brain. For each category the beneficial and adverse effects are discussed for both the pharmacokinetic and pharmacodynamic interactions. Some of the specific drug interactions discussed include phenobarbitone and orphenadrine; alcohol and diazepam; methylphenidate and imipramine; and lithium and diuretics.

Few data exist demonstrating the overall benefit of combined use of two or more psychotropic drugs in psychiatric therapy. More evidence exists to support beneficial interactions between psychotropic and nonpsychotropic drugs. Polypharmacy, while beneficial in a few situations, nearly always causes adverse effects in the elderly and very young.

The frequency of prescribing psychotropic drugs makes their interaction with alcohol very important, especially in the area of alcohol, drugs, and driving. Although there is no definitive answer concerning the role of psychotropic drug interactions with alcohol in traffic deaths, studies have shown higher accident rates among drivers using both psychoactive drugs and alcohol. (HSRI)

32 refs

KEYWORDS: Central Nervous System (CNS) Agents. Review. Review: Drug Effects.

UM-77-D0901

MEDIKAMENTE UND FAHRVERHALTEN [DRUGS AND DRIVING BEHAVIOR], P. Kielholz; V. Hobi, Therapeutische Umschau/Revue Therapeutique, v34 n11 p803-12 (Nov 1977)

Presented here is a review of recent literature concerning drugs and driving. The worldwide increase of legal and illegal drug consumption and the increase of offenses against narcotics laws makes the question of the influence of psychotropic substances on driving aptitude medically very important. Drugs which influence the performance of the CNS, the cardiovascular system, sensory processes, and neuro-muscular functions may influence driving aptitude. Hypnotics, sedatives, narcotics, analgesics, stimulants, antihistamines, muscle relaxants, and antihypertonics can all impair driving performance.

The most pronounced effects are widely observed at the beginning of treatment and with high initial dosages. The patient's level of confidence in the mode of action of the drug is very important in determining its effect. Hypnotics, sedatives, neuroleptics, tranquilizers, antidepressants, and antihistamines, especially, enhance the effect of alcohol. Any patient taking these drugs should be made aware of this by his physician.

As the number of addicted persons increases, special care must be given to those persons showing acute intoxication, abstinence syndromes, or changes of personality due to addiction. Scientific efforts must be intensified regarding the interaction of disease, medications, and driving behavior. (JAM)

38 refs German

KEYWORDS: Review: Drugs and Highway Safety.

UM-72-D0902

EFFECTS OF ALCOHOL AND DRUGS ON DRIVING BEHAVIORS, M. Buttiglieri; A.J. Brunse; H.W. Case. Human Factors in Highway Traffic Safety Research, T.W. Forbes, ed., p303-30, New York: John Wiley and Sons (1972)

This article provides a general overview of the effects of alcohol and other drugs on the human body and on driving behavior. The current literature concerning the prevalence of alcohol in fatal accidents is also reviewed and methods of control of the drinking driver are examined. The authors suggest that more stringent penalties for driving after drinking be enforced in the United States, which lags far behind other countries in this area. Present controls, though logical and widely used, have not proven to be very successful. Careful and objective studies of the effects of various drugs on driving behavior and skills are sadly lacking.

This paper discusses drug effects, both intended and nonintended, that affect those aspects of behavior which are most likely, in turn, to affect driving performance. Primary and secondary effects of various drugs and medications which may adversely affect driving may interfere with various levels and categories of psychomotor functioning. Such drug effects might include weakness, spasticity, gross tremors, or even convulsions. Central nervous system drugs and others which have either already demonstrable or highly probable potential for adversely affecting driving include sedatives, hypnotics, barbiturates, analgesics, pain reducers, psychotherapeutic drugs, antidepressants, central nervous system stimulants, antihistamines, hallucinogens, and carbon monoxide.

The authors make a plea for more scientific research on the effects of these substances on behavior performance in order to dispel the morass of ignorance and misinformation upon which are based most of the moral and legal codes and the actions of the community and society. (HSRI)

74 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drug Effects. Review: Drugs and Highway Safety.

UM-75-D0903

THE EFFECTS OF SMOKING ON PERIPHERAL MOVEMENT DETECTION. ANNUAL REPORT, C.R. Scoughton; N.W. Heimstra (August 1975)

Two studies were conducted to determine specific aspects of the relationship between smoking and the ability to detect peripheral movement under conditions of low illumination. The first study was designed to determine the relationship between nicotine dosage level and peripheral visual performance. The second study was designed to determine the time/response characteristics of smoking in terms of onset, duration, and delay of effects. To determine nicotine dosage effects, twelve smokers appeared

under conditions of (1) smoking, high nicotine (2.5 mg); (2) smoking, low nicotine (0.3 mg); and (3) smoking deprived. Ten nonsmokers were also tested and compared with the deprived smokers.

Analysis of the movement detection data showed high nicotine smokers significantly better able to detect zero movement trials than either the low nicotine or deprived smokers. Analysis of the four movement speeds and the velocity estimation data all yielded nonsignificant differences.

To determine the time/response characteristics of smoking, forty subjects (twenty smokers and twenty nonsmokers) were tested. Subjects appeared under conditions of smoking and smoking deprived.

Analysis of deviations from baseline for the movement detection task showed smokers superior in their ability to detect nonmovement of the target. For the velocity estimation task, a significant smoking treatment-blocks interaction was found. Subsequent simple effects tests were performed. These results showed deprived smokers to have significantly fewer errors after twenty minutes of trial presentations and significantly more errors after forty minutes.

These data, in conjunction with previous research, indicate a significant effect of smoking on the processing of peripheral visual information. It is suggested that further studies be conducted to more clearly delineate these effects. (AAM)

63 pages 25 refs

U.S. Army Medical Research and Development Command, Contract No. DADA 17-73-C-3037 (Year 2)

KEYWORDS: Ganglionic Blocking and Stimulating Agents: nicotine. Stimulants: nicotine. Experimentation: Dose-Effect Study. Tests of Sensory Function.

UM-75-D0904

THE EFFECTS OF SMOKING ON TIME ESTIMATION PERFORMANCE. ANNUAL REPORT. S.T. Breidenbach; J.L. Arnold; N.W. Heimstra (Sep 1975)

Two investigations were conducted to determine the effects of nicotine on the processing of visually presented information. In both studies, fifteen chronic smokers were tested under smoking and smoking deprived conditions, and ten nonsmokers were tested as a control group. Subjects were deprived of smoking for two hours prior to testing. The test sessions consisted of ten minutes of task performance, during which time baseline measures were taken. This was followed by a ten-minute treatment period, during which a cigarette was given to subjects in the smoking treatment, and finally, approximately forty-five minutes of task performance, during which time posttreatment measures were taken.

In the first study, subjects were tested on a simple velocity estimation task viewed in the central visual field. The results indicated that nicotine had an adverse effect on the ability of subjects to perform this task, but only under certain extreme conditions of object speed and viewing time. These results were compared to previous research where detrimental nicotine effects were found over a wide range of speed and concealment values when a similar task was presented peripherally.

In the second study, twenty-five male subjects aged 19 to 24 were required to estimate the velocity of a moving target and fire ahead of it to compensate for the time lag in a projectile trajectory. The results again indicated that smoking and smoking deprived subjects differed only under certain speed and exposure time conditions, but in this case, the smokers actually performed better than the deprived smokers. It was suggested that the higher level of information processing involved in this task was not adversely affected by nicotine. (AA)

60 pages 10 refs

U.S. Army Medical Research and Development Command, Contract No. DADA 17-73-C-3037 (Year 3)

KEYWORDS: Ganglionic Blocking and Stimulating Agents: nicotine. Stimulants: nicotine. Experimentation: Acute Dosage Study. Psychological Testing. Tests of Sensory Function.

UM-77-D0905

DRUGS AND THEIR EFFECTS ON DRIVING PERFORMANCE. D. Valentine; M.S. Williams; R.K. Young (May1977)

This report reviews the literature on the relationship of drug use to accidents. Both prescription drugs (major and minor tranquilizers, antidepressant drugs, amphetamines, and barbiturates) and illegally obtained drugs such as marijuana and hallucinogens are discussed in terms of their adverse side effects and influence on driving skills.

Research indicates that some of the major tranquilizers may affect performance on motor skills tests, often slowing reaction time. Although few studies have been performed that measure the effects of the minor tranquilizers or antidepressants on driving skills, there is an indication that minor tranquilizers and antidepressants impair driving performance; therefore, further investigation is needed. Additional evidence also suggests that the effects of alcohol in combination with psychotropic drugs increases impairment of motor skills and driving performance. Researchers highly recommend that patients undergoing drug therapy limit driving as much as possible and avoid drinking alcohol.

Research also indicates a relationship between impaired driving skills and marijuana use. Increases in speedometer errors, impaired peripheral vision, insufficient caution, and delayed action can be caused by marijuana intoxication.

Very little research is available concerning the effects of the hallucinogens. One study reported that all groups of illegal drug users had higher rates of accidents than a corresponding control group. The unpredictable effects of these drugs (including flashbacks) plus their effects in combination with alcohol lead one to suspect that an individual's ability to perform the complex tasks of driving may be severely impaired. (AAM)

45 pages 38 refs

Texas Office of Traffic Safety (77)7200-02B

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drug Effects. Review: Drugs and Highway Safety.

UM-77-D0906

COMBINED EFFECTS OF TOBACCO AND CAFFEINE ON THE COMPONENTS OF CHOICE REACTION-TIME, HEART RATE, AND HAND STEADINESS. D.L. Smith; J.E. Tong; G. Leigh. Perceptual and Motor Skills, v45 p635-9 (1977)

This study examines the combined effects of caffeine and nicotine on choice reaction time, heart rate, and hand steadiness. Eight male subjects between the ages of nineteen and twenty-six, all of whom were regular smokers and coffee drinkers, were tested under six conditions comprised of combinations of the following dosages: 200 mg caffeine; no cigarette; one 0.3 mg nicotine cigarette; one 1.3 mg nicotine cigarette. Subjects were tested for decision time and motor response on a choice reaction-time test. Heart rate was monitored from a pretest period throughout the session, and hand steadiness was measured on repeated occasions.

Decision-time scores were significantly decreased by both caffeine and nicotine, but no interaction was found. The high-nicotine cigarette had the greatest effect. Motor time scores were improved by caffeine only. Both caffeine alone and nicotine alone accelerated the heart rate but in combination appeared to have antagonistic effects. Hand steadiness was significantly impaired by both drugs but with no interaction. (JAM)

3 refs

KEYWORDS: Ganglionic Blocking and Stimulating Agents: nicotine. Stimulants: caffeine, nicotine. Experimentation: Comparison of Different Drugs. Experimentation: Study of Combined Effects of Drugs. Physiological Testing. Psychomotor Tests.

UM-78-D0907

REVIEW OF EFFECTS OF ALCOHOL AND OTHER LICIT DRUGS ON DRIVING-RELATED PERFORMANCE. P.A. Howat; R.G. Mortimer. People on the Move. Proceedings of the Human Factors Society 22nd Annual Meeting, E.J. Baise; J.M. Miller, eds., p564-72, Santa Monica, Ca.: Human Factors Society (1978)

A review is presented of the effects of alcohol and licit drugs on performance related to driving About 20% of persons of driving age use some licit drug, while a much greater percentage drink alcohol. Alcohol is used in combination with another licit drug by about 10% of persons of driving age. Alcohol is associated with about 50% of fatal traffic accidents, 30% of injury accidents, and 10% of noninjury accidents. Other licit drugs, such as diazepam, are involved in about 20% of nonfatal accidents. Alcohol combined with other licit drugs, such as diazepam, is involved in about 10% of injury accidents.

The effects of alcohol on driving-related skills is relatively well documented, but tests on the effects of other licit drugs present variable findings. There is some research which indicates additive or synergistic effects when alcohol is combined with other drugs.

Research to date on the effects of licit drugs alone and in combination with alcohol has many limitations. There have been comparatively few studies to test decision-making and perceptual-motor skills, such as used in driving or those actual driving tasks.

However, studies indicate that when combined with alcohol, some licit drugs lead to a deterioration in driving-related performance, but a need exists for further research involving more complex driving-related tests and actual driving situations. (AA)

79 refs

KEYWORDS: Anti-Emetics: chlorpromazine. Anticonvulsants (Anti-Epileptics): phenobarbital. Antihistamine Agents: diphenhydramine. Barbiturates: phenobarbital. Major Tranquilizers (Antipsychotics and Neuroleptics): chlorpromazine. Minor Tranquilizers (Anti-Anxiety and Ataractics): clorazepate. diazepam. meprobamate. Muscle Relaxants (Central): diazepam. Nonbarbiturates: diphenhydramine. Nonbarbiturates: ethanol (ethyl alcohol). Stimulants: amphetamine. Antihistamine Agents. Barbiturates. Stimulants. Tranquilizers. Review: Drugs and Highway Safety.

UM-78-D0908

THE RELIABILITY OF DRIVER PERFORMANCE--TEST RELIABILITY OR DRIVER STABILITY? M.H. Jones (Nov. 1978)

This study represents an attempt to establish the reliability of a recently developed driver performance test meeting the criteria of reasonable time, a large sample of driving behaviors, a large number of inependent observations, and interaction with normal traffic. This test, the University of Southern California's Driving Performance Test, requires appoximately thirty minutes of driving over a standardized route with specific traffic conditions.

In this experiment, ninety drivers were tested, forty-two who were inexperienced and forty-eight who were experienced. Each driver drove two runs with thirty minutes elapsing between runs. Drivers were scored on both occasions for observation, car control, speed, judgment, and path stability in a number of different situations, traffic densities, and maneuvers. Scores were compared and an attempt was made to determine the effects of learning and fatigue.

Results of analysis indicated that the correlation coefficients for the two different runs were nearly identical and exceedingly high in view of the brevity of the test, the complexity of the performance; and the possibility of some variability in traffic. The drivers did not perform differently on two tests run on the same day under closely controlled vehicular and environmental conditions. The University of Southern California's Driving Performance Test, therefore, appears to be highly reliable in a test-retest situation and is a potentially useful instrument for measuring driver performance of both novice and experienced drivers.

The author concludes that although this test was proved to be highly reliable, it is unknown whether driver performance can be predicted by means of any performance test because of uncontrolled variables in real life.

It is hypothesized that the drivers' performance is unstable and that therefore no performance test given at a single point in space and time can predict crash experience, no matter how reliable the test. The usefulness of state road tests is questioned since they do not take into account factors such as mood, health, stress, and other physiological or psychological variables which might cause a variation in driving performance from day to day. (HSRI)

12 pages 5 refs

Traffic Safety Center, University of Southern California Technical Report 78-13

KEYWORDS: Open Road Driving.

UM-77-D0909

THE EFFECTS OF TWO ANTIDEPRESSANTS, IMIPRAMINE AND VILOXAZINE, UPON DRIVING PERFORMANCE. A.B. Clayton; P.G. Harvey; T.A. Betts, Psycnopharmacology, v55 n1 p9-12 (1977)

The object of this study was to compare the effects of two antidepressants, impramine and viloxazine, on driving performance. Forty male volunteers ranging in age from 18 to 29 years were randomly assigned to one of four treatment groups on a double-blind basis: (1)imipramine (25 mg t.d.s.); (2) viloxazine (50 mg t.d.s.); (3) placebo; and (4) control (no tablets). Tests were carried out (1) before treatment; (2) two hours after the first dose; (3) on day 3 after seven doses; and (4) on day 7 after twenty-one doses. The driving tasks consisted of (1) weaving around a series of bollards while simultaneously responding to an auditory logic task; and (2) a gap acceptance task.

Using an analysis of covariance repeated measures design, it was found that imipramine tended to increase the level of risk acceptable to the subject as compared to either placebo or control, that is, it reduced normal caution. Imipramine also impaired performance on other tasks. Viloxazine appeared to be no different from either placebo or control on any tasks.

The results of this study suggest that semichronic administration of clinical doses of imipramine to normal healthy males results in a deterioration in performance of a number of basic driving skills as compared to placebo or control. If the effects of imipramine were to be transferred from the admittedly rather simulated test situation to actual driving performance on the road, then an increase in the risk of accident involvement would occur. (JAM)

16 refs

KEYWORDS: Antidepressants: imipramine. viloxazine. Closed Course Driving. Experimentation: Chronic Dosage Study. Experimentation: Dose-Effect Study.

UM-70-D0910

EFFECTS OF DRUGS ON PERCEPTION IN MAN. S. Malitz; M. Kanzler. Perception and Its Disorders. Proceedings of the Association for Research in Nervous and Mental Disease, December 6-7, 1968, New York, p35-53. Baltimore: Williams and Wilkins Co. (1970)

This paper discusses the alterations in perception produced by the ingestion of drugs. The dearth of information in this field is due to the fact that there has been a lack of systematic investigation of the purely perceptual aspects of drug effects. An attempt is made here to gather together the findings scattered through the literature regarding perceptual effects of the major classes of drugs. These include tranquilizers, antidepressants, stimulants, barbiturates, and the hallucinogens.

The critical flicker fusion test, the afterimage sensitivity test, and the apparent eye level test are examined in terms of usefulness in testing perception altered by various drugs.

Much of the information reviewed concerning the effects of drugs on perception is anecdotal, although some was obtained through the use of objective measures. It is concluded that no unified theory of the effects of drugs on perception has emerged nor is it likely to. Although future research will certainly shed light on the perceptual process in general, it is doubtful that the prediction of individual perceptual responses to drugs will be possible due to the complexity and diversity of the human organism and the unique set of previous life impressions that color each person's drug experience. (HSRI)

64 refs

Research Publications Association for Research in Nervous and Mental Disease

KEYWORDS: Antidepressants. Barbiturates. Hallucinogens and Related Agents. Stimulants. Tranquilizers. Review: Drug Effects.

UM-78-D0911

A REVIEW OF DRINKING AND DRUG-TAKING IN ROAD ACCIDENTS IN GREAT BRITAIN, B.E. Sabey, Proceedings of the AAAM (22nd) and The International Association for Accident and Traffic Medicine (VII) Ann Arbor, Michigan, 10-14 July 1978, D.F. Huelke, ed., v1 p188-98, Morton Grove, Illinois: American Association for Automotive Medicine (July 1978)

The current situation concerning the role of alcohol and drugs in road accidents in Great Britain is reviewed. The paper examines the evidence available on the involvement of different road user groups in alcohol-related accidents together with trends in alcohol-involved accidents since the introduction of legislation imposing a legal limit of 80 mg/100 ml alcohol in the blood of drivers. Action arising out of the Blennerhassett Committee of Inquiry into Drinking and Driving is also reported.

An exploratory investigation of the use of drugs in a general sample of 2,075 drivers found that fairly substantial numbers of men (8%) and women (15%) take therapeutic drugs before driving--sufficient numbers to warrant further research on the effects of drugs on driving behavior. In a sample of 1,216 drivers who had been injured in road accidents, 11% of the men and 26% of the females reported taking some type of drug forty-eight hours prior to their accident. Twenty-seven percent of the men and 17% of the women who reported taking drugs also admitted consuming alcohol within the six-hour period before their accident.

The paper concludes by discussing future research needs and proposals. The author believes that in order to develop effective countermeasures, each country must conduct studies determining whether the drinking-driving problem is related to social drinkers, problem drinkers, or alcoholics. Countermeasures can then be directed at the problem group. (AAM)

5 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Epidemiology: Self-Reported Drug Use by Drivers. Review: Drug Use.

UM-78-D0912

ALCOHOL AND DRUGS IN TRAFFIC ACCIDENT VICTIMS, B. Djerskog; B. Herner; B. Jacobsson; M. Sjoden; R. Bonnichsen; L. Ysander, Proceedings of the AAAM (22nd) and The International Association for Accident and Traffic Medicine (VII) Ann Arbor, Michigan, 10-14 July 1978, D.F. Huelke, ed., v1 p199-209, Morton Grove, Illinois: American Association for Automotive Medicine (July 1978)

This paper reports on an ongoing study which is attempting to determine the frequency of measurable blood alcohol concentrations, the frequency of drug use, and the frequency of certain drugs of importance for traffic safety in blood or urine samples in a traffic injury population. Seventy injured persons, all over fifteen years of age and responsible for their traffic behavior, were interviewed and examined for presence of alcohol and drugs.

Only nine persons (13%) had measurable amounts of alcohol in the blood. Seven persons had a concentration exceeding 15%. Seven of the nine were motor-vehicle drivers and two were cyclists. A clear correlation between alcohol intoxication and severe injuries was found.

Six persons of the total seventy declared that they were on continuous drug therapy because of chronic diseases. Two persons had taken benzodiazepines or aspirin in close relation to the accident. A few urine samples in selected cases were analyzed for traces of drugs having a possible traffic-safety risk. All of them were negative.

From the results of this study it is concluded that alcohol intoxication is rare in a traffic injury population, that there is a connection between severe injury and alcohol intoxication, and finally, that drug influence of any importance seems extremely rare in traffic accidents. (AAM)

10 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-78-D0913

DRUGS AND HIGHWAY SAFETY: RESEARCH ISSUES AND INFORMATION NEEDS. K.B. Joscelyn; A.C. Donelson. Proceedings of the AAAM (22nd) and The International Association for Accident and Traffic Medicine (VII) Ann Arbor, Michigan, 10-14 July 1978. D.F. Huelke, ed., v1 p268-92. Morton Grove, Illinois: American Association for Automotive Medicine (July 1978)

This paper attempts to answer two basic questions in the area of drugs and driving: (1) What information is required to define the highway safety risk of drugs? (2) What research must be performed to satisfy informative needs and to support programs designed to counter any identified risk?

The role that drugs other than alcohol play in traffic crash causation is unknown. Research has not established that any drug beside alcohol increases the probability of a traffic crash and associated losses. Basically, there is a problem of risk identification. Few researchers are willing to state that no drug and driving problem exists; but neither do most researchers recommend launching large-scale countermeasures.

Current knowledge supports an intermediate position Many drugs can impair driving skills and some are widely used in the general population, sometimes in combination with alcohol. As might be expected, many people who use drugs also drive, and some evidence suggests that some drugs may increase the traffic crash risk. The evidence is sufficient to cause concern and to warrant further inquiry, but not to establish that drugs other than alcohol should be a priority highway safety concern.

This paper also describes the present state of knowledge in drugs and driving and suggests general and specific directions for future research in this area. Each section emphasizes major research issues that hamper efforts to define the relationship of drugs and highway safety. Also stressed is the information needed to determine whether drugs, alone or combined with alcohol, increase crash risk. The final section presents conclusions and recommendations. (AAM)

70 refs

KEYWORDS: Review: Drugs and Highway Safety.

UM-78-D0914

DRIVING BEHAVIOR OF CANNABIS USERS AND NON-USERS IN CLOSED-COURSE AND NORMAL TRAFFIC SITUATIONS. S. Casswell. Proceedings of the AAAM (22nd) and the International Association for Accident and Traffic Medicine (VII) Ann Arbor, Michigan, 10-14 July 1978. D.F. Huelke, ed., v1 p330-41. (July 1978)

In the present study the driving performance of thirteen male subjects who reported regular use of cannabis was compared with that of a group of nonusing controls matched for age, education, and driving history. Subjects were tested in a closed-course driving situation involving perceptual and decision making tests and high speed driving. In addition to these measures, the subjects' driving on the road was monitored surreptitiously by activation of a video tape recorder system within the car while the subject drove the car to the experimental track.

The measures of driving performance in the closed-course and normal traffic situations showed some evidence for consistent driving patterns operating in both environments, particularly in the use of the vehicle controls and the speed of driving.

The cannabis users did not differ from nonusers in their use of vehicle controls, speed of driving, or performance measures obtained in the closed-course situation. There was a difference, however, in overtaking behavior and indicator use in the normal traffic situation, suggesting that some differences may exist in the nonintoxicated driving pattern of cannabis users compared with nonusers. These differences are related to the interpretation of the driving task and the subjective risks involved rather than in performance skills, and may well be related to the worse traffic record of cannabis users. (AAM)

22 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Closed Course Driving. Experimentation: Chronic Dosage Study. Open Road Driving.

UM-78-D0915

DRIVING UNDER THE INFLUENCE OF ALCOHOL AND THE COMBINED USE OF MEDICINE. D. Van Ooijen. Journal of Traffic Medicine. v6 n2 p22-6 (June 1978)

Presented here is a review of current research on driving while under the combined influence of alcohol and drugs in the Netherlands. Driving vehicles while under the influence of alcohol, coupled with the taking of medicine, has become a topic of major interest during the last few years. The combined use of alcohol and drugs has increased from 8.8% to 23.1% in the Netherlands from 1968 to 1978. Women more readily admit to combined usage than men.

The concurrent taking of both medicine and alcohol is significantly more frequent when swerving vehicles are involved, and even more so when an accident has taken place. Apparently there is a connection between the drinking of alcohol by DWI drivers and the taking of medicine. This is true especially for older drivers who often have high levels of alcohol in their blood or are problem drinkers. In general, drug-users tend to be polydrug users with alcohol as the most frequent companion. It was also found that the higher the position of the driver on the social scale, the more frequent are both the taking of medicine and the presence of intoxicants. (AAM)

16 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Epidemiology: Record-Based Survey. Review: Drug Use.

UM-74-D0916

EFFECTS OF MARIJUANA ON AGGRESSION AND RISK ACCEPTANCE IN AN AUTOMOTIVE SIMULATOR. A.B. Dott. Clinical Toxicology. v7 n3 p289 (1974)

Risk acceptance and aggression were studied in twelve marijuana users who operated an optical driving simulator after smoking 0, 11.25, or 22.5 mg of tetrahydrocannabinol. Subjects were required to perform on a driving simulator a passing test requiring immediate and rapid psychomotor responses. Blood and urine samples were also collected.

Performance was unchanged between nonsmoking and placebo conditions during the passing time. Cannabinoids were detected in thirteen out of fifteen samples, but no significant differences could be detected between the two dose levels. Subjects under the influence of marijuana completed fewer passes and took more time to decide whether to pass, but did not have a significantly greater number of accidents. It is concluded that chronic users under the influence of marijuana are less likely to accept risks than users not under the influence of marijuana. Therefore, marijuana, while it does affect aggression and possibly vigilance, is probably not as hazardous an intoxicant as alcohol. HSRI (HSRI)

0 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Driving Simulator. Experimentation: Dose-Effect Study.

UM-75-D0917

A REVIEW OF THE EFFECTS OF DIAZEPAM ON COGNITIVE AND PSYCHOMOTOR PERFORMANCE. R.A. Kleinknecht; D. Donaldson. The Journal of Nervous and Mental Disease. v161 n6 p399-411 (1975)

Studies evaluating the effects of diazepam on psychomotor and cognitive functions are reviewed and integrated. The importance of the full and clear documentation of such effects lies in the wide usage of diazepam today for a variety of medical, psychiatric, and dental purposes. The various tasks used to assess drug effects are classifiedinto major groups based on apparent similarity of functions tested. These groupings are reflex speed; critical flicker fusion threshold; attention and vigilance; decision making; learning and memory; and psychomotor performance.

In all functions except simple reflexive responding, some indications of impaired performances are reported in the literature, the results being most definitive for the critical flicker fusion where even small doses of diazepam lowered the threshold. A slower performance on letter cancellation tasks was also very evident.

There appears to be some interaction between diazepam and alcohol although the nature of this interaction is still unclear. Because of the extensive use of both of these drugs and the possibility of a synergistic or a potentiation effect, it is important that this area receive further study. It is suggested that future studies either control for or analyze the data to assess the possible interactive effects of diazepam with subject variables such as sex, personality type, and population characteristics. These variables have been shown to affect responses in other studies and hence could also interact with cognitive and psychomotor performance. It is noted that most of the studies reviewed used normal, healthy, male volunteer subjects and may not be comparable to the clinical populations for whom the drug is typically prescribed. (AAM)

49 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Review: Drug Effects.

NIOSH-77-124 UM-76-D0918

EFFECTS OF CO ON VIGILANCE PERFORMANCE--EFFECTS OF LOW LEVEL CARBON MONOXIDE ON DIVIDED ATTENTION, PITCH DISCRIMINATION, AND THE AUDITORY EVOKED POTENTIAL, V.R. Putz; B.L. Johnson; J.V. Setzer (Nov 1976)

Behavioral and neurological aspects of low level exposure to carbon monoxide were investigated in twenty males and ten females aged eighteen to twenty-six years in a double-blind study. Subjects were exposed for four hours to either 35 ppm or 70 ppm of carbon monoxide. Three behavioral measures were used: a compensatory tracking test to measure eye-hand coordination; a visual-peripheral monitoring task to measure light intensity discrimination; and an auditory monitoring task to measure tone discrimination. Neurological assessment consisted of an analysis of the components of the auditory evoked response. Carboxyhemoglobin levels of 1, 3, and 5% were obtained at the end of the fourth hour of exposure for carbon monoxide exposures of 5, 35, and 70 ppm, respectively. Statistically significant decrements in performance were noted at carboxyhemoglobin levels of 5%, the exposure level recommended by the National Institute for Occupational Safety and Health. A significant eye-hand coordination impairment of thirty percent occurred during the fourth hour of exposure at 70 ppm when 5% COHb was approached, as compared to performance at 5 and 35 ppm. Response times of subjects to the peripheral light intensity changes exposed at 70 ppm during the dual-task procedure increased during the third and fourth hours at a significantly faster rate than in control subjects or those exposed at 35 ppm.

Analysis of performance data from the auditory monitoring task indicated that response time, number of misses, false alarms, and percentage of correct detections for both critical and noncritical stimuli were not significantly affected by CO exposure conditions.

The significance of these findings as they relate to safe job performance by workers in CO-laden atmospheres remains to be determined. (AAM)

53 pages 41 refs

National Institute for Occupational Safety. Technical Report PB 274 219

KEYWORDS: Gases: carbon monoxide*. Experimentation: Dose-Effect Study. Psychomotor Tests. Tests of Sensory Function.

UM-78-D0919

THE EFFECTS OF A NEW ANTIDEPRESSANT, ORG GB (MIANSERIN HCL) ON PERFORMANCE RELATED TO DRIVING, K.J. Hofner, Clinical Therapeutics, v1 n4 p280-4 (1978)

The effects of mianserin hydrochloride (Org GB 94(R)), a new antidepressant, were measured in a variety of psychological tests which assessed concentration, reaction time, motor coordination, visual perception, and subjective symptoms. The subjects were fifty healthy student volunteers (twenty-five male, twenty-five female), ranging from eighteen to thirty years of age, who were treated with Org GB 94(R) or placebo for two weeks in a double-blind study.

The dosage was two tablets on day 1, increasing by one tablet daily to eight tablets on day 7. This dose, which is slightly more than that recommended for depression (60 mg/day), was continued until day 14.

The most frequent symptom reported was drowsiness during the first three to five days of treatment. The only other statistically significant effect associated with Org GB 94(R) treatment was seen in decreased performance in the concentration test on day 10 of treatment as well as on day 22, one week after stopping treatment. In all other tests (reaction time, bead threading, line labyrinth, tachistoscope, and reactive behavior under stress), there was a tendency towards impaired performance which generally decreased after the fifth day of treatment.

It is clear from this data that subjects taking Org GB 94(R) should be advised not to drive a motor vehicle for the first five days of treatment. After the fifth day, advice concerning driving should be given only after careful consideration, particularly since driving performance may be impaired without the subject being aware of it. This is particularly true for depressive patients since depressive illness in itself can affect performance. (JAM)

14 refs

KEYWORDS: Antidepressants: mianserin. Experimentation: Chronic Dosage Study. Psychological Testing. Psychomotor Tests.

UM-78-D0920

HAUFIGKEITPOSITIVER DIAZEPAM-BEFUNDE IN BLUTPROBEN ALKOHOLISIERTER VERKEHRSTEILNEHMER [OCCURRENCE OF DIAZEPAM IN BLOOD SAMPLES OF DRIVERS UNDER THE INFLUENCE OF ALCOHOL], H.P. Gelbke; H.J. Schlicht; G. Schmidt, Zeitschrift Fur Rechtsmedizin, v80 n4 p319-28 (1978)

Reported here is a study in which levels of diazepam were determined by radioimmunoassay and gas chromatography in 2,050 random blood or serum specimens of subjects who were suspected of driving under the influence of alcohol in the years 1974 and 1975. A cut-off limit of 20 ng/ml was selected. Diazepam was found in forty-six samples (2.24%). Twenty-seven samples (1.3%) exhibited concentrations of 20-100 ng/ml; fourteen samples (0.7%) showed concentrations of 100-500 ng/ml; one sample (0.05%) showed concentrations of 500-1000 ng/ml; and four samples (0.2% of the total 2,050 samples) showed concentrations of more than 1000 ng/ml.

Blood specimens of forty-four subjects who had claimed to have taken diazepam were withdrawn in another study. Diazepam was found in twenty-seven cases (61%).

Finally, blood specimens of 219 randomly selected inpatients of a surgical ward were investigated; 59 of these (27%) were found to be diazepam-positive. (JAM)

51 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam*. Muscle Relaxants (Central): diazepam*. Nonbarbiturates: ethanol (ethyl alcohol). Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-78-D0921

CLAZEPAM: PHARMACOKINETICS AND EFFECTS ON PERFORMANCE, J.F. Giudicelli; A. Berdeaux; N. Idrissi; C. Richer, British Journal of Clinical Pharmacology, v5 n1 p65-9 (Jan 1978)

This paper describes a study comparing the effects of clazepam (30 mg orally), a new benzodiazepine with antianxiety properties, on performance tests and the cardiovascular system to those of chlordiazepoxide (30 mg orally) and a placebo. This double-blind trial involved six healthy volunteers (three male and three female) between the ages of twenty and twenty-eight. Simultaneously, the pharmacokinetics of clazepam were investigated.

Blood samples were taken 1, 2, 4, 10, 24, and 48 hours after administration and urine was collected 1, 2, 4, 7, 10, and 24 hours after drug intake. Pulse rate, systolic blood pressure, diastolic blood pressure, critical flicker fusion, psychomotor performance at the pursuit rotor, telecran performance, and reaction time were measured 1,2,4, and 7 hours after drug intake. Alertness, nervous tension, concentration, and anxiety were assessed by means of a self-assessment questionnaire.

While clazepam itself could be detected neither in plasma nor in urine, it gave rise to two plasma metabolites: the former, an alcoholic derivative with a short half-life; and the second, desmethyldiazepam, with a long half-life. These two metabolites and

oxazepam were excreted in urine, and within the twenty-four hour period following drug intake, accounted for 73% of the ingested dose.

Seven hours after its administration, clazepam slightly improved performance and reduced anxiety. The kinetics of these effects and the metabolic data suggest that clazepam acts mainly through the formation of desmethyldiazepam. However, owing to the low blood levels of this metabolite, the activity of clazepam is very moderate. Efforts to identify clazepam itself were unsuccessful both in blood and urine. The absence of clazepam in blood raises the possiblity that this drug might undergo intestinal transformation into one or the other or both of its two plasma metabolites prior to intestinal absorption. (JAM)

11 refs

KEYWORDS: Major Tranquilizers (Antipsychotics and Neuroleptics): clazepam. Metabolites of Drugs and Other Agents: N-desmethyldiazepam. Minor Tranquilizers (Anti-Anxiety and Ataractics): chlordiazepoxide. N-desmethyldiazepam. Drug Concentrations in Body Fluids: Acute Dose Study. Experimentation: Comparison of Different Drugs. Pharmacokinetics: Acute Dose. Physiclogical Testing. Psychomotor Tests. Self-Evaluation of Drug Effects by Subjects.

UM-76-D0922

THE EFFECTS OF THE SUB-CHRONIC ADMINISTRATION OF AN ANTIHISTAMINE, CLEMASTINE, ON TESTS OF CAR DRIVING ABILITY AND PSYCHOMOTOR PERFORMANCE, I. Hindmarch, Current Medical Research and Opinion, v4 n3 p197-206 (1976)

The depressant side effects of antihistamines can be a matter of concern when car driving patients are involved. A double-blind placebo-controlled crossover trial was carried out in twelve male and nine female volunteers whose mean age was 34.6 years and whose mean length of car driving experience was 11.5 years. The purpose of the study was to study the effects of subchronic (1mg) administrations of clemastine, an antihistamine, on car driving ability and psychomotor performance.

Subjects were assessed on five tests representing various aspects of everyday car driving experience: garaging a car; controlled braking ability; estimation of width at a distance; maneuvering ability; and reverse parking. In addition, personality and subjective feeling states, sleep, and cognitive psychomotor performance were tested.

The results showed that repeated doses of 1 mg clemastine for three days had no significant consistent effect on any of the parameters measured relating to either driving ability or subjective reports. (JAM)

21 refs

KEYWORDS: Antihistamine Agents: clemastine. Closed Course Driving. Experimentation: Chronic Dosage Study. Psychological Testing.

UM-76-D0923

EVALUATION OF THE PSYCHOTROPIC EFFECT OF ETIFOXINE THROUGH PURSUIT ROTOR PERFORMANCE AND GSR, R. Corsico; J. Moizeszowicz; L. Bursuck; E. Rovaro, Psychopharmacologia, v45 n3 p301-3 (1976)

The purpose of this study was to define the scope of action of etifoxine in comparison with d-amphetamine and with placebo by means of the pursuit-rotor performance and the galvanic skin response in normal subjects. Etifoxine is a new psychotropic agent with a new chemical structure. When administered to animals this compound has tranquilizing effects with anticonvulsive, spasmolytic, and anticholinergic action. In patients suffering neurosis with asthenic-apathetic components, etifoxine has been reported to enhance intellectual and motor performance without impairing psychomotor coordination.

Six volunteer normal subjects (five males and one female) aged eighteen to twenty-five years all received etifoxine (300 mg), d-amphetamine (5 mg), and placebo in a double-blind random crossover design involving a single weekly dose. The subjects were tested before administration and two and six hours after drug administration. At two hours after administration, both galvanic skin response and pursuit-rotor performance obtained with each drug differed significantly from placebo, but not between drugs. The effects of etifoxine were similar to those of d-amphetamine in reducing the galvanic skin response and impairing pursuit rotor performance. In summary, the results of this test suggest that etifoxine could have, under some circumstances, a psychostimulatory

effect. However, the final psychopharmacological action of the drug is far from being fully known. (JAM)

10 refs

KEYWORDS: Anorectic (Appetite Control) Agents: dextroamphetamine. Minor Tranquilizers (Anti-Anxiety and Ataractics): etifoxine. Stimulants: dextroamphetamine. Sympathomimetic (Adrenergic) Agents: dextroamphetamine. Experimentation: Comparison of Different Drugs. Physiological Testing. Psychological Testing. Psychomotor Tests.

UM-77-D0924

DRUGS AND DRIVING. Medical Letter on Drugs and Therapeutics, v19 n24 p99-100 (2 Dec 1977)

Presented here is a brief review of the literature discussing the effects of various drug groups on driving. Many drugs, including some available without a prescription, can interfere with a patient's performance of routine or exacting tasks. For most patients, the greatest danger from such drugs is impairment of their ability to drive an automobile. Various laboratory studies of the effects of benzodiazepines on driving-related skills indicate a substantial risk lasting many hours after a single dose.

Most antipsychotic drugs, such as the phenothiazines or haloperidol, cause deterioration of psychomotor skills when given to both normal individuals and to inpatients who need them, especially during the first few days of treatment. Recommended doses of a large number of commonly used drugs can cause ataxia, blurred vision, nystagmus, dizziness, drowsiness, and tremor, particularly during initial treatment.

Alcohol is the major cause of accidents due to impaired driving ability, but various combinations of alcohol with drugs may be much more dangerous than either taken alone. (HSRI)

0 refs

KEYWORDS: Review: Drugs and Highway Safety.

UM-78-D0925

OPERATING ROOM NURSES' PSYCHOMOTOR AND DRIVING SKILLS AFTER OCCUPATIONAL EXPOSURE TO HALOTHANE AND NITROUS OXIDE, K. Korttila; P. Pfaffli; M. Linnoila; E. Blomgren; H. Hanninen; S. Hakkinen, Acta anaesthesiologia scandinavica, v22 n1 p33-9 (1978)

This paper reports a study in which concentrations of halothane and nitrous oxide were assayed by gas chromatography throughout a working day in three operating theatres and in the end tidal air of nineteen nurses fifteen and sixty minutes after leaving the theatres. Perceptual psychomotor and driving skills were measured in these nurses and in eleven younger nurses working in the ward of the same hospital who served as controls. A complicated psychomotor test battery and a driving simulator were used.

End-tidal air concentrations of halothane and nitrous oxide were positively correlated with the exposure level of these gases in the operating theatres. Some of the operating room nurses had greater amounts of halothane in their end-tidal air (average 15 ppm) than student volunteers four and one-half hours after three and one-half minutes of general anesthesia with a combination of halothane and nitrous oxide and oxygen (10 ppm halothane). These volunteers had worse psychomotor and driving performances when measured than controls who had not been anesthetized. No correlations were found between the concentrations of halothane or nitrous oxide in end-tidal air and psychomotor or driving performance. Despite their higher age and exposure to the operating room environment, the driving skills of the operating room nurses were similar to those of the ward nurses.

The results suggest that tolerance to anesthetic gases develops among operating room personnel. No impairment of driving skills can be expected after daily exposure to halothane and nitrous oxide among long-term employees in operating theatres. (JAM)

21 refs

KEYWORDS: Gases: nitrous oxide*. General Anesthetics: halothane*. nitrous oxide*. Hallucinogens and Related Agents: nitrous oxide*.

UM-77-D0926

THE INCIDENCE OF CANNABINOIDS IN FATALLY INJURED DRIVERS: AN INVESTIGATION BY RADIOIMMUNOASSAY AND HIGH PRESSURE LIQUID CHROMATOGRAPHY, J.D. Teale; J.M. Clough; L.J. King; V. Marks; P.L. Williams; A.C. Moffat, Journal of the Forensic Science Society, v17 n2-3 p177-83 (1977)

An attempt was made to assess the incidence of cannabis involvement in fatal road accidents in England and Wales by screening blood samples from fatally injured vehicle drivers. A survey of cannabinoid levels in postmortem blood from sixty-six fatally injured drivers showed, by radioimmunoassay alone, cannabis use in six cases. Further examination of three of the specimens by a combined system of high-pressure liquid chromatography and radioimmunoassay showed typical patterns of separated cross-reacting cannabinoids (CRC) and gave a specific measurement of THC levels. The total cross-reacting cannabinoid levels in the positive samples were low compared with the levels detected in earlier cases of intoxication or in volunteers smoking moderate doses of pure THC.

The report concludes that moderate THC-CRC levels (10-30 ng/ml) do not appear to be the probable cause of driving impairment. If the moderate blood THC-CRC levels detected in the majority of cases are associated with a degree of intoxication likely to be the cause of driving impairment, a much broader survey of cannabis involvement in all accidents, or even in all road-users, should be undertaken to ascertain the extent of its use. With more potent preparations of cannabis extract becoming popular, degrees of intoxication may exceed those previously experienced in an increasing number of users. This development may be reflected in cannabis becoming a more important factor in the causation of road accidents. (AAM)

10 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana*. Epidemiology: Analysis of Driver Body Fluids for Drugs. Specific Drug Screening: Other Techniques.

UM-78-D0927

NEUE ERKENNTNISSE ZUR LEISTUNGSFAHIGKEIT DES KRAFTFAHRERS, ZU IHREN GRENZEN UND ZU IHRER VERMINDERUNG DURCH MEDIKAMENTE UND ALKOHOL [NEW CONCEPTS REGARDING THE PERFORMANCE OF A DRIVER, ITS LIMITATIONS AND DECREASE CAUSED BY MEDICINES AND ALCOHOL], W. Muller-Limmroth; H. Schneble, Blutalkohol, v15 n4 p226-40 (July 1978)

The authors describe the operational mechanisms which a person initiates, be it intentionally or subconsciously, during the steering of a motorized vehicle. They also discuss those factors that influence these mechanisms with emphasis on occupational-physiological concepts. In this context, the influence of alcohol ingestion and the use of medicines is discussed. (JA)

0 refs German

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drugs and Highway Safety.

UM-77-D0928

THE DISRUPTION OF MARIJUANA INTOXICATION, R.O. Pihl; P. Spiers; D. Shea, Psychopharmacology, v52 p227-30 (1977)

The purpose of this study was to determine whether marijuana intoxication is disrupted by aversive noise. Ninety-six male subjects, all experienced marijuana users, aged 18 to 35, were divided by four drug conditions: coltsfoot, placebo, marijuana-low dose, and marijuana-high dose. Half of the subjects smoked marijuana while listening to music in a relaxing environment. The other half smoked marijuana in the same environment but had two ten-minute periods of aversive noise superimposed over the music.

A subjective measure of intoxication demonstrated significant drug and environmental group effects with suppression of self-reports of intoxication being especially strong for the marijuana low dose noise group. The usual positive correlation between subjective measures and pulse rate measures of marijuana intoxication was disrupted by the noise effect. Although subjective ratings were suppressed, the noise group demonstrated significantly higher pulse rates than the music group.

The results are discussed in terms of the effect of extraneous factors on marijuana intoxication. The results of this test may represent a phenomenon similar to the

frequent complaints of marijuana smokers about disrupting traffic noise. This study suggests that in spite of an aversive noise environment, the intoxication of the high dose subjects was unaffected. It is concluded that concern should be given to the marijuana smoker who when driving a car is "sobered" by numerous disrupting stimuli, but who physically remains intoxicated. (JAM)

14 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Experimentation: Dose-Effect Study. Other Factors Influencing Drug Effects. Physiological Testing.

UM-78-D0929

MOTIVATION LEVELS AND THE MARIHUANA HIGH, R.O. Pihl; H. Sigal, Journal of Abnormal Psychology, v87 n2 p280-5 (1978)

This study was undertaken to determine whether several different levels of motivation would serve differentially to reduce the marijuana effect. One hundred twelve male volunteers aged eighteen to thirty were randomly assigned to eight groups, with fourteen subjects in each group. For each of two drug conditions (no drug and four cigarettes containing .5g of marijuana at .8% THC) there were four motivation conditions. In the first motivation group, the subjects were merely given instructions concerning how to perform on each task. The second motivation group was given the additional instructions to "try as hard as possible" on each measure. The third motivation group could earn a small amount of money, contingent on the performance of the tasks. The fourth group could earn a substantial amount of money contingent upon task performance.

Time perception, choice reaction time, and a paired associate memory task were used as dependent measures.

The results indicated a significant detrimental drug effect on all measures and a significant motivation effect on the reaction time measure. The subjects in the nondrug condition had lower mean reaction times than those in the drug condition: The subjects in the no-motivation group had higher mean reaction times than those in the other motivation conditions. Close examination of the data suggests that the drug effect occurred because of the ineffectiveness of the motivation manipulation with the marijuana subjects. This study does, however, suggest the importance of individual and extrapharmacological factors in understanding the effects of marijuana intoxication. (JAM)

14 refs

KEYWORDS: Experimentation: Acute Dosage Study. Other Factors Influencing Drug Effects. Psychological Testing. Psychomotor Tests.

UM-78-D0930

TIME COURSE EFFECTS OF MARIJUANA AND ETHANOL ON EVENT-RELATED POTENTIALS, B.S. Kopell; W.T. Roth; J.R. Tinklenberg, Psychopharmacology, v56 n1 p15-20 (31 Jan 1978)

Since both marijuana and ethanol are popular social drugs and because their relative merits and drawbacks are under continuing discussion, the present study was designed to compare equivalent doses of these drugs in a single design. Twelve male college students (20-32 years) received orally on different days marijuana extract calibrated to contain 0.7 mg/kg delta-9-tetrahydrocannabinol, 1.0 ml/kg 95% ethanol, and placebo in a double-blind, balanced-order design. The contingent negative variation (CNV), auditory evoked potential (EP), heart rate (HR), and subjective measures of intoxication were recorded prior to drug ingestion and at regular intervals for four and one-half hours postdrug.

Both drugs produced significant subjective effects, with subjective change reported to be somewhat greater for marijuana than for ethanol. Marijuana increased heart rate but did not have a significant effect on CNV amplitude or EP peak amplitudes and latencies. Ethanol increased heart rate, but not significantly, and reduced CNV amplitude and N1-P2 amplitude. Time-action curves for ethanol's effect on subjective high, heart rate, and N1-P2 amplitude were parallel, peaking between 0.5 and 1.5 hours postdrug and returning to baseline by the end of testing. Time-action curves for ethanol's effect on the CNV showed continuing amplitude reduction throughout the test session.

It is concluded that heart rate, CNV amplitude, and N1-P2 amplitude are affected differently by marijuana and ethanol intoxication. The effects were different in both timing and pattern of changes. The behavior of the variables measured does not allow a simple psychological interpretation in terms of arousal or attention. (JAM)

32 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol, marijuana. Nonbarbiturates: ethanol (ethyl alcohol). Experimentation: Comparison of Different Drugs. Physiological Testing. Self-Evaluation of Drug Effects by Subjects.

UM-77-D0932

MANAGEMENT OF THE DISULFIRAM-ALCOHOL REACTION. R.M. Elenbaas, American Journal of Hospital Pharmacy, v34 n8 p827-30 (Aug 1977)

This paper reviews the proposed mechanisms of the disulfiram-alcohol interaction and discusses recommended management. Disulfiram (tetraethylthiuram disulfide) was first used in the management of chronic alcoholism in 1948 when it was accidentally discovered that human subjects pretreated with disulfiram experienced a characteristic unpleasant reaction following the ingestion of small amounts of ethanol. Manifestations of the typical disulfiram-alcohol reaction begin within five to fifteen minutes after alcohol ingestion, and include initially flushing and a "lobster-red" color accompanied by a sensation of warmth and diaphoresis, followed by palpitations, dyspnea, hyperventilation, tachycardia, headache, and hypotension. The hypotension may produce pallor, weakness, vertigo, nausea, and vomiting. Electrocardiographic changes may also occur. Although the reaction is usually short-lived and without sequelae, severe adverse effects have been reported including at least twenty deaths.

Recommended treatment consists of supportive measures such as Trendelenberg posture, administration of oxygen, intravenous infusion of fluid, solute, colloid, and if needed, a pressor agent such as norepinephrine.

Other drugs possessing disulfiram-like activity include metronidazole, sulfonylurea oral hypoglycemic agents, sulfonamide antibacterials, chloramphenicol, furazolidine, griseofulvin, procarbazine, quinacrine, and tolazoline. Patients ingesting alcohol while taking any of these drugs may experience disulfiram-alcohol reactions. Disulfiram can impair the clearance of some drugs and potentiate the therapeutic or toxic effects of others. Examples include precipitation of central nervous system toxicity due to isoniazid or metronidazole and potentiation of the hypoprothrombinemic effect of warfarin. Great care should be exercised when prescribing disulfiram to patients who drive. (HSRI)

36 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Unclassified Agents: disulfiram. Review: Drug Effects.

UM-78-D0933

THE PREDICTION OF NEUROPSYCHOLOGICAL IMPAIRMENT IN POLYDRUG ABUSERS. A.S. Carlin; F.F. Stauss; K.M. Adams; I. Grant, Addictive Behaviors, v3 p5-12 (1978)

Previous research has found a significant proportion of polydrug abusers to be neuropyschologically impaired and has implicated depressant and opiate use as contributing to the observed impairment. This investigation assessed the relative contribution of drug use and demographic and personality variables to the prediction of impairment in polydrug users. The data for this investigation were collected from three groups of subjects: a polydrug abuse patient group (N=15); a nondrug using sample of psychiatric patients (N=66); and a nondrug using, nonpsychiatrically ill group of "normal" volunteers (N=59), all groups being considered demographically similar for all practical purposes. The impairment status of each subject was based on extended Halstead-Reitan test battery results. Each subject also completed an MMPI and a detailed ten-year history.

The findings of the investigation indicate that drug style and life events are more indicative of neuropsychological impairment than amount of drug consumption. Previous research indicates that the degree of involvement of a polydrug abuser in the street culture and the motivation for drug use are important variables in understanding many aspects of drug behavior. This hypothesis is supported by this investigation which found that "straight" self-medicating polydrug users are more likely to be impaired,

while both straight and streetwise social-recreational users are more likely to be nonimpaired as measured by the Biosocial Sequellae Scale.

The data collected in this investigation do not allow a statement about causal relationships. It is not clear whether the chronic maintenance pattern of the self-medicating person is more likely to cause impairment or whether an impaired individual who becomes involved in drugs seeks a self-medicating drug style. Regardless of the causality, the straight self-medicating polydrug abuse patient is at greater risk of being impaired and requires treatment which takes this state into account. (HSRI)

8 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns. Other Factors Influencing Drug Effects.

UM-69-D0934

EFFECTS OF CHRONIC EXPOSURE TO LOW LEVELS OF CARBON MONOXIDE ON HUMAN HEALTH, BEHAVIOR, AND PERFORMANCE, Washington, D.C.: National Academy of Sciences, National Academy of Engineering (1969)

This report assesses the state of knowledge concerning the effects of carbon monoxide on human health. It discusses present research findings concerning these effects and recommends further research needed to provide answers to some key questions. It is especially useful to those responsible for developing ambient-air criteria and standards.

Attention is focused on the effects of low levels of carbon monoxide such as those most commonly encountered on city streets and in traffic tunnels. Some of the topics discussed are (1) the probable effects of carbon monoxide inhalation on mental performance; (2) possible effects of carbon monoxide on normal circulation; (3) hypothetical effects of carbon monoxide on susceptible (diseased) persons; and (4) possible adverse health effects of carbon monoxide absorbed while inhaling cigarette smoke.

Recommendations for needed research are discussed. Problem areas that should be given high priority in future research programs are behavioral studies, medical research, research on physiologic mechanisms, epidemiologic research, and environmental research. Studies of the effects of carbon monoxide on driving and other tracking tasks, vigilance, signal detection, and decision-making should also be given high priority. (HSRI)

Committee on Effects of Atmospheric Contaminants on Human Health and Welfare

66 pages 103 refs

KEYWORDS: Gases: carbon monoxide. Review: Drug Effects.

UM-74-D0935

THE ROLE OF ATMOSPHERIC CARBON MONOXIDE IN VEHICLE ACCIDENTS, I. Yabroff; E. Myers; V. Fend; N. David; M. Robertson; R. Wright; R. Braun, Menlo Park, Ca.: Stanford Research Institute (1974)

A literature search was performed to determine the state of knowledge concerning the degree to which atmospheric carbon monoxide occurring in heavy urban traffic is a contributing factor to vehicle accidents. At levels of carboxyhemoglobin of 5 to 20% (typical traffic induced concentrations), the performance of complex tasks as well as many visual tasks has been found to be slightly impaired. Attempts to relate high levels of atmospheric CO or blood levels of COHb to accidents have suggested that driver facilities do have higher levels of COHb than do drivers not involved in an accident. However, the degree to which this is because of smoking rather than absorption of atmospheric CO has not been determined. In addition, a correlation of atmospheric oxidant levels with the accident rate has been established. Neither of these results is a basis for demonstrating atmospheric CO as a contributing cause of accidents.

An experimental plan is described by which the degree of contribution of atmospheric CO to vehicle accidents can be established more firmly. This plan consists of an initial low cost correlation analysis using available atmospheric CO data in specified urban centers and police accident records available in those same centers. If a significant correlation can be established, it may be deemed worthwhile to proceed to a much more

comprehensive set of experiments in which the key contributing factors to vehicle accidents are analyzed in more detail to determine the degree to which atmospheric CO enhances their effect. This phase of the experimental plan would involve on-scene accident investigation and the analysis of drivers passing the scene of the accident as a control group. (AAM)

Coordinating Research Council, Contract CRC-APRAC Proj. CAPM-12-69

92 pages 78 refs

KEYWORDS: Gases: carbon monoxide*. Review: Drug Effects. Review: Drugs and Highway Safety.

UM-74-D0936

EFFECTS OF NOXIOUS GASES ON DRIVER PERFORMANCE, T.H. Rockwell; R.L. Wick; K.N. Balasubramanian (Oct 1974)

The nighttime driving performance of five healthy young subjects (age 21 to 30) and five healthy aged subjects (age 60 to 65) under the influence of CO (12% carboxyhemoglobin [COHb] level) was investigated over the period of one year. The subjects were tested on freeway driving, sign reading, car following, curve negotiation on rural roads, and novel occlusion tasks. Performance measures relating to the drivers' visual behavior, spare visual capacity, velocity mean and variability, halfway mean and variability, and peak lateral acceleration in curves were also measured.

Based on the results of previous CO research, it was hypothesized that significant effects due to CO would be observed more in the visual behavior of subjects at night than during the day because of the increase in stress provided by nighttime driving. It was also hypothesized that the aged would be more susceptible to CO than the young.

The results indicated that CO affects the visual search behavior of both the young and the aged but in a significantly different manner. Under CO there is a decreased visual activity for the young subjects. Under CO the aged concentrated their search patterns on the road elements much closer to their vehicle. One of the by-products of this research was the experimental observation of significant differences in the driving behavior between the young and the aged. It was also observed that the effects of age and CO are not additive.

In the physiological measure, the mean heart rate was significantly higher under CO for the young, whereas there was no change in the mean heart rate of the aged. However, the mean heart rate of the aged was always higher than that of the young at control conditions.

The overall results support the hypothesis with respect to young subjects, i.e., at night there are significant changes in their visual search patterns under CO resulting in their decreasing visual activity. With respect to older subjects it is suprising to see that they were more active under CO and had different visual search patterns compared to the young. One suggestion is that the higher level of arousal of older subjects in the experimental conditions might tend to mask subtle effects due to CO. (AAM)

128 refs

National Highway Traffic Safety Administration, Technical Report DOT HS-801235

KEYWORDS: Gases: carbon monoxide*. Age and Drug Effects. Experimentation: Chronic Dosage Study. Open Road Driving. Physiological Testing. Tests of Sensory Function.

UM-77-D0937

ON THE INFLUENCE OF MOBILETTEN(R) ON THE EFFECT OF ALCOHOL IN THE HUMAN, SECOND COMMUNICATION: INFLUENCE ON THE EFFICIENCY UNDER ALCOHOL STRESS, H.J. Mallach; G. Raff; R. Kraemer, International Journal of Clinical Pharmacology, v15 n12 p576-80 (Dec 1977)

The influence of alcohol in combination with Mobiletten(R), a preparation supposedly having the properties of increasing alertness and reducing the symptoms of fatigue often occurring after the consumption of an abundant meal or alcohol, was studied in fifteen subjects. After taking various amounts of alcohol and Mobiletten(R), the subjects were tested with the Wiener reaction device, the Wiener determination device, the efficiency test device, a motory efficiency test series, a steadiness test, and tracing and aiming

tests. They were also assessed for their subjective well-being. Tests were carried out 15, 60, 120, 240, and 300 minutes after ingestion.

Under the influence of the combination of alcohol and Mobiletten(R), the subjects showed significantly less efficiency loss in regard to single test parameters than under alcohol without intake of Mobiletten(R). These changes were noted in a comparison of the test results obtained at respective points of time as well as those obtained when the blood ethanol concentrations were practically identical.

A reduction in blood ethanol levels was discussed as a cause for these changes. Any specific sobering effect of the preparation, however, could not be demonstrated. (AAM)

4 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol)*. Unclassified Agents: Mobiletten(R). Experimentation: Study of Combined Effects of Drugs. Psychological Testing. Psychomotor Tests.

UM-77-D0938

REVERSAL OF ETHANOL INTOXICATION IN HUMANS: AN ASSESSMENT OF THE EFFICACY OF L-DOPA, AMINOPHYLLINE, AND EPHEDRINE, R.L. Alkana; E.S. Parker; H.B. Cohen; H. Birch; E.P. Noble, Psychopharmacology, v55 n3 p203-12 (1977)

Neurochemical and neuropharmacological evidence converge to suggest that pharmacological manipulation of brain catecholamine systems represents a promising method of reversing ethanol depression. To test this hypothesis, the effect of acute postethanol treatment with L-Dopa, aminophylline, and ephedrine (all centrally active catecholamine-stimulating drugs) was investigated. In one experiment, fourteen healthy male subjects 21-36 years of age ingested ethanol (0.8 g/kg) and then either L-Dopa (1.5 ng) or placebo. In the second experiment, subjects ingested ethanol (0.8 g/kg) followed by aminophylline (200 mg), ephedrine (50 mg), aminophylline (200 mg) plus ephedrine (50 mg), or placebo. A double-blind, within-subject crossover design was employed. The subjects were tested with a battery of behavioral and physiological tests sensitive to ethanol including platform balance, free-recall memory, divided attention, electroencephalographic recordings, mood adjective check list, inebriation ratings, and blood alcohol concentration.

Treatment with L-Dopa significantly reduced ethanol's effect on the electroencephalogram, motor coordination, and divided attention performance. Treatment with aminophylline or ephedrine or both also significantly reduced ethanol's effects on the electroencephalogram and motor coordination.

The ethanol-antagonism may result from central noradrenergic stimulation. Since L-Dopa, aminophylline, ephedrine, and the amphetamines stimulate both central dopamine and norepinephrine systems, part of their failure to consistently or completely reverse intoxication may result from their stimulatory effect on dopaminergic systems which masks or offsets antagonistic effects resulting from noradrenergic stimulation. (JAM)

67 refs

KEYWORDS: Anti-Asthmatics: aminophylline, ephedrine. Anti-Parkinsonism Agents: levodopa. Nonbarbiturates: ethanol (ethyl alcohol)*. Other Cardiovascular Agents: ephedrine. Stimulants: ephedrine. Sympathomimetic (Adrenergic) Agents: ephedrine. Physiological Testing. Psychological Testing. Psychomotor Tests.

UM-78-D0939

THE EFFECTS OF ALTITUDE AND TWO DECONGESTANT-ANTIHISTAMINE PREPARATIONS ON PHYSIOLOGICAL FUNCTIONS AND PERFORMANCE, E.A. Higgins; W.D. Chiles; J.M. McKenzie; A.E. Jennings; G.E. Funkhouser; S.R. Mullen, Oklahoma City: Civil Aeromedical Institute (Apr 1978)

Fourteen healthy male paid subjects (aged 18 to 33 years) were studied to determine the combined effects of two altitudes (ground level [1,274 feet] and 12,500 feet) and three preparations: lactose placebo; Actifed(R); and Dristan(R), as measured by the Civil Aeromedical Institute Multiple Task Performance Battery (MTPB). The battery measured physiological parameters, monitoring ability, and problem solving ability. Subjective evaluations were also made.

Physiological data showed that Actifed(R) was a stimulant and Dristan(R) a depressant. Subjects reported least subjective attentiveness with Actifed(R) and greatest with

lactose. Significant time effects were evident in subjective ratings (increasing fatigue and decreasing energy, interest, and attentiveness). The Multiple Task Performance Battery (MTPB) showed no effects of altitude, drugs,or time on overall performance; however, performance declined from the first to the second hour in several tasks, while problem solving improved. The data are compatible with previously reported decreasing interest and attentiveness; subjects enjoyed the problem-solving tasks and may have given those tasks preference as their levels of interest declined.

Though performance on the MTPB with the drug doses evaluated did not produce changes in the overall composite scores earned by these healthy subjects, the results from physiological parameters and some subjective evaluations indicate that time after ingestion and type of compound ingested are important. Declines in energy and attentiveness two and one-half hours after ingestion of Dristan(R) could result in neglect of important although routine tasks. Hypoxia might enhance this effect and consequences might be worse in subjects whose medical conditions require antihistamines. (AAM)

13 pages 9 refs

Federal Aviation Administration, Technical Report, FAA-AM-78-19

KEYWORDS: Antihistamine Agents: phenindamine. triprolidine hydrochloride. Actifed(R) (pseudoephedrine HCl + triprolidine HCl). Dristan(R) (phenylephrine HCl + chlorpheniramine maleate + aspirin). Decongestant and Cold Preparations: phenylephrine. pseudoephedrine. Sympathomimetic (Adrenergic) Agents: phenylephrine. pseudoephedrine. Experimentation: Comparison of Different Drugs. Physiological Testing.

UM-74-D0940

DRUGS AND ALCOHOL AS FACTORS IN ROAD ACCIDENTS, A.B. Clayton, Journal of Social and Occupational Medicine, v24 n2 p62-5 (April 1974)

A brief review of previous research into the role of drugs and alcohol in road accidents is presented. Data on the effects of the 1967 Road Safety Act are given and the problem of alcohol and the pedestrian is highlighted.

Few field data are available regarding the role of psychotropic drugs in accidents, but results of experimental studies have suggested that a potential danger exists, particularly during the early stages of therapy. The best available estimates, based mainly upon the results of American research, suggest that in a single year, about 15% of American drivers drive while under the influence of psychotropic drugs, particularly barbiturate and nonbarbiturate hypnotics, tranquilizers, stimulants, and antidepressants. (HSRI)

8 refs

KEYWORDS: Anorectic (Appetite Control) Agents: dextroamphetamine. Cannabis Sativa L. and Related Agents: marijuana. Minor Tranquilizers (Anti-Anxiety and Ataractics): chlordiazepoxide. Nonbarbiturates: ethanol (ethyl alcohol). Stimulants: dextroamphetamine. Sympathomimetic (Adrenergic) Agents: dextroamphetamine. Review: Behavioral Research Methodology.

UCLA-ENG-7302 UM-72-D0941

EFFECTS OF DRUGS AND ALCOHOL ON DRIVER PERFORMANCE. FINAL REPORT, H.W. Case; S.F. Hulbert (May 1972)

This study reports and discusses the methodology and results of experiments using both a driving simulator and a soundproof chamber, the aim of which was to test the effects of alcohol, chlordiazepoxide, dextroamphetamine, and marijuana on human driving performance. The study used two types of laboratory measures; one comprised of two auditory tasks simultaneously presented, the other comprised of two visual tasks simultaneously presented.

Results indicated that marijuana can affect driving behavior. Although a trend was found for the visual subsidiary task after ingestion of by marijuana, the results are statistically inconclusive. No effect was found on vehicle control scores and no tests were conducted on the auditory tests of attention.

Chlordiazepoxide was shown to increase reaction time to the visual subsidiary task in the driving simulator laboratory. Chlordiazepoxide with alcohol increased reaction time

even further. However, no chlordiazepoxide effect was found in the auditory test of divided attention nor were there any marked changes in vehicle control scores under the drug even when combined with alcohol.

Dextroamphetamine was found to decrease reaction time to the visual subsidary task. The combination of dextroamphetamine with alcohol produced reaction times equal to the sober (placebo) driving sessions. Evidence also indicated some disruption of the normal pattern of divided attention reaction time relative to task loading. (AAM)

164 pages

Institute of Transportation and Traffic Engineering, University of California FH-11-7499

KEYWORDS: Anorectic (Appetite Control) Agents: dextroamphetamine. Cannabis Sativa L. and Related Agents: marijuana. Minor Tranquilizers (Anti-Anxiety and Ataractics): chlordiazepoxide. Nonbarbiturates: ethanol (ethyl alcohol). Stimulants: dextroamphetamine. Sympatnomimetic (Adrenergic) Agents: dextroamphetamine. Driving Simulator. Experimentation: Chronic Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Study of Combined Effects of Drugs. Psychological Testing. Tests of Sensory Function.

UM-78-D0942

REPORT OF THE SUBCOMMITTEE ON HUMAN FACTORS OF THE NATIONAL SAFETY COUNCIL'S COMMITTEE ON ALCOHOL AND DRUGS, R.B. Forney, Traffic Conference of the National Safety Congress, 4-5 Oct. 1978, Chicago, Illinois (1978)

Contributions to the understanding of chemically modified human factors in motor vehicle accidents have continued in potpourri fashion and none have been commendably innovative. Listed here are some of the more important studies dealing with the effects of drugs and alcohol on driving. Twelve studies, primarily experimental papers published in 1977 and 1978, are listed and abstracted. (HSRI)

5 pages 14 refs

KEYWORDS: Antidepressants: imipramine. viloxazine. Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Nonbarbiturates: ethanol (ethyl alcohol). Unclassified Agents: trithiozine. Cannabis Sativa L. and Related Agents. Compilation.

UM-78-D0943

ALCOHOL, DRUGS AND ACCIDENT RISK, G.A. Starmer, Medical Journal of Australia, v1 n2 p78-9 (28 Jan 1978)

Presented here is a discussion of the role of alcohol and drugs in traffic accidents. Disease constitutes an invasion of the life style of the ambulant patient who must continue to follow his daily routine. Often unrecognized, however, is the fact that the prescribed drug treatment, while ameliorating symptoms, may also pose a threat to the patient and others. The main area of concern is in the effects of drugs on human perceptual, cognitive, and motor functions, especially in view of the concurrent increase in mechanization and drug use in society without a corresponding increase in knowledge of the interrelationships.

Psychoactive drugs of all types are shown to produce decrements in perceptual and psychomotor performance and are likely to contribute to impaired driving. It is the physician's responsibility to be aware of the likely effects of the drugs he prescribes on driving performance. However, in most cases this information is not available to him because pharmaceutical companies are reluctant to carry out this sort of research unless pressured by government regulatory bodies.

The problems of drinking while driving and mixing alcohol with drugs are also discussed. The author feels a public education program is long overdue. (HSRI)

14 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drugs and Highway Safety.

UM-78-D0944

THE DANGERS OF MIXING ALCOHOL AND DRUGS. Business Week Personal Business Supplement, n2556 p200-1,204 (16 Oct 1978)

This article discusses the increasing use of drugs with alcohol. Use of tranquilizers and barbiturates combined with alcohol is becoming a way of life for a great number of Americans over thirty-five, particularly those in the affluent suburbs. The dangers of using these combinations and cocaine are discussed. Cocaine use, besides its damage to the nasal system, can result in conditions of paranoid psychosis and psychological addiction.

The author believes that the best way for the middle to upper class addict to break his addiction is to seek some form of group treatment at a drug clinic in which a group of patients tackles the problem together and provides moral support for each other. A lone psychologist is handicapped in drug treatment because he, unlike a psychiatrist who is a medical doctor, is unable to treat the physical aspects or drug habituation of addiction. Furthermore, a family physician or psychiatrist may lack any knowledge or understanding of drugs which would be present at a clinic. (HSRI)

0 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drugs and Highway Safety.

UM-77-D0945

THE PROFILE OF THE SUSPECT DRUNK-IN-CHARGE DRIVER IN THE BELFAST AREA, W.A. Eakins; D. Faloon, Ulster Medical Journal, v46 n1 p32-7 (1977)

This paper describes some salient trends among drinking drivers. The conclusions are based on a survey of 578 unselected suspected drunk-in-charge drivers seen over the period between January 1973 to December 1974 by one police surgeon in Belfast. In some instances the information is incomplete because the individual refused to be examined or to give a specimen of blood or urine for laboratory analysis.

The information obtained showed widespread drinking by younger people, increasing to fairly heavy drinking in the 35-44 year old group. There was a high incidence of accidents which was mainly associated with blood alcohol levels over 150 mg per 100 ml. Fifteen per cent of the drivers had taken drugs in combination with alcohol.

The greatest incidence of accidents occurred between 2100 and 0300 hours, particularly on Friday and Saturday nights. This increased frequency of accidents occurred in spite of the fact that road traffic is of much smaller volume during this period than in the daytime. Alcohol is a likely major causative factor, although fatigue may also contribute and may to some extent act synergistically with alcohol. (HSRI)

6 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol)*. Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-78-D0946

EFFECTS OF SET ON SUBJECT'S INTERPRETATION OF PLACEBO MARIHUANA EFFECTS, H.W. Smith, Social Science and Medicine, v12 n2a p107-9 (Mar 1978)

This paper discusses the sufficient conditions and the effect of set on the subjects' interpretation of placebo marijuana effects. Research into the effects of marijuana on humans has tended to equate psychological and physiological effects. Administration of placebo THC to heavy marijuana users in a true experimental setting was done here in a attempt to identify certain social processes that may be responsible for some of the psychological set effects usually assumed to be caused by THC-induced physiological changes.

Eighteen males and eighteen females who claimed to smoke marijuana at least twice a week were administered a pill which they were told had a fifty-fifty chance of containing THC but which in actuality contained only sugar. Subjects were randomly assigned to one of two conditions: (1) a mixed sex dyad; or (2) an individual situation. Subjects were led into an experimental observation room where they singly or jointly were given two tasks--a labyrinth game, and a Rorschach ink blot, for which subjects had to make up a

story. At the end of the two tasks subjects were administered a questionnaire concerning their experience.

Seventeen of the eighteen dyadic condition subjects claimed to have felt they were administered a high dosage of marijuana. All of the subjects believed that their partners had been given THC, also. By contrast, among individuals who had performed the tasks individually, only three subjects felt they had received marijuana.

The results of this experiment support the view that socially embedded meanings may form a superstructure for physiological substructures. The data suggests that under placebo sets and settings, heavy marijuana users use these social systems to interpret themselves to themselves and to others. Hence, such sets and settings may lead the subject to experience feelings and to act behaviorally in ways which are due to cultural or social expectations rather than to the attributed physiological changes of drug-taking. Therefore, the author concluoes, researchers should pay more attention to the untangling of social attributions in their experiments with all drugs. (HSRI)

15 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Experimentation: Acute Dosage Study. Other Factors Influencing Drug Effects.

UM-78-D0947

DRUGS AND DRIVING, Drug and Therapeutics Bulletin, v16 n17 p65-7 (18 Aug 1978)

This brief paper discusses the potential traffic hazard of prescription drugs. Many drugs may adversely affect driving performance, although doctors do not always warn their patients of this possibility. Every doctor should be familiar both with possible unwanted reactions or interactions of drugs he prescribes and with the driving license regulations, and should advise his patients accordingly. No one should drive after taking any drug which could possibly impair driving until he feels fully alert and capable. Patients should avoid driving for the first few days after a significant change in dose, until they are positive that any unwanted effects are absent. A single dose of a drug may affect behavior for sometime and it is unwise for anyone to drive for at least twenty-four hours after the first dose of a drug acting on the CNS. (HSRI)

16 refs

KEYWORDS: Review: Drugs and Highway Safety.

UM-75-D0948

MENTAL ILLNESS AND SIMULATED DRIVING: BEFORE AND DURING TREATMENT, P. Bech, Pharmakopsychiatrie Neuro-Psychopharmakologie, v8 n4 p143-50 (1975)

The driving behavior of forty-six psychiatric inpatients between the ages of eighteen and sixty was tested on a car simulator before and during treatment with neuroleptics and tricyclic antidepressants in order to measure the interaction between psychotropic drugs and driving behavior. On the basis of the presence of psychotic symptoms, the patients were divided into a psychotic and a nonpsychotic group. They were matched according to age, sex, and driving experience.

In the psychotic group, seven patients were without physical treatment. Nine patients were treated with neuroleptics: (five received chlorprothixene in doses between 50 and 400 mg daily; two received haloperidol in doses between 6 and 8 mg daily; one received perphenazine- 48 mg daily; and one received flupenthixol-4.5 mg daily). Three received amitriptyline in doses between 150 and 200 mg daily, and one received 150 mg imipramine daily. The nonpsychotic group was given the same drugs in similar doses. Subjects were instructed to drive while measurements including brake time, starting time, number of gear changes, and mean speed were taken.

Before treatment the psychotic group had a statistically significant prolongation of brake time in such a way that their performance deteriorated more markedly over trials. The difference between the two groups after treatment was slight and never reached statistical significance, indicating that antipsychotic drugs given to psychotic patients do not impair their driving but on the contrary, increase vigilance. (HSRI)

14 refs

KEYWORDS: Antidepressants: amitriptyline, imipramine. Major Tranquilizers (Antipsychotics and Neuroleptics): chlorprothixene, flupentixol, haloperidol, perphenazine. Driving Simulator. Experimentation: Comparison of Different Drugs. Experimentation: Study of Combined Effects of Drugs.

UM-76-D0949

BLOOD LEVEL, MOOD AND MHPG RESPONSES TO DIAZEPAM IN MAN, R.C. Smith; H. Dekirmenjian; J. Davis; R. Casper; L. Gosenfeld; C. Tsai, Pharmacokinetics of Psychoactive Drugs: Blood Levels and Clinical Response, L.A. Gottschalk; S. Merlis, eds., p141-56, New York: Spectrum Publications (1976)

This paper describes the preliminary findings investigating a study of the effects of acute oral doses of diazepam on mood and MHPG (a catecholamine metabolite) responses in man and their relation to plasma and red blood cell levels in the drug. Subjects for this study were normal volunteers, anxious outpatients, and hospitalized psychiatric patients, all of whom had been off psychotropic drugs for at least a week prior to the study. Each subject received two doses--.3 mg/kg of diazepam, and placebo. Data on the psychological response to diazepam, blood levels of diazepam and its metabolites, and the effects of the drug on urinary MHPG and normetanephrine were collected over several hours. Subjective levels of moods, of anxiety, fatigue, vigor, dejection, confusion, and anger were also assessed.

Results showed that the effects of diazepam on sedation are stronger and more regular than its effects on anxiety. Marked effects of diazepam on moods other than anxiety and fatigue were prominent, especially among hospitalized patients, although these effects exhibited considerable individual variability.

There was no simple systematic relationship between diazepam's effect on mood and blood levels of the drug in plasma or red cells after a dose of .3 mg/kg. The effects of diazepam on anxiety, sedation, or mood change in individual subjects were not linearly related to peak blood levels, fall in blood level, or half-life of diazepam in either plasma or red cells. There was a significant (about 100%) increase in MHPG after a dose of .3 mg/kg diazepam, with females showing a larger and more consistent increase in MHPG. Overall, there was a positive relationship between the effects of diazepam including fatigue and increasing MHPG in all subjects, especially for females. (HSRI)

28 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam*. Muscle Relaxants (Central): diazepam*. Drug Concentration-Effect Study: Clinical Research. Drug Concentrations in Body Fluids: Acute Dose Study. Experimentation: Acute Dosage Study. Psychological Testing.

UM-76-D0950

RELATION OF EEG TO BLOOD LEVELS OF PSYCHOACTIVE DRUGS, M. Fink; P. Irwin, Pharmacokinetics of Psychoactive Drugs: Blood Levels and Clinical Response, L.A. Gottschalk; S. Merlis, eds., p243-50, New York: Spectrum Publications (1976)

While plasma concentrations of many drugs relate linearly to the amount of drug in target tissues, other factors may play important roles in the physiological response, especially for drugs affecting the central nervous system. In this study, quantitative EEG (electroencephalogram) measures were used to assess the effect of psychoactive substances on brain function in relation to blood level measures. Examples of a step function (1.0 to 2.0 g cycloserine); two-compartment distribution (4 mg/kg thiopental); active metabolite (60-120 mg triflubazam {ORF 8063(R)}) and correlations of blood and EEG measures (10 mg diazepam, 9 mg bromazepam, and 15 mg mianserin) are presented as applications of pharmacokinetic methods using noninvasive EEG indices.

Each study shows that the quantitative EEG reflects the dosage and, with varying delays, is related to blood levels. The curves for the two benzodiazepines and mianserin in blood and brain are so similar that the authors believe the quantitative EEG to be a satisfactory in vivo assay method for the activity of these agents in the brain. For some substances, such as ORF 8063, the EEG changes also relate to blood levels of the metabolite, suggesting that it has cerebral activity.

The author concludes that the sensitivity of EEG measures used in this study seems equal to that of chemical methods for the benzodiazepines and may exceed the sensitivity of chemical assays for mianserin. (HSRI)

15 refs

KEYWORDS: Antidepressants: mianserin*. Antituberculars: cycloserine. General Anesthetics: thiopental. Minor Tranquilizers (Anti-Anxiety and Ataractics): bromazepam*. diazepam. triflubazam (ORF 8063)*. Muscle Relaxants (Central): diazepam. Drug Concentration-Effect Study: Clinical Research. Experimentation: Comparison of Different Drugs. Pharmacokinetics: Acute Dose. Pharmacokinetics: Chronic Dose. Physiological Testing.

UM-74-D0951

VESTIBULAR AND OPTOKINETIC RESPONSES TO DIAZEPAM AND ALCOHOL. Z. Bochenek; R. Makowiecka. Acta Medica Polanda. v15 n3 p117-26 (1974)

Results of electronystagmographic (ENG) investigations of positional, postrotational, and optokinetic nystagmus on twenty young, healthy men aged 21 to 33 years after administration of diazepam and alcohol are reported. The subjects received diazepam (Relanium(R)) and placebo in daily doses of 15 mg for seven days. On the last day of diazepam or placebo administration the subjects were given alcohol orally (50 ml of 96% ethanol diluted with water and fruit juice to a volume of 100 ml). Each subject had six examinations, one before and one after each drug condition. Each investigation consisted of ENG recording of positional nystagmus in the sitting position, supine, right and left lateral positions, and in the supine position with the head hanging down. It was concluded on the basis of ENG investigations in this group that long-term diazepam administration potentiates the effects of alcohol. This was evidenced by additional reduction in the postrotational and optokinetic responses. In view of this finding all physicians prescribing psychotropic drugs to outpatients should warn them against drinking alcohol since it may lower their ability to perform their work, especially in driving tasks. (JAM)

21 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Nonbarbiturates: ethanol (ethyl alcohol). Experimentation: Chronic Dosage Study. Experimentation: Study of Combined Effects of Drugs. Tests of Sensory Function.

UM-75-D0952

EXPERIMENTALPSYCHOLOGISCHE UNTERSUCHUNG DER WIRKUNG EINER HEXOBENDIN-ETAMIVAN-ETOFYLLIN-KOMBINATION [EXPERIMENTAL PSYCHOLOGICAL STUDY OF THE EFFECT OF A COMBINATION OF HEXOBENDINE, ETAMIVAN, AND ETOFYLLINE]. E. Klebel. Arzneimittel Forschung. v25 n5 p831-6 (1975)

Presented here is an experimental psychological study in which Instenon(R), a combination of hexobendine, etamivan, and etofylline used for treatment of cerebral vascular inefficiency, was tested for its effects on performance, especially on functions related to driving. The experimental group consisted of fifteen male and nine female students, and the control group consisted of fifteen male and eight female students, all aged between seventeen and twenty-five years. All subjects were tested with the same series of psychological tests before and after long-term medication.

The male subjects showed moderate increases of concentration performance and short-term memory under Instenon(R) in various tests. Taking in complex traffic situations at a glance was significantly enhanced by the drug in the male experimental group, whereas reactive behavior under stress showed some impairment. In the female experimental group an increase of focal attention and an improvement of reactive behavior under stress was found; however, taking in complex traffic situations at a glance was impaired.

The results of this study indicate that in neither female nor in male subjects could a consistent positive or negative effect of Instenon(R) on functions related to driving be determined. Driving fitness in young healthy volunteers is not influenced by Instenon(R) in the dosage applied in this study. (JAM)

20 refs German

KEYWORDS: Anti-Asthmatics: etofylline. Stimulants: ethamivan. Vasodilating Agents: hexobendine. Instenon(R) (hexobendine + etamivan + etofylline). Experimentation: Chronic Dosage Study. Psychological Testing.

UM-74-D0953

ESTUDO DUPLO-CEGO DE NOVA ASSOCIACAO QUIMIOTERAPICA NA CEFALEIA DE TENSAO, C.S. Borges; J.M.B. de Lima, Folha Medico, v68 n4 p371-6 (1974)

In a double-blind trial, thirty-eight patients suffering from tension headaches were evaluated for a new analgesic compound. The dosage for the analgesic compound was two to six tablets a day, with a mean dosage of three tablets daily. The control group received placebo.

The compound appeared to be effective in that fifteen patients out of twenty from the treatment group experienced alleviation from their headache. Tolerance to medication was considered excellent. Only one patient presented a slight skin rash. Drowsiness was reported only with initial dosages when the dosage was higher than one tablet t.i.d. but it did not prevent patient activities like driving and teaching.

The authors conclude that this analgesic compound can be very effective in treating tension headaches, a very common complaint in about 80% of outpatients attending neurological and psychiatric clinics in Brazil. (JAM)

9 refs Portuguese

KEYWORDS: Analgesics and Antipyretics. Clinical Study. Experimentation: Chronic Dosage Study.

UM-78-D0954

BRAKE REACTION TIME--EFFECTS OF AGE, SEX, AND CARBON MONOXIDE, G.R. Wright; R.J. Shephard, Archives of Environmental Health, v33 n3 p141-50 (May-Jun 1978)

This paper reports a study in which simulated braking responses were tested in relation to blood carboxyhemoglobin (HbCO) levels. The experiment consisted of a rebreathing estimate of blood carboxyhemoglobin, completion of a questionnaire for collection of personal information, and performance of the braking response test. Three series of laboratory measurements of brake response time and its movement and reaction time were carried out. The first series examined immediate reactions to carbon monoxide. The second group of experiments examined possible longer-term effects of carbon monoxide (thirty minutes). The final series of experiments examined reactions to even more prolonged exposure (three hours).

In women the brake response time deteriorated from age sixteen, but in the men there was an improvement from age sixteen to the early twenties. Reaction times at all ages were better for men than for women. Average response times and the rate of aging of the braking response were very similar in smokers and in nonsmokers. In the nonsmokers, however, response times were inversely correlated with the square of the percentage of HbCO. Laboratory studies showed no change of total response time with step function CO increments of as much as 7% HbCO. There was a suggestion of a small increase of reaction time with an opposing decrease of leg movement time during the first few minutes after CO exposure; nevertheless, these trends were statistically insignificant. The author concludes that with the levels of carbon monoxide likely to be encountered in the urban environment, any change in the total braking response time is small and of no practical significance. On the other hand, since the braking task is a simplification of the normal driving situation, the suggestive deterioration of reaction times could become more pronounced on the road. Therefore, further tests appear warranted. (JAM)

27 refs

KEYWORDS: Gases: carbon monoxide. Driving Simulator. Experimentation: Other Single-Drug Study.

UM-78-D0955

DIAZEPAM, ALCOHOL AND DRIVERS, A.W. Missen; W. Cleary; L. Eng; S. McMillan, New Zealand Medical Journal, v87 n610 p275-7 (26 Apr 1978)

This paper reports results obtained during a three-year survey in New Zealand in which over fifteen hundred drivers' blood samples were tested for diazepam. The study examined 1,000 samples from hospitalized drivers whose blood samples were submitted for alcohol analysis, 370 blood samples from fatally injured drivers, 130 from apprehended drivers with low (less than 80 mg/ 100 ml) blood alcohol levels, and 42 blood samples analyzed for drugs at the request of traffic authorities.

Blood alcohol values were determined by gas chromatography. Of the 1,000 hospitalized drivers whose blood samples were forwarded for alcohol analysis, diazepam was detected in 2.0 percent and alcohol in over 90 percent. Diazepam was found to a lesser extent in the blood samples from the 370 fatally injured drivers and from 130 apprehended drivers who had low blood alcohol levels.

The significance of the levels of diazepam and its major metabolite in blood are discussed in relation to the blood alcohol level and consequent driving impairment. The author concludes that (1) a blood sample should be required from an impaired driver in all cases where use of drugs is suspected; (2) blood samples should be taken for alcohol and drug analysis from all drivers and pedestrians killed in road accidents; and (3) blood samples should be provided for alcohol analysis in all cases of hospitalized drivers. (JAM)

15 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam*. Muscle Relaxants (Central): diazepam*. Nonbarbiturates: ethanol (ethyl alcohol)*. Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-74-D0956

PSYCHOMOTOR PERFORMANCE DURING INSULIN-INDUCED HYPOGLYCEMIA. B.A. Fraser; L. Buck; J.B.R. McKendry. Canadian Medical Association Journal, v110 n5 p513-18 (2 Mar 1974)

The purpose of this study was to demonstrate the effect of insulin induced hypoglycemia on performance of a step tracking task and to relate degree of impairment to plasma glucose level. Six males and ten females were given intravenous injections of insulin or saline on separate occasions and then tested on a pursuit-tracking task. Seven subjects showed clear clinical signs of hypoglycemia which were accompanied by a plasma glucose concentration of 32 mg/dl or less and by impaired tracking performance. Seven subjects showing no hypoglycemic signs despite insulin and seven subjects receiving saline injections showed no impairment in tracking. Impairment lasted from about the fifteenth to the sixtieth minute following injection, and was more readily apparent in response execution than response selection. There were no changes in accuracy of performance.

Possible explanatory mechanisms, including neuroglycopenia, are discussed, and some implications for driving performance are noted. The results indicate that subjects with mild to moderate hypoglycemia have slower psychomotor responses which increase the risk that an accident will result from certain types of emergency situations encountered during the operation of vehicles. The increased risk appears to derive principally from delay in execution of an appropriate action rather than delay or error in selecting the correct response. (HSRI)

8 refs

KEYWORDS: Insulins: insulin*. Experimentation: Acute Dosage Study. Psychomotor Tests.

UM-74-D0957

EFFECT OF TRICYLIC ANTIDEPRESSANTS AND ALCOHOL ON PSYCHOMOTOR SKILLS RELATED TO DRIVING. T. Seppala; M. Linnoila; E. Elonen; M.J. Mattila; M. Maki. Clinical Pharmacology and Therapeutics, v17 n5 p515-22 (May 1975)

Twenty healthy subjects aged 20 to 25 years of age took amitriptyline (10 mg and 20 mg), doxepin (10 mg and 20 mg), and placebo for two weeks each in a double-blind crossover trial. Another twenty subjects aged 20 to 25 years of age took nortriptyline (10 mg and 20 mg), chlorimimpramine (10 mg and 25 mg), and placebo. The antidepressants were administered three times daily in doses generally used for neurotic patients. The presence of antidepressants in tissues was checked with the tyramine pressor test. On the seventh and fourteenth days of each period, psychomotor skills (choice reaction, coordination, and attention) were measured after the administration of drugs in combination with an alchoholic or placebo drink.

Dose-response graphs for the tyramine pressor effect were shifted to the right during the antidepressant treatment, indicating a blockade of the membrane pump in peripheral sympathetic terminals. This antityramine effect of antidepressants did not correlate with their psychomotor effects. No drug alone importantly impaired psychomotor skills. Amitriptyline in combination with alcohol increased cumulative choice reaction times, and doxepin in combination with alcohol increased both cumulative choice reaction times

and inaccuracy of reaction. Coordination was impaired after both of these combinations on the seventh day. Therefore it seems as if doxepin and amitriptyline, but not nortriptyline or chlorimipramine, in combination with 0.5 gm/kg of alcohol may be especially dangerous in driving. (JAM)

20 refs

KEYWORDS: Antidepressants: amitriptyline clomipramine, doxepin, nortriptyline. Nonbarbiturates: ethanol (ethyl alcohol) Experimentation: Chronic Dosage Study. Experimentation: Comparison of Different Drugs. Experimentation: Study of Combined Effects of Drugs. Psychomotor Tests.

UM-75-D0958

COMPARATIVE PSYCHOTROPIC EFFECTS OF METOCLOPRAMIDE AND PROCHLORPERAZINE IN NORMAL SUBJECTS, B.R.S. Nakra; A.J. Bond; M.H. Lader, Journal of Clinical Pharmacology, v15 n5-6 p449-54 (May-Jun 1975)

Eight normal healthy female subjects and two male subjects aged 21 to 35 years were each given metoclopramide and prochlorperazine at two dose levels (0.15 mg/kg body weight and 0.30 mg/kg body weight) and a placebo in order to investigate clinical pharmacological properties of the two drugs. Each subject was tested five times at weekly intervals in double-blind conditions. The subjects were tested with a battery of physiologic and psychologic tests which measured EEG, evoked response, pulse rate, blood pressure, pupil size, finger tremor, reaction time, key tapping rate, cancellation of digits, digit symbol substitution, and ability to copy symbols two and one-half and five hours after drug ingestion.

Results show that although both metoclopramide and prochlorperazine were used in the recommended clinical dose range, their effects upon the psychophysiologic variables studied were minimal. The only significant physiologic finding was in the broad waveband analysis of the EEG. Results also suggest that neither of the drugs produce marked psychotropic effects. Although the study used single doses, both drugs are often given in this way as antiemetics. In such dosages, they appear quite safe and unlikely to produce extrapyramidal effects. However, in view of the consistent reports of lethargy with both drugs, it is recommended that patients should not drive or operate dangerous machinery after taking either drug. (HSRI)

14 refs

KEYWORDS: Anti-Emetics: metoclopramide, prochlorperazine. Major Tranquilizers (Antipsychotics and Neuroleptics): prochlorperazine. Experimentation: Comparison of Different Drugs. Physiological Testing. Psychological Testing. Psychomotor Tests.

UM-79-D0959

MARIHUANA AND HEALTH. SEVENTH ANNUAL REPORT TO THE U.S. CONGRESS FROM THE SECRETARY OF HEALTH, EDUCATION AND WELFARE 1977, R.C. Petersen, Rockville, Md.: National Institute on Drug Abuse (1979)

Presented here is the seventh in a series of annual reports from the Secretary of Health, Education, and Welfare to the Congress as required by Title V of Public Law 91-296. The purpose of the report is to inform Congress and the public about the health implications of marijuana use based on epidemiologic and experimental research of the past year. Information is reported concerned with extent of use, detection of marijuana use, and developments in research on human effects.

The number of Americans using marijuana appears to be increasing. The number of those aged 12 to 17 ever having used marijuana has increased 25% since 1976. The number of current users in this group has increased by 30%. Three out of five in the peak using group (aged 18 to 25) have used marijuana, and over one in four use it currently. However, only 7% of those over 35 years have ever tried marijuana.

Few new research developments on marijuana effects in humans were reported in 1977. Special concern should be shown for use by those under 18 years who are still developing physically and psychologically, and for those with pulmonary or cardiac impairment. Evidence regarding the possible adverse effects of marijuana on the immune response remains inconclusive. Research on marijuana effects on endocrine functioning suggest diminished sperm counts and alterations in cellular characteristics of sperm in heavy hashish users. No new evidence concerning chromosomal abnormalities related to marijuana use has appeared.

While previous research on brain damage found no evidence for marijuana causing gross abnormalities, more subtle changes cannot be ruled out. Microscopic changes were found in brain cellular structure in monkeys trained to smoke marijuana.

Good evidence exists suggesting that marijuana use at typical social levels impairs driver performance and that driving while marijuana -intoxicated should be actively discouraged. Studies indicating impairment of driving skills include laboratory assessment of driving related skills, driver simulator studies, test course performance, actual street driver performance, and studies of drivers involved in fatal accidents.

As marijuana use becomes more common and socially acceptable and as the risk of arrest for simple possession decreases, an increasing number of users is likely to risk driving while high. Surveys have indicated that 60 to 80% of marijuana users admit to sometimes driving while high. Marijuana use in combination with alcohol is also quite common and the risk of the two drugs used in combination may well be greater than that posed by either substance alone. (HSRI)

52 pages 98 refs

National Institute on Drug Abuse, DHEW Publication no. (ADM) 79-700

KEYWORDS: Cannabis Sativa L. and Related Agents; delta-9-tetrahydrocannabinol, marijuana. Nonbarbiturates: ethanol (ethyl alcohol). Review: Drug Analysis Methodology. Review: Drug Effects. Review: Drug Use. Review. Drugs and Highway Safety.

UM-76-D0960

EPILEPSY AND DRIVING, K.S. Millingen, Proceedings of the Australian Association of Neurologists, v13 p67-72 (1976)

Reported here is a study in which 205 actual and potential drivers suffering from epilepsy were examined over a period of nine years in Tasmania under a state scheme whereby all such persons were referred to one neurologist. Three-tenths of one percent of all road traffic accidents in Tasmania were found to be due to epilepsy. Sixteen percent of the total who had been involved in an accident had failed to disclose their disability and another 10% who were nonaccident cases had similarly concealed their epilepsy. Only about 28% of the expected number (per year) of new cases of epilepsy in drivers disclose their disability. Alcohol was significantly associated with epilepsy in just over 8%. Only 2 out of 170 drivers approved to drive had a subsequent accident due to epilepsy. The accidents resulting from epilepsy caused negligible body injury.

It seems unnecessary therefore, to enact more restrictive legislation that would only have the effect of further encouraging epileptic drivers to conceal their condition. It is more realistic to see the problem of epilepsy and driving in perspective with other causes of road traffic accidents, notably alcohol. In view of the high degree of involvement of alcohol in highway crashes, the question should be asked whether resources, time, and energy are being properly directed. (AAM)

9 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Crash Investigation. Epidemiology: Record-Based Survey. Epidemiology: Self-Reported Drug Use by Drivers.

UM-74-D0961

ALCOHOL, SLEEP DEPRIVATION, AND DRIVING SPEED EFFECTS UPON CONTROL USE DURING DRIVING, M.S. Huntley; T.M. Centybear, Human Factors, v16 n1 p19-28 (Feb 1974)

The purpose of this study was to examine the influences of alcohol and sleep deprivation, singly and in combination, on control-use behavior. In addition to determining the sensitivity of alcohol and sleep deprivation effects to driving-speed differences, the influences of two driving speeds on control use were also examined. Twelve male subjects ages 21 to 25 with visual acuity equal to 20/20 were given either placebo or 1.21 ml of 100% ethanol per kg of body weight to produce a BAC of 100% on the four test days. They were required to drive a car through a simple, short, pylon-defined, serpentine course on each of four experimental days. There were four consecutive trials each day, after ingestion of an alcohol or a placebo beverage; and after a night of normal sleep or following twenty-nine hours of sleep deprivation.

In general, alcohol significantly increased control-use rate, whereas sleep deprivation tended to have the opposite effect in that it significantly decreased the effects of

alcohol on course-steering reversal rates. Furthermore, the magnitude of alcohol effects upon course-steering reversal rates was directly and significantly related to the extraversion of the drivers.

It was concluded that, if control-use behavior is to serve as an index of alcohol-associated impairment, the influence of sleep deprivation and individual differences (e.g. extraversion) will have to be taken into consideration. (JAM)

17 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Closed Course Driving. Experimentation: Chronic Dosage Study. Personality and Drug Effects.

UM-77-D0962

INFLUENCE OF ETHYL ALCOHOL IN MODERATE LEVELS ON THE ABILITY TO STEER A FIXED BASE SHADOWGRAPH DRIVING SIMULATOR, A.B. Dott; R.K. McKelvey, Human Factors, v19 n3 p295-300 (Jun 1977)

This study was designed to determine whether impairment of steering control, a coordinated perceptual motor skill, would occur at blood levels of 50 and 75 mg%. It also attempted to determine whether a modified Sim-L-Car driving trainer would serve as a reliable research vehicle for such an experiment. In the task selected the subject drove the simulated automobile around a curved path that was projected on a screen in front of him by a shadowgraph imaging system. The subjects were fifteen men and one woman, all of whom were experienced with alcohol. The mean age was twenty-nine years. An analysis of tracking error responses showed a statistically significant impairment of the performance of subjects less than thirty-five years old at a blood alcohol level of 50 mg %. Subjects over the age of thirty-five had difficulty operating the equipment. This undoubtably contributed to their higher mean error score and increased variability of performance, consequently partially masking the effects of alcohol on their performance. It is concluded that because of its mechanical limitations, the shadowgraph simulator is not a good choice for studies of directional control or lane keeping. (HSRI)

14 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol)*. Driving Simulator. Drug Concentration-Effect Study: Driving Skill Impairment.

UM-77-D0963

THE PSYCHOMOTOR EFFECTS OF ATENOLOL AND OTHER ANTIHYPERTENSIVE AGENTS, A.B. Clayton; P.G. Harvey; T.A. Betts, Postgraduate Medical Journal, v53 supp 3 p157-61 (1977)

The study described here attempted to investigate the effects of antihypertensive agents on actual driving in an off-highway situation. Sixty healthy male volunteers aged 18 to 29 years were randomly assigned to one of six treatment groups on a double-blind basis: (1) atenolol (50 mg); (2) methyldopa (250 mg); (3) propranolol (40 mg); (4) resperine (0.2 mg); (5) placebo; all given three times a day, or (6) control (no tablets). Tests were carried out before treatment, two hours after the first dose, on the third day after seven doses, and on the seventh day after twenty-one doses. The driving tasks consisted of weaving around a series of bollards while simultaneously responding to an auditory logic test and a gap acceptance task.

Kinetic visual acuity, an important driving-related ability, was also measured. Analysis of the overall trends in drug effects within each task suggested that both methyldopa and reserpine but not propranol and atenolol significantly impaired performance. This impairing effect, if transferred to the real world, could produce a potential hazard to safe driving. Atenolol enhanced kinetic visual acuity. The results tended to confirm the absence of any central effects with the two beta-blockers. (JAM)

14 refs

KEYWORDS: Anti-Anginal Agents: propranolol. Anti-Arrhythmia Agents: propranolol. Hypotensive (Antihypertensive) Agents: methyldopa. propranolol. reserpine. Major Tranquilizers (Antipsychotics and Neuroleptics): reserpine. Sympatholytic (Adrenergic Blocking) Agents: atenolol. Closed Course Driving. Experimentation: Chronic Dosage Study. Experimentation: Comparison of Different Drugs. Psychomotor Tests. Tests of Sensory Function.

UM-74-D0964

ON THE STUDY OF PERSONALITY FACTORS IN RESEARCH ON DRIVING BEHAVIOR, E.I. Signori; R.G. Bowman, Perceptual and Motor Skills, v38 p1067-76 (1974)

This paper reviews recent research and offers suggestions for further investigation of the relationships between personality characteristics and aspects of driving behavior. The involvement of personality factors in traffic accidents is supported by findings from psychiatric studies focusing on psychopathology, psychopathy, stress, alcoholism, and accident proneness, and from other studies which make use of psychological testing devices to measure components of personality. The literature in each of these fields is reviewed and evaluated in this paper.

The author concludes that it is unlikely that much progress will be achieved in determining the influence of personality on driving behavior as long as all accidents are treated as homogeneous events. Moreover, the assumption that personality measures might be significantly related to what appears to be a remote criterion, broadly defined as "accident/no accident", seems grossly unrealistic, and may account for the low correlations obtained from using personality inventories as predictors of such criteria. A problem that merits further investigation concerns personality factors in highway hypnosis. Other possibilities that may prove useful in investigating the relationship between driving behavior and personality may be gleamed from the psychological types described by Jung. (HSRI)

47 refs

KEYWORDS: Review: Behavioral Research Methodology.

UM-74-D0965

MEDICAMENTS ET CONDUITE AUTOMOBILE: ETAT DU PROBLEME [DRUGS AND DRIVING: RELEVANCE OF THE PROBLEM TODAY], J. Crespy, Le Travail Humain, v37 n1 p1-22 (1974)

Among the different possible causes of automobile accidents, alcohol remains the most important factor. However, in the last few years, drug intake has become an increasingly important cause. This article examines the implications of this problem. It discusses the increase in the percentage of consumption (especially for narcotics and tranquilizers) among the driver population as shown by epidemiological studies; behavioral effects of these drugs as discussed in experimental studies; the difficulties of establishing legislative measures; and the necessity of preventive and prophylactic measures. (JAM)

60 refs French

KEYWORDS: Review: Drugs and Highway Safety.

UM-76-D0966

ET TILFAELDE AF AKUT KARISOPRODOLFORGIFTNING. SYMPTOMKOMPLEKS OG METABOLISERING [A CASE OF ACUTE INTOXICATION WITH CARISOPRODOL. SYMPTOMS AND METABOLISM], I. Brandslund; N.A. Klitgaard; O. Kristensen, Ugeskrift for Laeger, v138 n5 p281-3 (1976)

This paper describes the symptoms and metabolism of acute carisoprodol intoxication. A case of acute intoxication after ingestion of 14.7 g carisoprodal is described. The patient suffered from convulsions during the first seventeen hours and was unconscious for thirty-three hours. Blood pressure and respiration remained stable, but slight tachycardia of 100 beats per minute was present during this period. When the patient woke up the blood concentration of carisoprodol was found to be 4.7 mg/l, but a meprobamate concentration of 53.8 mg/l was also found, though the patient had taken nothing else beside carisoprodol. It appears therefore, that the main metabolite of carisoprodol is meprobamate. A common dose-related side-effect is a feeling of drunkenness, and patients should be warned against driving while using this drug.

The authors conclude that the drug should be reevaluated after further clinical-pharmacological investigations. (JA)

10 refs German

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): meprobamate*. Muscle Relaxants (Central): carisoprodol*. Clinical Study. Experimentation: Acute Dosage Study.

UM-78-D0967

EFFECT OF CANNABIS ON DRIVING. G. Mendleson, Medical Journal of Australia. v1 n7 p391-2 (8 Apr 1978)

This letter to the editor of the Medical Journal of Australia deplores the inaccuracy of evidence presented to the Royal Commission of Drug Use which states that cannabis can help driving. The author cites recent research that contradicts this claim and shows that the effects of marijuana on motor skills and behavior that are relevant to driving ability--cooperation, attitude, irritability, judgment, speed, care, confidence, tension, aggression, and concentration--indicate that there are several mechanisms by which the drug may impair driving ability. (HSRI)

10 refs

KEYWORDS. Cannabis Sativa L. and Related Agents: marijuana. Review: Drugs and Highway Safety.

UM-78-D0968

CARDIORESPIRATORY ASSESSMENT OF DECONGESTANT-ANTIHISTAMINE EFFECTS ON ALTITUDE, $+G_z$, AND FATIGUE TOLERANCES. M.T. Lategola; A.W. Davis; P.J. Lyne; M.J. Burr, Oklahoma City: Civil Aeromedical Institute (Apr 1978)

Decongestants and antihistamines are known to produce effects capable of adversely modifying physiological function and psychomotor task performance. Because of relevance to safe pilot performance, this study investigated the effects of single doses of two decongestant-antihistamine preparations (Actifed(R) and Dristan(R)), on cardiorespiratory responses. Effects on twelve adult male volunteers were assessed in two equally spaced +2 Gz tests during separate two-hour exposures at ground level (1,274 feet MSL) and at 12,500 feet chamber altitude. Postaltitude fatigue was assessed by cardiorespiratory responses to submaximal bicycle ergometry.

Actifed(R) and Dristan(R) appeared to exert no significant detrimental effects on short-duration postaltitude ergometric fatigability. With two exceptions, all combinations of medication, altitude, and +Gz were well tolerated. Two of the twelve normal male subjects were clearly incapacitated during the first +2 Gz test under Actifed(R) at 12,500 feet altitude. It is concluded that the +Gz intolerance resulted mainly from an adverse interactive effect of Actifed(R) and altitude on vasomotor or chronotropic mechanisms or both. (JA)

24 pages 16 refs

Federal Aviation Administration, technical report FAA-AM-78-20

KEYWORDS: Antihistamine Agents: phenindamine, triprolidine hydrochloride. Actifed(R) (pseudoephedrine HCl + triprolidine HCl). Dristan(R) (phenylephrine HCl + chlorpheniramine maleate + aspirin). Decongestant and Cold Preparations: phenylephrine, pseudoephedrine. Sympathomimetic (Adrenergic) Agents: phenylephrine, pseudoephedrine. Experimentation: Comparison of Different Drugs. Physiological Testing.

UM-75-D0969

PRESCRIPTION DRUG LABELING REGARDING POTENTIAL DRIVING HAZARD. J.L. Weygandt, Journal of Traffic Medicine. v3 n3 p51 (1975)

In this brief article the author urges all physicians to warn their patients of the potential hazards regarding driving of some of the drugs they are prescribing. He also suggests that physicians reinforce their warnings by using drug warning labels, which are illustrated in the article. Each physician should indicate to the pharmacist on his prescription that he wants a warning placed on the container, or he may direct local pharmacists to place such warnings on the containers of all medications in specified categories. In order for this countermeasure to be effective, the physician himself must be aware of the threat to traffic safety posed by some medicines, especially sedatives, hypnotics, tranquilizers, stimulants, and antidepressants. (HSRI)

0 refs

KEYWORDS: Countermeasure Concepts.

UM-76-D0970

THE EFFECT OF ALCOHOL ON DRIVING SKILLS AND REACTION TIMES, H.T. Zwahlen, Journal of Occupational Accidents, v1 n1 p21-38 (Jul 1976)

This study had three major objectives: (1) to investigate the effect of 0.10% BAC on simple and choice reaction times for a stimulus and a response uncertainty mode in the laboratory; (2) to investigate in a field experiment the effect of 0.10% BAC on three components (driving skill, visual perception, and risk acceptance) used to determine the "Driver Safety Index" (DSI); and (3) to develop a theoretical system model which can be used to more effectively demonstrate why impairment in driving under the influence of alcohol is so dangerous. Twelve subjects (20 to 37 years old) were tested in the laboratory and eleven out of these were also tested in a car in the field, first under a no alcohol condition and then under an alcohol condition (approximately 0.10% BAC). In the laboratory the subjects' simple and choice reaction times for two uncertainty modes were measured and their information processing rates were determined. In the field test the subjects' driving skill for driving through a gap at 20 miles per hour, their static visual gap (car and post) judgment capabilities, and their gap risk acceptance decisions for a forty-six-foot viewing distance (using psychophysical experimental methods) were measured. Based upon the driving skill measure, the mean of the psychometric visual gap perception function and the mean of the psychometric gap risk acceptance function, the "Safety Distance" and the "Driver Safety Index" (DSI) were obtained. Based upon a statistical analysis of the laboratory and field data it is concluded that (1) in all experiments the effect of alcohol varies widely from one subject to another; (2) only a few increases in the group averages of the reaction time means (1-5%) and the standard deviations (20-42%) due to alcohol are significant at alpha=0.05; and (3) none of the changes in the group averages of the means and standard deviations of the driving skill measures due to alcohol are significant at alpha=0.05 (although most changes are in the expected direction when considering the adverse effect of alcohol).

Also described is a conceptual model illustrating a hypothetical localized system failure in which the system demands on the driver-vehicle system are represented in terms of choice reaction times, while the driver performance at any point in time is represented by two choice reaction time probability distributions, one representing the sober condition, the other representing the alcohol condition. This modified system model is used to demonstrate that the combined time increases in mean performance and performance variability under the influence of alcohol provide a much better explanation for higher accident involvement than the historically more frequently used rather small decrements in mean performance. (JAM)

9 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Closed Course Driving. Experimentation: Acute Dosage Study. Psychomotor Tests. Tests of Sensory Function.

UM-76-D0971

DER EINFLUSS VON COFFEIN AUF DIE RESORPTION UND EINIGE ZENTRALE WIRKUNGEN VON ATHANOL, O. Strubelt; K. Bohme; C.-P. Siegers; P. Bruhn, Zeitschrift fur Ernahrungswissenschaft, v15 n2 p125-31 (Jun 1976)

Described here is a study investigating the effects of caffeine on blood alcohol levels and psychomotor skills impaired by ethanol. The results show that caffeine given in a dose of 400 mg one hour before 1 g/kg ethanol did not influence the course of blood alcohol levels in male volunteers. Futhermore, caffeine did not improve psychomotor skills impaired by ethanol. Two cups of coffee ingested thirty minutes after ethanol (0.5 g/kg) caused a statistically significant increase in blood ethanol levels one hour afterwards (from 0.49 to .61%). This may be due to an accelerated absorption of ethanol caused by the ingestion of warm fluids. (JAM)

4 refs German

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Stimulants: caffeine. Experimentation: Study of Combined Effects of Drugs. Psychomotor Tests.

UM-64-D0972

WEITERE UNTERSUCHUNGEN ZUR FRAGE DER STRASSENVERKEHRS-TUCHTIGKEIT NACH PROPANIDID-NARKOSEN, P. Rittmeyer, Anaesthesiology and Resuscitation, n4 p298-301 (Jan 1964)

Described here is a study attempting to gain information on traffic fitness after short anesthesia with propanidid. The tests employed were a hearing test, an optical test, a combined optical and hearing test, and a reaction test. The tests were carried out shortly before anesthesia, immediately after awakening, and two hours later. The results were compared with those in a series of matching control subjects.

No instance of postanesthetic nausea or vomiting was observed. Thus it appears that fluid and light food can be taken three to four hours postanesthetically. However, the test results suggest that patients not drive for at least eighteen hours postanesthetic, since all tests showed significant impairment with propanidid (JAM)

0 refs German

KEYWORDS: General Anesthetics: propanidid. Experimentation: Acute Dosage Study. Psychomotor Tests. Tests of Sensory Function.

UM-78-D0973

PSYCHOMOTOR SKILLS IN DEPRESSED OUT-PATIENTS TREATED WITH L-TRYPTOPHAN, DOXEPIN, OR CHLORIMIPRAMINE, T. Seppala; M. Linnoila; M.J. Mattila, Annals of Clinical Research, v10 p214-21 (1978)

This paper describes a study that attempted to determine the effects of doxepin and chlorimipramine on psychomotor skills in depressed subjects. Psychomotor skills were measured in depressed outpatients during a three-week double-blind treatment with l-tryptophan (sixteen patients, 0.5-1.0 grams t.i.d.); doxepin (thirteen patients, 25-50 mg t.i.d.); or chlorimipramine (thirteen patients, 25-50 mg t.i.d.). The effect of depression on psychomotor skills was evaluated by comparing the results from the predrug scores (twenty-nine patients aged 19 to 63 years) with the respective performances of a reference group of twenty healthy volunteers matched for age and sex.

Before treatment, coordination, reactive skills, and attention were impaired in depressed patients when compared to the control group. The reaction times, assessed both subjectively and objectively, roughly correlated with the severity of depression. During treatment with doxepin or chlorimipramine, but not with l-tryptophan, the choice reaction times were shortened. The change in reaction times correlated with the amelioration of depression. When compared with other treatment groups, doxepin impaired coordination, attention, and flicker fusion discrimination.

It is suggested that depressed outpatients with marked symptoms should be warned about driving. Treatment with doxepin is a contraindication to driving during the first two weeks or up to the time when amelioration of symptoms is recorded. An interaction between tricyclic antidepressants and alcohol as well as the effect of depression per se may be more important in relation to driving safety than drug effects alone. (JAM)

36 refs

KEYWORDS: Antidepressants: clomipramine. doxepin. Vitamins: l-tryptophan. Clinical Study. Experimentation: Comparison of Different Drugs. Psychological Testing. Psychomotor Tests. Tests of Sensory Function.

UM-74-D0974

PLASMA CONCENTRATIONS AND EFFECTS OF METHAQUALONE AFTER SINGLE AND MULTIPLE ORAL DOSES IN MAN, G. Alvan; O. Ericsson; S. Levander; J.-E. Lindgren, European Journal of Clinical Pharmacology, v7 n6 p449-54 (1974)

This study was undertaken to investigate plasma concentrations after multiple doses of methaqualone and to evaluate methaqualone's sedative effects after single and multiple oral doses. Three healthy subjects took methaqualone (1.0 mg/kg) once daily for sixteen days. Equilibrium concentrations in plasma were established after multiple oral doses and there was a linear poststeady-state decline in the log plasma concentration of methaqualone. The drug was also given in single oral doses and plasma concentrations were followed for five days (halflife is thirty-six to thirty-eight hours). Sedative effects were studied by psychophysiological tests and subjective ratings both in the single and multiple dose experiments.

A significant impairment of flicker fusion discrimination ability occurred during the increase in plasma concentration of the drug; maximum effects preceeded peak plasma concentrations, and the impairment disappeared while plasma concentrations were still high. The same effects were found in the subjective ratings. The drug was shown to

have a possible tremorogenic effect after a hypnotic dose. One subject experienced sedation during the multiple dose experiment, despite the use of a low dose. It might be concluded from this that under longer periods of monotonous work with demands on a continuous high level of cortical arousal, such as in a classical vigilance task, adverse effects could be obtained even with this low dose. It also has implications for the ability to perform precision work such as vehicle driving during chronic treatment with recommended doses of sedatives. (JAM)

20 refs

KEYWORDS: Nonbarbiturates: methaqualone*. Drug Concentration-Effect Study: Driving Skill Impairment. Experimentation: Chronic Dosage Study. Pharmacokinetics: Chronic Dose. Psychomotor Tests. Self-Evaluation of Drug Effects by Subjects. Tests of Sensory Function.

UM-74-D0975

MARIJUANA: CNS DEPRESSANT OR EXCITANT? S.Y. Hill; D.W. Goodwin; R. Schwin; B. Powell, American Journal of Psychiatry, v131 n3 p313-15 (Mar 1974)

Marijuana has generally been thought of as having sedative effects. However, marijuana users often report a heightened perceptual awareness, suggesting that the drug may have stimulant as well as depressant properties. This study investigates the effects of marijuana on sensory processes as reflected in the critical flicker fusion threshold and in pain and touch sensitivity.

Thirty-one men, aged 21 to 30, were given either marijuana (1 g containing 1.4% THC) or placebo. The dose of marijuana thought to be actually absorbed was 12 mg. The subjects were then tested for ability to discern discrete flashes of light. Results showed that discrete flashes of light were seen longer following marijuana smoking.

In another study, twenty-six subjects were tested for pain and touch sensitivity. The same experimental design and method for administration of materials were used as in the earlier study. Painful and nonpainful simulation was produced electrically. Ascending sensation, descending sensation, ascending pain, descending pain, and pain tolerance were measured. The results indicated that sensitivity to painful and nonpainful stimulation is heightened under the influence of THC, suggesting that marijuana at this dose level has no analgesic properties. The authors conclude on the basis of these findings that marijuana increases sensitivity to intermittent light and to painful and nonpainful stimulation, and that it has as one of its prominent actions a stimulating effect on the central nervous system. (HSRI)

20 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Tests of Sensory Function.

UM-68-D0976

EXPERIMENTAL STUDIES OF MARIHUANA, L.D. Clark; E.N. Nakashima, American Journal of Psychiatry, v125 n3 p379-84 (Sep 1968)

This study illustrates some of the problems involved in measuring the effects of marijuana and similar drugs. Twelve naive subjects, ranging in age from 21 to 40, were given doses of marijuana which ranged from 0.0125 to 0.03 gm/lb of body weight. A series of tests was given in random order from one and one-half to four hours after drug administration. These consisted of reaction time, learning a digit code, depth perception, visual flicker fusion, auditory frequency discrimination, duration of afterimage, mirror pattern tracing, and visual motor coordination.

Effects on complex (choice) reaction time and on a digit code memory task were most consistently impaired, while effects of marijuana on less complex tasks were not as noticeable.

This study and other studies indicate the problems involved in measuring marijuana effects. A number of the performance tests proved insensitive to marijuana in the doses used. A high level of inter-and intrasubject variability in the effects of marijuana occurs in both animal and man. Wide oscillations in magnitude of dose effects appear particularly characteristic of this drug. The use of subjects as their own controls, the averaging of repeated measures with a given procedure during the period of drug intoxication, and the use of tasks which require longer time intervals to carry out are some means of limiting this variability. The very unpredictability of marijuana effects

in different individuals and on the same individuals at different times and under different conditions increases the risk to the user as well as making it difficult to measure its effects. (HSRI)

3 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Experimentation: Dose-Effect Study. Psychological Testing. Psychomotor Tests. Tests of Sensory Function.

UM-73-D0977

ALCOHOL INFLUENCES ON DRIVING-RELATED BEHAVIOR: A CRITICAL REVIEW OF LABORATORY STUDIES OF NEUROPHYSIOLOGICAL, NEUROMUSCULAR, AND SENSORY ACTIVITY, M.W. Perrine, Journal of Safety Research, v5 n3 p165-84 (Sep 1973)

This paper attempts to determine whether measurements of alcohol influences on performance in laboratory tasks have any valid transfer to or meaningful implications for real world driving behavior. Laboratory studies of basic psychophysiological functions assumedly relevant for on-the-road driving performances are reviewed critically in terms of susceptibility to alcohol influences and individual differences. Understanding alcohol influences upon more complex behavior (e.g. perception, attention, or even driving performance) can be facilitated by developing a relevant neurophysiological model. Two important interrelated issues for such a model are reviewed: (a) the actual site of alcohol effects in the nervous system; and (b) the apparent biphasic effects of alcohol. In terms of neuromuscular aspects, standing steadiness is a sensitive behavioral indicator of alcohol intoxication, but its validity for driving impairment is not yet conclusively established at blood alcohol concentrations (BAC) from 0.08% to 0.15%.

In terms of sensory activity, six reviewed aspects of vision are arranged in order of decreasing susceptibility to low and medium BAC's: (a) dynamic visual acuity; (b) adaptation and brightness sensitivity; (c) critical flicker fusion; (d) static visual acuity; (e) glare resistance and recovery; and (f) visual field. Only the first three aspects showed significant impairment at medium BAC's.

In terms of methodological issues, interrelations of variability and validity are discussed. Alcohol increases variability in many physiological and psychological response measures, even when the means are not significantly changed. The authors question whether unequivocally valid indicators of alcohol impairment exist that can be used to specify the criteria for impairment. They conclude that there is a need for obtaining unobtrusive measures of actual driving as impaired by alcohol. (JAM)

47 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Behavioral Research Methodology.

UM-74-D0978

ZUM PROBLEM DES PASSIVRAUCHENS: II. UNTERSUCHUNGEN UBER DEN KOHLENMONOXIDGEHALT DER LUFT IM KRAFTFAHRZEUG DURCH DAS RAUCHEN VON ZIGARETTEN [THE PROBLEM OF PASSIVE SMOKING: II. INVESTIGATIONS OF CO LEVEL IN THE AUTOMOBILE AFTER CIGARETTE SMOKING], H.-P. Harke; W. Liedl; D. Denker, Internationales Archive Fur Arbeitsmedizin, v33 n3 p207-20 (1974)

Described here is a study in which CO concentrations caused by smoking in an enclosed vehicle were measured. In an automobile of the lower middle class the CO concentration was measured after cigarette smoking. The car was occupied by four persons; only the driver was a nonsmoker. Experiments were carried out in a wind tunnel. The doors and windows of the car had been closed and the motor was off. At a relative wind velocity of 0 and 50 km/hr, ventilation varied as follows: ventilation 0= air jets closed, blower off; ventilation 1/2=air jets open, blower off; ventilation 1= air jets open, blower on.

In the first series of experiments, each of the three smokers smoked simultaneously in the following pattern: smoking period 9.0 minutes, time not smoking 19.4 minutes, smoking period 9.6 minutes. Experiments with the air jets open were stopped after a further 3.2 minutes. Experiments with the air jets closed were followed by a nonsmoking period of 9.5 minutes, a smoking period of 9.0 minutes, and again a nonsmoking period of 4.3 minutes. In the second series of experiments, one after another of the three smokers smoked a cigarette. In experiments with the air jets closed, six cigarettes were smoked within fifty minutes; and in experiments with air jets open, four cigarettes were smoked within thirty minutes.

The following results were obtained: (1) In the experiment with a relative wind velocity of 50 km/hr and ventilation 0, 1/2, or 1, as well as of 0 km/hr and ventilation 1, a stable CO level was already observed after a few minutes of smoking. (2) In the above mentioned experiments the CO concentration decreased in just a short time to the ambient CO level in nonsmoking periods. (3) The equilibrium of concentration depended on the number of cigarettes smoked simultaneously (not on the absolute number of cigarettes smoked) as well as on ventilation and relative wind velocity. (4) The following CO concentrations were measured: 50 km/hr, ventilation 0, 3x3 cigarettes, 30 ppm; 50 km/hr, ventilation 1/2, 2x3 cigarettes, 20 ppm; 50 km/hr, ventilation 1, 2x3 cigarettes, 10 ppm; 0 km/hr, ventilation 1, 2x3 cigarettes 8-10 ppm. (5) In the experiment with a relative wind velocity of 0 km/hr without ventilation the CO concentration increased remarkably. After three passengers had smoked simultaneously three cigarettes, nearly 110 ppm was measured. 80 ppm CO was measured after smoking six cigarettes one after another. In both cases an equilibrium was not observed; however, the increase of the CO level lessened progressively with the passing in the time of experiment. This indicates that an air exchange also occurred under these experimental conditions, which would rarely be reproduced in a real situation. (JA)

6 refs German

KEYWORDS: Gases: carbon monoxide. Experimentation: Other Single-Drug Study.

UM-74-D0979

ZUM PROBLEM DES PASSIVRAUCHENS: III. UBER DEN EINFLUSS DES RAUCHENS AUF DIE CO-KONZENTRATION IM KRAFTFAHRZEUG BEI FAHRTEN IM STADTGEBIET [THE PROBLEM OR PASSIVE SMOKING: III. THE INFLUENCE OF SMOKING ON THE CO CONCENTRATION IN DRIVING AUTOMOBILES], H.-P. Harke; H. Peters, Internationales Archive Fur Arbeitsmedizin, v33 n3 p221-9 (1974)

This paper describes a study in which CO measurements were made in automobiles of different types on a route of 15.35 km through Hamburg. The route included expressways, main roads, and side streets. Two riding sessions took place each day in the morning after rush hour. During the first ride no cigarettes were smoked; during the second ride, two of the four passengers smoked simultaneously two cigarettes. The doors and windows of the car were closed. Ventilation varied as follows; ventilation 0=air jets closed, blower off; ventilation 1/2=air jets open, blower off; ventilation 1 = air jets open, blower on. The following results were obtained: (1) The CO level in the car distinctly increased during smoking but decreased to ambient CO levels within two to three minutes after smoking. This observation was also made in a nonventilated car. (2) The absolute CO value depended on ventilation and speed. At one measuring point, for example, a mean concentration of 21.4 ppm at ventilation 1/2 was found; and 12.0 ppm at ventilation 1. Under the same conditions at ventilation 0, a mean CO concentration of 12.1 ppm at about 80 km/hr was found, and 24.3 ppm at about 35 km/hr. (JAM)

6 refs German

KEYWORDS: Gases: carbon monoxide. Experimentation: Other Single-Drug Study.

UM-75-D0980

DIE BEEINTRACHTIGUNG DER FAHRTUCHTIGKEIT BEI BLUTALKOHOLKONZENTRATION UM 0.05%, R. Richter; V. Hobi, Schwizerische Medizinische Wochenschrift, v10 n27 p884-90 (1975)

As a contribution to the discussion surrounding reduction of the 0.08% limit, empirical data concerning the influence of blood alcohol levels around 0.05% on driving ability are reviewed. The papers reviewed, all of which satisfy the usual methodological standards, show that in hundreds of the subjects investigated there was already marked impairment of driving ability below alcohol levels of 0.08%. Marked impairment is particularly apparent in those abilities which, with regard to the complexity of the perceptual and psychomotor patterns involved, are most relevant to the real driving situation. These include: 1) decreased performance of simple and complex perceptual mechanisms, attention, and vigilance; and 2) decreased performance of psychomotor skills, resulting in impaired control of the vehicle in the real traffic situation.

It can be concluded that even at these low blood alcohol levels an increased accident risk is to be expected. (JA)

87 refs German

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drug Effects.

UM-75-D0981

ZUR THERAPIE DER DEPRESSIONEN MIT PSYCHOPHARMAKA [THE THERAPY OF THE DEPRESSIVE SYNDROME WITH ANTIDEPRESSANTS], J. Fleischhauer, Therapeutische Umschau/Revue Therapeutique, v32 n8 p507-14 (1975)

Reviewed here is the literature concerning prescribing antidepressants. Most depressive patients are treated today as outpatients. Some important questions must be answered before treatment is started. These concern the suicidal risk, the severity of the illness, and the nosological and the syndromatological form of the depressive syndrome. After the decision to treat the patient as an outpatient and with antidepressants has been made, the best way to start the treatment is to begin with an antidepressant with central sedative effects in doses which are increased slowly. The level of the dosage must be determined by the clinical efficiency of the medicant. The duration of the treatment is dependent upon the duration of the depressive phase because at this point in time therapy with antidepressants can not be more than a symptomatic one. If the desired clinical effect is achieved, the dosage can be reduced slowly in greater intervals. Knowledge of the side effects is of great importance. The author concludes that it is of special importance in outpatient treatment to inform the patient about the alcohol-potentiating effect of antidepressants and the possible interference of drugs and alcohol with driving ability. (JAM)

9 refs German

KEYWORDS: Antidepressants. Review: Drug Effects.

UM-71-D0982

DOSE-RESPONSE ANALYSIS OF THE EFFECTS OF TETRAHYDROCANNABINOL IN MAN, G.F. Kiplinger; J.E. Manno; S.E. Rodda; R.B. Forney, Clinical Pharmacology and Therapeutics, v12 n4 p650-7 (Jul-Aug 1971)

In order to investigate the presence or absence of a dose-dependent relationship between THC and performance, fifteen male student volunteers smoked marijuana cigarettes calibrated to deliver THC on a microgram per kilogram basis under controlled laboratory conditions on five occasions. The cigarettes were calibrated to deliver doses of 0, 6.25, 12.5, 25, and 50 micrograms per kilogram of THC. A randomized block, double-blind design was used. The parameters measured were pulse rate, conjunctival injection, subjective response, motor performance, mental performance, and stability of stance as measured by a wobble board.

Dose-dependent decrements in performance were observed in all of the pursuit meter patterns. Dose-dependent decreases in performance occurred with several of the delayed auditory feedback tests. Increased ataxia, as measured with the wobble board, was produced by higher doses of THC. Heart rate and conjunctival redness also increased with dose as did scores on sensation and mood questionnaires. (HSRI)

11 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. Experimentation: Chronic Dosage Study. Experimentation: Dose-Effect Study. Physiological Testing. Psychological Testing. Psychomotor Tests. Self-Evaluation of Drug Effects by Subjects.

UM-75-D0983

THE EFFECT OF DIAZEPAM AND FENTANYL ON MENTAL, PSYCHOMOTOR AND ELECTROENCEPHALOGRAPHIC FUNCTIONS AND THEIR RATE OF RECOVERY, M.M. Ghoneim; S.P. Mewaldt; J.W. Thatcher, Psychopharmacologia, v44 n1 p61-6 (1975)

The purposes of this study were to determine the extent to which a single dose of diazepam or fentanyl affects mental and psychomotor functions in man, and to determine the rate of recovery of these functions if they are compromised.

Ten healthy male subjects ranging in age from 21 to 25 years received diazepam (10 or 20 mg), fentanyl (0.1 or 0.2 mg), or a placebo intravenously at weekly intervals according to a latin square design. They were tested on a battery of psychological and electroencephalographic tests at 0.5, 2, 6, and 8 hours following injection. The following tests were used: backward digit span; tapping board; serial learning; short-term memory; delayed recall; simple reaction time; choice reaction time; visual retention test; subjective rating questionnaire; and electroencephalography.

Results showed that fentanyl had little effect on memory while diazepam reduced the ability to learn without increasing forgetting of material already acquired. By the second hour postinjection, only the low dose of fentanyl had no residual effect. Recovery was complete by the sixth hour for all treatments according to the psychological tests except for the lagging effect of the high dose of diazepam on memory. The electroencephalographic effects of diazepam persisted beyond the end of the testing sessions while those of the high dose of fentanyl recovered by the eighth hour.

Thus, in dosages tested, diazepam had more intense and prolonged effects than fentanyl. This should be kept in mind especially as outpatient anesthesia and surgery continue to increase in popularity due to spiraling hospitalization costs and lack of facilities and hospital personnel. (JAM)

19 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Opiates and Related Agents: fentanyl. Experimentation: Comparison of Different Drugs. Experimentation: Dose-Effect Study. Psychological Testing. Psychomotor Tests.

UM-78-D0984

THE EFFECTS OF HIGH DOSES OF OXPRENOLOL AND OF PROPRANOLOL ON PURSUIT ROTOR PERFORMANCE, REACTION TIME AND CRITICAL FLICKER FREQUENCY. C.W. Ogle; P. Turner; H. Markomihelakis, Psychopharmacologia, v46 n3 p295-9 (1976)

The effects of oral oxprenolol (320 mg) or propanolol (240 or 320 mg) and of diazepam (5 mg) or lorazepam (2 mg) on pursuit rotor performance, reaction time, and critical flicker frequency were investigated in three separate studies. The same six healthy male subjects participated in each study. Their ages ranged from 23 to 41 years and their weights from 64-90 kg.

Results showed that a 240 mg dose of propranolol significantly impaired pursuit rotor performance, but 320 mg of propranol or oxprenolol did not. Neither beta-adrenocepter blocker affected reaction time or critical flicker frequency. Diazepam impaired pursuit rotor performance and reaction time, but not critical flicker frequency. Lorazepam generally impaired all three parameters.

These findings suggest that it is possible for beta-adrenoceptor blockers to depress skeletal muscle activity without having a central effect. This is shown by impairment of CNS function tests that rely on muscle coordination, but not of those tests relying only on central activity. These results also show that single oral doses of oxprenolol or propranolol as high as 320 mg do not have central effects. This supports the belief that small anxiolytic doses of these blockers exert their actions through peripheral blockade of beta-adrenoceptors. (JAM)

29 refs

KEYWORDS: Anti-Anginal Agents: propranolol. Anti-Arrhythmia Agents: propranolol. Hypotensive (Antihypertensive) Agents: propranolol. Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. lorazepam. Muscle Relaxants (Central): diazepam. Vasodilating Agents: oxprenolol. Experimentation: Acute Dosage Study. Experimentation: Comparison of Different Drugs. Psychomotor Tests. Tests of Sensory Function.

UM-74-D0985

STRASSENVERKEHRSDELINQUENZ IM ZUSAMMENHANG MIT DROGENMISSBRAUCH [STREET TRAFFIC DELINQUENCY AND MISUSE OF DRUGS], A. Kreuzer, Blutalkohol, v11 n5 (1974)

Discussed here is the literature concerning the problem of "drugs and traffic delinquency". Since crime statistics concerning traffic delinquency in connection with drug use are not available, interviews of drug abusers and case studies are still indispensable; particularly lacking are simple means of detecting drug intake. Here the situation differs fundamentally from the situation with alcohol, where blood alcohol levels can be easily determined. Intensive interviews of young drug addicts show that they often drive motor vehicles while under the influence of drugs when their faculties are impaired. Typical cases of dangerous situations and behavior are also discussed in this study. The author concludes that the correlation of traffic offenses and drug use is nearly entirely undetected by police and remains an unknown quantity. (JAM)

36 refs German

KEYWORDS: Review: Drugs and Highway Safety.

UM-74-D0986

EXPERIMENTELLE. UNTERSUCHUNGEN ZUR FAHRTUCHTIGKEIT NACH EINNAHME EINES BROMHALTIGEN SCHLAFMITTELS SOWIE NACH GLEICHZEITIGEM ALKOHOLGENUSS [TRAFFIC SAFETY AFTER INGESTION OF A BROMINE CONTAINING HYPNOTIC WITH OR WITHOUT CONCOMITANT ALCOHOL INTAKE]. R. Helmer; H. Wegner; I. Krafft. Blutalkohol, v11 n6 p385-91 (1974)

This study attempted to determine the effects of carbromal on psychomotor reflexes. In thirty subjects the administration of 1 g carbromal (Adalin(R)) per day for seven days led to an increased serum bromine level of an average of 7.3 mg %. When the agent was discontinued, the bromine concentration in the blood dropped again with a half-life period of thirteen days under a normal diet.

By the Bourdon test as modified by Gruner, tests performed not earlier than twenty-four hours after discontinuation of the agent indicated significant impairments of the psychomotor reflexes. This impairment was slightly greater in degree than the psychomotor impairment measured when the blood alcohol concentration was about .05% in the same test. It is concluded that drivers using carbromal suffer from impairments similar to those caused by alcohol in their driving ability. (JAM)

9 refs German

KEYWORDS: Anticonvulsants (Anti-Epileptics): bromine. Nonbarbiturates: bromine, carbromal. Experimentation: Chronic Dosage Study Psychomotor Tests.

UM-75-D0987

DIE ANFLUTUNGSWIRKUNG BEIM FAHREN UNTER ALKOHOLEINFLUSS [THE FLOODING EFFECT IN DRIVING UNDER THE INFLUENCE OF ALCOHOL]. V. Kaufmann. Blutalkohol, v12 n1 p39-42 (1975)

This author opposes the absolute reliance on blood alcohol levels when determining fitness to drive under the influence of alcohol (a maximum blood level of 0.13%). At any time there must be a certain alcohol concentration before a flooding effect is produced by the alcohol in the driver.

The author also objects to legislation that is based upon research results based on the natural sciences. He instead argues for new legislation that would bring about standardization based upon scientific facts. (JAM)

0 refs German

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Other Sociolegal Study.

UM-75-D0988

DIE ALKOHOLBEDINGTE FAHRUNTUCHTIGKEIT--IST SIE ABSOLUT ODER RELATIV? [THE ABILITY TO DRIVE RELATED TO ALCOHOL--IS IT ABSOLUTE OR RELATIVE?]. V. Kaufmann. Blutalkohol, v12 n5 p301-7 (1975)

This author argues that in view of the fact that driving ability is impaired by alcohol beginning at blood alcohol levels of .06% or .07%, the pressure to raise the permissible blood alcohol level to .08% can lead to consequences harmful to the public.

Making a distinction between relative or absolute unfitness to drive is considered by the author to be a confusing and unjustified practice. Limits between fitness and unfitness should not be set at a level where all drivers become unfit but at lower levels where drinking drivers already impaired in their responses to traffic can be prosecuted. Legal positions must be made clearer to drivers by creating statutory driving offences for blood alcohol levels exceeding .08%. (JAM)

0 refs German

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Other Sociolegal Study.

UM-76-D0989

ZUM BEGRIFF DER "SICHEREN FUHRUNG" VON WASSERFAHRZEUGEN UND IHRE "BEHINDERUNG" DURCH ALKOTOLEINFLUSS [DEFINITION OF "SAFE STEERING" OF VESSELS AND ITS "IMPAIRMENT" BY THE INFLUENCE OF ALCOHOL], R. Helmer; K. Peters, Blutalkohol, v13 n1 p39-44 (1976)

Presented here is an analysis of the differences in the tasks and functions which those in charge of a watercraft and a motor vehicle must perform. These differences result from the different external conditions of road and shipping traffic, both functional and organizational. Because of strict traffic rules, the standardization of roads and traffic facilities, and the simplicity of operation of a motor vehicle, the driver is able to survey the traffic relatively easily and to foresee the behavior of the other road users. The captain of the ship is expected to follow the numerous complex rules of shipping and sea route regulations using his past experience and his crew. In spite of the fact that he has a completely accurate operations system, his vessel is not easily manipulated. Furthermore, recognition and surveillance is usually possible for him only by a complicated navigatory process. Therefore it is necessary for the captain to abstain from any alcohol while at work. Even the driver of a sports boat may be prevented from maneuvering his boat safely by the influence of alcohol, thereby endangering himself and others. It is concluded that sea traffic, both shipping and leisure, could be made much safer by enforcing the same rules concerning alcohol use for sea traffic as for road traffic. (JAM)

7 refs German

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drugs and Highway Safety.

UM-76-D0990

RELATIVE FAHRUNTUCHTIGKEIT AUS MEDIZINISCHER SICHT [RELATIVE DRIVING INABILITY FROM THE MEDICAL VIEWPOINT], D. Metter, Blutalkohol, v13 n4 p241-9 (Jul 1976)

This paper discusses the importance of examining the personality, personal habits, and medical condition of the accident involved driver. Indications of relative driving incapacity can be drawn from the motorist's personality traits, his personal conduct, his driving behavior and external conditions. Personality traits of special significance are alcohol usage, driving practices, any disabling illnesses, and use of medicines.

While driving, the motorist can become conspicuous through improper handling of his vehicle and by driving in a mannner inconsistent with traffic regulations. The influence of alcohol should be suspected in accidents that are the result of swerving off the road or are rear-end collisions.

When evaluating the conduct after the accident the physical condition as well as the remarks and behavior of the accused should be taken into consideration. Symptoms of physical deficiency or impairment are particularly important.

The indications of driving incapacity must be judged collectively. (JAM)

19 refs German

KEYWORDS: Review: Drugs and Highway Safety.

UM-77-D0991

UNTERSUCHUNGEN UBER DEN KOMBINATIONSEFFEKT ALKOHOL-FENETYLLIN (CAPTAGON) AUF EINIGE REFLEXMECHANISMEN DES MENSHEN [COMBINED EFFECT OF ALCOHOL AND FENETYLLINE ON REFLEX MECHANISMS IN MAN], Blutalkohol, v14 n1 p19-46 (1977)

Double-blind studies were carried out with thirty male students to investigate the influence of 0.08% blood alcohol content, 50 mg fenetyllin (Captagon(R)), and the combined effect of both these substances on the patellar reflex (PSR) and the labyrinthine sense after oral application. The threshold for mechanical stimulus of the PSR was estimated by a specially devised Winkelreflexgerat, while reflectory muscular reactions were registered by a cathode-ray oscilloscope. The labyrinthine sense was checked by investigating standing steadiness in Romberg position on a wobble board (Sphallograph).

The mechanical threshold of the PSR was elevated by ethanol to about 22%. This effect was reduced to only 13% after premedication with Captagon(R). Captagon(R) by itself

reduced the threshold as well as the latent period of the reflex slightly. The prolonging effect of ethanol on the latent period was nearly completely repaired by Captagon(R).

The duration of muscle action potentials of the M quadriceps was not influenced by Captagon(R), while the prolonging effect of ethanol of about 11% was slightly reduced to 6% after simultaneous application of Captagon(R) and ethanol.

The amplitude of the muscle potentials, amounting to slightly above normal values of about 2% after application of Captagon(R) as a result of more synchronic muscular reaction, was not affected at all after simultaneous application of Captagon(R) and ethanol.

Captagon(R) also improved standing steadiness. Normal reactions as well were not affected by ethanol when Captagon(R) was given before.

The central and peripheral nervous mechanisms underlying these results are discussed. The restoring or defensive effect of Captagon(R) to changes of nervous functions due to ethanol must be considered in future research. (JAM)

48 refs German

KEYWORDS: Stimulants: fenethylline*. Experimentation: Study of Combined Effects of Drugs. Psychomotor Tests.

UM-77-D0992

DIE ERMITTLUNG DES RISIKOFAHRERS DURCH DOKUMENTIERTE KLINISCHE UNTERSUCHUNG [DETECTION OF THE DANGEROUS DRIVER BY DOCUMENTED INVESTIGATION], H. Roer, Blutalkohol, v14 n5 p315-30 (1977)

This article discusses the reliability of using blood alcohol levels as measures of intoxication. The judgment of the ability to drive after the ingestion of alcohol is presently limited to measurement of the blood alcohol level. This author believes that the measurement of BAC as the final determinant of the impairment of the drivers should be replaced by an overall clinical assessment. Videotechnology makes it possible to reproduce a standardized and objective test battery model whereby the risk which a driver may present in traffic can be judged by experts and the court after presentation of the videotape. The following tests were conducted with fifteen test subjects: orientation and behavior; weight perception; picking up matches; finger to finger test; counting backwards; speaking test; and postrotatonic nystagmus.

Two videotapes show the individual performances on the tests. The alcohol content of the subject was reliably determined by three breath tests and one blood sample.

This technique gave expected results. Some drivers are traffic risks at an alcohol limit of .08% while others do not present a hazard. With the method described the individual biological limit of driving capability after the ingestion of alcohol can be determined. The same method could most probably also be employed with drug ingestion, fatigue, and illness. Only after development of the video technique will differential punishment of drivers be possible. (JAM)

93 refs German

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Drug Concentration-Effect Study: Driving Skill Impairment. Psychological Testing. Psychomotor Tests.

UM-71-D0993

THE EFFECT OF FLUPHENAZINE IN PSYCHOLOGICALLY NORMAL VOLUNTEERS: SOME TEMPORAL, PERFORMANCE, AND BIOCHEMICAL RELATIONSHIPS, D.J. Safer; R.P. Allen, Biological Psychiatry, v3 n3 p237-49 (1971)

Very little data is available concerning the psychopharmacology of the phenothiazine tranquilizer fluphenazine in psychologically normal subjects. To obtain further information concerning the drug's effects, a study was made of fifty psychologically normal male volunteers between 19 and 35 years of age, ranging in weight from 118 to 227 pounds, who were given 10 to 40 micrograms/kg of fluphenazine intramuscularly. The purposes of the study were to study drug effects on memory, manual dexterity, and visual motor coordination; to determine whether cholinergic mechanisms can account for

extrapyramidal signs; and to note whether personality factors can account for some of the irritability caused by the drug.

The results showed that extrapyramidal signs (EPS) occurred commonly on the second day and were dose-related. Irritability also occurred frequently and was related to dose and personality. Both motor and cognitive performance impairments were also related to dose. Fine motor functioning was related temporarily to EPS.

Small doses of physostigmine were used to explore possible cholinergic mechanisms involved in EPS. When given in repeated small doses, physostigmine had no effect upon the EPS.

The findings of this study support the hypothesis that psychological factors are important in the proclivity to the reaction of irritability. The high frequency of drug-induced irritability in healthy volunteers along with the relation to dose supports the argument that direct organic factors also play an important etiologic role in this response. (HSRI)

27 refs

KEYWORDS: Major Tranquilizers (Antipsychotics and Neuroleptics): fluphenazine. Parasympatholytic (Cholinergic Blocking) Agents: physostigmine. Experimentation: Acute Dosage Study. Experimentation: Dose-Effect Study. Personality and Drug Effects. Psychological Testing. Psychomotor Tests.

UM-75-D0994

EPILEPSY AND DRIVING, Drug and Therapeutics Bulletin, v13 n8 p31-2 (1975)

This brief article summarizes regulations in Great Britain concerning the epileptic driver. A patient who has been free of epileptic attacks for three years may be allowed a driving license, but if he is on anticonvulsant medication this medication must be continued and supervised. If medication is to be reduced or stopped, it must be done very slowly. Even then it is desirable to forbid driving for about one year, although the regulations do not insist on this. Because of drug interactions, driving may have to be stopped for a while if another drug that might increase the tendency to epilepsy is also prescribed.

Those who have epilepsy only while asleep need not report further attacks to the licensing authority. All other patients should report subsequent attacks. (HSRI)

8 refs

KEYWORDS: Review.

UM-76-D0995

NARCOTIC ANTAGONISTS: THE SEARCH FOR LONG-ACTING PREPARATIONS, R. Willette, ed., NIDA Research Monograph 4 (Jan 1976)

The use of narcotic antagonists in the treatment of opiate addiction is based on the concept of a pharmaceutical agent capable of blocking the reinforcing properties of a dose of opiate taken during an addict's rehabilitation. Probably the most desirable component of antagonist therapy would be a long-acting drug. In order to obtain a long-acting drug delivery system or a sustained-release preparation of an acceptable but short-acting antagonist, implanted disks with time release capacity or chemical microcapsules injected intramuscularly can be used.

This monograph is comprised of clinical studies testing these devices. Some of the devices discussed are polylactic/glycolic acid implantable cylinders, injectible microcapsules coated with dl-poly (lactic acid), injectable implants of naltrexone in natural glycerides, and naltrexone encased in glutamic acid and leucine copolymers. While most of these studies were carried out with mice, it appears that these devices are very promising for future use in human narcotic addicts. (HSRI)

U.S. Department of Health, Education, and Welfare publication no. (ADM) 78-296

KEYWORDS: Opiates and Related Agents. Animal Research. Compilation.

UM-76-D0996

RX: 3X/WEEK LAAM: ALTERNATIVE TO METHADONE. J.D. Blaine; P.F. Renault, eds., NIDA Research Monograph 8 (Jul 1976)

This monograph is comprised of summaries of biomedical papers and assessments of LAAM (Levo-alpha acetylmethadol), a new treatment drug for heroin addiction which was developed as an alternative to methadone. Because methadone patients must take their dose daily, they have been allowed take-home doses to reduce the number of clinic visits they must make, a practice which has contributed to a great deal of illicit diversion and abuse of the drug. In contrast, LAAM dosage is three times a week and it does not yield a quick high but rather provides a level, sustained effect.

The papers summarized here discuss various aspects of LAAM. Some of these aspects are the pharmacology and toxicology of LAAM, its chemistry, a comparison of the effects of LAAM and methadone in veterans, and clinical experiences with LAAM. A bibliography of the drug is also provided which deals with both preclinical and clinical aspects.

The editor concludes that LAAM appears to be promising for patients who may need opiate stabilization in that it provides more choice in tailoring treatment to each individual's needs. (HSRI)

U.S. Department of Health, Education, and Welfare publication no. (ADM) 78-347

KEYWORDS: Opiates and Related Agents: heroin, l-alpha-acetylmethadol, methadone. Compilation.

UM-76-D0997

NARCOTIC ANTAGONISTS: NALTREXONE. PROGRESS REPORT. D. Julius; P. Renault, eds. (Sep 1976)

The purpose of this volume, which is comprised of several research papers, is to inform, act as a reference for clinical procedures, encourage interest, and possibly stimulate further innovation and research in naltrexone. The first set of papers in the volume describes the Federal role in the development of naltrexone by recounting the history of the political and bureaucratic processes. The second group of papers describes the conceptual basis and the results of the double-blind study of naltrexone's clinical safety and efficacy. The third group of papers deals with the NIDA open clinical studies of the drug's safety and efficacy. The fourth group of papers includes theoretical discussion and the clinical testing of behavioral hypotheses concerning the treatment of opiate addiction with narcotic antagonists. The last paper is a current assessment of the data collected on naltrexone safety to date.

The authors conclude that naltrexone is at present a safe and efficacious drug for treatment of healthy heroin addicts. Its use, however, is limited to a minority of patients who are highly motivated. Naltrexone promises, with further research, to be a potentially powerful and effective treatment. (AAM)

U.S. Department of Health, Education, and Welfare publication no. (ADM) 77-387

KEYWORDS: Opiates and Related Agents: naltrexone*. Compilation.

UM-77-D0998

REVIEW OF INHALANTS: EUPHORIA TO DYSFUNCTION. C.W. Sharp; M.L. Brehm, eds., NIDA Research Monograph 15 (Oct 1977)

This monograph provides a thorough review of the literature concerning inhalant abuse and a critical assessment of the state of present knowledge. Papers are presented dealing with the sociocultural-epidemiological aspects of inhalant abuse; clinical evaluation of psychological factors; the medical evaluation of inhalant abusers; specific clinical and laboratory neurological evaluation of inhalant abusers; abuse of inhalation anesthetics; toxicology of alcohols, ketones, and esters when inhaled; review of the aliphatic and aromatic hydrocarbons; and preclinical pharmacology and toxicology of halogenated solvents and propellants. Also discussed are nervous system damage from mixed organic solvents, preclinical behavioral toxicology of inhalant solvents, and recommendations for prevention of abuse.

Some of the potential approaches to the problem are the addition of obnoxious materials to solvents, product composition changes to lessen euphoric effects, product formulation

changes to reduce toxicity, limitations of sales to adults, and community action. The editors believe prevention to be a matter that must be given serious consideration, especially in the light of the fact that the majority of users are very young and that glue sniffing can cause paralysis, permanent damage, and even death.

The volume also contains an extensive bibliography of inhalant abuse literature published after 1970. (HSRI)

U.S. Department of Health, Education, and Welfare publication no. (ADM) 77-553

KEYWORDS: Other Toxicants. Volatile Solvents. Compilation. Review: Drug Effects. Review: Drug Use.

UM-77-D0999

RESEARCH ON SMOKING BEHAVIOR. M.E. Jarvik; J.W. Cullen; E.R. Gritz; T.M. Vogt; L.J. West, eds., NIDA Research Monograph 17 (Dec 1977)

Cigarette smoking is a habit of the most widespread proportions. This volume attempts to investigate the reasons people smoke, the distribution of cigarette smoking in the world today, the dangers involved, and methods of treatment for those who want to quit smoking. Smoking is analyzed from four different viewpoints: epidemiology, etiology, consequences, and treatment. Some of the papers presented deal with specific topics such as potential measures that should be taken to reduce the adverse impact of smoking upon health; the role of nicotine in addiction; motivational factors in quitting; measurement of carbon monoxide in expired air and thiocynate in blood plasma; the relationship of sociocultural factors to smoking, and the economic costs of smoking-induced illness.

Several areas badly needing additional research are development of innovative treatment procedures for teaching people how to stop smoking, pharmaco-therapeutic techniques for maintaining abstinence, and biological assays to detect tobacco, nicotine, and its metabolites. (HSRI)

U.S. Department of Health, Education, and Welfare publication no. (ADM) 78-581

KEYWORDS: Ganglionic Blocking and Stimulating Agents: nicotine. Stimulants: nicotine. Compilation. Review: Drug Effects. Review: Drug Use.

UM-76-D1000

COCAINE--SUMMARIES OF PSYCHOSOCIAL RESEARCH, G.A. Austin; J. Phillips; N. Soifer; C. Spotts; R. Eichberg, eds., NIDA Research Issues 15 (Dec 1976)

The sixty-nine articles and books abstracted in this volume include selections from both the scientific and popular literature on the psychosocial aspects of human use of cocaine and, to a lesser extent, coca. These documents, representing a time span from the turn of the century to the present, were selected from recommendations of researchers from many disciplines. Consequently the abstracts cover a wide range of topics and cover highly scientific, technical research as well as general review articles and personal perspectives.

The abstracts have been grouped into five categories: (1) histories of cocaine use; (2) overviews and perspectives; (3) research and clinical observations; (4) treatment studies; and (5) incidence studies.

Some of the specific articles included deal with the comparison of the effects of cocaine and synthetic central stimulants; cocaine poisoning; cocaine use in prisoners, university students, jazz musicians, and South America Indians; and patterns of drug abuse in school children. (AAM)

U.S. Department of Health, Education, and Welfare publication no. (ADM) 77-391

KEYWORDS: Local Anesthetics: coca. cocaine. Stimulants: coca. cocaine. Compilation. Review: Drug Effects. Review: Drug Use.

UM-78-D1001

BEHAVIORAL ANALYSIS OF CHRONIC COCAINE INTOXICATION IN THE CAT, S. Castellani; E.H. Ellinwood; M.M. Kilbey, Biological Psychiatry, v13 n2 p203-15 (1978)

This study was designed to provide a systematic evaluation of the effects of chronic intravenous cocaine administration on preseizure-seizure events and posturo motor behaviors in seven female cats. Video tape of behavior pre- and postcocaine on days 1, 4, 7, 10, and 13 in seven cats, and in addition, on days 21, 28, and 35 for a subset of four cats, was rated for several scales of the Behavioral Rating Inventory for Drug-Generated Effects (BRIDGE), a test developed to quantify stimulant-induced behaviors. Preseizure events were measured using scales for Tremor Intensity and Preseizure Intensity (PSI) developed to quantify local anesthetic-induced behaviors.

Behaviors associated with cocaine's local anesthetic effects, such as tremor intensity and preseizure intensity levels, showed tolerance over the treatment period, while behaviors associated with cocaine's psychomotor stimulant effects, such as the BRIDGE measures, showed augmentation, or reverse tolerance. These data are discussed in terms of catecholamine supersensitivity, kindling mechanisms, and stimulant models of psychosis.

These findings illustrate the potential value of chronic cocaine intoxication in animals as a heuristic model for studying psychomotor pathology and for evaluating the multiple potential underlying mechanisms. (JAM)

46 refs

KEYWORDS: Local Anesthetics: cocaine. Stimulants: cocaine. Animal Research. Experimentation: Chronic Dosage Study.

UM-74-E0001

EPIDEMIOLOGY OF ACUTE DRUG INTOXICATIONS: PATIENT CHARACTERISTICS, DRUGS, AND MEDICAL COMPLICATIONS, R.B. Stewart; M. Forgnone; F.E. May; J. Forbes; L.E. Cluff, Clinical Toxicology, v7 n5 p513-30 (1974)

This study is part of an intensive surveillance of drug utilization and adverse drug reactions being carried out in the University of Florida Hospital and its clinics. It describes the prevalence of drug use, drugs most commonly used, patient characteristics, medical complications, and economic impact of acute drug intoxication in a university oriented community and rural area.

Of the 415 adult patients treated for acute drug intoxications in a university hospital emergency room, 64 (15.4%) required admission to the medical service for intensive care. A significantly larger proportion of patients over forty years of age required hospitalization. Forty-eight of the episodes requiring hospitalization were identified as intentional drug intoxication. Women were admitted in 41 (64.0%) instances while men were admitted on 23 (36.0%) occasions. The most commonly used drugs were nonbarbiturate depressants, barbiturates, tranquilizers, and antidepressants. Almost one-half of all hospital patients, however, had taken multiple drugs. Medical complications in these 64 patients included coma in 43 (67.2%); acute hypertension or hypotension in 21 (32.8%); and pneumonia in 16 (25%). Complications occurring less frequently were cardiac arrest in three (4.7%); anemia in two (3.2%); neuropathies, soft tissue necrosis, quadraplegia, renal failure, bullous dermatitis, and fetal death in one patient each. Two (3.2%) patients died as a result of drug ingestions. Forty-eight percent of the patients had experienced previous episodes of acute drug intoxication.

This study found that instances of intentional and nonintentional acute drug poisonings are increasing. An awareness of the medical and psychological problems as well as the socioeconomic impact of these situations is important if the physician is to deal effectively with these patients. (AAM)

76 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-74-E0002

CROSS-NATIONAL STUDY OF THE EXTENT OF ANTI-ANXIETY/SEDATIVE DRUG USE, M.B. Balter; J. Levine; D.I. Manheimer, New England Journal of Medicine, v290 n14 p769-74 (4 Apr 1974)

The object of this study was to determine the extent of use of antianxiety and sedative drugs on a cross-national basis in order to be able to compare the use of drugs in the U.S. with drug consumption in other countries. National samples of respondents in nine Western European countries (Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden, and the United Kingdom) were asked in household surveys identical

questions about their use of antianxiety and sedative drugs during the past year and about their general attitudes toward tranquilizers. The proportion of persons who used antianxiety and sedative drugs on one or more occasions varied from 17% in Belgium and France to 10% in Spain. In almost every country the percentage of females who had used antianxiety and sedative drugs was approximately twice that of males. Persons over forty-five years of age were overrepresented among drug users in all countries in relation to their presence in the national population. The rank order of the countries on attitude toward tranquilizers was poorly correlated with rank order on use rates. However, within each country there was a sharp difference in attitude between users and nonusers. Independent data place the United States in a middle position among the nine countries surveyed on use of antianxiety and sedative drugs. (JAM)

6 refs

KEYWORDS: Sedatives and Hypnotic Agents. Epidemiology: National Survey of Drug Use Patterns.

UM-74-E0003

METHODS OF STUDYING PREVALENCE AND INCIDENCE OF DRUG ABUSE. N. Bejerot; C. Maurice-Bejerot. Scandinavian Journal of Social Medicine, v2 p99-104 (1974)

Many methods commonly used in studying morbidity such as hospital admissions and health surveys are unsuitable in estimating the prevalence of drug addiction. This paper discusses the weaknesses of some of these methods which include health surveys and statistics, case studies, registers of addicts and drug abusers, mortality studies, interviews, and questionnaires.

The injection mark method, which has been used on a large scale in Stockholm since 1965, is suggested by the authors as an alternative method. Since venous puncture causes easily observed injection marks, epidemiological studies can be based on these marks, particularly in highly affected areas and populations. The injection mark technique has been validated against blood and urine tests and also against the statements of the addicts themselves. The diagnostic reliability has been proven to be very high. The observer variation in the actual arm examination has a margin of error of about 2%. The investigation, when combined with a few questions on the time and place of the first intravenous injection, has made it possible to study the course of development of the epidemic.

The injection method appears to be a simple, cheap, and effective method of following the development of intravenous abuse in a population if it is directed to a subpopulation where this form of abuse is very widespread. When supplemented by suitable representivity studies the method is a reliable way of estimating the rates of intravenous abuse in society and changes in the extent of this abuse. (HSRI)

59 refs

KEYWORDS: Opiates and Related Agents. Review: Survey Methodology.

UM-77-E0004

EPIDEMIOLOGICO-STATISTICAL PROBLEMS IN CONNECTION WITH THE IDENTIFICATION OF THE EFFECTS OF DRUGS ON TRAFFIC SAFETY. B. Friedel, 7th International Conference on Alcohol, Drugs, and Traffic Safety, Melbourne, Australia (Jan 1977)

This paper surveys the statistical and methodogical problems which arise when an attempt is made to scientifically clarify the relationship between the use of drugs and traffic safety. The problems inherent in both epidemiological approaches and experimental approaches are discussed in detail. One of the problems of the epidemiological approach is the lack of exact terminology and clear definitions. Definite information concerning the lapse of time between drug use and road usage is also difficult to obtain. A further difficulty of the epidemiological approach is the forming of comparable groups. Other problems include lack of willingness to participate on the part of subjects, the uncontrollable simultaneous overlapping of variables, and frequent use of compound preparations or drugs in combination with alcohol.

One of the problems inherent in the experimental approach is the difficulty in the selection of the appropriate placebo. Furthermore, there is not yet sufficient scientifically sound knowledge available concerning the relationships among visual perception, reaction behavior, risk taking behavior, and other variables, and the

behavior of road users. Another difficulty is that the planning of experimental surveys requires an exact pharmacological knowledge of the drugs to be examined.

The authors conclude that in view of these problems, research must be intensified. Systematic long-term planning of research will have to concentrate on the design and carrying out of different approaches in order to solve these problems. (HSRI)

14 refs

KEYWORDS: Review: Survey Methodology.

UM-77-E0005

THE EPIDEMIOLOGY OF DRUG ABUSE: CURRENT ISSUES, L. Richards; L.B. Blevens, eds., NIDA Research Monograph 10, Washington, D.C.: U.S. Government Printing Office (Mar 1977)

This monograph is comprised of a series of papers presented at the Conference on Current Issues in the Epidemiology of Drug Abuse held in Miami Beach, Florida, on November 18-19, 1974. The purposes of the conference were to review the state of epidemiological research at the time, to identify major problems and gaps, and to recommend new directions that should be taken. The papers are divided into five major sections: (1) issues underlying incidence and prevalence of drug use; (2) problems in data acquisition; (3) problems related to applying and extrapolating data; (4) current estimates, ranges, and trends of drug use; and (5) current epidemiology programs and recommendations. Some of the topics discussed are polydrug use, subcultural groups, arrests, deaths, incidence of hepatitis, urinalysis screening, and ecological studies of narcotic addiction. (HSRI)

259 pages

Department of Health, Education And Welfare publication no. (ADM) 77-432

KEYWORDS: Compilation. Review: Drug Use. Review: Survey Methodology.

UM-75-E0006

METHAQUALONE ABUSERS: A PRELIMINARY SURVEY OF COLLEGE STUDENTS, G.E. Kochansky; T.S. Hemenway III; C. Salzman; R.I. Shader, Diseases of the Nervous System, v36 p348-51 (Jul 1975)

This paper describes a survey of methaqualone abuse and abusers. The study attempted not only to determine prevalence of use and user habits but also whether nonusers and users could be differentiated on the basis of psychological tests. A questionnaire was used to survey the methaqualone experiences of fifteen college student users. Psychological test data from these users and from a control group consisting of ten nonusers were compared. The mean age of all subjects was 19.5 years.

The results of the questionnaire showed that of the fifteen methaqualone users, all but one stated that they had been introduced to the drug by their friends. Six users stated they preferred marijuana to methaqualone. Most subjects took the drug when happy or bored and avoided its use when angry or depressed. Only two users reported adverse reactions to methaqualone. Of twelve subjects who answered the question regarding the effect of methaqualone on sex, ten stated that it definitely increased sexual arousal.

The male user was found to be relatively indistinguishable from a large normative sample of a population of normal male volunteers for drug research or from a specific comparable sample of male nonusers on measures of trait anxiety, depression, extraversion, neuroticism, a test-taking response set, and risk taking. This was also the case for females. One differential pattern found was that methaqualone users had experimented with a wider variety of psychoactive drugs than had nonusers. The authors conclude that more intensive and extensive research will be necessary to elaborate upon this preliminary picture of the methaqualone abuser and abuse experience. (HSRI)

15 refs

KEYWORDS: Nonbarbiturates: methaqualone. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-74-E0007

TOWARD AN EXISTENTIAL THEORY OF DRUG DEPENDENCE, G. Greaves, The Journal of Nervous and Mental Disease, v159 n1 p263-74 (1974)

The author examines five leading theories of drug dependence: a) the acquired drive theory; b) the avoidance paradigm theory; c) the metabolite disease theory; d) the conditioning theory; and e) the automedication theory. Of these five major theories, four account for drug dependence only after the fact, and the fifth theory is essentially incomplete. Thus, the author concludes that these theories of drug dependence miss the essential point: that persons who become drug dependent are those who are unable to provide themselves with usual forms of euphoric experience primarily because of personality and attitudinal variables, and thus resort to drug use as a substitutive experience. Unlike social-recreational users who may employ drugs as simply another avenue of pleasure, drug-dependent persons find their drug of choice their primary source of pleasure.

Just as drug theories have missed this point, so have drug programs which emphasize good behavior and ascetic values. These programs unwittingly contribute to continued drug use. Because of the ascetic orientation of most drug programs, they thus tend to undermine the very goal for which they strive. The only way out of this self-defeating cycle is to place program emphasis on helping persons to secure their basic pleasure needs in nondrug ways. (AAM)

82 refs

KEYWORDS: Review.

UM-75-E0008

DRUG USE DATA: A DIFFERENT PERSPECTIVE, A.M. Lee, Journal of the American Medical Association, v234 n12 p1242-4 (22 Dec 1975)

This article criticizes the proposal of J. Donald Rucker (published earlier in the journal) to establish a computerized drug information system that would provide, among other benefits, a means of ongoing peer review of medications prescribed. The author critizes Ruckle for his stating that the 600 million dollar price tag of developing this system would be a small price to pay when compared to the cost of adverse drug reactions which Ruckle claims stands at four billion dollars. The author examines the facts behind this claim, and concludes that Ruckle's estimate of four billion dollars is ridiculously high.

The author also accuses Ruckle of citing his own studies for facts, for using nonexistent citations, for implicitly calling for drastic intervention by the government, and for failing to make a reasonable estimate of the cost of such a computer network. The author believes that at a time of general budget stringency in health and other public services, a decision to devote such a sum to one project would necessitate taking it away from projects of higher priority. (HSRI)

32 refs

KEYWORDS: Review: Survey Methodology.

UM-76-E0009

STATUS OF DRUG QUALITY IN THE STREET-DRUG MARKET--AN UPDATE, J.K. Brown; M.H. Malone, Clinical Toxicology, v9 n2 p145-68 (1976)

This report summarizes a study done of the determination of the actual chemistry of street drugs and their quality based on samples voluntarily submitted. The drugs evaluated in this study were mescaline, lysergic acid diethylamide, psilocybin, tetrahydrocannabinol, marijuana, hashish, amphetamine, cocaine, MDA, heroin, and opium.

Thirty-seven hundred street drug analyses were conducted for nineteen months. In only 2,604 (70%) was the alleged material actually present. Even then, the actual amount present varied considerably. Only 17.1% of the alleged mescaline samples contained any mescaline as compared with the alleged LSD samples where 92% did have various amounts of this compound. Only 14.5% of alleged psilocybin samples contained some psilocybin, and these were in each case mushrooms. Of the alleged THC submissions, no authentic material was found. Thirty-nine per cent of the alleged amphetamine samples contained various amounts of either amphetamine or methamphetamine. Sixty-eight percent of the

alleged cocaine samples contained varying amounts of cocaine as the only active ingredient.

Information such as the availability of each drug, the quality, the use, the cost, and the popularity is also provided in this paper. (HSRI)

74 refs

KEYWORDS: Review. Review: Drug Use. Review: Survey Methodology.

UM-74-E0010

SMOKING AND DRUG CONSUMPTION IN WHITE, BLACK, AND ORIENTAL MEN AND WOMEN. C.C. Seltzer, G.D. Friedman; A.B. Siegelaub, American Journal of Public Health, v64 n5 p466-73 (May 1974)

This paper reports the results of a study investigating whether or not cigarette smokers differ from nonsmokers with respect to the consumption of medicinal drugs. Responses to questions on medicinal drug consumption were examined for nonsmokers and cigarette smokers in 70,289 white, black, and oriental men and women who underwent a Kaiser-Permanente Multiphasic Health Checkup from 1964 to 1968. The results showed, with few exceptions, that cigarette smokers report that they use more drugs than their nonsmoking counterparts. These differences were apparent for black, white, and oriental males and females. Thus, in white and black men and women (and to a lesser extent in orientals), more cigarette smokers than nonsmokers report taking cough medicine, aspirin-containing drugs, pain medicine, prescription analgesics such as codeine, phenobarbital or barbiturates, sleeping pills, tranquilizers, diuretics, hormones, iron or anemia medicine, Benzedrine(R) or Dexedrine(R), antibiotics, stomach or digestive medicine, and laxatives and cathartics. The only drugs taken by a larger percentage of nonsmokers were those for allergic conditions, antihistamines, and asthma medicine.

Numerous racial and sex differences in the frequency of use of drugs were also reported. Taking medicines was more common among women than men. This sex difference was particularly true among whites and blacks. Also, especially among whites and blacks, women were much more apt to take aspirin-containing drugs.

Possible reasons for the differences between nonsmokers and smokers with regard to the usage of such a wide variety of drugs are examined. (AAM)

9 refs

KEYWORDS: Ganglionic Blocking and Stimulating Agents: nicotine. Stimulants: nicotine. Unclassified Agents: tobacco. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-75-E0011

DRUG USAGE: AN ALTERNATIVE TO RELIGION? J. Westermeyer, V. Walzer, Diseases of the Nervous System, v36 n9 p492-5 (Sep 1975)

This paper attempts to determine the relationship between drug usage and church attendance. By identifying religion as "the opiate of the people," Marx intended that the time and materials donated to religious activity should be invested in the economic goals of society. The authors suggest that once people have abandoned such traditional social activities as religion, many of them do not invest their surplus time and finances in the pursuits of the state. Instead they are apt to invest in other activities, such as drug usage, which facilitate the personal and social benefits formerly achieved by religious practice.

Over the twelve months of 1972, sixty-two consecutively admitted patients aged 17 to 25 were interviewed at the University of Minnesota Hospitals. Thirty-eight patients were placed in the "nonabuse" category, while twenty-three were characterized as drug abusers. The interviews indicated that there were no significant differences between the two groups regarding religious affiliation, occupation, and discharge diagnosis. There was, however, a significant difference between the two groups in terms of church attendance. Almost half of the nonabuse patients had attended church in the four weeks prior to hospital admission. By comparison only a few drug abusers had attended church.

Several possible explanations are given: 1) Cessation of church attendance and commencement of illicit drug usage may both function as a form of adolescent rebellion. 2) For some persons, certain traditional activities such as church attendance

function as a major means for relating to other people. Bereft of this, the individual might employ other means, such as drug usage, as a focus of social intercourse. 3) Religious ritual and intoxicant usage seldom occur concurrently today; this modern development has evolved from earlier times when both activities often occurred together. 4) Drug usage may enable some people to attain certain desirable internal states which others attain by religious practice. (HSRI)

16 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-74-E0012

SURVEY OF ADOLESCENT DRUG USE, IV. PATTERNS OF DRUG USE, M. Weitman; R.O. Scheble; K.G. Johnson, American Journal of Public Health, v64 n5 p417-26 (May 1974)

Described here is a study which attempted to determine whether data collected from a large sample of high school youth would support existing theories concerning the pathways to habitual use of drugs.

A group of 2,634 young people between the ages of fourteen and eighteen attending public high schools in Portland, Oregon anonymously reported their use of twelve categories of drugs. Individual patterns of reported drug use were employed to test twelve hypotheses concerning the motivations for use of narcotics, barbiturates, hallucinogens, cocaine, sedatives, inhalants, amphetamines, and marijuana.

The findings of the survey indicate that of the hypotheses tested, experimentation is the single most important motive contributing to the use of drugs by high school youth. Furthermore, to the extent that correlational data allow, the evidence is quite strong against any particular "road to" use of specific categories of drugs. The less popular the drug, the more idiosyncratic are the patterns of use associated with it, and the fewer the number of students per pattern, suggesting that individual patterns to drug use are equally idiosyncratic. Taken together, these data provide strikihg support for the position that most adolescents who report use of one or more of the four least used drugs are seeking to explore the varieties of drugs available. (AAM)

13 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0013

NIDA SERVICES RESEARCH REPORT: A STUDY OF LEGAL DRUG USE BY OLDER AMERICANS, D. Guttmann, Washington, D.C.: U.S. Government Printing Office (May 1977)

This study was conducted to explore the patterns of behavior and the problems associated with the medical and nonmedical use of drugs by older Americans. The investigation focused on the assumed differences between elderly users and elderly nonusers of legal drugs including prescription drugs, over- the-counter drugs, and alcohol. Information was also sought on the extent of side effects resulting from the use of various drugs in combination; on whether subjects sought treatment voluntarily for adverse side effects; on whether they were able to obtain the drugs they thought they needed; and on whether subjects exhibit any degree of dependence on legal drugs for the performance of the regular activities of their daily living. Interviews were obtained with senior citizens sixty years or older from representative sectors of the population.

The results of this study imply that there are specific demographic and psychosocial variables associated with older Americans who use or refrain from using prescription and over-the-counter drugs. Patterns of legal drug use vary according to marital status, sex, age, living arrangements, and self-perception. This exploratory research indicates that prescription drugs are used heavily by the elderly, particularly by unmarried elderly women who are living alone.

While this study indicates that the great majority of elderly users of legal drugs are using their drugs appropriately, a potential danger exists in the use of these drugs in combination. The significance of this danger is underscored with the realization that less than 5% of respondents abstained from all drugs and approximately half of the respondents reported using both prescription and over-the-counter drugs with alcohol.

14 pages 9 refs

Department of Health, Education and Welfare publication no. 77-495

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-71-E0014

DRUG CULTURE IN THE SEVENTIES. K.D. Charalampous. American Journal of Public Health, v61 n6 p1225-8 (Jun 1971)

A broad overview of the problem of drug dependence is presented. The author suggests several ways to decrease drug abuse. He suggests that methods for making drugs less glamorous be explored. Pharmacotherapy in general must become more selective and better supervised. Secondly, support should be given to the development of governmental and academic organizations which address themselves to all drugs of abuse in a comprehensive way, not just to certain drugs of abuse. Thirdly, efforts should be made to reestablish and justify credibility in medical personnel. Fourthly, in the area of primary prevention, social efforts to promote the development and viability of groups which provide alternatives to preoccupations with drugs should be supported, especially in view of the importance of peer group control. Finally, more facilities are needed for comprehensive and continuous care rather than emphasis of one treatment at the expense of others. (HSRI)

10 refs

KEYWORDS: Countermeasure Concepts. Review: Drug Use.

UM-71-E0015

MOOD-MODIFYING DRUGS PRESCRIBED IN A CANADIAN CITY: HIDDEN PROBLEMS. R. Cooperstock; M. Sims. American Journal of Public Health, v61 n5 p1007-16 (May 1971)

The research described in this report investigated the legal use of mood-modifying or psychoactive drugs in urban noninstitutionalized populations through the collection of a sample of prescription slips that showed what drugs were dispensed, by whom, and to whom. Sampling covered two one-week periods six months apart in October 1965 and April 1966 and took place in seventy-two retail pharmacies in Toronto.

Results showed that mood-modifying drugs alone accounted for 24% (1,369,000) of prescriptions issued in one year. On any one day the number of people taking a mood-modifying drug was about 7% of the adults in the population. Ninety-two percent of the prescriptions were dispensed by retail pharmacies, while only 8% were dispensed by hospitals. City residents were found to get a disproportionately large share of mood-modifying drug prescriptions while suburbanites get a disproportionately small number.

Prescriptions for women constituted 69% of all mood-modifying prescriptions. Prescription use did not vary by socioeconomic level. In examining the role of the physician, it was found that general practitioners wrote a disproportionately high number of prescriptions for mood-modifying drugs. Also, physicians who graduated from medical school after 1950 tended to prescribe more drugs than did earlier graduates, especially tranquilizers. (HSRI)

13 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0016

DRUG USE AMONG THE ELDERLY: A REVIEW. D.M. Petersen; F.J. Whittington. Journal of Psychedelic Drugs, v9 n1 p25-37 (Jan-Mar 1977)

This paper presents a review and summation of the relevant literature and available research evidence on drug use and misuse among the elderly, particularly alcohol and other psychoactive drugs. Attempts are made to identify gaps in the existing knowledge and to provide suggestions for future research in this area.

The surveys of drinking practices among American men and women reflect a general lower prevalence of drinking among the elderly as compared to younger individuals. However, surveys on public intoxication among the elderly indicate that arrest rates for males over sixty exceed that for all persons under forty. Studies of the outcome of treatment

for alcoholism appear to support the theory that older patients tend to show greater and more lasting improvement than their younger cohorts.

Literature indicating that drug misuse among the elderly is a growing problem is of recent date but has been appearing with increasing regularity. Despite a rather substantial increase in the literature there is very little empirical basis for issues such as the reasons for drug abuse in the elderly, factors that exacerbate elderly drug misuse, and suggestions for action. Available data suggests that the elderly are the largest consumers of certain drugs and are at high risk for the potential misuse of these substances. There remains, however, a lack of basic data on the real extent of use and misuse of both alcohol and other psychoactive drugs among older persons. Lacking are such basic data as the demographic and social correlates of drug use and misuse among the elderly.

This report includes a table of studies done on drug use among the elderly providing such information as the size and type of sample used, the site of data collection, and a summary of the findings of the study. (HSRI)

47 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Compilation. Review. Review: Drug Use.

UM-77-E0017

SOUR NOTES FROM THE VINTAGE YEARS: SUBSTANCE ABUSE AMONG THE ELDERLY, J. Dobbie, Addictions, v24 n3 p58-75 (Fall 1977)

Presented here is an overview of the problem of substance abuse in the elderly. Alcohol is the foremost substance of abuse by the elderly, followed by drugs obtained legally through prescriptions and over-the-counter drugs. Illicit drug use is not unheard of, but its prevalence is low, a fact explained in part by the maturing out of drug addicts after age forty-five and the inability of older people to meet the economic costs of a sustained habit.

Alcoholism and other types of alcohol abuse constitute a major health and social problem for the elderly. The enormous task of identifying and treating the elderly alcoholic and problem drinker begins with the recognition that the problem exists. The stress of aging which results from both physical changes and society's treatment of its senior citizens make the alcohol problems of the elderly different from those of other groups.

Alcoholism peaks between the ages of 45 and 54 and again from 65 to 74, much of it hidden. One study estimates that 7.5% of the over fifty-five population have an alcohol problem. Very few nursing homes will accept aged alcoholics, leaving them no place to go.

The same physical, mental, and social stresses that play a role in alcoholism among the elderly also influence the use of drugs among the elderly, exposing them to a greater number and variety of other drugs for potential abuse. Data for prescription drugs alone reveal that people over sixty-five, while comprising roughly one tenth of the population, receive a quarter of all prescriptions written. The likelihood of abuse among the aged, whether intended or inadvertent, increases significantly with age for several reasons, including the lowered physical reserves of the elderly, the tendency for the elderly to share their drugs with their friends, and the increased likelihood of their confusing dosages and medications. (HSRI)

0 refs

KEYWORDS: Review. Review: Drug Use.

UM-76-E0018

PERSONALITY FACTORS IN HIGHWAY ACCIDENTS, F.L. McGuire, Human Factors, v18 n5 p433-42 (1976)

This article, which reviews systematic studies in various disciplines, describes those personality factors associated with highway accidents. In general, those persons involved in accidents can be described as being emotionally less mature, less responsible, more asocial or antisocial, and not as well-adjusted as those not involved. They also tend to have a more disturbed history, such as an unhappy childhood, delinquency, family disruption, and uneven work record. Many characteristics of accident

involved persons are age related, which in the average person tend to be modified as one matures. The role of external stress and the concept of accident proneness are also discussed. (JAM)

62 refs

KEYWORDS: Crash Investigation. Review.

UM-75-E0019

AN INTERPRETATION OF TRENDS IN STREET DRUG ANALYSIS PROGRAMS: WHOM DO THEY SERVE?
E.R. Kealy; R. Webber, Journal of Psychedelic Drugs, v7 n3 p281-9 (Jul-Sep 1975)

A survey of the literature concerning reports of street drug analysis programs is presented in order to demonstrate that existing street drug programs may embody serious social biases. Programs were chosen for analysis that were most consistently active during the last five years and that had accessible and complete data.

The results of the study indicate that certain trends are evident in existing street drug programs: 1) there has been a tremendous increase in the popularity of such programs among illicit drug users; 2) there is a marked increase in the submission of sensitizing street drugs, primarily LSD, cocaine, and amphetamines; 3) there has been a great increase in the use of phencyclidine as a drug of substitution; and (4) there has been an equally marked tendency of street drug programs to receive very few submissions of desensitizing drugs such as heroin, barbiturates, and PCP dust, drugs that in their illicit form are often greater health risks to users than the sensitizers.

The authors offer an interpretation of this data that emphasizes social factors in the explanation of trends in submission and rates of misrepresentation. Using available impressionistic data on the social organization of existing programs, it is argued that these programs may embody social biases that result in only particular privileged groups of illicit drug users with particular drugs of choice having access to the programs. Systematic social research is necessary to study and evaluate the extent of these biases so that plans for expanding street drug analysis programs can avoid them and include the means to address those populations who most need the service. (HSRI)

24 refs

KEYWORDS: Review. Review: Drug Use.

UM-75-E0020

SELECTIVE DESCRIPTIVE CHARACTERISTICS OF POLYDRUG ABUSERS, M.W. Kirby; G.J. Berry, Journal of Psychedelic Drugs, v7 n2 p161-7 (Apr-Jun 1975)

The purpose of this paper is to characterize various subgroups of polydrug abusers. It describes the first 189 patients admitted to the Denver Polydrug Treatment Center since its inception in September 1973. These subjects, representing a cross-section of society, are briefly described in terms of twelve selected demographic variables. Five substance categories are discussed: amphetamines, barbiturates, minor tranquilizers, marijuana, and the psychedelics. For each category of drugs information concerning the use, age of user, and trends is presented.

The results of this study indicate that these patients are a heterogenous group. In fact, their demographic characteristics are similar to those found in the general population of Colorado. This finding suggests that polydrug abuse cuts across different socioeconomic and cultural groups; and that male and female, young and old, single and married, and transient and stable persons engage in the abuse of a wide variety of drugs. There seems to be little or no relationship between any demographic characteristic and polydrug abuse. However, at least for these patients, when the particular kind of drug abused is taken into account, there is a significant association between the abuse of that drug and certain demographic characteristics. For example, amphetamine use was related to age and marital status; barbiturate use to age and educational level; tranquilizer use to sex and age; marijuana use to sex, age, marital status, and living situation; and use of psychedelics to age, marital status, and living situation.

The findings of the study challenge much of the prevailing stereotypy surrounding drug abusers. (HSRI)

5 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Barbiturates. Hallucinogens and Related Agents. Stimulants. Tranquilizers. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-75-E0021

STREETWISE AND NONSTREETWISE POLYDRUG TYPOLOGY: MYTH OR REALITY. D.R. Wesson; D.E. Smith; S.E. Lerner, Journal of Psychedelic Drugs, v7 n2 p121-34 (Apr-Jun 1975)

This paper discusses the validity of the categorization of drug users into two distinct groups--streetwise and nonstreetwise. In a preliminary study in 1969, the authors became aware of two distinct patient populations. Appearing for treatment at the Haight Ashbury Free Medical Clinic and the San Francisco General Hospitals were individuals who lived a street-oriented lifestyle, sharing many cultural values common to the drug-using youth subculture. In private practice, the individuals requesting treatment knew very little about the street-oriented lifestyle, and usually obtained their drugs of abuse through medical channels.

In May 1973, the San Francisco Polydrug Project was established. The project, in order to attract the "middle class addict", began operation in what appeared to be a private office. A great many "streetwise" drug addicts were also attracted.

In view of these two groups, the project attempted to determine by computer the differences in demographic and psychological characteristics of the groups. Results show a long list of significant demographic differences including marital status, licensure to drive, prior hospitalization for drug abuse, number of times in drug treatment, drug related arrests, and drug convictions. Psychological data, too, indicated differences between the two groups. The streetwise polydrug abuser shows a higher degree of psychopathology in both males and females.

The authors conclude that categorization of streetwise and nonstreetwise users is valid and useful. The classification is pragmatic because the nature of treatment services must be geared to one or the other population. The store-front drug treatment facility commonly used with streetwise populations is clearly not applicable to the majority of nonstreetwise patients for whom effective medical or psychiatric treatment alone is sometimes sufficient. The successful treatment of the streetwise user, however, generally involves a considerably wider range of vocational, social, educational, support, and rehabilitation services. Their needs usually cannot be met by medical treatment alone. (HSRI)

6 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-75-E0022

THE FEDERAL POLYDRUG ABUSE PROJECT: INITIAL REPORT. J. Benvenuto; P.G. Bourne, Journal of Psychedelic Drugs, v7 n2 p115-20 (Apr-Jun 1975)

This article reports the findings of a study that attempted to produce data on which subsequent policy decisions concerning treatment of drug abusing populations could be based. Thirteen polydrug programs were analyzed for demographic characteristics of the population served and types and amounts of drugs used.

The data to date suggest a number of important findings. First, while the level of utilization of the units has varied from one location to another, perhaps due to some variations in local need, the quality of service, or the vigor of the advertising, there has been a steady but not overwhelming demand for treatment. In view of this, one must consider that in spite of the preconceived notions about the existence of a major polydrug problem in the country, there appears to be a relatively small group of people who actually develop problems with depending on these drugs serious enough to warrant admission. Ultimately, however, the most accurate interpretation may be that in spite of the efforts to remove the stigma associated with the treatment of drug abuse, many patients, particularily the middle-aged and middle class, still do not feel comfortably in or attracted to drug treatment facilities.

The data also indicate a great amount of psychopathology among the polydrug abuser. The repeated occurrence of significant emotional problems in this group of patients suggests the appropriateness of providing them care that has a more direct relation to the existing mental health care system rather then establishing a new and separate drug treatment network. The level of psychopathology suggests the need for the addition of a

much more intensely trained professional and paraprofessional staff than is usually available. Also, the entire role of confrontation techniques employed by many heroin addiction programs must be reevaluated for use with these patients who appear more fragile. (HSRI)

0 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-72-E0023

LEGITIMATE AND ILLEGITIMATE DISTRIBUTION OF AMPHETAMINES AND BARBITURATES, D.E. Smith; D.R. Wesson, Journal of Psychedelic Drugs, v5 n2 p177-81 (Winter 1972)

Discussed in this paper is the legitimate and illegitimate distribution of amphetamines, barbiturates, and other drugs. Data from the Bureau of Narcotics and Dangerous Drugs indicate that diversion exists at virtually every point at which drugs are stored or distributed. The most common modalities of diversion are hijackings and thefts; spurious orders from nonexistent firms; illicit sales by wholesalers, retailers or practitioners; forged prescriptions; and numerous but small- scale diversions from family medicine chests or legitimate prescriptions.

Control alone will probably not be effective in reducing the demand for these drugs on the black market. Drugs of abuse obey the same rules of economic supply and demand as any other commodity. A decreased supply in face of a continued demand will increase the price. When the price becomes sufficiently high, industrious entrepreneurs will enter the field and new sources of supplies will be generated. In spite of this, the authors believe that the pharmaceutical industry must assume much more responsibility in the advertising and distribution of psychoactive drugs. The issue is not simply one of economics but rather of ethical responsibility on the part of drug manufacturers. It is ethically irresponsible for legitimate manufacturers of drugs to continue producing quantities as large as the market will bear with the knowledge that a large portion of their manufactured drugs actually is finding its way to the black market. The authors are of the opinion that the short-acting barbiturates could be removed from the medical market without in any way eliminating the clinician's ability to treat the disorders for which barbiturates usually are prescribed. Safer and more efficacious drugs such as flurazepam are available which could supplant barbiturates as hypnotics.

Faced with the limited amount of funds and resources, research and control efforts should be focused upon those drugs which present the greatest potential risk to the individual and society. Based on the risk to the individual and society, the dangers of marijuana are minimal compared with the risks associated with the abuse of amphetamines and barbiturates. Control of these substances is considerably more urgent and government control and law enforcement resources should be redistributed away from marijuana and toward amphetamines and barbiturates. (HSRI)

5 refs

KEYWORDS: Barbiturates. Stimulants. Review.

UM-72-E0024

CURRENT PERSPECTIVES ON COCAINE USE IN AMERICA, N.A. Eiswirth; D.E. Smith; D.R. Wesson, Journal of Psychedelic Drugs, v5 n2 p153-7 (Winter 1972)

This article presents a broad overview of cocaine. The history of the drug from its earliest use in the Incan civilization to its present day popularity in the United States is presented. Also discussed is the cocaine black market and the high doses used in America. Characteristics of high-dose cocaine "highs" are described, as well as those of low chronic use such as that of the coca leaf-chewing inhabitants of the Andean Mountains in South American. The article also describes the pharmacology of cocaine.

Treatment of cocaine which must be accomplished on a symptomatic basis is also discussed briefly. (HSRI)

21 refs

KEYWORDS: Local Anesthetics: cocaine. Stimulants: cocaine. Review. Review: Drug Use.

UM-72-E0025

AMPHETAMINE USE AND MISUSE WITH RECOMMENDATIONS FOR STIMULANT CONTROL POLICY. J.C. Kramer; R. Pinco. Journal of Psychedelic Drugs, v5 n2 p139-45 (Winter 1972)

This paper discusses the problems involved with both legitimate and illegitimate use of amphetamines, as well as recommendations for the solution of these problems. Amphetamine misuse is a dangerous and widespread problem. Excessive prescribing and diversion of up to one-third to one-half of the legally produced amphetamine into illicit channels have made amphetamines available to a wide range of ages. Only a small proportion of the prescribing is for purposes which can be considered fully warranted, such as for control of narcolepsy and hyperactivity in children.

One of the dangers inherent in amphetamine abuse is the drug's tendency to encourage violent behavior. Suspiciousness and hyperactivity produced by large doses of amphetamine may combine to induce precipitous and unwarranted behavior.

Governmental controls of amphetamine are discussed. The moderate government restrictions placed on practitioners in the 1960s proved so ineffective that public pressure intensified, and laws restricting production and distribution of the drug were legislated. In addition, most states have passed restrictive laws.

The authors suggest that, in order to supplement these laws, an effort should be made to more fully inform medical students and physicians about the real value and risks of amphetamines. Prescribing in quantities greater than one hundred should be avoided and dosage units should contain no more than five milligrams of amphetamine or methamphetamine per tablet or capsule. Tablet and capsule preparations containing small quantities of phenothiazines in combination with amphetamine should be carefully studied since it appears that such combinations may be less prone to abuse. In conclusion, voluntary action on the part of doctors and drug companies as well as restrictions on prescribing and manufacturers are needed to minimize accidental dependence and to cut off a major source of supply to the illicit market. (HSRI)

20 refs

KEYWORDS: Stimulants. Review. Review: Drug Use.

UM-72-E0026

AN ANALYSIS OF AMPHETAMINE TOXICITY AND PATTERNS OF USE. J.F.E. Shick; D.E. Smith; D.R. Wesson. Journal of Psychedelic Drugs, v5 n2 p113-30 (Winter 1972)

Presented here is a delineation of the differing patterns of amphetamine abuse, as well as a discussion of the possible toxic effects, both acute and chronic, attendent with these patterns. Amphetamine abuse continues to occur in the United States and is prevalent to an unassessed degree among the youth of the nation and older groups alike. Oral abuse of amphetamine preparations is more prevalent than intravenous abuse. Amphetamine is used in either an experimental, circumstantial-situational pattern or a compulsive pattern; and is used only occasionally recreationally. Amphetamines are also often used in attempts at self-treatment for an underlying disorder or a recent life crisis. Oral compulsive use is generally of a low-dose maintenance type, while intravenous abuse is presently in high-dose cyclical patterns. The great number of toxic effects, the high mortality rate, and the rapid progression to other drugs tend to limit the extended abuse of amphetamines intravenously. Persons are often initiated into amphetamine use by friends or by medical personnel who indiscriminately prescribe the drug for appetite suppression and for studying for exams.

Heroin and barbiturate experimentation is extensive in the speed scene and may be tried initially to counteract the subjective effects of the crash. Later, heroin may be preferred because its characteristic dreamlike state serves as an escape from the sufferings of speed abuse. Although the phrase "speed kills" does not apply to acute effects, deaths from violence, hepatitis, suicide, and psychotic behavior, all stemming from amphetamine abuse, as well as experimentation with other drugs, are daily occurrences.

Drug abusers tend to abuse any drug they use, and as the serious consequences of amphetamine abuse become generally known, many multiple drug abusers are turning to other drugs. Treatment for amphetamine dependence must be individualized, but enforced abstinence in a therapeutic hospital setting is often necessary to prevent early relapse during the acute abstinence phase and for the correct diagnosis of drug-free personality makeup. (AAM)

97 refs

KEYWORDS: Stimulants. Review. Review: Drug Use.

UM-77-E0027

THE DOWNER HEARINGS: A CURRENT PERSPECTIVE ON THE POLITICS OF BARBITURATES IN AMERICA. D.R. Wesson; D.E. Smith. Journal of Psychedelic Drugs, v5 n1 p45-8 (Fall 1972)

Summarized here is the testimony before the Senate Subcommittee to Investigate Juvenile Delinquency concerning barbiturate abuse. The testimony focused on four areas: (1) barbiturate use as an intoxicant; (2) barbiturate abuse patterns; (3) the source of supply of barbiturates; and (4) recommendations for positive steps in resolving some of the issues of barbiturate abuse.

Intoxication with barbiturates is similar to that seen with alcohol, and is usually accompanied by a high-spirited sense of well-being, medically referred to as "disinhibition euphoria". As with any drug experience, the subjective response depends upon the psychological make-up of the individual, the conditions under which the drug is taken, and the expectations of the user. Not all barbiturates have the same propensity to produce disinhibition euphoria.

There are three major patterns of barbiturate intoxication. Chronic intoxication involves individuals generally between thirty and fifty years of age who obtain the drugs legally. Episodic intoxication is seen most commonly in teenagers who take sufficient amounts orally to produce a "high". Intravenous barbiturate use is usually seen in young adults involved in the illegal drug culture.

The authors recommend steps which they feel would resolve some of the problems associated with barbiturate use: (1) As an aid in tracing the source and identifying the illegal distribution pattern, each manufacturer could be required to add a small amount of an inert substance to his product. (2) There should be increased federal regulation controlling the distribution and prescription of barbiturates. (3) Medical schools should revise their curricula to include courses in drug abuse. (4) Highway intoxication with barbiturates is as hazardous as intoxication with alcohol. If a person is suspected of driving under the influence of barbiturates , authority for blood tests for the drug should be available. (HSRI)

1 ref

KEYWORDS: Barbiturates. Review: Drug Use.

UM-69-E0028

TRAFFIC IN AMPHETAMINES: PATTERNS OF ILLEGAL MANUFACTURE AND DISTRIBUTION, R.C. Smith. Journal of Psychedelic Drugs, v2 n2 p20-4 (Spring 1969)

This paper describes patterns of illegal manufacture and distribution of amphetamines. Criminal traffic in commercially produced amphetamines has existed since the 1930s and remains unchecked today. As the legal penalties for manufacture of methamphetamine increase, the market place has become increasingly organized and formal in its method of operation. While many of the early speed chemists and high level distributors were themselves heavy users of speed, few individuals today in the upper level of the marketplace are users, although most of them are former users with numerous connections in the subculture of users.

Speed users tend to be from middle-class backgrounds and have few of the "hustling" skills required to support a compulsive drug habit. The general lack of skills which most speed users bring to the scene is exacerbated by the effect of the drug itself which makes traditional "hustles" difficult. As the speed scene diffuses outward, however, there is an increasing tendency for these relatively unsophisticated users to associate with more knowledgeable and skilled "hustlers". Following a period of apprenticeship, many speed users have learned to control their drug use and engage in fairly lucrative business. If this trend continues, it can be expected that violence related to the market place will decrease, while property and money crimes will increase. In short, the speed scene has begun to resemble that of heroin as it becomes increasingly criminalized. In many ways, law enforcement activities contribute greatly to the suspiciousness, paranoia, and violence which have in the past existed in the speed community. (HSRI)

0 refs

KEYWORDS: Stimulants. Review.

UM-69-E0029

AMPHETAMINE ABUSE IN NEW YORK CITY 1966 TO 1968, B.M. Angrist; S. Gershon, Journal of Psychedelic Drugs, v2 n2 p84-91 (Spring 1969)

The purpose of this report is to present data from sixty amphetamine-related admissions to Bellevue Psychiatric Hospital that occurred between the last months of 1966 and the end of 1968 (a twenty-two-month period). Demographic features, symptomatology and modes of presentation, characteristic features of the patients' past histories, use of other drugs, and characteristic life styles are examined. Data on the social, occupational, and sexual adjustment are specifically evaluated. An attempt was made to reevaluate the effects of amphetamine-taking that have emerged in other studies. The suggestions of an association between amphetamine abuse, criminality, and violence are also discussed.

The data obtained from these patients seem to indicate that in terms of both their acute and their long-term effects amphetamines are very dangerous. A definite association appears to exist between amphetamine use and psychiatric hospitalizations, occupational difficulties, severe pathology, and problems with the law. However, if one evaluates these data somewhat more critically, it becomes evident that this association does not necessarily mean a direct causal relationship. Behavior problems, truancy, and difficulties in maintaining orientation toward constructive application were prominent features of these patients' histories prior to amphetamine use, as were problems involving infractions of the law. Other features that deserve comment are the protean psychiatric manifestations observed in these patients. The classic paranoid or paranoid hallucinatory psychoses were observed in over half; however, symtom constellations chiefly characterized by emotional liability, depression, hallucinosis, manic-like behavior, assaultiveness, and barbiturate overdose were noted as well.

Whatever the preexisting pathology in these patients, it appears that once established, the abuse of amphetamine by these patients appears to be a chronic detrimental condition. (AAM)

32 refs

KEYWORDS: Stimulants. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-76-E0030

HEROIN ABUSE TRENDS IN LOS ANGELES COUNTY BETWEEN 1960 AND 1975, F.S. Tennant; J. Ruckle, Journal of Psychedelic Drugs, v8 n4 p291-8 (Oct-Dec 1976)

Reported here is the epidemiologic assessment of heroin abuse trends in Los Angeles County between 1960 and 1975. Several indirect epidemiologic indicators--heroin-related deaths, arrests, visits to hospital emergency rooms, court referrals to civil commitment and probation, hepatitis cases, admissions to heroin detoxification programs, and year of onset of heroin use in 1,003 persons seeking treatment--have been used to determine trends. These indicators, when used properly, can interpret indirect evidence of the heroin trend.

The results of this study indicate that heroin abuse steadily increased from 1960 to 1973. It does appear, however, that heroin abuse prevalence may have somewhat stabilized or even slightly decreased in 1973. The overall increase in prevalence does not appear to have become of epidemic proportions as predicted.

Indirect epidemiologic indicators of heroin abuse have been misinterpreted in the past. They are not precise determinants of heroin-use prevalence, and they should be appropriately analyzed. Data presented here indicate that it would be entirely possible to believe that heroin abuse was either significantly increasing or decreasing if data from only three or four years were analyzed. Several years must be examined in order to obtain the long-term trend. Indirect indicators should be given as a rate per 100,000 population rather than as absolute numbers in order to take into account changes in the population. Also, a variety of indirect indicators should be analyzed rather than one or two.

An obvious concern raised by this study is the effectiveness of current prevention, treatment, and law enforcement efforts. This study clearly shows that new heroin cases are being added to the population of addicts each year and that heroin control measures have not reversed a fifteen-year general trend. (HSRI)

11 refs

KEYWORDS: Opiates and Related Agents: heroin. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-75-E0031

DIAZEPAM USE BY PATIENTS IN A METHADONE PROGRAM--HOW SERIOUS A PROBLEM? G.E. Woody; J. Mintz; K. O'Hare; C.P. O'Brien; R.A. Greenstein; E. Hargrove. Journal of Psychedelic Drugs. v7 n4 p373-9 (Oct-Dec 1975)

This paper examines the issue of misuse and abuse of diazepam and reports on the patterns of diazepam use among patients. It discusses the frequency of use and relative degree of preference for diazepam as compared to other street drugs, the frequency with which certain complications result from diazepam use among patients, the relationship of these issues to demographic characteristics, and the possible significance of the findings.

Seventy-seven patients who were in methadone treatment at the Philadelphia VA Hospital were interviewed between November 1973 and January 1974. Results of the interviews show that diazepam is rapidly becoming a popular street drug. Twenty-nine percent of the patients had bought it on the street in the preceding month. More patients reported using it without a doctor's prescription than reported using either barbiturates or methaqualone. Forty percent of the patient sample was defined as "diazepam users", meaning they either mentioned diazepam as a favorite drug or reported buying it on the streets during the preceding month. Thirty-five percent of these patients also reported obtaining diazepam from physicians.

Exactly what proportion of this "diazepam use" represents misuse and abuse is uncertain. The findings are highly suggestive of a situation in which there is considerable diazepam abuse in many narcotic addicts. Use of diazepam, like that of marijuana and alcohol, was greater than would be expected from its preference rating alone. This may reflect its relative abundance as compared to the more tightly controlled narcotics, amphetamines, barbiturates, and methaqualones.

Given the facts of widespread diazepam use among people with proven addictive problems, its known potential for abuse, and evidence that considerable misuse and abuse may be occurring, the authors feel that tighter legal controls are necessary. (HSRI)

91 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-76-E0032

NONMEDICAL USE OF PSYCHOACTIVE SUBSTANCES. PART I: MAIN FINDINGS. H.I. Abelson; P.M. Fishburne. Princeton, New Jersey: Response Analysis Corporation (Sep 1976)

Presented here are the results of a nationwide survey of youth and adults concerning their attitudes toward nonmedical use of both legal and illicit drugs and their recreational use of twelve types of drugs: marijuana; hashish; inhalants; LSD and other hallucinogens: cocaine: heroin; methadone; opiates; sedatives; tranquilizers; stimulants; and over-the-counter preparations. Data were based on personal interviews with 2,590 adults and 986 young people conducted during the period January through April 1976.

Some of the major conclusions include the following: (1) Of all the psychoactive drugs studied, marijuana was the substance most frequently used. Among youth aged 12 to 17, more than one in five reported having used marijuana. (2) Drug use is strongly related to age. The 18 to 25 year group reported the highest level not only of marijuana, but of every psychoactive drug studied. (3) 8.1% of the 12 to 17 age group reported having used inhalants compared to 9.0% of those 18 to 25 and 1.9% of those 26 years and older. (4) Nonmedical use of psychotherapeutic drugs ranks second to marijuana use among both youth and adults. One in ten young people and one in seven adults reported having some nonmedical experience with over-the-counter or prescription sedatives, tranquilizers, or stimulants.

The survey also collected a great deal of demographic information about the drug user. This information is tabulated and compared to data collected in three previous studies. (HSRI)

118 pages 0 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: hashish. marijuana. Hallucinogens and Related Agents: lysergic acid diethylamide (LSD). Local Anesthetics: cocaine. Opiates and Related Agents: heroin. methadone. Stimulants: cocaine. Hallucinogens and Related Agents. Opiates and Related Agents. Other Toxicants. Sedatives and Hypnotic Agents. Stimulants. Tranquilizers. Volatile Solvents. Epidemiology: National Survey of Drug Use Patterns.

UM-74-E0033

ANXIETY OR CAFFEINISM: A DIAGNOSTIC DILEMMA, J.F. Greden, American Journal of Psychiatry, v131 n10 p1089-92 (Oct 1974)

This paper reviews the pharmacological and medical literature on the effects of caffeinism and presents three clinical case reports to emphasize that occasional recognition must be given to the use of coffee, tea, and other sources of caffeine in research, clinical evaluation, and routine treatment of anxious patients. The author reports that high intake of caffeine ("caffeinism") can produce symptoms that are indistinguishable from those of anxiety neurosis such as nervousness, irritability, tremulousness, occasional muscle twitching, insomnia, sensory disturbances, tachypnea, palpitations, flushing, arrhythmias, diuresis, and gastrointestinal disturbances. The caffeine withdrawal syndrome and the headache associated with it may also mimic anxiety. Patients with caffeinism will generally be identified only by routine inquiry into their caffeine intake. The psychiatrist should especially suspect caffeinism in patients who do not respond to psychopharmacological agents or who have psychophysiological complaints and recurrent headaches, in chronic coffee-drinking patients, and in hyperkinetic children. Three case reports illustrate the syndrome. (JA)

29 refs

KEYWORDS: Stimulants: caffeine. Review: Drug Effects. Review: Drug Use.

UM-77-E0034

ANXIETY, DEPRESSION AND CAFFEINISM AMONG PSYCHIATRIC INPATIENTS, J.F. Greden; P. Fontaine; M. Lubetsky; K. Chamberlain, American Psychiatric Association Meeting, 2-6 May 1977, Toronto, Ontario, Canada (1977)

The purpose of this study was to study average caffeine intake among a sample of psychiatric patients and to relate this data to psychiatric symptoms and rating scales in order to determine whether or not there would be a relationship between total caffeine intake and reported clinical symptoms or rating scores. Among eighty-three hospitalized adult psychiatric patients, 22% reported being high caffeine consumers (750 mg. or greater per day). When compared with moderate and low consumers, those with high caffeine intake scored significantly higher on the State-Trait Anxiety Index and on the Beck Depression Scale. High consumers also described significantly more clinical symptoms and felt that their physical health was not as good. They also reported greater use of sedative-hypnotics and minor tranquilizers.

Since caffeine modifies catecholamine levels, inhibits phosphodiesterase breakdown of cyclic AMP, and sensitizes receptor sites, associations of caffeinism with both anxiety and depression are possible. Caffeinism may be present among a large percentage of psychiatric patients with mixed anxiety-depression profiles. Such subjects will only be identified, however, by history taking. Without inquiry, there will be no diagnosis; without diagnosis, there will be no relief.

The authors conclude that, in view of their findings, caffeine should not be part of psychiatric treatment routines, for example, to reduce drowsiness from psychotropic medications. (AAM)

20 refs

KEYWORDS: Stimulants: caffeine. Clinical Study. Epidemiology: Regional or Local Survey of Drug Use Patterns. Experimentation: Dose-Effect Study. Psychological Testing.

UM-77-E0035

BARBITURATES: THEIR USE, MISUSE, AND ABUSE, D.R. Wesson; D.E. Smith, New York: Human Sciences Press (1977)

This book is a pragmatically oriented, clinical book focusing on the barbiturates--their current medical uses as well as their misuse and abuse. A great many important contributions to the literature on barbiturates scattered throughout the journals of anesthesia, psychiatry, drug abuse, pharmacology, and general medicine are reviewed or referenced. Case reports are critiqued in terms of the rationality of their conclusions. Experimental studies are evaluated in terms of methodology, statistical analysis, and conclusions. Included are classical studies, reports of new developments, and articles providing useful overviews of selected topics.

Although the bulk of this book is devoted to the physiological and medical aspects of barbiturate use and abuse, an attempt was made to develop a broad overview of the social, political, and economic aspects of the topic, making the information to be of value not only to medical students, physicians, and other health professionals, but also to social workers, psychologists, attorneys, and legislators in the field of drug abuse. The book also provides basic pharmacological information about barbiturates. It makes specific recommendations for medical treatment of the complications of barbiturate abuse and treatment techniques. It examines the availability and sources of drugs of abuse, the social and economic factors involved in drug abuse, and various patterns of barbiturate abuse. (HSRI)

144 pages 110 refs

KEYWORDS: Barbiturates. Review: Drug Effects. Review: Drug Use.

UM-77-E0036

DIMENSIONS OF MARIJUANA USE IN A MIDWEST CATHOLIC UNIVERSITY: SUBCULTURAL CONSIDERATIONS, D.L. Dodge, The International Journal of the Addictions, v12 n7 p971-81 (1977)

Reported here is a study that attempted to investigate the theory that acceptance of subcultural values determines whether college students choose to use marijuana. Theorists and researchers for over two decades have indicated repeatedly that marijuana use by college students has a subcultural base. Crucial here is the impact that the subculture has on its members' identities, values, attitudes, and belief patterns. While it may be true that not all members of a subculture evidence the same commitment to a subculture's attitudinal and normative patterns, nonetheless they share common patterns. The more an individual becomes involved the more he manifests these subcultural patterns. In this paper explorations of this subculture rationale are conducted utilizing a trichotomy of marijuana user types--consistent nonuser, systematic user, and heavy user.

A random sample of 134 was chosen from 6,400 undergraduate students of a private male Roman Catholic university located in a medium-sized metropolitan setting in the Midwest. Each subject answered an anonymous questionnaire designed to collect data on type and frequency of drug use; the respondent's values, attitudes, and beliefs concerning the personal consequences of marijuana use and the types of persons who use marijuana; the beliefs of the respondents regarding current law enforcement practices; whether or not marijuana should be legalized; and if legalized, what societal consequences this would have.

Results show that the relatively small number of noticeable differences between recreational users and heavy users provides only weak support for the suggestion that as one becomes more involved in a subculture, the more he tends to manifest the value, attitudinal, and behavior patterns that set that particular subculture apart from others. Moreover, there are sufficient numbers of reverse patterns from the expected between heavy and recreational users to further weaken this suggestion. Rather the results indicate that a threshold variable, that is, a certain magnitude, penetrance, or degree of involvement in the use of marijuana must be reached before striking differences occur. The findings lend support more to the theoretical notion of subculture intervention being a threshold variable than a continuum variable. (JAM)

12 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Review: Drug Use.

UM-77-E0037

PSYCHOLOGICAL, SOCIAL AND COGNITIVE CHARACTERISTICS OF HIGH-RISK DRIVERS: A PILOT STUDY, R.E. Mayer; J.R. Treat, Accident Analysis and Prevention, v9 n1 p1-8 (Mar 1977)

This paper attempts to identify the distinguishable and theoretically interesting characteristics of high risk drivers. It also provides information on four major theories of accident causation which are suggested in current literature: (1) the social maladjustment theory; (2) the personal maladjustment theory; (3) the impulse noncontrol theory; and (4) the information-processing defect theory. A battery of short tests and a questionnaire were administered to thirty eighteen- and nineteen year old college drivers who reported being involved in three or more accidents during the past three years, and to thirty drivers who had no accident history but were matched for age, sex, and exposure to driving. The higher accident group scored higher on measures of personal maladjustment, social maladjustment, and to a lesser extent on measures of impulsivity and information processing deficiency. A discriminant function based on data for forty-six drivers in the original sample was able to predict at 86% accuracy the group membership for seven additional high accident drivers and seven matched controls on the basis of the test scores.

Although the above study supports the theory that certain psychological, social, and cognitive factors may be related to accident involvement, the findings are limited by the fact that self-reports of a small, young sample were used. In order to overcome the problems inherent in self-reports and to expand and increase the subject pool, an analysis of 287 accident involved drivers using in-depth interviews was conducted. This study too, showed that drivers at fault were higher than controls in social and personal maladjustment. In addition, drivers committing alcohol, inattention, and human errors were more personally maladjusted than controls.

The fact that social maladjustment is higher in accident drivers than in controls suggests that a general sense of antisociability, negativism, and hostility is manifested in the driving situation. This theory contends that drivers lash out against society by intentionally engaging in risk-taking behavior and thus are engaged in accidents involving such factors as high speed. (JAM)

22 refs

KEYWORDS: Crash Investigation. Psychological Testing.

UM-77-E0038

PAIR-MATCHING--A REAPPRAISAL OF A POPULAR TECHNIQUE, S.M. McKinlay, Biometrics, v33 n4 p725-35 (Dec 1977)

This paper reviews some of the major advantages and disadvantages of pair-matching as it is generally used in medical investigations. Pair-matching is undoubtably one of the most popular techniques for controlling variation in both medical and other investigations involving human populations. Given the obvious advantages of the ease of implementation and comprehension, apparent efficiency, and simplicity of analysis, this popularity is understandable.

Despite this appeal, however, pair-matching frequently involves high cost (particularly in the loss of unmatchable units), cannot claim efficiency when appropriate comparisons of precision are made, and suffers some important limitations in the analysis which directly affect inference. The persistence of the technique in the face of these limitations is discussed with reference to the disjunction between theoretical models and practical research constraints. It is concluded that this design may not be the optimal choice in many, if not most, research situations. (JAM)

40 refs

KEYWORDS: Review: Behavioral Research Methodology. Review: Survey Methodology.

UM-77-E0039

STREET-DRUGS IN THE UNITED STATES: SIMILARITIES AND DIFFERENCES. AN UPDATE, J.K. Brown; D. Eskes, First International Action Conference on Substance Abuse, 9-13 Nov 1977, Phoenix, Arizona (1977)

Presented here is a comparison of the composition and availability of the more popular illicit drugs available in the street markets of the Netherlands, Germany, and the United States. Analyses of thousands of street drugs collected in the Netherlands, Germany, and the United States have shown that alleged LSD samples usually do contain LSD with the amount of LSD per dose varying widely. Alleged mescaline-containing samples frequently rely on LSD for activity. Psilocybin generally was not available but the ubiquitous LSD was substituted for it. The substituted amphetamines such as MDA,

DOM, STP, DOB, MMDA are available in the United States but are not seen in Europe. Pure THC has never been identified in a street sample; most frequently the tranquilizer-anesthetic PCP is the active ingredient. The use and availability of PCP seems to be restricted to North America, the United States in particular.

Hashish is common in Europe and marijuana is more common in the United States but the availability of hashish in the United States seems to be increasing. The quality of material alleged to be amphetamine in the United States has decreased dramatically. The quality of amphetamine and methamphetamine in Europe is usually quite good.

Cocaine and cocaine-local anesthetic mixtures may be more common in the United States than in Europe, but there is evidence that cocaine is now more popular and available in Europe. The increased number of cocaine and cocaine-local anesthetic samples seen in the forensic laboratory would tend to substantiate this impression. The greatest international differences are found in regard to street-heroin. Heroin in the United States contains 5-10% of the drug with small amounts of quinine or procaine. Heroin in Europe contains 40-50% of the drug with 50-60% caffeine and a small amount of strychnine (0.5-5%). The American heroin user would have serious medical problems (overdose) if he used the much more potent European heroin preparation (AAM)

23 pages 48 refs

KEYWORDS: Epidemiology: National Survey of Drug Use Patterns.

UM-78-E0040

STREET DRUGS 1977: CHANGING PATTERNS OF RECREATIONAL USE, R.K. Siegal, Drug Abuse and Alcoholism Review, v1 n1 p1,3-13 (Jan/Feb 1978)

The present report reviews the subject of street drugs in terms of sources of information, mythology and folklore governing street drug use, patterns of use with particular reference to the most prevalent drugs, new trends, and prediction of future street drugs and their patterns of use.

Sources of information concerning street drugs include DAWN (Drug Abuse Warning Network), street drug analysis laboratories, the alternative or underground press, and medical-scientific literature. From these sources one can obtain information on sources of drugs, quality, new drugs, and trends in popularity.

A number of myths and beliefs have sprung up around the drug culture, generated by both prodrug and antidrug groups. A strong belief persists that organic drugs are better for the user's health than synthetic drugs. Others believe that drugs can be divided into two types -- "mind drugs" and body drugs. Two of the most dangerous myths are (1) that the best information about street drugs is from the users themselves; and (2) that "dope is getting better and better on the street and most of the cuts won't hurt you". These myths are discussed in terms of their significance and truth.

Specific drug patterns and trends are discussed for amphetamine, methamphetamine, barbiturates, cannabis and derivatives, cocaine, heroin and other opiates, LSD, mescaline, psilocybin, MDA, methaqualone, and phencyclidine. For each drug, information is provided concerning its first occurrence on the street, popularity, quality, ingredients, cost, and effects.

The most dramatic new trend is the increase in the street use of cocaine. The authors believe that the use of cocaine and intranasal drugs will increase in the future. Also, herbal preparations will be more widespread as will substitutes for controlled substances. Psilocybin will probably become the most common street hallucinogen other than marijuana. PCP use will escalate, due to its low cost. New exotic psychedelics will appear. At the same time, street drug users will become more informed and adverse reactions will decrease. (HSRI)

42 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Hallucinogens and Related Agents: mescaline. methylenedioxyamphetamine (MDA). phencyclidine. Local Anesthetics: cocaine. Nonbarbiturates: methaqualone. Opiates and Related Agents: heroin. Stimulants: cocaine. methamphetamine. Barbiturates. Stimulants. Review: Drug Use.

UM-78-E0041

HIGHLIGHTS FROM THE NATIONAL SURVEY ON DRUG ABUSE: 1977. J.D. Miller; I.H. Cisin; A.V. Harrell (Jan 1978)

This report is intended primarily to provide interested persons with estimates of levels of illicit drug use in the United States. It contains highlights of the larger more extensive National Survey on Drug Abuse: 1977. The report focuses on five major illicit drugs or drug classes: marijuana and hashish; cocaine; hallucinogens; heroin; and other opiates. In addition, data on the use of inhalants (including glue, gasoline, and other substances), alcohol and cigarettes, and the nonmedical use of psychotherapeutic drugs are summarized.

A sample of 4,594 respondents, aged twelve years and older, randomly selected from the household population of the contiguous United States, provided the basis for this survey. Respondents were interviewed early in 1977. Throughout the report, data are presented separately for three population groups: youth aged 12 to 17; young adults aged 18 to 25; and older adults aged 26 or over.

Estimates of lifetime experience with and current use of individual drugs or drug classes, based on the 1977 study, are reported along with an analysis of patterns of illicit drugs. Changes or trends in the use of marijuana and stronger drugs over the past fifteen years are also described (using trend analyses based in part on reconstructed data). The report concludes with an examination of the present social climate of illicit drug use and discusses the changes in social climate that have accompanied increases in illicit drug use over the past fifteen years. The social climate indicators are based on respondent reports of encounters with illicit drugs. (HSRI)

36 pages 1 ref

National Institute on Drug Abuse 271-76-3324

KEYWORDS: Cannabis Sativa L. and Related Agents: hashish. marijuana. Local Anesthetics: cocaine. Opiates and Related Agents: heroin. Stimulants: cocaine. Hallucinogens and Related Agents. Opiates and Related Agents. Epidemiology: National Survey of Drug Use Patterns.

UM-78-E0042

NATIONAL SURVEY ON DRUG ABUSE: 1977. A NATIONWIDE STUDY--YOUTH, YOUNG ADULTS, AND OLDER ADULTS VOLUME I: MAIN FINDINGS, H.I. Abelson; P.M. Fishburne; I. Cisin (1978)

This survey was designed to assist the National Institute on Drug Abuse in achieving one of its basic research missions: the nationwide monitoring of the extent of illicit drug use. The findings from this survey are expressed in statistical terms and form an empirical basis for program and policy formulation at the Federal level. They also provide data for use by professionals in the drug abuse field and for other concerned Americans.

The report focuses on five major illicit drugs or drug classes: marijuana and hashish; cocaine; hallucinogens; heroin; and other opiates. In addition, data on the use of inhalants (including glue, gasoline, and other substances), alcohol and cigarettes, and the nonmedical use of psychotherapeutic drugs are summarized.

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0 refs

National Institute on Drug Abuse DHEW (ADM) publication no. 78-618

KEYWORDS: Cannabis Sativa L. and Related Agents: hashish. marijuana. Local Anesthetics: cocaine. Opiates and Related Agents: heroin. Stimulants: cocaine. Hallucinogens and

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Stimulants: caffeine. Hallucinogens and Related Agents. Stimulants. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0047

THE NATIONAL ACCIDENT SAMPLING SYSTEM--A STATUS REPORT, C.J. Kahane; J.C. Fell; R.A. Smith, American Association for Automotive Medicine. 21st Conference. Proceedings, D.F. Huelke, ed., p412-34, Morton Grove, Illinois: A.A.A.M. (1977)

This paper describes the objectives and philosophy of the National Accident Sampling System (NASS), an ambitious project of the NHTSA to improve the accident data base for the traffic and highway safety community. In terms of data quantity and quality it is substantially greater than past efforts. Implementation of the system has begun, including the first establishment of randomly selected accident data collection sites. The complete system is not expected to be operational before 1982. This system consists of between thirty-five to sixty small teams of accident investigators who will collect and analyze accident data for selected counties across the U.S.

Objectives of the system are discussed in detail, including the production of national statistics and the planning needed to take advantage of NASS in countermeasure evaluation. The underlying design philosophy for NASS is also discussed. Misconceptions that have arisen in the design stages of the system are identified and explained.

It is emphasized in this report that NASS will not be effective without close cooperation and planning between analysts who require highway safety field data and those who are responsible for designing, implementing, and operating the system. While every data need may not be met through NASS, its success will establish a highly useful detailed data base that is truly national in character. Furthermore, its statistical character will permit actual sampling errors to be computed for such national statistics. (AAM)

9 refs

KEYWORDS: Crash Investigation.

UM-77-E0048

PATTERNS OF DRUG ABUSE: RELATIONSHIPS WITH ETHNICITY, SENSATION SEEKING, AND ANXIETY, E. Kaestner; L. Rosen; P. Appel, Journal of Consulting and Clinical Psychology, v45 n3 p462-8 (1977)

The purpose of this study was to investigate the relationships of ethnicity and motivational variables with the numbers and types of drugs used by a sample of narcotics abusers. The Sensation-Seeking Scale and the State Trait Anxiety Inventory were administered to thirty white, thirty black, and thirty Hispanic male narcotic drug abusers in residential treatment. Individual drug abuse histories were assessed in semistructured interviews.

The results indicate the following: (a) White subjects scored significantly higher on the five sensation-seeking subscales than did either black or Hispanic subjects. No significant differences were obtained between ethnic groups on state or trait anxiety. (b) Even though the prevalence of the use of alcohol, cannabis, street methadone, and cocaine was similar in the three ethnic groups, significantly more white subjects had used amphetamines, barbiturates, tranquilizers, methaqualone, inhalants, and psychedelics. (c) Measures of sensation seeking and anxiety correlated significantly with the number of different drugs used by whites, although the measures were virtually unrelated to drug use among nonwhites. The frequency of use of stimulant, depressant, or hallucinogenic drugs was unrelated to the user's level of sensation seeking or anxiety. Among individuals with extensive histories of drug abuse, ethnicity appeared to be more closely related to drug use patterns than motivational variables such as sensation seeking and anxiety. (JA)

8 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-74-E0049

TRENDS IN DRUG USE AMONG METROPOLITAN TORONTO HIGH SCHOOL STUDENTS: 1968-1974, R.G. Smart; D. Fejer; D. Smith; W.J. White, Toronto, Canada: Addiction Research Foundation of Ontario (1974)

Data from earlier surveys (1968 and 1970) indicated a dramatic increase in the use of alcohol, marijuana, barbiturates, LSD, and other hallucinogens among young people. Among metropolitan Toronto students, however, between 1970 and 1972, the use of illicit drugs appeared to stabilize. This 1974 study attempted to assess whether this relative stabilization continued into 1974 or whether new patterns of drug use had emerged. It also attempted to determine the prevalence of use of various drugs by students in grades 7,9,11, and 13; to measure changes in drug use over the past six years; to investigate the relationships among drug use, social, and demographic characteristics; and to observe any changes which have occurred in these relationships over time.

A total of 3,479 students in grades 7,9,11, and 13 completed the questionnaire. Results indicate that drug use in metropolitan Toronto has not markedly changed among high school students since 1972. The decline in tobacco use from 38.3 to 33.7% is encouraging and may be a reflection of the impact of various antismoking campaigns. Declines in LSD and other hallucinogen use are evident, perhaps due to educational efforts. Alcohol and marijuana use continue to increase. It now appears that 73% of all students in grades 7,9,11, and 13 use alcohol. Use of opiates, speed, stimulants, barbiturates, and solvents other than glue has remained relatively unchanged in the past two years. The authors conclude that the use of many drugs in the Toronto area appears to have reached a plateau over the past four years. Use of alcohol and marijuana, however, does not appear to be leveling off for the student group. Future educational programs, therefore, should focus more heavily on these two drugs. (HSRI)

15 pages 0 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Ganglionic Blocking and Stimulating Agents: nicotine. Hallucinogens and Related Agents: lysergic acid diethylamide (LSD). Nonbarbiturates: ethanol (ethyl alcohol). Other Toxicants: glue (model builder's). Stimulants: nicotine. Unclassified Agents: tobacco. Barbiturates. Hallucinogens and Related Agents. Opiates and Related Agents. Other Toxicants. Stimulants. Tranquilizers. Volatile Solvents. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0050

ALCOHOL AND DRUG USE AMONG ONTARIO STUDENTS IN 1977, R.G. Smart; M.S. Goodstadt; I.J. Sone, Toronto, Canada: Addiction Research Foundation of Ontario (1977)

The purpose of this study was to determine: (1) the extent to which various drugs were used by students in Grades 5 to 13 across the province of Ontario; (2) the availability of various drugs; (3) the differences in use and availability among various age groups and among various social groups; and (4) the extent of exposure to alcohol and drug education programs in the schools and student attitudes to them. In order to do this, 5,862 students from 104 schools in grades 5, 7, 9, 11, and 13 completed a questionnaire concerning their use of and attitudes toward specific drugs.

Results showed that alcohol was used by 81.9% of the students from grades 7 to 13. The next most popular drugs were tobacco and cannabis, used by 48.6% and 25.1% of the students respectively in the past year. Illicit drugs such as heroin (1.9%), speed (2.7%), and cocaine (3.8%) were used by the smallest numbers of students. Psychoactive drugs were differentiated as to whether they were taken on a prescription basis or not. Far more students used tranquilizers and barbiturates on a prescription than on a nonprescription basis. However, with stimulants the proportions of prescription and nonprescription users were more similar. This perhaps reflects the difficulty of obtaining stimulants by prescription.

Users of most drugs used them frequently in the previous year. The majority of users of glue, solvents, heroin, speed, psychoactive drugs, and illicit drugs reported using them only once or twice. However, use of alcohol, cannabis, and tobacco was much more frequent among users.

The report also provides information and tables pertaining to drug use by age, by sex, by grade, by grade average, by father's occupation, by mother's occupation, and by region. (HSRI)

19 pages 3 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0051

THE EVOLUTION OF NON-MEDICAL OPIATE USE IN CANADA--PART I 1870-1929, R. Solomon; T. Madison, Drug Forum, v5 n3 p237-65 (1976-77)

Presented here is the historical account of nonmedical opiate use in Canada. Canada's first criminal prohibitions against nonmedical opiate use were directed against the Chinese and were initiated by influential moral reformers. Prior to 1908, no legal restrictions were imposed on the sale or consumption of opiates for either medical or pleasurable purposes. Before this time thousands of pounds of crude opium and large quantities of other opiates were imported annually to supply the Chinese opium factories of British Columbia which produced smoking opium and the pharmaceutical companies which produced a variety of opium-based products. Opiates were freely prescribed by doctors and were readily available in pharmacies at low prices with or without prescriptions. Opiate dependence was regarded as a personal misfortune, not as a crime or indication of psychological disturbance.

However, the public attitude changed with the spread of the California-based anti-Asiatic movement and the advent of moral reform. The drug user's public image was changed from that of a morally weak, but otherwise harmless character, to that of a dangerous, fiendish criminal. This change preceded the enactment of greater police powers, decreased rights for the accused, and harsher penalty provisions. The Royal Canadian Mounted Police were eventually given responsibility for enforcing drug laws and became a powerful ally of the reformers. Concern for the effectiveness of law enforcement was added to the preservation of Christian morality as a justification for these measures. (JAM)

52 refs

KEYWORDS: Opiates and Related Agents. Review.

UM-77-E0052

THE EVOLUTION OF NON-MEDICAL OPIATE USE IN CANADA--PART II 1930-1970, R. Solomon, Drug Forum, v6 n1 p1-25 (1977-78)

Continued here is the historical account of the nonmedical use of opiates in Canada. Between 1930 and 1950, illegal drug use was an insignificant public issue. During the early 1950s, even though the known addict population of Canada was decreasing, public concern rose sharply following sensationalized accounts of spiralling addiction in American east coast ghettos. A special Canadian Senate committee was established. Their findings led to the enactment of the 1961 Narcotic Control Act, which consolidated earlier amendments and strengthened the penalty provisions. The sharp increase in hallucinogenic drug use among Canadian youth and increasing heroin addiction in the United States during the late 1960s prompted the formation of a Canadian Royal Commission to study all aspects of nonmedical drug use. Despite the tougher laws and greater enforcement resources, heroin use in Canada grew steadily from the mid-1950s onwards. This increase, however, was not as dramatic as the increase in the United States. Heroin use is currently spreading out from the major urban centers to small cities and towns. Heroin trade is no longer confined to the downtown core as in the past. (JAM)

36 refs

KEYWORDS: Opiates and Related Agents: heroin. Opiates and Related Agents. Review.

UM-78-E0053

TOXICOLOGY TEST-ORDERING PATTERNS IN A LARGE URBAN GENERAL HOSPITAL DURING FIVE YEARS: AN UPDATE, C.B. Walberg; V.A. Pantlik; G.D. Lundberg, Clinical Chemistry, v24 n3 p507-11 (Mar 1978)

Analytical data from the clinical toxicology laboratory of a large urban hospital, the Los Angeles County-University of Southern California Medical Center, are reported for the year 1976 and are compared to similar data previously documented for the year 1972. This was done in order to assess the evolution and stability of this organizational approach, as well as to determine any shifts in patterns of drug use and detection. Drugs assayed, number of tests requested, and number of positive results are collated.

Total workload increased by 75% and the number of patients for whom some toxicologic assay was requested doubled in spite of a decrease in the number of patients admitted to the hospital during this five-year period. The data show that assays for some socially and clinically significant drugs such as ethanol, diazepam, tricyclics, and phencyclidine increased disproportionally while others remained relatively constant or even decreased.

The growing use of the toxicology service may be attributed in part to increased physician awareness of and confidence in rapid and reliable service, in part to changing patterns of inpatient population, in part to generally increasing reliance upon laboratory testing, and in part to pattern shifts in drug use by the general population. The patterns of drug use as reflected in drugs found in patients admitted to this medical center show definite changes in some areas and very little change in others during these five years. (JAM)

7 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0054

PREVALENCE, SOURCES AND USES OF TRANQUILIZERS AMONG COLLEGE STUDENTS, R.A. Kleinknecht; J. Smith-Scott, Journal of Drug Education, v7 n3 p249-57 (1977)

The purposes of this study were (1) to investigate the prevalence and use characteristics of tranquilizers among a college population; and (2) to investigate whether there was a relationship between student use of tranquilizers and parental use of psychoactive drugs. One hundred fifty-seven male (mean age 21.89) and 187 females (mean age 20.38) served as subjects in the present survey. Each subject was required to fill out a questionnaire asking whether and which tranquilizers had been used within the past year or used ever, the purposes for which they were used, sources of acquisition, effects reported, activities engaged in while taking the drugs, frequency of use, and reported parental use of tranquilizers.

Among those who acquired tranquilizers by their own prescription, the vast majority used them for medically indicated purposes, while those who acquired them from others' prescriptions or from black market sources tended to use them for pleasure or to get high. The most frequently cited nonprescription sources were from mothers for females and from friends for males. One-half of male users and one-fourth of female users reported driving while taking the drugs and nearly half (48%) of the male users reported combining alcohol with tranquilizers.

The hypothesis suggesting that parental use serves as a model for students' use was clearly supported by this study. Students were twice as likely to use tranquilizers if their parents used them than if parents did not use them. This study indicates that not only do parents provide models of use, but that in many cases, especially mothers, they also provide the means of mood-modification. (HSRI)

10 refs

KEYWORDS: Tranquilizers. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0055

PSEUDOEPIDEMICS OF HEROIN ADDICTION, A. Richman; H. Abbey, Drug and Alcohol Dependence, v2 n4 p221-37 (1977)

This paper focuses on the distribution of year of onset among groups of treated heroin addicts. Problems in the nature of these data, the methods used for their analysis, and the assumptions associated with these methods are discussed; the production of "epidemic-like" distribution without changes in onset is detailed.

Smooth unimodel skewed distributions, sometimes referred to as "epidemic-like" curves, are often used as evidence of time-to-time changes in incidence. Data on the year of onset from groups of treated heroin addicts are generally alleged to reflect incidence, and this distribution is used to evaluate effectiveness and predict future needs.

The development of simple demographic models that demonstrate the production of epidemic-like curves without changes in incidence, ascertainment, or duration of disorder is described. These graphic models are relevant to other noninfectious

disorders where there is continuing exposure to the etiologic agents and where intervals between onset and ascertainment are not uniformly distributed. (AAM)

0 refs

KEYWORDS: Opiates and Related Agents: heroin. Review: Survey Methodology.

UM-77-E0056

DYNAMICS OF DRUG USE, J.H. Rollins; R.H. Holden. Journal of Drug Education, v7 n3 p231-6 (1977-78)

This paper analyzes data from interviews with 167 individuals who were using illegal drugs or abusing legal drugs. The in-depth interviews were undertaken in an attempt to answer questions about family life, the initial use of drugs, the chronology of drug use, and the types of drugs used, as well as attempts at rehabilitation and degree of success of that rehabilitation for the individual cases studied.

The subjects ranged in age from thirteen to sixty years with a median age of twenty-two. Results indicated that more than one-third of the sample came from homes in which the father was absent. One particularly striking finding relating to birth order was that many of the subjects were later-borns from large families. The age of first drug experience ranged from nine to twenty-five with the median age sixteen. The drug most often tried first was marijuana. Drug taking was found to be primarily a social experience. Only 24 subjects said that they usually take drugs alone. The majority reported positive effects during their first drug experience. Typically, the initial drug use involved marijuana or alcohol and progressed to other substances. The great majority (122) of the sample at one time or many times has tried to stop using drugs.

It is clear from these cases that prevention needs to be conceptualized on a much broader basis than arresting pushers and drug users. Prevention measures must deal with the personal problems which originate in the weakening ties of home and family in contemporary life. (HSRI)

5 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-78-E0057

SUBSTANCE ABUSE AMONG MICHIGAN'S SENIOR CITIZENS: CURRENT ISSUES AND FUTURE DIRECTIONS, Lansing, Michigan: Michigan Office of Services to the Aging (Aug 1978)

This paper investigates the nature and extent of problems with alcohol and other drugs among Michigan citizens over the age of sixty, and makes recommendations for changes in programs and policies to solve these problems. A variety of problems with alcohol, prescription drugs, and over-the-counter medications affects a significant proportion of Michigan's citizens aged sixty years and older. Seven percent of the senior citizens interviewed reported having five or more drinks every day, which is considered heavy alcohol consumption. Over one-quarter of the seniors interviewed said they knew other seniors who had medication problems. About two-thirds of the health care professionals saw prescription drug problems in over 20% of their senior clients. Other kinds of problems with prescription medications include sharing prescriptions with friends, difficulty in opening safety closures, difficulty in reading or understanding label directions, difficulty in remembering when to take prescriptions, and side effects impairing driving ability. Overuse of over-the-counter preparations is another major problem.

Seniors are especially at risk for these problems because of the many crises accompanying aging: death of a spouse or friend, illness, and lowered income all contribute to the possibility of emotional problems. In addition, a number of changes take place in the body as it ages that significantly influence the pharmacological effects of alcohol and other drugs, making the elderly more likely to suffer side effects or adverse drug reactions. The fact that seniors use so many types and combinations of drugs both to treat disease and for pleasure increases their risk for experiencing interactional problems. Seniors' lack of knowledge about medications and the lack of coordination of senior health care on the part of health personnel exacerbate the problem.

In order to deal with these problems, the Task Force proposes twenty recommendations in six areas of need. These recommendations are examined in detail in this report. The

rationale and suggested implementation for each is discussed. The six areas of need are program development; needs assessment and evaluation; public information; training of health care providers; monitoring and regulation of medication use; and accessibility to services. (HSRI)

Seniors and Substance Abuse Task Force

41 pages 0 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0058

RECORDING OF DRUG PRESCRIPTIONS IN THE COUNTY OF JAMTLAND, SWEDEN. I. METHODOLOGICAL ASPECTS, G. Boethius; F. Wiman, European Journal of Clinical Pharmacology, v12 p31-5 (1977)

Prescribed drugs dispensed to 13% (17,000) of the inhabitants in the county of Jamtland, Sweden have been continuously recorded since 1970. Individual patients in the investigation are fully indentifiable by their identity number as used in Sweden; therefore patients exposed to a particular drug or group of drugs can be reached subsequently for such things as studies of the incidence and nature of side effects. This paper describes the methodology involved in this program and potential use of this data.

The following information is coded at the local pharmacies:prescribing physician; dispensing pharmacy; year and week of dispensation; name, amount, and price of drug; dosage; and type of prescription record. In a five-year period the rate of prescriptions not recorded decreased from 9% in 1970 to 4% in 1974. Every year at least one drug is prescribed for approximately 60% of the population. During the five-year period 74% of the male and 80% of the female population purchased prescription drugs. The representative nature of the data is discussed as well as their value in detection of drug abuse and ascertaining any particular patient's drug history. (JA)

12 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0059

PURCHASES OF HYPNOTICS, SEDATIVES AND MINOR TRANQUILLIZERS AMONG 2,566 INDIVIDUALS IN THE COUNTY OF JAMTLAND, SWEDEN. A SIX-YEAR FOLLOW-UP, G. Boethius; E. Westerholm, Acta psychiatrica scandinavica, v56 p147-59 (1977)

The purpose of this investigation was to study the purchase pattern of psychotropic drugs among individuals who five years earlier had obtained hypnotics, sedatives, and minor tranquilizers on prescription. Data from a continuous recording of drug prescriptions to 16,600 individuals in the county of Jamtland, Sweden revealed that 2,566 patients (15.5%) obtained prescriptions for hypnotics, sedatives, and minor tranquilizers in 1970. Occasional use (one purchase only) was seen in 7.4% of the population, and intermediate use (two to six purchases) in 6.9%, whereas only 1.2% were regular users (seven purchases or more). For each group there was five years later a highly significant intraindividual reduction in the purchases of these drugs as well as of other psychotropic drugs. In all groups, 10-23% had increased their purchases, most of them insignificantly. Fifteen of the thirty patients with a marked increase in consumption developed a regular purchase pattern, but signs of overuse or abuse were seen in only four persons. During the studied period the benzodiazepines increased their share of the total from 45 to 60%. Antihistamines also increased in all groups while the proportion of barbiturates and combined preparations decreased markedly. (JAM)

10 refs

KEYWORDS: Sedatives and Hypnotic Agents. Tranquilizers. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-76-E0060

RISK-TAKING AND DRUG DEPENDENCE. G. Booth; M. Gossop. British Journal of Addiction. v71 n3 p269-74 (1976)

This study attempted to investigate differences in risk-taking between two types of drug abusers--those who inject, and those who use drugs orally. Intravenous drug users are commonly thought to be at greater risk in terms of infections and to be more deviant than other drug users. Twenty-three subjects (twenty males and three females) who were intravenous users and eighteen who were oral users (ten males and eight females) ranging in age from 16 to 35 years were administered three questionnaires to determine their risk-taking behavior in several areas of behavior.

Results indicate that on the three questionnaires no overall differences in risk-taking propensity between oral and intravenous users of drugs were shown. Also, no overall sex differences were found which reached statistical significance. It was found that risk-taking declines with age.

It appears that while groups do not differ with respect to risk-taking over a wide variety of situations, oral users take significantly more risks regarding money than intravenous users. Thus the results suggest that what differences do exist in risk-taking between oral and intravenous users are in the opposite direction than that which is commonly believed, i.e., oral users take more risks than intravenous users. (HSRI)

17 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-78-E0061

PATTERNS OF NEW DRUG DETECTION IN THE DRUG ABUSE WARNING NETWORK. R.L. Retka. British Journal of Addiction. v73 n2 p155-65 (Jun 1978)

The structure of the Drug Abuse Warning Network (DAWN), a broadly based system designed to collect information on drug-related deaths and medical emergencies, is described. Likely reporting patterns for various drugs and methodology for monitoring the appearance of "new" drugs of abuse are also described. The methodology involves the calculation of the number of days between the first and fiftieth reports of a drug to DAWN. The value resulting for each drug is considered its "Emergence Index" (EI). A table is presented comparing EI's for drugs reaching their fiftieth mentions in successive months to detect those substances displaying unusual initial activity patterns. The five most mentioned drugs are heroin, marijuana, diazepam, "drug unknown", and alcohol.

A review of initial drug activity patterns presented above is reassuring in that there appear to be very few truly "new" serious problem drugs emerging. However, this conclusion must be tempered by the realization that the present analysis combined data from all regions of the country. Drugs well known in one part of the country could emerge as problem drugs in another area quite rapidly. (JAM)

2 refs

KEYWORDS: Epidemiology: National Survey of Drug Use Patterns. Review: Survey Methodology.

UM-78-E0062

THE VALIDITY OF REPORTED DRUG USE: THE RANDOMIZED RESPONSE TECHNIQUE. M.S. Goodstadt; G. Cook; V. Gruson. The International Journal of the Addictions. v13 n3 p359-67 (Apr 1978)

A working outline is provided of the "randomized response model" which offers an alternative indirect procedure for obtaining estimates of drug use. This technique may offer a more valid estimate of drug use by overcoming some of the tendency to understate drug use. The randomized response technique allows greater anonymity, encouraging respondents to answer questionnaires more honestly. The procedure presents a person with alternative questions. Only one answer is given, anonymously, and without revealing the question to which it refers. Essential to this technique is prior knowledge of the probability of selecting either question for response.

Approximately eight hundred high school students (aged 15-19) received randomly assigned sets of questionnaires. A significantly larger proportion of persons failed to complete the drug-use question when asked in a traditional direct fashion than when the randomized response procedure was used. With only one exception (hallucinogen use), mean reported drug use was significantly greater when the randomized response procedures were employed then when direct questioning was used.

The present study therefore demonstrates the viability and utility of employing the randomized response technique to obtain estimates of drug use. The results also showed a significant tendency for persons to underreport their drug use when standard direct procedures are utilized, raising serious questions concerning the validity of results from the many surveys and studies which have failed to investigate or check the validity of their findings. (HSRI)

11 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns. Review: Survey Methodology.

UM-79-E0063

DETERRENCE OF METHAQUALONE ABUSE THROUGH MASS URINALYSIS, E. K. Jeffer, International Journal of the Addictions, v14 n3 p445-50 (1979)

This paper reports the effect of mass urinalysis programs on methaqualone abuse. A temporary court-ordered cessation of U.S. Army urine testing programs in Europe and the widespread abuse of Mandrax(R), a detectable methaqualone-containing drug, provided this opportunity. The suspension was in effect from June 1974 until February 1975. During this period, reported cases of Mandrax(R) abuse increased. However, at the end of the suspension period when urinalysis was resumed, a sharp decrease in cases of Mandrax(R) was observed. The author concludes from these results that in this instance, urinalysis, or threat of detection, acted to deter usage of Mandrax(R). (HSRI)

3 refs

KEYWORDS: Nonbarbiturates: methaqualone. Sedatives and Hypnotic Agents: Mandrax(R) (methaqualone + diphenhydramine). Countermeasure Development, Testing, and Evaluation. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-75-E0064

STRESS-SEEKING AND HALLUCINOGENIC DRUG USAGE, R.A. Bogg, Canadian Journal of Public Health, v66 n5 p369-73 (Oct 1975)

Hallucinogenic drug usage by young persons has frequently been viewed as a "cop-out" from the stresses of modern life. This paper explores the opposite possibility--that drug usage is actually stress-seeking, and that fear and physical discomfort is an acceptable if not desirable part of the experience.

One hundred ninety-five middle class students from a technical institute in Alberta were given a questionnaire which was designed to assess feelings toward activities with stress-seeking possibilities as well as actual and hypothetical drug-taking. Stressful activities included skiing, attending a rock festival, speeding, and hitchhiking. The data showed a strong correlation between participating in stressful activities and using certain popular hallucinogenic drugs. In both types of activities it would appear that the user experiences fear and the exhilaration of overcoming it, as well as increased visual, auditory, tactile, oral, or nasal inputs, and some discomfort or even pain. Thus it appears that the traditional view of the young drug abuser as attempting to escape stress must be questioned. (HSRI)

10 refs

KEYWORDS: Hallucinogens and Related Agents. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0065

DRUG INFORMATION SOURCE CREDIBILITY AMONG JUNIOR AND SENIOR HIGH SCHOOL YOUTHS, R. Dembo; J. Schmeidler; D.V. Babst; D.S. Lipton, American Journal of Drug and Alcohol Abuse, v4 n1 p43-54 (1977)

In order to perform the job of drug education properly, it is necessary to learn what sources of information on drugs are regarded as credible by the members of various target audiences. This study attempts to determine the credibility of various drug information sources among a cross-section of respondents. It also attempts to learn how belief in these sources relates to an individual's demographic and drug use characteristics.

The study is based on the responses of a representative sample of 8,553 seventh through twelfth grade students from 102 New York State public schools. A ten-page questionnaire was used to obtain information regarding the students' backgrounds; drug use; family and social relationships; their awareness of and reactions to drug education and prevention programs; and their opinion of various drug information and treatment sources. The results showed important relationships between student involvement with substances and belief in both media and nonmedia information sources. Among the various mass media, pamphlets are considered to be most believable. Most members of the medical profession, especially doctors and nurses, are trusted by a majority of youths. Former drug users with personal experience in regard to drug use are judged as most believable by 55% of those surveyed. A social worker, clergyman, lawyer, a nondrug using friend, and neighbors were felt to be the least credible.

The findings also clearly show that the greater a student's involvement with drugs (1) the less credible he regards professional and institutional agents, the various mass communication systems, and family members as sources of information on drugs; and (2) the more believable he feels persons with experience in drug use are for this information. These relationships appear to be linear. The authors conclude that nonmedia drug information sources, particularly various "experts" and former drug users, are perceived to be more believable than any of the mass media sources the youths were asked about. The high rating of pamphlets and their relatively low cost recommends their continued use in drug education work. (HSRI)

23 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0066

ALCOHOL AND MARIJUANA CONSUMPTION AMONG UNDERGRADUATE POLYDRUG USERS, M. Hochhauser, American Journal of Drug and Alcohol Abuse, v4 n1 p65-76 (1977)

Although some research exists documentating the physiological and psychological effects of combining licit drugs, virtually no evidence exists describing either the particular patterns of illicit polydrug consumption or the behavioral consequences of such consumption. Essential information is unavailable in at least two areas: (1) the age at which polydrug use begins; and (2) the specific drug combinations that are used by various age groups.

In order to investigate these areas, 365 undergraduate students were asked to voluntarily report on their patterns of drug use in a twenty-five item multiple choice questionnaire assessing sex, residence, frequency of drug use, duration of drug use, and drug consumption patterns involving tobacco, marijuana, polydrug, and nonpolydrug use.

Of the 365 students surveyed, 42% admitted to polydrug use. The rank order of drugs used was: alcohol, marijuana, tobacco, hallucinogens, barbiturates, amphetamines, cocaine, opiates, and inhalants. Forty-four percent used one drug combination, 25% used two to three combinations, 17% used four to seven combinations, and 14% used eight to fourteen combinations. Nearly 85% used alcohol plus marijuana with nearly 33% combining alcohol or marijuana with barbiturates, hallucinogens, or amphetamines. Alcohol appeared to be the first drug used; however, it was not abandoned when marijuana use began. Both drugs were simply used concurrently, and new drugs were incorporated into the existing patterns of drug use.

Initial use of alcohol, tobacco, and marijuana was in most cases several years prior to this survey. Over 50% of the polydrug users had used these drugs for two years or more. This suggests that polydrug use is not simply a function of occasional experimentation with isolated substances, but a consistent pattern of drug consumption over relatively lengthy periods of time. (HSRI)

23 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Nonbarbiturates: ethanol (ethyl alcohol). Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0067

TOWARD CLASSIFYING PSYCHOACTIVE CHEMICAL USE. J.R. Weinberg, American Journal of Drug and Alcohol Abuse, v4 n1 p77-90 (1977)

A classification scheme for psychoactive chemical use is proposed based on the description of consequences of psychoactive chemical use. It is an alternative to the assignment of current labels (e.g. alcoholic, drug abuser, chemically dependent) which are often controversial or pejorative, as well as being imprecise and limited to pathology. The following categories are suggested: Helpful; Low Risk Potential Harm; High Risk Potential Harm; and Harmful. These are briefly defined and illustrative examples are cited. The appropriate treatment responses for the four categories are respectively Encouragement; Accurate Information; Persuasive Education; and Active Intervention. The basic rationale and procedure for each treatment is discussed. Prevention as well as cure is thus incorporated into the study. The goal is to provide a more helpful approach to one of the nation's greatest concerns. (JAM)

11 refs

KEYWORDS: Countermeasure Concepts. Review: Drug Use. Review: Survey Methodology.

UM-77-E0068

THE CLIENT-ORIENTED DATA ACQUISITION PROCESS (CODAP-77), E.N. Siguel; W.H. Spillane, American Journal of Drug and Alcohol Abuse, v4 n2 p201-21 (1977)

This report describes the new data collection system called Client Oriented Data Acquisition Process (CODAP) and illustrates its application. The purpose of CODAP is to provide current information describing drug abuse clients and the treatment provided to them in order to aid in planning, management, and evaluation activities. CODAP has proven to be an extremely valuable tool for managers of drug treatment clinics at the national, state, and local levels. Managers may evaluate resource utilization by using CODAP data collected at admission and during treatment. State and national level tabulations of the frequency and percent of clients in each modality/environment combination can be prepared for each quarter. A clinic director can look at the modality/environment regimens of clients admitted or in treatment to determine if the clinic should modify its treatment approach by comparing the national, regional, or state averages to those of the individual clinic. The data may indicate to the director whether or not the clinic is assigning more clients to expensive regimens than is necessary.

Managers can also use the data available from CODAP to obtain an indication of the length of time clients should spend in treatment under various modalities, environments, and drug programs. Such information is valuable in estimating the number of clients that can be treated in a given slot over a year and in evaluating the progress of clients in treatment in a manner similar to the use of hospital "length of stay measures". In conclusion, intelligent use of CODAP data by drug abuse treatment managers, researchers, and clinic staff may provide an important step toward the goal of greatly reducing drug abuse in the United States. (HSRI)

0 refs

KEYWORDS: Countermeasure Concepts. Review: Drug Use. Review: Survey Methodology.

UM-77-E0069

ALCOHOL ABUSE BY DRUG-DEPENDENT PERSONS: A LITERATURE REVIEW AND EVALUATION, J.F.X. Carroll; T.E. Malloy; F.M. Kenrick, American Journal of Drug and Alcohol Abuse, v4 n3 p293-315 (1977)

Presented here is a literature review concerned with drug dependency combined with alcohol abuse, and the nature and magnitude of this abuse. A review of existing literature indicates a high rate of alcohol abuse by individuals diagnosed as drug dependent. The review also very clearly indicates that the majority (80%) of drug-dependent persons abused alcohol before becoming addicted to other drugs such as heroin.

The authors suggest that any form (sequential or concurrent) or level of involvement with alcohol that is conditioned to a drug habit warrants careful attention. The rising rate of treatment failures in methadone maintenance programs associated with alcohol abuse was cited as illustrating this principle. Drug users tend to fall back on older related habits when newer habits are disrupted.

The literature review also indicates the high risk and hazards associated with concurrent drug and alcohol use. These mixtures are directly linked to death and a variety of deleterious physical complications. Concurrent drug and alcohol abuse was also observed among individuals arrested for driving while intoxicated.

Multiple substance abuse patterns, especially those involving alcohol abuse by drug-dependent persons, clearly necessitate a modification of thinking regarding research methodology and clinical practice in the substance abuse field. Research which treats drug abuse as a phenomenon which is mutually exclusive of alcohol abuse will surely produce misleading and biased results. Clinical treatment of drug-related problems which is substance-specific will also be prone to failure if clinicians neglect to investigate the possibility of past or present alcohol abuse. An alternative strategy for both research and treatment would be to focus on the combination of drug and alcohol problems, a generic approach which would help the substance abuse field to understand more completely and deal more effectively with the societal and human problems associated with substance abuse. (AAM)

72 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drug Use.

UM-77-E0070

DRUG ABUSE BY ALCOHOLICS AND PROBLEM DRINKERS: A LITERATURE REVIEW AND EVALUATION, J.F.X. Carroll; T.E. Malloy; F.M. Kenrick, American Journal of Drug and Alcohol Abuse, v4 n3 p317-41 (1977)

Presented here is a review of recent literature concerned with drug abuse by alcoholics and confirmed problem drinkers. The estimate of drug abuse by alcoholics and problem drinkers in the literature varies from a low of 1% to a high of 90%. These studies, coupled with data from the National Drug/Alcohol Collaborative Project, led the authors to estimate the figure to lie somewhere between 60 and 80%, being somewhat higher for individuals under forty than over forty.

Several developments are cited in the literature as contributing to an increase in the extent of drug abuse by alcoholics and problem drinkers. The introduction in the 1950s of psychotropic medications and their indiscriminant and excessive prescription by physicians, coupled with TV advertising campaigns conducted to increase sales of over-the-counter preparations, served to create an attitude of greater acceptance for the relief of emotional discomfort through chemical use. The growing sense of personal powerlessness and hopelessness as well as social alienation in the 1960s also encouraged polydrug use.

Problems associated with investigating this phenonemon are discussed and illustrated. Physiological and medical complications of drug-alcohol use and abuse are also briefly discussed. (JAM)

65 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drug Effects. Review: Drug Use.

UM-77-E0071

EXPERIMENTAL HEROIN USERS: AN EPIDEMIOLOGIC AND PSYCHOSOCIAL APPROACH, D.B. Graeven; W. Folmer, American Journal of Drug and Alcohol Abuse, v4 n3 p365-75 (1977)

This paper discusses two issues: (1) the pattern of heroin use and the role of the experimental user in a heroin epidemic; and (2) the psychosocial factors that discriminate between those experimenters who use heroin only one or two times as compared to those who have higher and more consistent patterns of use. The data were collected as part of a study on the causal factors associated with involvement in an adolescent heroin epidemic which occurred between 1965 and 1974 in two primarily white, suburban, working-class high schools. Forty-four experimental users and seventy-five heroin addicts were interviewed in two-hour sessions. Psychosocial measures were obtained for family life, high school and peer involvement, experience with the criminal justice system, self-esteem, and positive or negative attitudes toward the future. Questions on drug use included frequency of use, exposure to drugs, and information on first use of heroin.

Results showed that heroin use patterns varied, with heavy users stabilizing at a low frequency of use over a long period of time. Results also showed that experimental use was more likely to occur in the late phase of a local heroin outbreak. Psychosocial data indicated that heavy users differed from experimental users in that they had less supportive family experiences, more experience with the criminal justice system, and less positive feelings about self and future. Addicts tended to be less involved in academics, only marginally involved in school, somewhat more likely to have high association with peers, and more likely to be involved in a deviant peer group. The data reported support the information obtained in previous studies that there is a pattern of occasional heroin use that can be maintained over a number of years. (HSRI)

11 refs

KEYWORDS: Opiates and Related Agents: heroin. Epidemiology: Regional or Local Survey of Drug Use Patterns.

UM-77-E0072

COMPARISON OF DRUG ABUSE CLIENTS IN URBAN AND RURAL SETTINGS. B.S. Brown; T.C. Voskuhl; P.E. Lehman. American Journal of Drug and Alcohol Abuse, v4 n4 p445-54 (1977)

This study attempted to explore similarities and differences between persons admitted to rural and to urban drug abuse programs. Examination was made of differences between the demographic and drug-using characteristics of 2,262 persons admitted to forty-nine rural drug abuse treatment units and 8,017 persons admitted to sixty-one urban treatment units in Arizona, Colorado, Georgia, Iowa, Maine, Minnesota, Montana, and Vermont.

Substantial differences were found to exist between the drugs reported by rural and urban clients. Whereas 65.7% of urban clients reported opiates as the primary drug of abuse, only 8.1% of rural clients did so. By comparison, 30.7% of rural admissions reported marijuana as their major drug of abuse compared to only 10.7% of admissions to large urban programs. In addition, 15.8% of rural as compared to 5.8% of urban clients reported amphetamines as a primary drug of abuse, and 16.6% of rural as compared to 6.9% of urban admissions reported sedative/hypnotic drugs as primary drugs of abuse.

The treatment population seen in rural settings is significantly younger than that seen by urban programs: 62.2% of admissions to rural programs are below the age of twenty-one compared to 18.5% of urban admissions. Admissions to rural programs are far more likely to be enrolled in school, to have less total years of schooling, and to be without prior treatment experience. Urban clients are far more likely to be minority group members than are rural clients. There are, however, relatively small differences between groups in terms of rates of employment, sex, or legal status on admission.

These results have implications for treatment programs. Urban programs should gear their treatment regimens to opiate abuse while the rural community should be prepared to contend with significant numbers of marijuana, sedative/hypnotic, or amphetamine abusers. Rural programs which deal with younger clients should put greater emphasis on educational programs while urban programs must emphasize vocational programming. (HSRI)

5 refs

KEYWORDS: Epidemiology: National Survey of Drug Use Patterns.

UM-73-E0073

EPIDEMIOLOGICAL ASPECTS OF ALCOHOL IN DRIVER CRASHES AND CITATIONS. P.M. Hurst. Journal of Safety Research, v5 n3 p130-48 (Sep 1973)

In an amplification of a previous work, a number of controlled studies of highway crashes and citations (with parallel roadblock samples) are treated in a consistent manner by a Bayesian technique. Relative probabilities of involvement are derived as functions of blood alcohol concentrations (BAC) and of other important predictor variables. The studies compared are the Evanston Study, the Toronto Study, the Manhattan Study, the Grand Rapids Study, the Vermont Study, and the French Study. Relative "effectiveness" estimates for hypothetical BAC limits are derived from the assumption of perfect enforcement, that is, universal acquiescence to a given blood limit. Estimated effectiveness is compared on the basis of differences in driver population characteristics and in the chosen criterion. These results are supplemented by comparisons with uncontrolled studies of alcohol in fatal crashes. The role of self-reported drinking habits is considered to be a moderator of hazard BAC relationships and of enforcement implications.

Some tentative implications for control practices are drawn with recommendations for research. In terms of expected fatality reduction, enforced compliance to a relatively liberal limit could potentially eliminate most of the incremental loss associated with alcohol. In terms of expected property damage, not only is the incremental loss associated with alcohol much less, but the relative effectiveness of any nonzero limit is also much reduced. Based on the data at hand, it would seem advisable to concentrate upon enforcement rigor rather than to enact more stringent BAC limits. Emphasis in research should be on public acceptance factors and the logistics of drinking and driving. (JAM)

28 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Review: Drug Use. Review: Survey Methodology.

UM-78-E0074

BIOSTATISTICAL PERSPECTIVES IN THE EPIDEMIOLOGY OF NARCOTIC ABUSE, H. Smith; J. D. Goldberg; D. C. Korts, Annals of the New York Academy of Sciences, v311 p25-34 (1978)

This paper evaluates biostatistical methods of analysis useful in identifying narcotic abuse Three methods are discussed--the Randomized Response Technique, the Linear Model Analysis of Multi-Dimensional Contingency Tables, and Life Table Analysis of Longitudinal Data. Brief descriptions of each technique and its potential areas of application follow.

The Randomized Response Technique deals with gathering sensitive information which in some way is threatening to the respondent. This method supposedly elicits more accurate responses in surveys. The Multi-Dimensional Contingency Table methods deal with the analysis of cross-sectional data. Computer programs are able to analyze these multidimensional tables by linear models. Life Table or actuarial methods deal with the problem of estimating from follow-up data the probabilities of surviving without return to narcotic drug use. This approach may be extended to permit comparison of cumulative proportions surviving drug-free in different subgroups of patients: patients with different demographic characteristics; patients on different treatments; patients enrolled in different programs; and patients with possibly unequal followups.

The authors conclude that all of these methods have great potential value in the epidemiology of narcotic abuse. (HSRI)

20 refs

KEYWORDS: Review: Survey Methodology.

UM-77-F0001

MEASURING THE DRIVING TASK THROUGH VISUALS, J.A. Beno, Journal of Traffic Safety Education, v24 n4 p11,25 (Jul 1977)

This study describes and evaluates a method for testing a driver's decision-making ability. The use of slides and film clips as a test instrument was researched at Illinois State University in 1975 using 120 students who participated in on-street driving tests, classroom tests, and slide and film tests. The on-street driving test was used to validate the two different classroom tests.

The findings of this study indicate that 35mm sides and 16mm motion picture films can be used in a classroom setting to predict the selection by a driver of lateral position in a vehicle on-street when responding to real or potential hazards in the intended path of travel. The use of visuals as a testing mode in driver education seems not only practical but perhaps uniquely appropriate in the study of ability dimensions which do not lend themselves to other forms of testing. They also provide an excellent control or standardization of testing conditions. (HSRI)

0 refs

KEYWORDS: Driving Simulator. Review: Behavioral Research Methodology.

UM-76-F0002

ACCIDENTS, RISKS, AND MODELS OF EXPLANATION. D.H. Taylor, Human Factors, v18 n4 p371-80 (Aug 1977)

This article attempts to show that accidents and behavior in environments where there is risk of them form an area of human activity about which two different kinds of questions must be asked: (1) scientific (cause-based); and (2) purposive (teleological or reason-based). These two models of explanation are outlined: the causal model, used in the physical sciences and in traditional behavioristic psychology; and the purposive model, which although not strictly "scientific", is making a useful comeback in modern cognitive psychology. It is shown that both models are required to produce a satisfactory definition of the concept of accident, four aspects of which are considered. The discussion is extended to the concept of risk, where it is shown that the two models used together illuminate the notions of objective and subjective risk. It is suggested that the latter is closely associated with loss of intentional control. A rule-following model of driving is proposed, initially based on an outdated hedonic theory, but which is shown to have close links with current psychological concepts of attention and arousal. Finally, it is argued that both models of explanation must be acknowledged if progress is to be made in understanding accidents and risk. (JAM)

13 refs

KEYWORDS: Review: Behavioral Research Methodology.

UM-76-F0003

SOCIAL INTERACTION PATTERNS IN DRIVER BEHAVIOR: AN INTRODUCTORY REVIEW. G.S. Wilde, Human Factors, v18 n5 p477-92 (Oct 1976)

This paper investigates the role of immediate social influence upon the driver's perception, his decision-making, and his actions. Despite all apparent anonymity of people who use the streets and roads as vehicle operators or as pedestrians, participation in traffic does not take place in a social vacuum. The individual performs his driving task in the collective of road users. This context is characterized by the central tendencies of social habits and values, expectations, and communications as well as their patterns of deviation. This paper attempts to bring together the existing points of view, hypotheses, and empirical evidence obtained with respect to the role played by social interaction factors in the behavior of road users. Literature is reviewed concerning social factors in information intake and anticipations with respect to the behavior of other drivers, social factors in the subjective estimation of danger, social factors in drivers' decision making, demographic variables influencing interactions between drivers, social effects upon motivational states, and social manipulation of tolerated risk. (JAM)

58 refs

KEYWORDS: Review.

UM-70-F0004

A FACTOR ANALYTIC APPROACH TO THE DRIVING TASK. V.S. Ellingstad, Behavioral Research in Highway Safety, v1 n2 p115-26 (Summer 1970)

Psychomotor performance data were collected from eighty subjects who drove the Ford Motor Company's Highway Systems Research Car (HSR) and fifty-six subjects who were tested on the Sim-L-Car point light source driving simulator in order to evaluate the psychomotor activities involved in the execution task, a subtask of controlling the automobile. All subjects were unpaid male volunteers who ranged in age from 18 to 59. Six steering and speed control variables were included in the HSR Car battery, while nine variables were included in the Sim-L-Car battery. Data from each battery were subjected to a principal axis factor analysis which employed an orthogonal rotation as a final step.

Results indicated that the test space of the HSR car battery was defined by three orthogonal dimensions representing steering control, speed control, and operator input variability. For the Sim-L-Car four dimensions were extracted by the analysis. These involved steering control, tracking error production, speed control, and operator input variability. These data suggest that a smaller set of variables could be used. Inclusion of all HSR car battery tests adds very little to the total measurement. Therefore the size of the battery can be reduced with little loss. (JAM)

3 refs

KEYWORDS: Review: Behavioral Research Methodology.

UM-70-F0005

DRIVING SIMULATION: AN OVERVIEW, T.R. Schori, Behavioral Research in Highway Safety, v1 n4 p236-49 (Winter 1970)

An increasing number of reports dealing with driving simulation are appearing in the literature. However, this area is so new that many readers are not familiar with the terminology employed or the nature of the simulation referred to in these reports. This paper is intended to present an overview of the field of driving simulation for those readers. Classification of simulators is presented as well as a brief description of several types of simulators. Included are the point light source simulator, the television simulator, the direct optical viewing simulator, and the moving picture simulator. Brief evaluations of these simulators are also provided.

The author believes that the television simulator, because of its versatility, is probably the most desirable choice for an institution wishing to conduct driving research with a simulator. However, if the initial expense is a critical factor, the point light simulator is excellent because it is nearly as versatile as the television simulator but costs less.

Training aspects of simulation are briefly discussed but the main emphasis of this paper is on research versions of the various driving simulators. (JAM)

51 refs

KEYWORDS: Review: Behavioral Research Methodology.

UM-71-F0006

EDITORIAL, S.F. Hulbert, Behavioral Research in Highway Safety, v2 n1 p3-4 (Spring 1971)

This editorial questions the accuracy of some of T.R. Schori's statement in his article "Driving Simulation: An Overview" (see F0005). This author feels that Schori's cost estimate for a TV simulator ($100,000) was unreasonably low. He also accuses Schori of failing to take into account in his evaluation many variables of great importance in behavioral research such as color versus black and white in the visual display and clarity of visual image. Furthermore, considering the present state of art and the limited funds currently available, it is clear that no "all purpose" simulator will be built in the near future as Schori implies. The author feels that several of Schori's comments constitute overgeneralization and that other statements are too simplistic and may mislead the reader into thinking of simulation as being far more advanced than it is in reality. (HSRI)

2 refs

KEYWORDS: Review: Behavioral Research Methodology.

UM-71-F0007

CONSISTENCY IN DRIVER RISK TAKING, P.M. Hurst, Behavioral Research in Highway Safety, v2 n2 p73-82 (Fall 1971)

A driver's choice dilemma among options having different risk levels is considered from the viewpoint of expected-cost minimization. A rational rule for such decision making is developed from statistical decision theory, supported by behavioral research on choice determinants. The relevant parameters are considered for potential modification. Comparison suggests that an effort to raise the risk-taking threshold is apt to be less successful than one aimed at reducing the inconsistency of choice behavior with a given threshold value. Although some traffic control innovations may fulfill the latter function, evaluation is hampered by lack of techniques for quantifying inconsistency. One such technique is derived. It applies to any observable choice dimension but requires operational definition of the most relevant stimulus function controlling the choice behavior under study. An example is given in which alternative stimulus functions were evaluated for control of blocked-lane merging behavior. The most relevant of these was used to evaluate traffic control innovations for reduction of driver inconsistency. Further examples are introduced showing how the stimulus control

function varies at different stages of on-ramp merging and under varying illumination. (JA)

10 refs

KEYWORDS: Review: Behavioral Research Methodology.

UM-71-F0008

PROBLEM DEFINITION: THE DRIVING TASK IN THE SYSTEM CONTEXT. M. Blumenthal, Behavioral Research in Highway Safety, v2 n1 p43-52 (Spring 1971)

This paper discusses the problem of traffic safety in the system context. The contributions of behavioral scientists to the amelioration of the traffic safety problem have hindered the development of an effective approach to the traffic safety pattern, according to this author. Society views traffic accidents as due principally to driver behavior, a theory which behavioralist scientists support. If the driver fails to succeed in the established traffic system, he must be studied and prodded so that he can function within the existing system. The fundamental design and management problems of the motor vehicle transportation system limit the contribution of behavioral scientists to the problem. Contrary to industrial safety principles, the vehicle operator is forced to compensate for limitations of the system, resulting in a large and growing social cost particularly to the inexperienced, the aged, the inebriated, and those with physical or emotional limitations. The inadequate management and design of the system are seen as persisting because of limited understanding of the problem and the failure to make explicit and to examine the priority given to technological values over human values. (JAM)

14 refs

KEYWORDS: Review: Behavioral Research Methodology.

UM-77-F0009

EVALUATION OF LABORATORY METHODS FOR THE STUDY OF DRIVER BEHAVIOR: RELATIONS BETWEEN SIMULATOR AND STREET PERFORMANCE. D.S. Edwards; C.P. Hahn; E.A. Fleishman, Journal of Applied Psychology, v62 n5 p559-66 (1977)

This study was designed to compare the performance of drivers on the road with their performance in the laboratory on two widely used simulators. Road performance data on 304 taxi drivers were obtained by pairs of trained observers using behavioral checklists. Drivers did not know they were being observed. Two-thirds of the drivers were then asked to participate in the laboratory study in which they performed on two different driving simulators and on four perceptual-motor tests. Officially recorded accidents and violations over a five-year period were obtained for each driver for comparison with performance data.

Few of the scores from the simulators or tests were found to be significantly correlated with road performance. A number of significant relations were found between perceptual-motor test performance and simulator performance. Although these correlations were not high, they tended to be more significant than those between performance on the two simulators. Age was negatively correlated with simulator performance. Relations between all performance measures and officially recorded accident and violation data were low. Some significant predictors of certain classes of violations were achieved from road performance measures obtained in the study.

The results of this study suggest the need for caution in extrapolating data from these simulators to on-the-street driving behavior. (JAM)

10 refs

KEYWORDS: Review: Behavioral Research Methodology.

UM-76-F0010

VISUAL ACUITY AND HIGHWAY ACCIDENTS. H.W. Hofstetter, Journal of the American Optometric Association, v47 n7 p887-93 (Jul 1976)

This study attempted to demonstrate the statistical relationship between driving performance and visual test scores. It also attempted to take into account the roles of

sex, age, driving employment requirements, years of driving experience, and driving behavior characteristics. An analysis of binocularly obtained visual acuity test scores of 13,786 automobile drivers was made and compared to the number of accidents reported by each driver during a twelve- month period. For each of eight different age categories (20-24, 25-29, 30-39, 40-49, 50-59, 60-69, 70+), the drivers were classified as having poor acuity if their scores were below the lower quartile and as having good acuity if their scores were above the median.

The percent of drivers with poor acuity who reported three or more accidents was approximately double the percent of drivers with good acuity who reported three or more accidents. The proportion with poor acuity who reported two accidents was approximately 50% greater than the proportion for those with good acuity. The differences were statistically significant and prevailed at all age levels above nineteen years.

The differences in proportions reporting one accident and no accident for the poor and good acuity categories were not significant. A definitive determination of the level of acuity loss which may be considered dangerous for driving was not made, but the author concludes that for maximum safety, the driver's acuity should be the best attainable. (JAM)

6 refs

KEYWORDS: Crash Investigation.

UM-77-F0011

LABORATORY AND FIELD ANALYSES OF DECISIONS INVOLVING RISK, E.B. Ebbesen; S. Parker; V.J. Konecni, Journal of Experimental Psychology: Human Perception and Performance, v3 n4 p576-89 (1977)

The effects of the velocity and distance of an oncoming car on decisions to cross in front of it were examined in a 4(velocity) x 5(distance) laboratory experiment and in two different field studies. Judgments of the risk of crossing in front of the car were also obtained in the laboratory experiment. The subjects used in this experiment were ten male and ten female undergraduate students who held current driver's licenses.

The results from the laboratory simulation indicated that while judged risk was an additive function of velocity and distance, normalized crossing probability was described in part by the ratio of perceived distances to perceived velocity. Tests of the external validity of the latter finding suggest that real-world crossing decisions are based on a single dimension--the temporal distance between the subject's car and the approaching car. Differences between laboratory and field results supported the view that decision strategies may be task and procedure specific and that tests of the external validity of decision models should be incorporated into decision-making research. (JA)

22 refs

KEYWORDS: Driving Simulator.

UM-76-F0012

TOTAL IMPAIRMENT RISK FACTORS, R.A. Warren, Ottawa, Ontario: Traffic Injury Research Foundation of Canada (Jul 1976)

The relative contributions of driver impairment from alcohol and of age-related factors to an individual driver's risk of motor vehicle fatality were examined through the use of a Bayesian Analysis Technique. It was found that drivers of all ages were at considerably greater risk of being killed when driving while impaired (BAC> .095) than when driving while not impaired.

Age-related factors exerted a powerful intervening influence upon the risk of being killed for both impaired and nonimpaired drivers of various ages. Nonimpaired drivers age 30-34 were found to have the lowest risk of fatality, being only 0.31 times as likely to be killed as was the average nonimpaired driver. On the other hand, age-related factors inflated significantly the risk of fatal collision for both the very young (age 16-19) and older (over age 50) nonimpaired drivers. Drivers from these age groups were between 1.69 (age 50 and over) and 2.20 (age 18-19) times as likely to be killed as the average nonimpaired driver on the road, even when exposure to risk was controlled.

The combination of the two above indices allowed an assessment of individual impaired driver's total risk of fatal collision involvement relative to the average nonimpaired driver. It was found that the combined effects of age and alcohol render the impaired driver aged 16-17 years 165 times more likely to be killed than the average nonimpaired driver. The "safest" group of impaired drivers were those age 30-34, whose total risk of fatality was still seventeen times as great as the risk faced by the average nonimpaired driver.

In summary, the combined effects of age and alcohol in determining the relative probability of fatal collision reached their maximum for the very young driver age 16-17. This influence decreased for each successive age group up to age 30-34, where it reached its minimum, and increased with driver age thereafter. (AA)

20 pages 20 refs AA

KEYWORDS: Crash Investigation. Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-76-F0013

THE YOUNG DRIVER PARADOX, R.A. Warren; H.M. Simpson, Ottawa, Ontario; Traffic Research Foundation of Canada (Sep 1976)

This paper discusses the results of risk factors in driving behavior and interprets these findings and their implications for the understanding of the collision behavior of young drivers. To become an experienced driver one must drive more. The more one drives, the greater the exposure to risk, the greater the exposure to risk the more likely one is to be involved in a crash. Herein lies the young driver paradox. Accordingly, experience or exposure oriented countermeasures aimed at the young driver will in most instances have little or no effect since the gains along the one dimension will result in and be offset by losses along the second. In that regard, the case of the young or perhaps newly licensed driver is unique; the young driver is the only driver whose exposure-to-risk factor and driver experience risk factor are both greater than 1.00. As such, one factor exerts a multiplier effect on the other risk factor in determining the total risk of the young driver. For every other age group driver, the score on one factor exerts a moderating influence when combined with his score on the second factor. Indeed, the importance of bidirectionality of the multiplier effect cannot be overstressed. As a result of this bidirectionality a countermeasure may even have a negative impact if the gains along one risk dimension are more than offset by the losses along the second. In that regard, countermeasures such as probationary licenses for young drivers and tougher licensing standards are seen potentially as having a very small likelihood of success.

The former countermeasure and its major ramification, license suspension, will only delay the combination of exposure-experience risk factors for specific drivers, which can be expected to manifest itself later in time. The latter countermeasures may even have a negative impact, inducing increased exposure at the very time when driver-experience is at its lowest, unless driver training would be able to compensate for these increased demands. To be effective, any young driver countermeasures must of necessity take into account this paradox and the nature of the tradeoffs involved. (AA)

10 pages 5 refs

KEYWORDS: Countermeasure Concepts.

UM-77-F0014

RESPONSE TIMES TO STIMULI OF INCREASING COMPLEXITY AS A FUNCTION OF AGEING, T.C. Jordon; P.M.A. Rabbitt, British Journal of Psychology, v68 p189-201 (1977)

This study had several objectives: (1) to consider the effects of aging on response times to stimuli of increasing complexity in serial choice reaction time tasks; (2) to consider whether age differences were reduced or abolished on such tasks; and (3) to examine repetition effects involving repetitions of the whole or part of a complex signal and of a particular motor response. An attempt was therefore made to discover if and how practice, compatibility, and the repetition effect interact with age, and further to attempt to specify the locus of any such effects.

Twelve elderly (mean age 69) and twelve young subjects (mean age 20) were tested on a series of experiments with increasing complexity of perceptual-response mapping. As task complexity increased the differential slowing in performance between young and old increased, and an age-task complexity interaction was observed. However, with practice

this phenomenon disappeared leaving an apparent age lag constant. This slowing was due to increased central processing time rather than peripheral factors.

No major differences in strategies were observed between the groups, though the old subjects tended to be less able to extract critical (useful) features from the display. Stimulus repetitions of a new kind were found where all characteristics of the stimulus (relevant and irrelevant) were important. Repetitions of coding rules rather than of particular signals or responses also facilitated reaction time. It was also found that later in practice old subjects were making fewer errors than the young, reversing earlier observations. (HSRI)

15 refs

KEYWORDS: Psychomotor Tests.

UM-77-F0015

VEHICLE CONTROL AND DRIVING EXPERIENCE: A PSYCHOPHYSIOLOGICAL APPROACH, M. Helander, Zeitschrift fur Verkehrssicherheit, v23 n1 p6-11 (1977)

The objective of this study was to compare the response pattern in electrodermal response, heart rate, and electromyographic measures for experienced and inexperienced drivers and to relate them to vehicle control parameters. An instrumented vehicle was used for real-time recording of driver's physiological characteristics (galvanic skin response, heart rate, and muscle activity); steering and braking behavior; and vehicle response (speed, distance travelled, and triaxial accelerations).

Thirty-three drivers performed driving tests along a twenty-five-kilometer stretch of rural road. Seventeen of the drivers were inexperienced (less than thirty thousand kilometers during the last five years, average age 35.4 years) and sixteen were experienced (more than one hundred seventy-five thousand kilometers during the last five years, average age 42.0 years).

The manipulation of vehicle controls was identical in both groups, whereas physiological responses displayed large differences. Through the use of multiple regression techniques it was demonstrated that for the inexperienced group, road traffic situations involving the use of the brake explain most of the variance in the physiological measures. Similarly, the steering response was the most important variable for the experienced group. The results also show that galvanic skin response seems to be an efficient indicator of the mental effort involved in driving.

The author concludes that road-traffic environment is interpreted differently as a function of experience. Inexperienced drivers constitute an important target group in accident prevention. For road design purposes it is suggested that road elements involving the use of the brake should be avoided. (JAM)

13 refs

KEYWORDS: Open Road Driving.

UM-76-F0016

TRAFFIC ACCIDENTS AND PSYCHOMOTOR TEST PERFORMANCE. A FOLLOW-UP STUDY, S. Hakkinen, Modern Problems in Pharmacopsychiatry, v11 p51-6 (1976)

An essential problem in the methodology of the research on drugs and driving is the question of criterion and validity. It is not possible to perform studies of this kind in real traffic circumstances, therefore simulation and different kinds of psychological tests must be used. This paper discusses the relationship between traffic accidents and psychomotor test performance and the reliability of studies concerning this relationship.

This study is a follow-up study to a basic psychological study which was carried out with 100 drivers over a period of exposure of eight years. The reliability of accidents was 0.80. Fourteen tests with a total of 300 variables were used. A comparison of the averages for the safe and accident drivers was made, and correlations and factor analysis were computed for gaining a concise description of the safe and accident prone type of drivers. No significant differences were found between the safe and accident groups in intelligence tests or in the variables measuring simple, disjunctive, or choice reaction times.

The present follow-up study was done with 66 drivers out of the original group of 100 who had an average driving exposure time of 9.3 years. The statistics reveal that the correlations of the test variables with the accident criterion in different exposure periods are of nearly the same order of magnitude. Correlations in the follow-up period are approximately equal to those in the first period, although the time lapse between the testing and the latter exposure period varied from one to twenty years.

In summary, the accident behavior of professional city drivers proved to be very constant, and this behavior is capable of being detected by specially planned psychological tests. These may provide an expedient for many kinds of research of driver behavior not using actual driving variables, such as accidents, as a criterion. (HSRI)

2 refs

KEYWORDS: Open Road Driving. Psychomotor Tests.

UM-77-F0017

AN INVESTIGATION OF TIME-SHARING ABILITY AS A FACTOR IN COMPLEX PERFORMANCE, A.E. Jennings; W.D. Chiles, Human Factors, v19 n6 p535-47 (Dec 1977)

The purpose of this study was to examine two different complex tasks by using the factor analytic method to determine whether any of the performance measures exhibit statistical properties that could be construed as evidence of a time-sharing ability. Thirty-nine healthy college males in their twenties were tested in a variety of skills using the Multiple Task Performance Battery. Tests included a choice reaction time task, a meter monitoring task, mental arithmetic, pattern identification, group problem solving, and two-dimensional compensatory tracking. Performance was measured on each task presented individually and on two complex tasks made up of two groups of three tasks.

A factor analysis performed on the resultant data revealed a factor that showed high loadings for two different monitoring tasks for complex performance but negligible loadings for these tasks for simple performance. Separate, orthogonal factors were found for the two monitoring tasks when they were performed under simple-task conditions The monitoring measures thus appear to possess properties that would be expected of measures of a time-sharing ability. The authors conclude that selection and screening programs for complex jobs, such as air traffic control, might very well be improved by the incorporation of suitable measures that test time sharing as a basic ability. Furthermore, these findings provide indirect support for the use of secondary tasks to assess the workload properties of primary tasks. (HSRI)

25 refs

KEYWORDS: Psychomotor Tests.

UM-77-F0018

SECONDARY TASK MEASUREMENT OF WORKLOAD AS A FUNCTION OF SIMULATED VEHICLE DYNAMICS AND DRIVING CONDITIONS, W.W. Wierwille; J.C. Gutmann; T.G. Hicks; W.H. Muto, Human Factors, v19 n6 p557-65 (Dec 1977)

The study described here concerns an attempt to use the secondary-task method of workload assessment to discriminate differences in vehicle handling parameters. A driving simulator with a six-degree of freedom computer-generated display, a four-degree of freedom physical motion system, and a three-channel sound system was used to determine the sensitivity of a secondary task to vehicle handling parameters and various driving conditions. Six subjects drove a simulated vehicle with normal automobile handling and another six drove with the degraded handling (slow response). Steering ratio and disturbance level were adjusted within each set of six subjects. A secondary task consisting of reading random digits aloud from a single digit dashboard display was used to assess workload.

It was found that workload increased significantly as disturbance level increased. Furthermore, workload increased significantly with degraded vehicle handling. In contrast, increasing steering ratio did not produce a significant change in workload. These results indicate that the secondary task method can be used to assess the major effects of simulated vehicle handling on driver workload. The secondary task used is directly transferrable to test vehicles, and it allows the assessment of large changes in primary task difficulty even though direct primary task measurement may not be

feasible or economical. Problems remain, however, in designing more sensitive secondary task measures. (JA)

23 refs

KEYWORDS: Driving Simulator.

UM-77-F0019

DRIVERS' EYE MOVEMENTS AS RELATED TO ATTENTION IN SIMULATED TRAFFIC FLOW CONDITIONS, A. Ceder, Human Factors, v19 n6 p571-81 (Dec 1977)

The purposes of this study were (1) to investigate and characterize eye-movement amplitude (angular distances between successive fixations) and fixation duration in four simulated traffic flow conditions; (2) to explore the effect (if any) of changes in traffic flow conditions on drivers' attention levels; and (3) to obtain insight into the driver uncertainty model, which assumes that the driver is periodically in a low attention driving situation and reacts according to his level of uncertainty.

In this experiment a motion picture film was used to simulate aspects of a driving situation. Drivers' eye-movement amplitude and fixation duration were studied in four simulated traffic flow conditions: (1) within free-flow mode; (2) under maximum flow conditions; (3) within congested flow; and (4) on an urban street between signalized intersections. Of major interest was the possible correlation between eye-movement data and drivers' attention demands. During observation, two sensitive electrodes were connected independently close to the seven subjects' eyes and to an amplifier; from these electrodes horizontal eye-movements were recorded.

Results of the experiment indicate that there is a correlation between eye-movement data and various traffic flow conditions. The results also suggest an interpretation for the discontinuity phenomonen in the flow concentration relationships under peak flow conditions. This means that the driver's transient attention from the normal attention situation to overload attention and the return to normal attention can account for the discontinuity phenomenon. Since information processing in driving is a highly subjective process, the advantages of the uncertainty model, which provides a quantitative approach for evaluating drivers' attention levels in various traffic flow conditions, could be derived only by looking at the model from a general point of view rather than from being concerned with its adjusted parameter values. (HSRI)

13 refs

KEYWORDS: Driving Simulator.

UM-77-F0020

MANIPULATING THE CONDITIONS OF TRAINING IN TIME-SHARING PERFORMANCE, D. Gopher, R.A. North, Human Factors, v19 n6 p583-93 (Dec 1977)

This experiment attempted to determine factors that reduce the stress induced by high performance requirements. It also investigated whether timesharing performance with unequal task priorities produces changes in concurrent performance and learning. A one-dimensional compensatory tracking task and a digit-processing reaction time task were combined to assess three aspects of training under time-sharing conditions: (1) manipulation of desired levels of dual task performance; (2) training under equal and unequal task priorities; and (3) repeated sequencing of single and dual task presentations. Six groups of ten subjects each participated in the experiment.

Larger performance improvements under time-sharing conditions were observed when desired performance indicators were computed relative to a dual-task rather than a single-task reference. Training under unequal task priorities revealed that tracking was more sensitive to priority differences than the digit-processing task. Tracking performance continued to improve during repeated single-task presentation, whereas digit processing improved only in the time-sharing conditions. These findings suggest that improvement on the tracking task is in the specific skill of tracking, while digit-processing improvement results from improved time-sharing ability.

The differences between the two tasks suggest an important practical implication for the design of training schedules. They suggest that if the locus of the learning process is the mastering of a certain task, the rate of learning is directly correlated with its relative priority in a multitask situation. (JAM)

20 refs

KEYWORDS: Psychological Testing.

UM-77-F0021

QUANTITATIVE SUBJECTIVE ASSESSMENTS ARE ALMOST ALWAYS BIASED, SOMETIMES COMPLETELY MISLEADING, E.C. Poulton, British Journal of Psychology, v68 pt 4 p409-25 (Nov 1977)

Presented here is a general discussion of the use of subjective assessments of performance, particularly their weaknesses. Subjective assessments are used widely in civilized societies for evaluating people, the work they do, and the stresses they work under. Yet most people who use subjective assessments are probably not aware of the pitfalls that are involved in their use.

Range effects introduced by the investigator almost inevitably bias quantitative subjective assessments unless very special precautions are taken to prevent or eliminate the bias.

When the investigator takes special precautions not to introduce bias, the observers may use their own standards which they bring with them to the investigation. In judging acceptable noise levels, the standards used by observers will depend upon the noise levels to which they are accustomed.

The chief danger of subjective assessments is that they may be based upon a rule which may not apply in the particular circumstances of the investigation. A result may then be obtained which is the direct opposite of truth. Examples are the popular beliefs that noise and heat interfere with work. Yet performance can improve in both noise and heat. Results of this kind are revealed by measuring performance objectively, not by asking people how noise or heat affects them. Subjective assessments should be used to complement measures of performance, not to replace them, since subjective assessments are almost always biased and are sometimes completely misleading. (JAM)

55 refs

KEYWORDS: Review: Behavioral Research Methodology.

UM-77-F0022

A TAXONOMIC ANALYSIS OF VIGILANCE PERFORMANCE, R. Parasuraman; D.R. Davies, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p559-74, New York: Plenum Press (1977)

Task classification is introduced as a method for the evaluation of vigilance behavior in different task situations. On the basis of an analysis of different vigilance tasks, several task "dimensions" of relevance to a taxonomy of vigilance tasks are identified. The perceptual speed and flexibility of closure ability categories, which may also be identified with signal discrimination type, are considered to comprise one of the major dimensions in the taxonomy.

In the first study, two experiments are reported whose results indicate that these ability categories exert a significant influence on the determination of the consistency of performance between different vigilance tasks, and that individual differences in vigilance performance are not so much task specific as task-type specific.

In the second study, it is demonstrated that a classification of the vigilance literature leads to an improved specification of the types of tasks in which reliable decrements of efficiency occur in terms of a few dimensions of the vigilance task taxonomy.

It is concluded that task classification enables the specification of task situations to which particular classes of performance are restricted and the systematization of the research literature so that improved generalization can be made in extrapolating data from one laboratory task to another and from laboratory to operational tasks. (JA)

KEYWORDS: Review: Behavioral Research Methodology.

UM-77-F0023

THE INFLUENCE OF PERSONALITY AND AGE ON THE RELATIONSHIP BETWEEN VIGILANCE PERFORMANCE AND AROUSAL LEVEL, C.M. Stroh, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p617-22, New York: Plenum Press (1977)

The purpose of this study was to investigate the possible importance of the personality dimensions introversion-extraversion and neuroticism-stability in determining the nature and extent of the relationship between arousal levels and vigilance performance. Twenty-four male volunteer subjects (aged 18-53) took part in a one-hour visual vigilance task in which they were required to detect flashes of unusual intensity in a regular series of flashes. EEG alpha incidence, log skin conductance, and pulse rate, recorded in the ten-second period prior to each of the eighteen signal presentations, did not distinguish between signals missed and signals detected.

Analysis of individual differences in EEG change revealed significant differences due to neuroticism and age. Older, less neurotic subjects improved their performance when their arousal level was raised; younger, more neurotic individuals evidenced a performance decrement when arousal level was increased. These results strongly suggest that if one wants to investigate the relationship between physiological processes and performance, he must consider individual personality differences. (JAM)

KEYWORDS: Physiological Testing. Psychomotor Tests.

UM-77-F0024

PSYCHOLOGICAL PROCESSES IN SUSTAINED ATTENTION, J.S. Warm, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p623-44, New York: Plenum Press (1977)

This paper describes the current status of vigilance research with respect to selected empirical findings and their theoretical explanations. Behavior in a vigilance task can be viewed within the framework of several task relevant stages. These include: (1) storage of background information; (2) selection of stimulation and the operation of sensory transducers; (3) orientation movements and decision making; and (4) the activity of neural attention units. Empirical findings in vigilance and their principal theoretical explanations are reviewed in relation to these stages. It is suggested that the various theoretical models have focused upon somewhat different aspects of the vigilance problem and that they are not mutually exclusive. Most of the models can account for some but not all of the data and each invites criticism on several grounds. It seems likely that future theoretical developments in this area will have to synthesize these different points of view. (JAM)

KEYWORDS: Review: Behavioral Research Methodology.

UM-77-F0025

AN UPDATE OF FINDINGS REGARDING VIGILANCE AND A RECONSIDERATION OF UNDERLYING MECHANISMS, M. Loeb; E.A. Alluisi, Vigilance: Theory, Operational Performance, and Physiological Correlates, R.R. Mackie, ed., p719-49, p719-49, New York: Plenum Press (1977)

The effects of numerous display, task, and organismic variables known to influence monitoring behaviors are reviewed, and the principal models or theories to explain such behaviors are assessed in light of empirical findings. The current status of vigilance theories in the mid-1970s is summarized as follows: (1) Recent research, like previous research, has failed to confirm any one theory exclusively. (2) The data available continue to cast doubt on the prospect of any current theories being able to account adequately for all established vigilance phenomena. (3) The differentiation of "cortical arousal" may provide a basis for a useful advance in an arousal-theory explanation of some monitoring phenomena, especially as related to certain brainwave activities. (4) Other factors not encompassed by any of the theories are known to affect vigilance, some of them to appreciable extents. (JA)

KEYWORDS: Review: Behavioral Research Methodology.

UM-77-F0026

TRI-LEVEL STUDY OF THE CAUSES OF TRAFFIC ACCIDENTS: AN OVERVIEW OF FINAL RESULTS. J.R. Treat, American Association for Automotive Medicine, 21st Conference, Proceedings, D.F. Huelke, ed., p391-403, Morton Grove, Illinois: AAAM (1977)

Final results of a trilevel accident causation study are reported, as well as results of special analysis projects investigating the relationship of driver vision, knowledge, and psychological attributes to accident involvement. A total of 2,258 accidents investigated by technicians and 420 accidents investigated by a multidisciplinary team are reported.

Human factors were cited as probable causes in 93% of the accidents compared to 34% for environmental factors and 13% for vehicular factors. Leading human factors included failure to look, excessive speed, inattention, and improper evasive action. View obstructions and slick roads were leading environmental factors. The most frequently involved vehicle factors were gross brake failure, inadequate tire tread depth, side-to-side brake imbalances, and underinflation of tires. Vision (especially poor dynamic visual acuity) and personality (especially poor personal and social adjustment) were related to accidents. However, knowledge of the driving task was not shown to be related. (JA)

0 refs

KEYWORDS: Crash Investigation.

UM-78-F0027

HUMAN AND BAYESIAN INFORMATION PROCESSING DURING PROBABILISTIC INFERENCE TASKS. T.O. Kvalseth, IEEE Transactions on Systems, Man, and Cybernetics, vSMC-8 n3 p224-9 (Mar 1978)

The purpose of this study is to demonstrate the feasibility of using basic information theory statistics as quantitative performance measures of human information processing during a probabilistic inference task. The task required subjects to estimate the probabilities of a set of events based on sequential data observations.

The reanalysis of previously published experimental data reveals that the subjects were able to gain relatively little information that Baye's theorem prescribed as being available. (Baye's theorem is used as a standard of performance (normative model) against which to compare actual (observed) human performance for tasks when the data have been in the form of suitable conditional probabilities.) The average subjective uncertainty (additional entrophy) for the set of events was significantly higher than the Bayesian uncertanity, while the data redundancy was lower in the subjective than in the Bayesian case. Additional data observations had only minor impact on the subjective values of these informational measures, especially when compared with Baye's norm. The human information processing performance improved substantially when a probabilistic information processing system was used.

The informational approach developed in this paper provides a concise description of human performance during probabilistic inference tasks. Instead of the traditional use of imprecise verbal inferences about information processing based on sets of generated conditional probabilities, this informational approach takes advantage of the fact that information theory deals with definable and measurable quantities. Such an approach would seem to be particularly advantageous for complex tasks involving the simultaneous probability assessment of several events, such as driving. (JAM)

26 refs

KEYWORDS: Psychological Testing.

Report Number 2

UM-64-F0028

ERRORS IN DRIVER RISK-TAKING. P.M. Hurst, Report Number 2, Division of Highway Studies Institute for Research, State College, Pennsylvania, (Jun 1964)

This paper contends that accidents are usually accidental and not the result of willful negligence or other motivated behavior. Accidents result from confusion. A statistical means for measuring average degrees of driver confusion and comparing these averages across different highway and traffic conditions is presented. Suggested cross-validational procedures are also discussed. The argument is set forth that "confusion", as operationally defined by the suggested procedure, will furnish a valuable intermediate criterion to investigators in the accident prevention field. (AA)

10 pages 7 refs

Division of Highway Studies Institute for Research, State College, Pennsylvania

KEYWORDS: Review: Behavioral Research Methodology.

UM-78-F0029

DRIVER VISION AND ACCIDENT INVOLVEMENT: NEW FINDINGS WITH NEW VISION TESTS. D. Shinar, Proceedings of the AAAM (22nd) and the International Association for Accident and Traffic Medicine (VII) Ann Arbor, Michigan, 10-14 July 1978, D.F. Huelke, ed., v2 p81-91, Morton Grove, Illinois: American Association for Automotive Medicine (10-14 Jul 1978)

This paper provides a summary of the updated evaluation of the reliability, validity, and practicality of Mark II, a recently designed battery of integrated vision tests. An evaluation of a fully automated battery of driving-related vision tests was conducted on 890 licensed drivers ranging in age from 17 to 89. The tests measured static central visual acuity under conditions of optimal illumination, low levels of illumination, and glare; dynamic visual acuity; visual field; movement detection threshold in the central and peripheral fields; and visual search-and-scan ability. The present paper also summarizes the main findings of a previous study of the test-retest reliability of the Mark II vision tests with particular emphasis on the relationship between driver accident involvement and driver performance on the vision tests.

Regression analyses regressing performance on the vision test against accident involvement yielded multiple correlations ranging from .09 to .30 depending on the particular driver age group and the accident condition (day vs. night). The results indicated that (1) dynamic visual acuity and static acuity under low levels of illumination were the two tests most consistently related to accidents in general as well as to driver-caused and vision-related accidents in particular. (2) Poor static acuity under low levels of illumination was specifically associated with overinvolvement in nighttime accidents. (3) The third most relevant vision test was sensitivity to central angular movement. (4) When broken down by age groups, it was found that no single vision test was significantly associated with accident involvement for one or more of the age groups. Further analysis indicated that additional changes in equipment and procedures are necessary before the Mark II battery can be used in the driver licensing environment. However, for most tests, the Mark II proved to be both valid and reliable. (AAM)

11 refs

KEYWORDS: Review: Behavioral Research Methodology. Tests of Sensory Function.

UM-78-F0030

APPLICABILITY OF DRIVERS' ELECTRODERMAL RESPONSE TO THE DESIGN OF THE TRAFFIC ENVIRONMENT. M. Helander, Journal of Applied Psychology, v63 n4 p481-8 (Aug 1978)

This study had two main objectives: (1) to identify the relative contribution to electrodermal response (EDR) of physical and mental factors by comparison of simultaneous recordings of both EDR and muscular activity during driving; and (2) to interpret the results in terms of their ergonomic design applications. Electrodermal response, heart rate, and muscular activity were measured in sixty subjects driving a rural test route. Brake pressure and steering wheel angle were also recorded, and traffic events encountered were categorized by the experimenter using a keyboard. A total of seven million data points were obtained and stored on a digital tape recorder in the test vehicle. Traffic event categories were then rank ordered according to magnitude of response. For electrodermal response and brake pressure, a Spearman rank correlation coefficient of .95 was obtained. Time sequence analyses of the drivers' physiological responses and motor activity show that electrodermal responses are induced by the mental effort of the driving task rather than by the physical effort necessary to maneuver the vehicle.

These results have ergonomic implications for highway design. Roads should be designed so that the reduction in speed on any section along the road is less than 10 mph for instance, in going from a straight road into a curve. Ample evidence exists that traffic events involving the use of the brake are perceived as stressful. Accident rates increase when there are large variations in speed. Therefore, it is suggested that highway design minimizing braking be employed. (JAM)

19 refs

KEYWORDS: Countermeasure Concepts. Open Road Driving. Physiological Testing.

UM-78-F0031

DRIVER PERFORMANCE TESTS: THEIR ROLE AND POTENTIAL, P.F. Waller; L.K. Li; R.G. Hall; J.C. Stutts, Chapel Hill, N.C.: University of North Carolina Highway Safety Reseach Center (Mar 1978)

Presented here are the findings of a conference that examined the role of state road tests, especially their usefulness as screening devices, diagnostic tools, and educational instruments. It also identified the short- and long-term research needs in this area. First, literature on performance tests was reviewed. Second, performance testing in other modes of transportation was reviewed. Third, an interim report was presented. Fourth, the present and potential roles of state road tests were considered and research needs identified. Fifth, a final report was prepared, summarizing the current state of the art and identifying short- and long-term research needs in driver performance testing.

The conference participants found that the road test is currently used primarily as a criterion to guarantee that beginning drivers have achieved a minimal level of skill. The role of the test for diagnostic and educational purposes is less clear. The participants recommended that short-term research should focus first on compiling a road test based on the best elements of those carefully developed performance tests available. Other short-term research should examine route selection, tests for operators of motorcycles and heavy trucks, use of the test as a motivator, and the demography of existing state road tests.

Long-term research should first identify those human performance parameters that differentiate between novice and experienced drivers. This information will provide the basis for a meaningful licensing program that should be coordinated with driver training, highway engineering, and vehicle design. Implications of this long-term research for licensing, diagnosis, and education are discussed. (AAM)

141 pages 110 refs

National Highway Traffic Safety Administration technical report no. DOT-HS-7-01698

KEYWORDS: Countermeasure Concepts. Physiological Testing.

UM-58-F0032

TRAFFIC ACCIDENTS AND DRIVER CHARACTERISTICS: A STATISTICAL AND PSYCHOLOGICAL STUDY, S. Hakkinen, Otaniemi, Finland: Institute of Technology (1958)

This study consists of two parts. In the first part an attempt is made to discover, by the use of statistical means, if it is possible to infer from the traffic accident rates of drivers whether the individual differences in accident rates are influenced by personal factors or by so-called accident proneness. Also discussed in this connection are the problems concerning the reliability and validity of comparing these rates in terms of external conditions, the period of exposure, and the classification of accidents.

Results of the statistical study indicate that (1) accident proneness changes with factors that change with time such as age and driving experience; (2) the possibility of bringing the constant factors into relief is decisively influenced by the degree of homogeneity of the groups studied with respect to the changing factors mentioned; (3) correlations between accidents, an investigation of the distributions, and a comparison of the averages yielded identical results, showing that constant personal factors exert a considerable influence upon accident rates.

The second part of the study is a psychological investigation in which an attempt was made to discover the psychological factors that give rise to accident proneness. The results of this study, which studied one hundred professional drivers, found that the accident groups did not differ from the safe groups in age, experience, or time of employment.

Not one of the differences between the safe and the accident groups in the intelligence and mechanical aptitude tests was significant. Differences between the groups were also insignificant in terms of simple, disjunctive, and choice reaction time. Simple motor

speed was somewhat greater for the safe than for the accident group, while the decline in speed during the test was stronger for the latter than the former. In eye-hand coordination the accident groups did significantly worse than the safe groups.

Psychological factors giving rise to the accident proness of drivers may have been discovered in this study. However, the generality of the traits discovered is indicated by the fact that the majority of them have been found in both driver groups. (AAM)

198 pages 226 refs

Finland's Institute of Technology Scientific Research No. 13

KEYWORDS: Open Road Driving. Psychological Testing. Psychomotor Tests.

UM-74-F0033

COMPUTER-NYSTAGMOGRAPHIE ALS NEUE BESTIMMUNGSMETHODE VON VIGILANZ UND REAKTIONSVERHALTEN UNTER PSYCHOPHARMAKA [COMPUTER-NYSTAGMOGRAPHIE, A NEW METHOD OF DETERMINING CHANGES IN VIGILANCE AS A RESPONSE TO PSYCHOTROPIC DRUGS], J. C. Aschoff; W. Becker; D. Weinert, Arzneimittel Forschung, v24 n8 p1085-7 (1974)

Described here is an on-line computer program for the evaluation of drug and alcohol effects on the eye. It is able to analyze five hundred saccidic eye movements (registered by means of electronystagmography) for their maximum velocity, accuracy, and reaction times.

A new thymoleptic-neuroleptic drug N-[1-ethylpyrrolidin-2yl)-methyl]-2-methoxy-5-sulfamoyl-benzamide (sulpiride, Dogmatil(R)) tested with this new method showed no influence on velocity and reaction times and may even enhance the accuracy of saccidic eye movements. It can, therefore, be considered safe for use by drivers. (JAM)

7 refs German

KEYWORDS: Major Tranquilizers (Antipsychotics and Neuroleptics): sulpiride. Tests of Sensory Function.

UM-75-F0034

COMBINING THE BLOOD ALCOHOL AND CLINICAL EXAMINATIONS FOR ESTIMATING THE INFLUENCE OF ALCOHOL, M. Kataja; A. Penttila; M. Tennu, Blutalkohol, v12 n2 p108-15 (1975)

This study investigates the prospects for combining the results of blood alcohol tests and clinical examinations, and for utilizing the clinical examination in estimating the influence of alcohol in drinking drivers in a new way. Various psychomotor functions of 494 suspected drunken drivers were studied by utilizing the standardized clinical examination procedure. Various alternatives were studied to combine mathematically the blood alcohol level and the total error point value obtained in clinical examination. The nonmandatory blood acohol limit value 0.05% and the mandatory value .15% were utilized for the present analysis.

The "choice model" proved to be the best method of estimating the influence of alcohol. This model used both the blood alcohol levels and clinical examination results. In this model, the result of clinical examination had value only in those cases where blood alcohol was less than .05% while the clinical exam result exceeded 0.5 error points; or when the blood alcohol content was between .05% and .15% while the result of clinical exam was more than 1.5 error points. There was little difficulty in relating the total clinical error points to the same numerical range with blood alcohol values. When this schema was applied to 494 cases, the result of clinical examination was decisive in about 15% of the cases, whereas in about 85% of the cases the nonmandatory and mandatory blood alcohol limit values were decisive. Therefore it can be concluded that the standardized clinical examination procedure is of great value in examination of suspected drunken drivers with prominent clinical disturbances at low blood alcohol levels. In spite of the relatively rare incidence of these cases in practice, this method is a valuable tool in that it takes into account individual reactions to alcohol effects. (JAM)

13 refs

KEYWORDS: Epidemiology: Analysis of Driver Body Fluids for Drugs.

UM-78-F0035

THE PLACEBO DILEMMA, L. Schindel, European Journal of Clinical Pharmacology, v13 n3 p231-5 (31 May 1978)

This paper discusses and reviews published studies dealing with the problems inherent in placebo use. Placebos have been used since about 1950 in evaluation and interpretation of drug efficacy, especially of new drugs. They have also been used to establish the clinical and therapeutic value of existing compounds through comparison. A number of problems are connected with the use of an "inert nothing". Some of these are informed consent, the doctor's consciousness of deceitful behavior, the potential risk for the patient and the doctor, the high effect rate of placebos (± 35%), unexpected side effects, dependency of the patient on placebos, and discovery by the patient of the placebo treatment. Other problems are independent of the medication. These include such factors as the doctor's bias, the nurse's influence, the significance of placebo color, the inconsistency of placebo-reactor or nonreactor types, and the generic state of the patient. There are also problems associated with double-blind testing.

The author concludes that only a well-trained and experienced clinical observer should employ a placebo in establishing the therapeutic value of drugs in order to avoid undesired pitfalls. In view of the many problems involved, there is no doubt that the existence of the "inert nothing" and the accompanying placebo effect make evaluation and interpretation of drug testing difficult and complicated. (JAM)

17 refs

KEYWORDS: Review.

UM-59-F0036

THE PHARMACOLOGY OF PLACEBOS, S. Wolf, Pharmacological Reviews, v11 n4 p689-704 (Dec 1959)

Discussed here are various aspects of placebo effects as reviewed in current literature. The author believes that placebo therapy should not be relied on too heavily because due to many complicating factors, results are rarely consistent, predictable, or persistent. Placebos may induce in an organ a major change or no change at all. Placebos have been demonstrated to produce changes in opposite directions. Several studies report toxic reactions in response to the administration of placebos. Numerous instances of addiction to placebos have been reported, as well as occurrence of hallucinations following administration of placebos.

The "meaningful situation" has a great effect on the efficacy of the placebo. The intensity of the patient's perceptions plus that of his reaction to the situation of suffering sets up a central excitatory state which facilitates the action of a placebo; that is, the greater the patient's need for help, the more likely is a positive response from the placebo. Studies also show that the subconscience plays an important role in placebo effect. It is concluded that placebo reactions depend upon the particular circumstances prevailing at each administration. Relevant among these would be the nature of the symptom being treated, the motivation of patient and physician, the nature of the test agent, its mode of administration, and the life situation of the subject at the time he is tested.

The value of placebo in therapeutic research is discussed, as well as therapeutic design. It is stressed that recognition of the power and properties of the placebo is essential to successful therapeutic experiments. (HSRI)

79 refs

KEYWORDS: Review.

UM-75-L0085

THE DRINKING DRIVER AND THE LAW: LEGAL COUNTERMEASURES IN THE PREVENTION OF ALCOHOL-RELATED ROAD TRAFFIC ACCIDENTS, J.D.J. Havard, Research Advances in Alcohol and Drug Problems, R.J. Gibbins; Y. Israel; H. Kalant; et al., eds., v2 p123-45, New York: John Wiley and Sons (1975)

Recent trends in legal countermeasures against drinking drivers in both the United States and Europe are reviewed. Methods of detection, confirmation, conviction, disposal, and evaluation are compared and evaluated. In the light of these trends, the

authors formulated several recommendations: (1) Drivers should be required to take a screening breath test whether or not they exhibit signs or symptoms of alcoholic intoxication, and law enforcement officers should be given powers to stop traffic for the purpose of taking such tests. (2) Drivers suspected of driving under the influence of alcohol as a result of the screening breath test should be required to provide a sample of blood for quantitative estimation of the concentration of alcohol in the blood. (3) Driving with a blood alcohol concentration in excess of a statutory limit should be regarded as a separate offense, distinct from other offenses involving driving while impaired. (4) Suspension of the driving license for a period of at least one year should be mandatory in all cases where persons have been convicted of the offense, and courts should have power to place conditions on the return of the license at the end of this period. (5) Authorities responsible for the prevention and control of road accidents should ensure that adequate baseline data are collected before the introduction of any changes in legislation so their effects can be evaluated by scientific methods. (HSRI)

46 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Countermeasure Concepts.

UM-77-L0086

A PSYCHOLOGICAL STUDY OF DRIVERS' CONCERN FOR ROAD SAFETY AND THEIR OPINIONS OF VARIOUS PUBLIC POLICY MEASURES AGAINST DRINKING AND DRIVING, G.J.S. Wilde, 7th International Conference on Alcohol, Drugs, and Traffic Safety, Melbourne, Australia, 24-28 Jan, 1977 (1977)

The purpose of this study is to investigate the structure and extent of drivers' beliefs in the effectiveness of potential public policies for safety, to investigate the structure and extent of their views on the desirability of these policies, to investigate the nature and extent of the concern that drivers may have for their own safety on the road, and to examine the relationships of the above features to one another as well as to demographic variables.

Three questionnaires were administered to 1,288 individuals who visited the Offices for Extension of Motor Vehicle Permits in Ottawa, Ontario and Kingston, Ontario.

Drivers were found to differ markedly in their concern for road safety. An individual characterized by a high level of concern may be described as a person who maintains the view that the general potential for traffic accidents is great. He reports that he experiences a considerable amount of anxiety when driving and that he makes many efforts to reduce the likelihood of having an accident and to minimize accident severity. On the other hand, a driver who is unconcerned about road safety is someone who says that the roads are relatively safe and that he experiences little anxiety when driving. He takes very few initiatives to reduce accident likelihood or accident severity.

This study also found evidence that individual differences in safety concern are related to some demographic variables. Women tend to be more concerned, as are older people. It was found that the following five countermeasures enjoy the greatest amount of general public support: (1) requiring that all drivers take lessons to learn how to control a car in a skid; (2) providing more public transportation in towns and cities; (3) requiring that all drivers be examined for eyesight and physical health every five years; (4) doubling the present penalties for drivers impaired by alcohol; and (5) equipping new cars with improved headlights for increased visibility at night.

While public policies for the promotion of road safety should not be chosen and implemented only on the basis of what the public wants, it is also unwise to disregard public views on whether the measure makes sense and on whether the public will support the measure. Popular reaction should be researched and profoundly understood before the measure is launched. (HSRI)

29 pages 28 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Countermeasure Development, Testing, and Evaluation.

UM-77-L0087

IMPAIRED DRIVING AND PUBLIC POLICY: AN EVALUATION OF PROPOSED COUNTERMEASURES, R.G. Ferrence; P.C. Whitehead, Blutalkohol, v14 n2 p106-17 (Mar 1977)

The rising public consciousness about the harmful effects of the growing consumption of alcohol has increasingly focused on the problem of drinking and driving. Research findings on impaired driving and the effect of lowering the drinking age on collision behavior among young drivers have been widely publicized. Largely as a result of these efforts, Canada's legislature at both the federal and provincial levels has publicly proposed a number of changes in the laws relating to drinking and to drinking and driving.

This report examines some of the major recommendations made and assesses their appropriateness and potential utility in the light of current research. These measures include raising the drinking age, mandatory identification cards, raising the driving age, probationary licenses, comprehensive driver education, lowering the legal limit for blood alcohol concentration, roadside breath testing, and police authority to stop vehicles at roadside to administer breath tests to suspicious drivers. Each of these proposals is evaluated.

The authors suggest a program that would require the following changes in legislation and procedures: (1) raising the drinking age first to age nineteen, then to twenty; (2) reducing the legal limit for blood alcohol concentration to .04 mg per 100 ml; (3) introducing probationary licenses for young drivers aged sixteen to nineteen that could be suspended for any serious violation; and (4) allowing police to require roadside breath tests on a random basis as part of their regular duties in addition to the provision of special units to patrol during heavy drinking hours. (HSRI)

29 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Countermeasure Development, Testing, and Evaluation.

UM-77-L0088

RESEARCH INVOLVING HUMAN SUBJECTS: AN EMPIRICAL REPORT ON HUMAN SUBJECT REVIEW COMMITTEES, B.H. Gray; R.A. Cooke; A.S. Tannenbaum; D.H. McColloch, American Sociological Association Annual Meeting, Chicago, Illinois, 7 Sep 1977 (1977)

Institutions involving human subjects are required by the National Research Act of 1973 to have institutional review boards (IRBs) to review such research conducted at or sponsored by the institution. The purpose of IRBs is to review research proposals to determine whether subjects will be placed at unwarranted risk, whether the rights and welfare of subjects are protected, and whether informed consent will be obtained by adequate and appropriate means.

This study focuses on review procedures and research projects in a sample of 61 institutions drawn from the more than 420 institutions with review committees approved by the Department of Health, Education, and Welfare. The study covered research reviewed by these review committees between July 1, 1974 and June 30, 1975. Approximately 3,900 persons were interviewed between December 1975 and July 1976. This included slightly more than 2,000 research investigators whose proposals had been reviewed, over 800 members of review boards, and 1,000 subjects. Members of the review committees were questioned on topics such as how they learned about what was expected of them in their role as a review committee member, their acceptance of selected research practices, their approval of risks and benefits of research, the kinds of risks involved in their projects, and the type of informed consent form used in their project. Approximately 60% of the studies reviewed by the IRBs were primarily biomedical, most frequently involving the administration of drugs or the study of samples of body fluids or tissues. The report also discusses the readability of consent forms for the subject and the degree of success in the operation of the review process. (HSRI)

40 pages 3 refs

KEYWORDS: Research with Human Subjects.

UM-75-L0089

MARKETING AND DISTRIBUTING HEROIN: SOME SOCIOLOGICAL OBSERVATIONS, L.J. Redlinger, Journal of Psychedelic Drugs, v7 n4 p331-53 (Oct-Dec 1975)

This paper discusses the marketing and distribution of heroin from a sociological viewpoint. The distribution of heroin is viewed by the author as a form of collective market activity operating under the constraint of illegality. The paper analyzes the collective nature of heroin markets and compares the similarities of the decisions and

practice of participants in the heroin market to those made by participants in other markets.

The data on which this report is based were gathered in 1967 and 1968 from interviews with patients at the N.I.M.H. Clinical Research Center, a federal narcotics hospital in Fort Worth, Texas, and from fieldwork and interviews with participants in the San Antonio, Texas heroin market. From these interviews the author obtained information concerning the quality and standards of heroin, the consumers, retailers, wholesalers, prices, profit, ethics, and the effects of law enforcement on the market.

The heroin market, like legal markets, is a network of collective activity whose goal is to successfully move a product. All markets are social organizations that must recruit and retain staff and develop constraints and commitments for doing so. All markets exist outside of the rule of law but all are affected by the enforcement of the law. As long as law enforcement officers and legislators view dealers and consumers of heroin as different and pathological, they will fail to understand their behavior and fail in their attempts to deal with the heroin problem. (HSRI)

43 refs

KEYWORDS: Opiates and Related Agents: heroin. Other Sociolegal Study.

UM-74-L0090

METHADONE AND THE CULTURE OF ADDICTION, I. H. Soloway, Journal of Psychedelic Drugs, v6 n1 p91-9 (Jan-Mar 1974)

This paper explores some of the features of the culture of the urban heroin addict that have undergone radical change following the introduction of a methadone maintenance outpatient therapy program in the community. The effects of both legal and illegal methadone use are examined. One hundred three current and past heroin addicts were interviewed, 80 of whom were currently using or had in the past used methadone.

From this study it became very evident that methadone maintenance, as it is currently viewed by the addict in the street, seems to represent less of an opportunity for rehabilitation than a chance to control the demands of one's habit. Some addicts who apply for treatment view methadone maintenance programs as a form of preventive medicine, allowing them to avoid withdrawal discomforts while cutting back on heroin. The money saved still allows addicts to use heroin as a luxury. The addict may cease his consumption of heroin and supplement his prescribed methadone with illegally procured methadone in order to get high. Some methadone users simultaneously enroll in more than one methadone maintenance program and sell the additional methadone. Once enrolled in a methadone maintenance program and receiving a daily prescribed dose of methadone, the addict can use alcohol or barbiturates with the methadone. Both substances act in concert with methadone to produce an intensified and more dangerous depressant effect.

Therefore two mutually exclusive cognitive models exist regarding methadone and methadone maintenance. The dispensers of methadone and the advocates of narcotic substitution therapy believe that methadone aids in cessation of drug abuse, cessation of criminal activity, and efforts toward employment. The actual effect on the addict has been the opposite, a fact which must be accepted by the therapeutic establishment. What society would like the addict to regard as medicine the addict has learned to regard as another way to get high. If society is to ever successfully treat drug addicts, it must first study the addict's culture. Secondly, the therapeutic establishment must make more use of such self-help organizations as Narcotics Anonymous. (HSRI)

11 refs

KEYWORDS: Opiates and Related Agents: methadone. Epidemiology: Regional or Local Survey of Drug Use Patterns. Other Sociolegal Study.

UM-72-L0091

SOCIAL PROBLEMS--ALCOHOL AND MARIJUANA, D.A. Rockwell, Journal of Psychedelic Drugs, v5 n1 p49-55 (Fall 1972)

This author believes that the current controversy over the hazards of marijuana will prove irrelevent in the long run. The issue is simply not medical-scientific but rather more social-political. The author believes that the social problems of alcohol and

marijuana are very similar historically; therefore society can learn from history to intervene more intelligently in the marijuana controversy. This historical perspective gives great insight into the potential impact and consequences of social control, both intended and nonintended.

In both alcohol and marijuana, the consequences of consumption disturb a sufficiently influential segment of the public to result in the enforcement of a criminal law to prohibit use of the drugs. When consumption is not suppressed by such an effort prohibition is replaced by regulation. This shift from prohibition to regulation often takes place as the result of the great social costs of the attempted suppression. These costs include direct costs of supporting the control agency and indirect costs such as corruption of police and criminalization of the illegal consumer. This sequence has already occurred with alcohol and appears to be in progress with marijuana and opiates. (HSRI)

34 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Countermeasure Concepts. Other Sociolegal Study.

UM-77-L0092

EXPERIMENTS ON HUMANS: WHERE TO DRAW THE LINE? P. London, Psychology Today, v11 n6 p20,23 (Nov 1977)

This paper discusses several ethical and legal aspects of human experimentation. The principle of informed consent has become a major point of professional ethics in recent years. This principle requires that the subject must be informed as to what will be done to him when he agrees to participate in an experiment. This presents a problem in situations where there is a lack of information or where deception is a central requirement of the experiment. In some important drug research and social psychology studies, giving subjects advance information about all aspects of the experiment could bias their responses to it in ways that might make the results meaningless. In some studies, even letting people know that there is an experiment going on and that they are subjects might ruin the outcome. On the other hand, subjects should be made aware of any possible risks or damage from the experiment.

As the tensions between these needs increase, discussion of the issues is leaving the area of individual or professional ethical concern and becoming a matter of law. In 1974, Congress created a National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research which was assigned to devise guidelines and make recommendations for the ethical issues surrounding research. These guidelines offer no firm rules as to when some amount of deception may be necessary and proper. They do, however, encourage researchers to use the least amount of deception possible. (HSRI)

0 refs

KEYWORDS: Informed Consent. Research with Human Subjects.

UM-76-L0093

EFFICACY OF LAW ENFORCEMENT PROCEDURES CONCERNING ALCOHOL, DRUGS, AND DRIVING, R.F. Borkenstein, Modern Problems of Pharmacopsychiatry, v11 p1-10 (1976)

The subject of this paper is the role of law enforcement in alleviating the problems caused by the driver impaired by alcohol. Alcohol-related crashes tend to cluster at the top of the crash-severity scale in terms of both personal injury and property damage. Evidence collected since 1940 indicates that programs directed at drinking while driving have had little impact on the frequency of alcohol involvement in fatal crashes. A major cause of the problem is that most drivers perceive a low risk of being apprehended.

The author suggests several recommendations for a successful program to solve the problem of drinking while driving: (1) Law enforcement must be optimized to modify the drinking behavior of drivers by "putting teeth" in the messages of the media. (2) The police and justice systems who enforce most of the laws dealing with the drinking driver must be systematized to handle a problem of epidemic proportions. (3) All operations against the drinking driver should be directed primarily at general deterrence, and secondarily at apprehension of particular individuals, although in practice the primary goal may be achieved by vigorously pursuing the secondary goal. (4) The laws dealing with the drinking driver should be reviewed and revised, embracing current social

science knowledge and legislative and legal trends. (5) Alcohol in the driver should be considered an aggravating factor in traffic offenses rather than a primary cause. (6) Sanctions should range from punitive to therapeutic according to individual need. (7) Finally, a time-series study of statistically significant proportions should be undertaken to provide a means of sensing change brought about by the countermeasures. (HSRI)

10 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Countermeasure Concepts.

UM-77-L0094

SUBJECTS RIGHTS, FREEDOM OF INQUIRY, AND THE FUTURE OF RESEARCH IN THE ADDICTIONS. R.E. Meyer, American Journal of Psychology, v134 n8 p899-903 (Aug 1977)

This paper discusses the issues involved in the area of human experimentation, particularly pertaining to drug studies. Since the recent passage of regulations concerning subjects' rights and freedom of inquiry, opposition by the public and others to some areas of research in the addictions has prevented its implementation or continuation. Research investigators in the biomedical and behavioral sciences have been placed in the position of defending their work in an adversary climate.

The author points out the importance of transmitting to the public, the scientific community, and legislators the investigator's concern that subjects' rights not be viewed only in a legalistic context, but also in the context of patient safety. Scientists have a major educative role relative to the public pertaining to freedom of inquiry and subjects' rights. At this point in time, the surface has been barely scratched, a situation which prohibits public understanding and cooperation. It may be necessary to organize a coalition of lay persons and biomedical and behavioral scientists to present to the public, the scientific community, and legislators a working system that includes both freedom of inquiry and subjects' rights. (JAM)

11 refs

KEYWORDS: Research with Human Subjects.

UM-77-L0095

DRIVING, DISEASE AND THE PHYSICIAN'S RESPONSIBILITY. G.S. Sharpe, American Association for Automotive Medicine, 21st Conference, Proceedings, D.F. Huelke, ed., p64-85, Morton Grove, Illinois: AAAM (1977)

This paper examines the responsibility of Canadian physicians to report conditions in their patients which may make driving dangerous for them. Also discussed is the potential liability for physicians who grant their patients exemptions from wearing seat belts should these patients be later involved in automobile accidents where injury is inflicted which could have been prevented had they been wearing a seat belt. In order to define the scope of the physician's duty, a number of Canadian court cases are examined where car accidents clearly resulted from the driver's physical disability. Cases are considered which deal with mental disorders, diabetes, and heart attacks. While each case should be examined individually as to whether an individual with a chronic ailment such as heart disease, diabetes, and epilepsy should refrain from driving, recent cases such as these combined with the apparent legislative intent behind Canada's statutory requirements indicate an unsympathetic approach to the physician who places his patient's welfare ahead of society's.

Common law in Canada is increasingly recognizing the contributory negligence of individuals injured in automobile accidents who fail to wear a seat belt. The Canadian Medical Association has recently released a list of medical conditions where wearing a seat belt may be contraindicated. This list operates in a guidance capacity only and not with any force of law. Therefore it is a question of judgment on the part of the physician to determine what medical conditions will justify his issuing a certificate of exemption to his patients. To avoid liability, the physician should carefully document the rationale for issuing such a certificate. (HSRI)

43 refs

KEYWORDS: Other Sociolegal Study.

UM-77-L0096

MEDICAL REPORTING OF DRIVERS WITH EMOTIONAL PROBLEMS. J.L. Weygandt, American Association for Automotive Medicine. 21st Conference Proceedings, D.F. Huelke, ed., p86-100. Morton Grove, Illinois: AAAM (1977)

The purpose of this paper is to consider the special licensing problems of those persons with a history of mental illness. The decision to license for persons with medical problems has traditionally been based on subjective judgment, generally with no research findings to justify the cut-off limits which are used. Driving problems caused by emotional illness have been particularly difficult to define, especially those caused by depression, schizophrenia, and similar conditions where there is often very little correlation between the severity of the condition and driving impairment.

For the past two years Wisconsin has been using a reporting form based on functional behavioral conditions believed to be most closely related to driving impairment: suicidal, homicidal, and assaultive. This paper reports on a three-month study of the approach and on assessment of its use.

Review of the reporting forms for the three-month study period suggests that this approach represents a move in the direction of more meaningful reporting of persons with mental or emotional problems which can serve, in part, in the driver licensing decision. There is generally good response by the reporting physician, though there are sufficient inappropriate responses to suggest that an attempt should be made to emphasize the limited areas of concern, namely, demonstrated overt homicidal, suicidal, or assaultive behavior. Also, some physicians objected to making a recommendation with regard to driver licensing.

The author believes that the Wisconsin approach to the licensing of the emotionally ill represents a step forward in that it places emphasis on certain types of overt behavioral manifestations most likely to impair safe driving. The medical advisory personnel in Wisconsin are currently in the process of revising the reporting forms for use in their state. (AAM)

26 refs

KEYWORDS: Countermeasure Development, Testing, and Evaluation.

UM-77-L0097

DRUG USE IN AUSTRALIA AND THE UNITED STATES AS REFLECTIONS OF LEGISLATION AND SOCIAL ATTITUDES, D.A. Knapp; D.E. Knapp; G.E. Brooks, Drug Intelligence and Clinical Pharmacy, v11 n5 p298-303 (May 1977)

This paper compares drug use and the drug industry in the United States and Australia, examining the similarities and differences regarding legislation and underlying social attitudes. Three major aspects are examined: (1) government controls over the distribution of drug products; (2) economics of obtaining drugs and related pharmacy services; and (3) factors affecting individual physicians' decision-making in prescribing.

The U.S. and Australia have similar requirements which must be met before drugs are permitted be marketed, and both have prescription versus nonprescription categories. A major difference is that the U.S. government does not itself market any drugs. Both governments have controls over drug promotion with the United States having tighter controls over prescription drugs and Australia having more controls over nonprescription drugs.

Patients in the U.S. traditionally have paid for outpatient prescription drugs directly without assistance from private or public insurance programs. The basic U.S. economic system of capitalism has been predominant in the outpatient prescription drug market. Under Australia's Pharmaceutical Benefits Scheme (PBS) hospital patients do not pay out-of-pocket costs for drugs. On a nonhospital basis, veterans and pensioners receive drugs free of charge. All others pay a $2.00 charge per prescription.

The main difference between the Australian and U.S. systems with regard to physician use is in the review process. In the Australian system under the PBS, the Pharmaceutical Benefits book delineates drug use. The review process occurs primarily at the Federal level, whereas in the U.S. review starts at the local level.

At this time, the two countries are moving closer together in the drug area, with the U.S. apparently moving toward a drug benefit under national health insurance, and Australia striving to strengthen its quality assurance mechanism. (HSRI)

5 refs

KEYWORDS: Other Sociolegal Study.

UM-77-L0098

VALUE FOUNDATIONS FOR DRUG USE, R.M. Veatch, Journal of Drug Issues, v7 n3 p253-62 (Sum 1977)

This article investigates the relationship of value foundations to the use of drugs. The argument is presented that it is logically impossible to make drug use decisions without evaluating the outcome of various alternatives and choosing the most highly valued in the circumstances. A map of the major value foundations upon which drug choices might be made is provided, and their relationship to one particular drug category, the antianxiety agents or tranquilizers, is explored.

The conclusion is reached that a purely therapeutic drug ethic may be problematic as an acceptable basis for drug use. The author also concludes that pluralism and freedom of choice are not enough for a policy on drug use choices. At least three reasons require moving beyond this freedom of choice ethic: (1) There are limits to what is tolerable in society. (2) Society must have guidelines for proper drug use for those who cannot choose for themselves. (3) The drug consumer should know what he ought to do, not simply what he is free to do. (JAM)

25 refs

KEYWORDS: Other Sociolegal Study.

UM-77-L0099

PHARMACEUTICAL AND LEGAL RESTRICTIONS ON A DRUG ANALYSIS PROGRAM, E.R. Sinnett; J. Leslie, Professional Psychology, v8 n2 p170-7 (May 1977)

This article describes a street drug information program at the Kansas State University using a modified telephone answering service and discusses the restrictions curtailing its activities. This system gave detailed descriptions of illicit drugs currently being sold in the area including street name, what it purported to be, appearance, and cost; it offered warnings concerning probable misrepresentation based on users' reports of reactions; and it invited each caller to contribute information. This program proved to be very successful in spite of a great deal of opposition to it.

Such dissemination of current, detailed information about street drugs, however, was regarded as dangerous by state and federal government agencies and the Kansas State Board of Pharmacy. Although first amendment protections seem to apply, legal action has circumscribed educational, research and counseling activities, causing this program and all drug information programs in the state to discontinue their services.

Objections and arguments for and against street drug information programs are examined. (HSRI)

154 refs

KEYWORDS: Countermeasure Development, Testing, and Evaluation.

UM-77-L0100

DRUG USE AND ABUSE: SOME CULTURE-CROSSING QUESTIONS, M.H. Agar, Journal of Psychedelic Drugs, v9 n1 p69-73 (Jan-Mar 1977)

This article advocates a cross-cultural approach to drug research. This approach compares the results of several specific studies of group cultures. The author believes that the development of a cross-cultural metalanguage, a culture-free yet culture-specific detailed language, has a potentially rich payoff for an understanding of drug use and abuse in American society. However, the metalanguage that can prove so valuable in backlighting the influences of any culture on discussions of drug use can only

develop with a general understanding of man-chemical relationships. Obviously such an understanding cannot be obtained solely by studying American society.

In order to advance cross-cultural research, more competent ethnographic descriptions of patterns of drug use in both traditional and modern societies are needed. Such studies can add to the substantive knowledge of the range of existing man-chemical relationships, as well as report the variations in folk definitions of terms concerning drug use. Such studies are also necessary to discuss drug use patterns without the heavy loading of cultural biases that usually accompany such discussions. (HSRI)

14 refs

KEYWORDS: Other Sociolegal Study. Review: Survey Methodology.

UM-78-L0101

MOTOR VEHICLE LAW REVIEW: DIFFERING "DUE PROCESS" REQUIREMENTS, J.P. Hennessee, AAMVA Bulletin, v43 n1-2 p8-9 (Jan-Feb 1978)

This article reports on a series of four cases which apply the "due process" requirements to driver license suspensions. In Tolbert v. McGrief, a three-judge Federal Court in Alabama held that a presuspension notice and hearing is required in instances where driver licenses are being suspended for medical and mental incompetence. Tolbert had had brain surgery as a youth and was thereafter required to take phenytoin and diazepam to avoid seizures. Although his Alabama driving record showed no seizure problems, the Drivers License Division, upon receipt of an outside complaint, began taking steps to suspend Tolbert's license. After a medical report and interview, Tolbert's license was suspended. He was not informed of any opportunity to contest the decision nor was he given an opportunity to present his side of the story. The court ruled that the licensee must be given the opportunity for a full hearing before his right to drive actually terminates and that he must be given adequate notice of this opportunity.

A month later this same court reached a similar conclusion in Smith v. McGrief, a case relating to suspension due to alcohol abuse.

Contrasted with these holdings, the same court held earlier in Radar v. Dolhard that neither previous cases nor the constitution requires a prerevocation hearing where the revocation is mandatory following conviction for driving a motor vehicle while intoxicated. In a similar vein, the United States Supreme Court in 1977 vacated and remanded a United States District Court opinion which held that a Massachusetts statute was unconstitutional which provided for the automatic suspension of a driver's license upon the state's assertion that the licensee refused a chemical test. (HSRI)

0 refs

KEYWORDS: Other Sociolegal Study.

UM-72-L0102

THE USE OF HUMAN SUBJECTS IN HUMAN FACTORS RESEARCH, J.M. Miller; T.H. Rockwell, Human Factors, v14 n1 p35-40 (Feb 1972)

Some legal and ethical aspects of using human subjects in research are discussed. Among these key issues are the following: (1) How does one make a fair judgment of the risks involved as opposed to the potential benefits to be gained? (2) Can one be assured of a subject's informed consent? (3) How can a researcher protect himself against liabilities arising from accusations of negligent behavior?

In partial answer to these issues, it is suggested that the Human Factors Society establish committees to recommend a code of ethics for its members and review proposals for human research at the request of its members. Such provisions could be of legal and ethical value in the protection of its member researchers and would help establish and preserve a high professional recognition for the society's leadership in human factors research involving risk to the human subject. (JA)

12 refs

KEYWORDS: Informed Consent. Research with Human Subjects.

UM-76-L0103

PENALTY FOR THE POSSESSION OF MARIJUANA: AN ANALYSIS OF SOME OF ITS CONCOMITANTS, R.B. Stuart; K. Guire; M. Krell, Contemporary Drug Problems, v5 n4 p553-63 (Winter 1976)

This four-year quasi-experimental study examined the effects of milder penalties for marijuana possession. Data were collected in public schools in four neighboring Michigan communities during the period 1972-1975: Ann Arbor, where the mild marijuana law was passed; and three other communities which did not have the novel marijuana ordinance --Chelsea, Dearborn, and Willow Run. High school classes in grades 10, 11, and 12 were selected randomly and assessed by a questionnaire which collected a variety of data: present and past drug use; sale of drugs; friends' use of drugs; information about the physiological, psychological, and legal concomitants of drug use; and minimal demographic information.

The authors conclude that the turmoil in Ann Arbor resulting in the removal, reimposition, and subsequent removal of penalties for the possession of marijuana had little apparent impact of students' rates of use of this drug or any other of the drugs studied. Rates of use by Ann Arbor students in 1975, in spite of four years of change, still closely resembled those of students in neighboring communities as well as those living out of state. Attitudes toward decriminalization were related to the drug in question and were predictable from students' rates of use of these drugs. Most students indicated that they would be little affected by any change in the legal status of specific drugs.

It is possible that the changes in the Ann Arbor law may have needed more time before they were translated into changes in adolescents' use of drugs. But the fact that students' illegal drug use was already widespread indicates that adolescents were not strongly influenced by the legal status of the drugs. It appears that while laws relating to drug use may have an important impact upon adult behavior, the laws seem to have minimal impact upon adolescent drug use. If this finding is repeated in other jurisdictions, it should lead to serious questioning of one commonly accepted approach to shaping the behavior of youth, namely, recourse to law. (HSRI)

6 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Epidemiology: Regional or Local Survey of Drug Use Patterns. Other Sociolegal Study.

UM-78-L0104

REGULATION--WONDERLAND REVISTED, W.C. Wescoe, MRI Quarterly, p14-19, Kansas City, Mo.: Midwest Research Institute (Summer 1978)

This article represents Dr. W. Clarke Wescoe's presentation delivered at the annual meeting of the Midwest Research Institute (MRI) on the occasion of his receipt of the MRI Citation. He discusses the negative impact of excessive drug regulations on medical care. Regulations relating to safety and proof of efficacy have led to adverse consequences for the American patient and the American pharmaceutical industry. These include a needless delay in the introduction of new medicines in this country coupled with substantially increased costs for pharmaceutical research. The author claims that the overriding problem is that regulatory officials tend to be overly concerned with risk and to be less than sensitive to benefit.

Another problem is the vast array of unnecessary regulatory agencies, all of which have different and often contradictory regulations. Regulations are often written for law which are not specific or clear.

The present administration, contrary to its avowed intent, has not decreased regulation. Conversely, the anticipated expenditures on regulatory activities continue to rise. (HSRI)

0 refs

KEYWORDS: Countermeasure Development, Testing, and Evaluation. Other Sociolegal Study.

UM-76-L0105

CLINICAL EXAMINATION AS MEDICOLEGAL PROOF OF ALCOHOL INTOXICATION, A. Penttila; M. Tenhu, Medicine, Science, and the Law, v16 n2 p95-103 (1976)

During the past two decades the use of clinical examination as medicolegal proof of alcohol intoxication has sharply decreased because of increased use of the blood alcohol level determination. Some aspects of the application of clinical examination for medicolegal purposes in practice are discussed in the present survey, particularly recent developments in the field.

The result of the clinical examination is dependent on three factors: the person to be examined, the examining physician, and the examination methods. Each of these factors can influence the conclusions made about the degree of intoxication, and all are discussed in this paper.

The source of error in clinical examination is usually caused by erroneous conclusions made about the degrees of intoxication on the basis of test results which are of questionable value. This author believes, however, that at present it seems very difficult to replace a clinical examination composed of simple psychomotor tests with another examination system which could give as much information on the effects of alcohol on psychomotor functions and which could be used on almost every occasion. Only a clinical examination can provide information on the individual effects of alcohol on psychomotor functions. It can also be used to reveal the effects of other narcotics and additional factors on the operation of psychomotor functions. In drug and other narcotic cases (except those involving alcohol) the result of a clinical examination is usually more informative than simple identification and quantitation of chemical compounds. (HSRI)

37 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Countermeasure Development, Testing, and Evaluation.

UM-78-L0106

REPORT OF THE LIAISON TASK PANEL ON PSYCHOACTIVE DRUG USE/MISUSE, Task Panel Reports Submitted to the President's Commission on Mental Health, v4 p2104-40 (Feb 1978)

Presented here is the report of the Liaison Task Panel on Psychoactive Drug Use and Misuse. This report reviews the scope and nature of the mental health-related aspects of psychoactive drug use and misuse and discusses future areas of needed knowledge and policy changes. The authors believe that the dichotomy between licit and illicit drug use should be discarded in favor of the view that all psychoactive drug policy, including that for alcohol and tobacco, should be founded on the same general principles. Psychoactive drug use can then be viewed as common rather than as sick or deviant behavior except when the individual develops patterns of intensified or compulsive use having dysfunctional consequences.

A strong need exists for a differentiation between drug use and misuse or abuse. Illicit users, if apprehended by law enforcement officers, are often labelled as deviants by society and come to see themselves as deviants. The resultant legal and social alienation may have mental health consequences as severe as the destructiveness of compulsive drug use itself. Furthermore, the social and personal costs of the continued criminalization for other psychoactive substances may outweigh the costs of the dysfunctional drug problems themselves. The task panel recommends that all possible efforts be made legally, medically, and socially to make distinctions between that psychoactive drug use with minimal social costs--experimental, recreational, and circumstantial--and the more dysfunctional, intensified, and compulsive use patterns. The task panel believes that the most important and immediate goal should be to decriminalize personal possession and use of small amounts of marijuana.

The task panel recommends that drug education and prevention strategies be aimed at the avoidance of the destructive patterns of psychoactive drug use rather than at abstinence or drug free behavior.

In view of the inherent political and bureaucratic constraints of public institutions, the task panel believes a private sector committee should be formed to monitor governmental drug abuse expenditures and treatment programs, to respond to and critique governmental drug abuse information, to develop public policy options, and to fund research in those politically controversial areas. (HSRI)

0 refs

KEYWORDS: Countermeasure Concepts.

UM-74-L0107

BLOOD ALCOHOL IN AUTOMOBILE DRIVERS: MEASUREMENT AND INTERPRETATION FOR MEDICOLEGAL PURPOSES. I. EFFECT OF TIME INTERVAL BETWEEN INCIDENT AND SAMPLE ACQUISITION, T.A. Loomis. Quarterly Journal of Studies on Alcohol, v35 p458-72 (1974)

This study consists of an experimental approach to the evaluation of the limits of time intervals after a drinking-driving incident that would be of significant medicolegal importance. It evaluates the role of the actual drinking and driving conditions, the role of the fluctuations in sequential breath testing of subjects, and the role of the analytical accuracy of the breath-testing procedure in determining whether a driver is legally intoxicated.

Three separate experiments are described in which the results of Breathalyzer tests were compared with other methods of measuring blood alcohol content.

Medicolegal problems are often complex when dealing with individual cases. The present study indicates that in a given individual, regardless of whether the rate of disappearance of alcohol from the blood is the minimum or the maximum that has been observed in various subjects, the difference is not great enough to measure by conventional breath or blood analysis unless sufficient time has been permitted to elapse between two single tests. The problem comes, however, when one tries to determine the length of time needed to elapse before the difference in a pair of BAC tests becomes a difference that can be scientifically valid and useful for medicolegal purposes. The data from these experiments and previous experiments indicate that because of the observed ranges of rate in change in BAC and because of the limits of accuracy of the chemical analytical methods, the time interval between any two single tests in an individual subject would have to be greater than two hours before the difference would have any practical value. In practical terms, if a BAC in an automobile driver is determined at any time within two hours following an incident, the BAC is not practically different from what it was at the time of the incident. Furthermore, in medicolegal cases, a BAC determined in excess of two hours following an incident should not be considered equivalent to the BAC at the time of the incident.

The results also support the conclusion that in no case should BAC as determined by breath test be estimated to the third decimal point, since the accuracy of the apparatus is not adequate for this procedure. (HSRI)

10 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Evaluation of Methods for Drug Analysis. Other Sociolegal Study.

UM-77-L0108

THE RELUCTANCE TO COMBINE, D.J. Ottenberg. American Journal of Drug and Alcohol Abuse, v4 n3 p279-91 (1977)

This paper discusses the potential use of and effectiveness of combined treatment in terms of the similarities and differences between alcoholics and drug abusers. The shifting of substance abuse in this country away from a pattern of single substance dependence toward multiple substance abuse has been accompanied by renewed interest in the possibilities of combined treatment and its ideological base, a generic conceptualization that encompasses and integrates into a unitary theory all types of substance abuse. This view maintains that many of the differences separating alcoholic persons from other substance abusers have more to do with factors like ethnic, social, and cultural background, age, and prejudice than with real differences in the addictive processes or therapeutic needs.

Several recent studies of combined treatment have found it no less effective than substance segregated treatment. Some persons are helped, others are not. Until reliable ways are developed to select out those who would benefit from combined treatment from those who would not, the method remains experimental, not yet to be advocated for mass use.

The author concludes that what is needed immediately is a generic concept of substance abuse. This would prepare the way for planning, legislation, program organization, national data systems, and research that could be designed for the most effective response to today's needs and problems. An especially pressing need is for generic training and accreditation of workers in the alcohol and drug fields.

As the many questions raised by a generic viewpoint are considered, one can observe that much of the resistance to this concept among professionals is attributable to fear of the unfamiliar, protection of vested interest, misapprehension about consequences, and not least, prejudice reflecting the stereotyped ideas of the general population. (JAM)

23 refs

KEYWORDS: Countermeasure Concepts.

UM-76-L0109

DRUGS AND CRIME: THE RELATIONSHIP OF DRUG USE AND CONCOMITANT CRIMINAL BEHAVIOR, G.A. Austin; C. Phil; D.J. Lettieri, eds., NIDA Research Issues 17 (Dec 1976)

This is the first of two volumes presenting abstracts of major research and theoretical studies that explore various aspects of the relationships between drugs, criminal behavior, and the law. This volume addresses the issue of the relationships of drug use and concomitant criminality, that is, criminal acts other than the possession of or trafficking in illicit drugs. Most of the 107 studies included in this volume focus on habitual offenders who are engaged in a criminal lifestyle. Each of the studies attempts to investigate such problems as determination of the kinds of crimes committed by certain types of drug use, whether crime is a necessary corollary to drug use, what the causal relationship between drug abuse and criminal behavior is, and whether changes in drug laws have had any impact on criminal behavior.

The volume is divided into seven topic areas: (1) reviews and theories; (2) drug use and criminal behavior; (3) addiction and criminal behavior; (4) drugs and delinquency; (5) crime and female drug users; (6) the impact of treatment modalities; and (7) the economics of drugs and crime.

Each abstract is intended to be a faithful representation of the original study, conveying what was done, why it was done, what methodology was employed, what results were found, and what conclusions were derived from the results. (AAM)

U.S. Department of Health, Education, and Welfare publication no. (ADM) 77-393

KEYWORDS: Compilation.

UM-77-L0110

DRUG USERS AND THE CRIMINAL JUSTICE SYSTEM, G.A. Austin; D.J. Lettieri, eds., NIDA Research Issues 18 (Jun 1977)

This is the second of two volumes presenting summaries of major research and theoretical studies exploring various aspects of the interrelationships of drug use, criminal behavior, and the law. This volume consists of sixty-seven summaries focusing on the issues of drug use, possession, or trafficking as a crime; and on the effect of the criminal justice system, the law, and law enforcement procedures on drug use and the drug user. It is divided into two sections: (1) drugs and the law; and (2) treatment and rehabilitation of the drug offender. Each summary is intended to be a faithful representation of the original document, conveying the purpose and scope of the research or study, the methods employed, and the results obtained, as well as the author's conclusions derived from those results.

Several broad areas are discussed by a wide variety of papers: attitudes toward drug laws, patterns of enforcement, community-based compulsory treatment, civil commitment in California and New York, the half-way house, prison-based treatment, and drug offenders on parole. (AAM)

U.S. Department of Health, Education, and Welfare publication no. (ADM) 79-510

KEYWORDS: Compilation.

UM-78-L0111

PLACEMENT OF PHENCYCLIDINE IN SCHEDULE II, Federal Register, v43 n17 p3359-60 (25 Jan 1978)

This rule places phencyclidine in Schedule II, making it subject to the controls for Schedule II drugs concerning manufacture, distribution, dispensing, importation, and

exportation. Reasons given for its transfer from Schedule III to Schedule II are its high potential for abuse, its current use in veterinary treatment in the United States, and the fact that abuse of phencyclidine may lead to severe psychological dependence. The rule is effective as of February 24, 1978. (HSRI)

0 refs

Drug Enforcement Administration

KEYWORDS: Hallucinogens and Related Agents: phencyclidine. Other Sociolegal Study.

UM-78-LO112

PLACEMENT OF 1-PHENYLCYCLOHEXYLAMINE AND 1-PIPERIDINOCYCLOHEXANE-CARBONITRILE, IMMEDIATE PRECURSORS OF PHENCYCLIDINE, IN SCHEDULE II. Federal Register, v43 n96 p21324-5 (17 May 1978)

This rule was issued in order to place 1-phenylcylohexylamine and 1-piperidinocyclohexane-carbonitrile, immediate precursors of phencyclidine, into Schedule II as of June 16, 1978 because they are the principle compounds used in the manufacture of a controlled depressant substance. Information concerning the registration, security, labeling and packaging, quotas inventory, records, order forms, importation and exportation, and criminal liability is also provided for the two compounds by this rule. (HSRI)

0 refs

Drug Enforcement Administration

KEYWORDS: Unclassified Agents: 1-phenylcyclohexalamine. 1-piperidinocyclohexane-carbonitrile. Other Sociolegal Study.

UM-78-LO113

PLACEMENT OF PREPARATIONS CONTAINING DIFENOXIN IN COMBINATION WITH ATROPINE SULFATE INTO SCHEDULES IV AND V, Federal Register, v43 n167 p38382-4 (28 Aug 1978)

This rule requires that the manufacture, distribution, dispensing, importation, and exportation of preparations combining 1 mg difenoxin with 0.025 mg atropine sulfate be subject to the controls applicable to narcotic substances in schedule IV of the Controlled Substances Act and that preparations combining 0.5 mg difenoxin with 0.025 mg atropine sulfate be subject to the controls applicable to schedule V narcotic substances. This rule results from a request of the Assistant Secretary for Health, Department of Health, Education, and Welfare, in behalf of the Secretary, review thereof by the Drug Enforcement Administration, review of the current drug control obligations of the United States under the the United Nations Single Convention on Narcotic Drugs, 1961, as amended, subsequent publication in the Federal Register of a notice of proposed rulemaking, and review of comments submitted in response to the published notice. Effective date is September 27, 1978. (JA)

0 refs

Drug Enforcement Administration

KEYWORDS: Antidiarrhea Agents: difenoxin. Mydriatics: atropine sulfate. Opiates and Related Agents: difenoxin. Parasympatholytic (Cholinergic Blocking) Agents: atropine sulfate. Other Sociolegal Study.

UM-75-LO114

WHITE PAPER ON DRUG ABUSE, Washington, D.C.: U.S. Government Printing Office (1975)

Presented here is a review of the overall federal effort in the prevention and treatment of drug abuse. The specific objectives of the review were (1) to assess the effectiveness of current drug programs and policies; (2) to determine if the Federal drug strategy, priorities, and organizational structures are appropriate to meet current needs; and (3) to examine the need for, and structure of, a drug management and coordination mechanism in the Executive Office of the President. The paper reviews and assesses federal agencies in an operational context to see if they are rational, properly targeted, and structured to achieve their intended purposes. Also included in

the report are recommendations for improving the Federal drug program. These recommendations deal with priority in both supply and demand reduction, priority in treatment, enforcement, intelligence activities, development of international cooperation in preventing illicit production of drugs, education, vocational rehabilitation, and the criminal justice system. (HSRI)

Domestic Council Drug Abuse Task Force

U.S. Department of Health, Education, and Welfare

KEYWORDS: Countermeasure Development, Testing, and Evaluation. Other Sociolegal Study.

UM-77-L0115

DRUGS AND HEALTH, F.A. Whitlock, Journal of Drug Issues, v7 n4 p397-403 (Fall 1977)

Reviewed here are the contradictions and inconsistencies surrounding existing drug laws in Australia. Laws that are passed mainly by the middle-aged and older members of society concerning drugs used by younger people consistently ignore the drugs to which their own age groups are addicted, such as sedatives, even though the harm caused by abuse of sedatives may be much greater than that caused by illegal drugs. Furthermore, society appears to be less wracked by evil consequences from the wider use of cannabis than it is by the disastrous consequences of alcohol and tobacco use. Also, a double standard exists concerning the treatment of drug users suffering from ill effects of drug abuse. This double standard permits the medical profession to treat one variety of drug-induced disease without undue concern while treating narcotic abusers with a negative attitude.

The author concludes that ideally one should try to live without recreational drugs of any kind. Such an ideal, however, is contrary to human experience and behavior the world over. One must accept the fact that people have a desire for mind-affecting drugs, and will, irrespective of government controls, obtain the drugs they desire. This fact must be acknowledged at all levels. Governments must cease to frame laws designed to regulate morals, except insofar as any drug-induced behavior may have a damaging effect on the rest of society. They must recognize that the use of all drugs in private is a matter of concern solely for the user and not for the legislator. (HSRI)

16 refs

KEYWORDS: Countermeasure Concepts.

UM-74-M0200

MODERN IONIZATION TECHNIQUES IN MASS SPECTROMETRY, G.W.A. Milne; M.J. Lacey, CRC Critical Reviews in Analytical Chemistry, v4 iss1 p45-104 (Jul 1974)

This review deals with the various methods available for the ionization of organic molecules in mass spectrometry. A total of fourteen methods are considered but detailed consideration is given only to two important new methods--field ionization and chemical ionization. These are discussed from the theoretical and practical points of view. Their development prior to 1974 is reviewed and their potential evaluated. They are compared and contrasted with each other and also with electron ionization. The main sections in the review are (1) methods of ionization; (2) field ionization (introduction, theory, techniques and instrumentation, design considerations, and results); (3) chemical ionization (ion-molecule reactions, instrumentation, physical studies, and applications to organic analysis); and (4) comparison of electron ionization, field ionization, and chemical ionization.

The review concentrates on literature published between 1967 and 1973. There have been in this period some 500 pertinent papers and of these, about 300 are drawn from. The review is not, therefore, comprehensive so much as selective; it seeks to obtain a reliable perspective on the present state of the science of ionization in organic mass spectrometry as well as its potential use in the future. (JA)

325 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-75-M0201

RECENT DEVELOPMENTS IN IONIZATION PROCESSES RELATED TO ANALYTICAL METHODS IN MASS SPECTROMETRY, S.R. Smith, CRC Critical Reviews in Analytical Chemistry, v5 iss3 p243-65 (Oct 1975)

Ion fragmentation processes of interest to the analytical chemist are reviewed. A continually increasing proportion of this work is carried out by gas chromatography-mass spectrometry combinations aided by data processing equipment which match and identify spectra. Progress in this area is evident in drug analysis, food analysis, geochemical studies, and air pollution studies, several of which are reviewed here.

The application of spark source mass spectrometry in trace analysis is being continually expanded into new areas; spark source research is reported in biochemical, geochemical, and air pollution studies. The report also discusses new working structure determination by both high and low resolution mass spectrometry and the use of chemical ionization as an auxiliary technique in structure determination. Advances in isotope analysis, isotope dilution techniques, surface analysis by secondary ion mass spectrometry, thermal analysis methods, and other applications are reported. (JAM)

187 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-72-M0202

GAS CHROMATOGRAPHY-MASS SPECTROSCOPY INTERFACIAL SYSTEMS, C.F. Simpson, CRC Critical Reviews in Analytical Chemistry, v3 iss1 p1-40 (Sep 1972)

A number of techniques have been developed over the last decade for effecting the pressure drop from 1 atm to 10^{-3} to 10^{-} that is necessary between a gas chromatograph and a mass spectrometer. This paper reviews and critically compares the existing systems of such interface systems with the ideal requirements. A number of different techniques of the combined gas chromatograph-mass spectrometer are also described.

The paper begins with separate examinations of gas chromatography and mass spectrometry. The operating parameters and problems of each method are discussed. For gas chromatography, column efficiency and column sensitivity are discussed. For mass spectroscopy, resolution, scanning speed, and pumping speed are discussed in detail.

The construction and performance of various separators are examined in detail. Those discussed include the Jet Separator, Porous Glass Separator, Teflon Capillary Separator, Silver Membrane, Silicone Rubber Membrane Separator, Coated Silver Membranes, Porous Silver and Silicone Membrane, Variable Separator, and the Palladium Separator.

The author concludes that no one separator is completely satisfactory for all applications, particularly if the solutes under examination are of low molecular weight and are present in submicrogram quantities. In the author's opinion the following three interfaces would satisfy all possible requirements: (1) the Palladium Separator, specifically for low-molecular-weight volatile inorganic compounds and compounds that would not be reduced by the presence of active hydrogen; (2) the Micro Silicone Rubber Membrane Separator for organic compounds up to a molecular weight of 250; and (3) the Jet Separator, single-stage or double-stage, dependent on carrier-gas flow rate, for molecular weights from 100 upwards. (HSRI)

60 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-75-M0203

HIGH RESOLUTION LIQUID CHROMATOGRAPHY, H. Veening, CRC Critical Reviews in Analytical Chemistry, v5 iss2 p165-200 (Jul 1975)

This paper reviews, analyzes, and evaluates high-resolution (or high-pressure) liquid chromatography. High-pressure column liquid chromatography is a relatively new technique that has experienced a great increase in research activity in the past few years. The advantage of liquid chromatography is that thermally unstable, nonvolatile compounds that cannot be eluted by gas chromatography can often be separated by liquid chromatography since the columns are operated at or near room temperature.

The initial part of this review discusses the latest developments in such areas as improved column technology, liquid chromatography packings, the use of chemically bonded phases, and selectivity. Several noteworthy developments in instrumentation are also discussed. These include the use of gradient elution, improved high pressure pumps, new detection systems, unique mixed stream concepts utilized in postcolumn detectors, and specifically designed liquid chromatographs for the separation of biochemical mixtures.

Application of liquid chromatography to various chemical problems such as the separation of metal complexes and the use of liquid chromatography in clinical analysis are also described. The author concludes that high-resolution liquid chromatography offers a far greater choice of operating conditions, modes of operation, and methods of detection than gas chromatography. While high-resolution liquid chromatography is presently still a separation method which is complementary to gas chromatography, developments in the field indicate that liquid chromatography will become the more widely applicable of the two methods in the future. (JAM)

102 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-75-M0204

A REVIEW OF DETECTORS FOR GAS CHROMATOGRAPHY, E.R. Adlard, CRC Critical Reviews in Analytical Chemistry, v5 iss1 p1-36 (May 1975)

Presented here is a review of both new and well-established detectors for gas chromatography commercially available. A special attempt is made to indicate the advantages and disadvantages of several more recent or lesser known detectors which may offer special advantages for particular applications.

The first part of the review deals with the two main universal detectors, the katharometer and the flame ionization detector. Also discussed are the piezoelectric detector, the reaction coulometer, and the gas density balance.

The second part of the review deals with a variety of selective detectors of which optical emission and absorption devices constitute an important group. The properties of the flame photometric detector for sulphur and phosphorus are discussed in some detail, as are the properties of other flame emission detectors. In this section there is also a description of the microwave plasma detector. The second section deals with the flame thermionic detector, and the third section discusses techniques using coulometric and conductometric methods. The last section deals with the electron capture detector with its unique property of compound selectivity.

The review ends with a discussion of the choice of a selective detector for specific applications. The author concludes that individual requirements for specific applications vary so much that it is impossible to determine a detector of choice. Each situation must be examined in terms of the complexity of the sample to be analyzed, cost, and time available. (JAM)

95 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-76-M0205

THE SECRETION OF METHADONE AND ITS MAJOR METABOLITE IN THE GASTRIC JUICE OF HUMANS: COMPARISONS WITH BLOOD AND SALIVARY CONCENTRATIONS, R.K. Lynn; G.D. Olsen; R.M. Leger; W.P. Gordon; R.G. Smith; N. Gerber, Drug Metabolism and Disposition, v4 n5 p504-9 (Sep/Oct 1976)

This investigation had four major objectives: (1) to estimate the quantity of methadone which appears in the gastric juice and saliva in normal individuals after a single intramuscular dose of the drug; (2) to evaluate these parameters in tolerant subjects receiving high daily doses of methadone; (3) to compare the concentration of the drug in gastric juice with that in the blood of both groups of subjects; and (4) to examine the possibility that the major metabolite of methadone, 2-ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine, is excreted into the gastric juice.

Four healthy male subjects between 20 and 30 years of age and four addicts on high daily maintenance doses of methadone each received a parenteral dose of methadone hydrochloride (9.4-80.5 mg im) following an overnight fast. The concentration of

methadone in blood was compared with that in the gastric juice obtained over an eight-hour period by continuous low-pressure suction via a nasogastric tube. The concentration in the gastric juice ranged from 25 to 200 times that measured at the same time in the blood. Thus, eight hours after drug injection mean blood concentrations of 28 and 210 ng of methadone per ml were recorded in the normal subjects and the addicts, respectively. The corresponding concentrations in gastric juice were 2,200 ng/ml and 18,000 ng/ml, respectively. In the normal subjects about 2% of the administered dose was recovered in the gastric juice in eight hours, whereas in addicts about 7% was recovered. The greater recovery of methadone from the addicts appears to be the result of the larger volume of gastric juice recovered from the latter subjects. Methadone was also excreted in the saliva of both groups of subjects. In addicts, salivary concentrations were often ten times those recorded in the blood. The N-monodemethylated metabolite of methadone was identified in the gastric juice of addicts by gas chromatography and mass spectrometry. (JAM)

16 refs

KEYWORDS: Metabolites of Drugs and Other Agents: 2-ethylidene-1,5,-dimethyl-3,3-diphenylpyrrolidine. Opiates and Related Agents: methadone*. Drug Concentrations in Body Fluids: Acute Dose Study. Drug Concentrations: Comparison of Body Fluids.

UM-71-M0206

FLUOROMETRIC PROCEDURES FOR ILLICIT DRUG DETECTION, R.A. Passwater, Fluorescence News, v6 n3 p8-11 (Dec 1971)

Described here are two procedures for fluorometric morphine detection. Both of these procedures, the author claims, are valuable in that they have solved several problems present in earlier procedures.

The Mule and Hushin procedure involves oxidation of morphine and is fairly rapid. The morphine fluorophore is prepared by adjusting the pH of 2 ml of urine to 9-10 with 3.7 NH_4OH, extracting with 4 ml of 3:1 (v/v) chloroform: isopropanol, followed by evaporation of the organic extract to complete dryness. After drying, 0.1 ml of concentrated H_2SO_4 is added to the residue and vortexed. Next, 1 ml of distilled water and 1 ml of concentrated NH_4OH are added to the sample. This mixture is vortexed and autoclaved for fifteen minutes at 120 degrees C under fifteen to eighteen pounds of pressure. The final pH is near 8.4. Concurrent detection of quinine, used to dilute and camouflage heroin, is also possible using this method. This method is very sensitive (0.22 mcg/ml free base of 390 ng morphine in cuvet) and specific (the phenanthrene nucleus and a free 3-OH group are both required to produce the fluorophore).

The Goldbaum procedure extends the ferricyanide procedure to urine and provides some major simplifications in extraction procedures when compared to earlier methods. This test is quicker (eighteen minutes) even than the Mule and Hushin procedure and requires fewer manipulations and less training for routine screening by technicians. The Goldbaum method combines the use of fluorometry and gas chromatography. The instrumental sensitivity allows a small sample to be used and dispenses with the need for complete extractions. This procedure also eliminates the practice of drying the samples or extracts. The only interfering drugs when using this process are Dilaudid(R), Nalline(R), and Talwin Pentazocaine(R). (HSRI)

7 refs

KEYWORDS: Opiates and Related Agents: morphine. Evaluation of Methods for Drug Analysis. Specific Drug Screening: Optical Techniques.

UM-74-M0207

A SYSTEM OF MODELS FOR THE ACTION OF DRUGS APPLIED SINGLY OR JOINTLY TO BIOLOGICAL ORGANISMS, J.R. Ashford; J.M. Cobby, Biometrics, v30 n1 p11-31 (Mar 1974)

This paper is concerned with a system of mathematical models for the action of drugs when applied singly or jointly. The models are based upon the concepts of "sites of dosage" and "sites of action" of drugs and "physiological systems" which may be affected by drugs at sites of action. A drug may have one or more sites of action and may at each such site affect one or more physiological systems. Two or more drugs may have common sites of action. The action of a drug at any particular site is assumed to take place as a result of the "occupation of receptors", an occupied receptor behaving differently from an unoccupied receptor. The occupation of receptors is governed by the

"law of mass action" and depends upon the concentration of the drugs at the site of action. If two or more drugs act at the same site, they compete for receptors at that site. The effect of occupying receptors at a site is to change the activity of the corresponding physiological system. This change may not be capable of direct assessment, but may be revealed by a change in the state of the system, which is assumed to be a monotonic function of the change of activity.

The action of a drug when applied alone is considered in the light of this conceptual framework. It is shown that if the state of a system is a monotonic function of the concentration of the drug, a model involving a single site of action of the drug is appropriate. If, as is sometimes observed, the relationship is nonmonotonic with a single extremum, a two-site representation is required. The extension of the basic models to the joint action of two drugs is then discussed in terms of the number of sites of action of each drug separately and whether or not certain sites of action are common to each drug. A feature of this approach is that the joint action is completely determined by the action of the separate drugs and the existence of common sites.

The classification of models for the joint action of drugs is then considered. It is shown that if the transfer of the drugs from sites of dosage to sites of action is regarded as a separate phenomenon, a classification in terms of the concentrations of drugs at their sites of action can be formulated in very simple terms. This classification embraces all the major distinctions which are present in alternative systems and elucidates concepts such as synergism and antagonism. The application of the models is illustrated by an analysis of data concerning the effect of alcohol and meprobramate on human subjects. (JA)

20 refs

KEYWORDS: Minor Tranquilizers (Anti-Anxiety and Ataractics): meprobamate. Nonbarbiturates: ethanol (ethyl alcohol). Review.

UM-75-M0208

RELIABILITY AND SIGNIFICANCE OF RESULTS OF ALCOHOL AND DRUG ANALYSES, A.S. Curry, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam: S. Lambert, eds., p469-81, Toronto, Canada: Addiction Research Foundation of Ontario (1975)

This paper discusses two types of identification procedures that can be used to characterize a drug that has been extracted from a body fluid, namely, those based on spectroscopic methods and those based on chromatographic parameters. Methods and problems of identification are discussed for light absorption methods; mass spectroscopy; paper, thin-layer, and high-pressure chromatography; and immunological procedures. Problems in quantitation, that is, how much drug is present in a particular biological fluid, are also discussed.

One of the main problems of the analyst deals with accuracy and precision. The accuracy and precision that can be obtained in any particular laboratory depend on the substance to be analyzed, the techniques used, and the in-built tests that are performed in a particular laboratory, all of which are subject to a great deal of variation.

In the case of alcohol, 100% accuracy can be achieved and precision of 1 to 2% can be maintained. Analysis for drugs in urine and blood, however, involves highly complex procedures, more difficult and complex than those for alcohol. Some of the problems involved in drug analyses include determination of the amount of drug taken, determination of relationship between dose and effect, differences between blood samples taken from different parts of the body, individual variations in drug metabolism, and determination of the protein bound fraction.

In terms of highway safety, the relationship of drugs to accident involvement is much more complex than for alcohol in that each individual drug must be considered separately. Before any laws can be formulated concerning the use of drugs while driving, it will be necessary to undertake studies relating accidents to a particular drug in the same way as was done for alcohol. Samples of urine or blood will have to be taken from motorists involved in an accident and compared to those of a similar motorist passing on the same road at the same time. Only if this is done will a statistical estimation be possible as to whether drugs cause traffic accidents. (HSRI)

8 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-75-M0209

IMMUNOASSAYS FOR THE DETECTION OF DRUGS IN DRIVERS, R.B. Forney; I. Sunshine, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p613-7, Toronto, Canada: Addiction Research Foundation of Ontario (1975)

Presented here is a broad overview of immunoassay methods. Four different immunological assay systems for drug abuse are analyzed, compared, and evaluated: (1) Free Radical Assay Technique (FRAT); (2) Enzyme Multiplied Immunoassay Technique (EMIT); (3) Radioimmunoassay (RIA); and (4) Hemaglutination Inhibition (HI). Cost, time, method, equipment, complexity, and applicability are discussed for each method.

Taken as a group, the most serious limitation of immunoassays is that specificity for a drug is not absolute and drugs of a similar chemical structure may cross react. Therefore all positive results must be confirmed by some other procedure. Nevertheless, immunoassays are sensitive, accurate and rapid, making possible the analysis of large numbers of specimens on a routine basis. They eliminate the need for prior extraction and concentration of drug from the sample.

The author concludes that each immunoassay method has its own advantages and limitations. The particular method best suited for application in any particular institution is determined by the number of samples to be analyzed per day, the sensitivity and accuracy needed, time requirements, and money available for hardware and reagents. (HSRI)

8 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-75-M0210

A SIMPLE METHOD FOR THE DETERMINATION OF THE SMOKING OF MARIJUANA, L.C. Kier, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p623-6, Toronto, Canada: Addiction Research Foundation of Ontario (1975)

Presented here is a method for detection of marijuana that involves an examination of chloroform-washed fingers or lips of persons alleged to have handled or smoked cannabis. The method of collection is simple enough for collection in the field by law enforcement agencies and the method of analysis is simple enough to be carried out in most laboratories. The method is also inexpensive and rapid. It is based on thin-layer chromatography.

Several studies utilizing this technique are cited. The technique was found to be sensitive down to 0.5 mg of either delta-8- or delta-9-THC. It was found to detect the smoking of marijuana up to at least six hours after smoking, depending on the strength of the marijuana and the technique of smoking. (HSRI)

0 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: marijuana. Specific Drug Screening: Thin-Layer and Paper Chromatography.

UM-75-M0211

QUALITY CONTROL IN A TOXICOLOGY LABORATORY, B.M. Kapur; L. McLaughlin, Proceedings of the 6th International Conference on Alcohol, Drugs, and Traffic Safety, S. Israelstam; S. Lambert, eds., p627-33, Toronto, Canada: Addiction Research Foundation of Ontario (1975)

Problems of quality control related to qualitative and quantitative analysis in a toxicology laboratory are discussed. The Center for Disease Control in Atlanta, Georgia developed a quality program for on-the-spot checks designed to determine if there was a problem with the operator, with a particular drug, or with the thin-layer chromatography operating conditions used for drug analysis. With about every ten patient urine samples, one spiked urine control was processed. On every thin-layer plate there was a human aqueous standard and a urine control spotted. Both unknown and blind controls were also processed as patient samples.

The most common errors identified by this procedure were changed thin-layer spotting techniques; errors in the detection of morphine; incorrectly prepared solvents; solvent tanks that were left open; poor quality of reagents; and insufficient time lapse between sprays. By allowing the thin-layer plate to be left for about an hour after spraying with acidic iodoplatinate before interpretation, the percentage accuracy in the identification of morphine was improved from 89% to 96%.

Problems of quality control relating to quantitative analysis are also discussed. When using the gas chromatography (GC) technique both the GC conditions and operator techniques should be monitored. By processing standards, quality control sera, and split samples, it is possible to monitor the extraction and quantitation, tabulation of results, the operator, and the operator's techniques. This program allows interjection wherever action is necessary. The errors corrected in this manner at the Center for Disease Control were inconsistency in extraction methods, misidentification, and calculation errors. A sequential reporting form using the initial results of the patient as a control makes the analyst immediately aware of any changes and allows immediate investigation of any sudden change in results from positive to negative or vice versa. (HSL)

4 refs

KEYWORDS: Quality Control. Review: Drug Analysis Methodology.

UM-76-MO212

A CHROMATOGRAPHIC METHOD FOR THE DETECTION OF LSD IN BIOLOGICAL LIQUIDS. J. Christie; M.W. White; J.M. Wiles. Journal of Chromatography, v120 p496-501 (1976)

The exceptionally small amount of LSD required for a "trip" makes its detection in biological specimens extremely difficult. This paper describes a method for the detection of LSD in urine using a combination of high-pressure liquid chromatography (HPLC) and thin-layer chromatography (TLC). The use of a fluorimetric detector in HPLC provides the necessary sensitivity and specificity to make detection possible. Identity of the compound was further confirmed by mass spectrometry.

In order to estimate the amounts of LSD recovered, 1 microliter of extract was injected on to the HPLC column and the area of the resulting peak compared with that obtained from 1 microliter of a freshly prepared solution of LSD tartrate of known concentration. The amounts of LSD isolated from the specimens examined ranged from 0.3 to 19.5 ng/ml. The efficiency of the extraction procedure is approximately 70%.

The method described has been applied sucessfully to samples from persons believed to have taken LSD.

8 refs

KEYWORDS: Hallucinogens and Related Agents: lysergic acid diethylamide (LSD). Confirmatory/Quantitative Drug Analysis: Gas Chromatography-Mass Spectrometry. Specific Drug Screening: Gas Chromatography. Specific Drug Screening: Thin-Layer and Paper Chromatography.

UM-76-MO213

THE DETECTION OF DRUGS IN BIOLOGICAL FLUIDS. A.E. Robinson. Medicine, Science, and the Law, v16 n2 p91-4 (Apr 1976)

Many factors influence the success or failure of tests for the detection of drugs in body fluids. The purpose of this paper is to outline these factors in relation to laboratory tests as an aid to the recognition and investigation of the suspected nonmedical use of drugs. The following factors must be considered in designing and developing suitable methods for drug analysis: (1) the nature of the drug and its metabolites; (2) the distribution and elimination of the drug and its metabolites in man; and (3) the nature and amount of specimens available for analysis; and (4) the practical limitations of the analytical methods. Several problems, however, often arise. Drug distribution and elimination can be very complex for some drugs, making drug analysis very difficult. The route of administration, the age of the individual, and chronic alcohol use can all influence drug metabolism and elimination.

Limitations on analysis are also imposed by restricted volumes of specimens available. Many drugs are available in biological fluids only in minute amounts, also making analysis difficult. Drug analysts are also limited by the equipment and facilities

available to them. Many methods for drug detection, while they are suitable for clinical and epidemiological purposes, are not acceptable in a medicolegal context without additional confirmatory evidence of the substances present. Purpose of the analysis, therefore, must be carefully examined before purchasing equipment and selecting the method of analysis. (HSRI)

15 refs

KEYWORDS: Review. Review: Drug Analysis Methodology.

UM-70-MO214

RELATIVITY OF MASS SPECTRA. F.W. Karasek, Research/Development, v21 n11 p55-8 (Nov 1970)

Presented here is a basic explanation of the parameters influencing mass spectrum. The purpose of this explanation is to enable the reader to understand the many unpredictable variables influencing spectral patterns. Such a knowledge is necessary in order to interpret qualitative information when computer search programs are used for compound identification.

Several factors affecting the mass spectrum are discussed. Some of these are: (1) the effect of temperature on ion-electron interaction; (2) the method used by the mass selector to extract and separate the ions; and (3) the distortion of chromatographic peaks due to varying sample concentrations in gas chromatography-mass spectrometry. (HSRI)

9 refs

KEYWORDS: Evaluation of Methods for Drug Analysis. Review: Drug Analysis Methodology.

UM-73-MO215

GC/MS DATA SYSTEM. F.W. Karasek, Research/Development, v24 n10 p40,42-7 (Oct 1973)

This paper reports the results of a study that tested the capability of a new gas chromatography-mass spectrometry data system, the Finnigan Interactive System. This system allows the analyst to interact with all the data stored within the computer memory. The data can be very easily manipulated, adjusted, converted, expanded, and studied on a screen display until the information converges to an answer. The Finnigan system uses a quadrupole mass spectrometer. It has linear mass scale, can tolerate high operating pressures, gives very rapid mass scans, and easily adapts to computerization.

In order to test the system's capabilities, the author ran samples of blood serum and airborne particulate matter. The paper briefly describes his procedure and the operation of the system.

The author concludes that this system is powerful, rapid, sensitive, convenient, and thorough. The system is particularly valuable for rapid survey analyses of absorbed organic compounds on particulate matter. (HSRI)

14 refs

KEYWORDS: Evaluation of Methods for Drug Analysis. General Drug Screening: Systems.

UM-74-MO216

CHEMICAL AND BIOCHEMICAL METHODS OF DRUG DETECTION AND MEASUREMENT, J.A. Marshman, Research Advances in Alcohol and Drug Problems, R.J. Gibbins; Y. Israel; H. Kalant; et al. eds., v1 p33-91, New York: John Wiley and Sons (1974)

This paper discusses some selected advances in drug research methodology that have facilitated research into problems associated with nonmedical drug use, drug dependence, and related phenomena. One of the more recent developments in drug analysis is the use of resins in the extraction process. The ion-exchange resin method, the nonionic resin method using Amberlite XA2-2, and preparative gas chromatography are described and evaluated.

Another topic discussed in detail is gas chromatography, particularly the types of detectors. Derivative formations for barbiturates, cannabinoids, narcotic analgesics, amphetamines, and compounds related to amphetamines are examined.

Recent developments in fluorescence measurements and mass spectrometry are also discussed, particularly direct inlet mass spectrometry. Gas chromatography-mass spectrometry is discussed both in terms of identification of street drugs such as amphetamines and cannabinoids and its applicability to drugs in biological samples.

Finally, immunochemical methods such as radioimmunoassay, free radical assay technique, and homogeneous enzyme immunoassay are described and compared. (HSRI)

292 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-75-M0217

ALCOHOL AND OTHER DRUG TESTING IN TRAFFIC DEATHS; A REPORT ON CURRENT PRACTICES IN CANADA, H.M. Simpson; B. Heayn, Ottawa, Ontario: Traffic Injury Research Foundation of Canada (Oct 1975)

This paper provides a summary of a national survey of laboratory testing agencies in Canada that perform alcohol and other drug analyses on victims of motor vehicle accidents. The purpose of the survey was to examine practices and procedures that would affect the reliability and comparability of information relating to alcohol and drug involvement in traffic fatalities, since such data are used extensively for policy making, information programs, and educational purposes.

Results showed considerable uniformity in the practices of laboratories, although substantial discrepancies exist in many areas. Some of these discrepancies included the anatomical site used to collect blood samples; use of standard containers for shipment and storage of blood samples; time elapsed between time of death and testing; testing procedures for detection of alcohol; routine screening procedures for unknown drugs; and capability of testing for specific drug groups.

It is recommended that consistency in these areas be developed in order to render interlab reports more meaningful and to enable more information to be gathered concerning drug involvement in traffic fatalities. (HSRI)

30 pages 0 refs

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol). Proficiency Testing.

UM-70-M0218

DRUG AND CHEMICAL BLOOD LEVELS, C.L. Winek, Legal Medicine Annual: 1970, C.H. Wecht, ed., p67-77, New York: Appleton-Century-Crofts (1970)

The purpose of this paper is to discuss the relatively new concept of drug and chemical blood levels and to provide blood level data that are currently known or available. The knowledge of a blood level for a given drug or chemical can be used in many ways for legal or medical purposes. Some of these are to establish cause of death: to adequately treat poison cases; to test for therapeutic effectiveness; to demonstrate generic equivalency; and to indicate overexposure to industrial toxins and possible impending morbidity. A brief discussion is presented concerning each of these uses.

The study concludes with three tables intended as a guide for making judgments in clinical situations and in medicolegal cases: (1) drug blood levels (therapeutic, toxic, and lethal); (2) chemical blood levels (normal, toxic, and lethal); and (3) blood levels of metals, metalloids, and inorganic substances (normal, toxic, and lethal). (HSRI)

32 refs

KEYWORDS: Drug Concentrations in Body Fluids: Tabulated Data.

UM-70-M0219

DRUG AND CHEMICAL BLOOD LEVELS--UPDATE, C.L. Winek, Legal Medicine Annual: 1973, C.H. Wecht, ed., p115-20, New York: Appleton-Century-Crofts (1973)

Presented here is an updated version of a 1970 article dealing with drug and chemical blood levels. The present paper defines therapeutic, toxic, and lethal blood levels. It also outlines the value and uses of blood level data. Factors affecting the blood

level values are listed. These include (1) method of analysis; (2) pathological state of the patient; (3) age, sex, race, and weight of the patient; (4) dosage of drug or amount of exposure to a chemical; (5) combinations of drugs or chemicals or both; (6) time of analysis of blood sample (loss of chemical due to storage); (7) time between ingestion and sampling of blood; (8) time of discovery of a poisoned patient or death victim; (9) biologic half-life of drug and dosage regimen; and (10) tissue binding of drug or chemical. All of these factors can be instrumental in explaining the variation that is observed in drug and chemical blood levels.

Three tables of blood level data are provided in order to act as a guide for toxicologists, pathologists, and other forensic scientists: (1) drug blood levels (therapeutic, toxic, and lethal); (2)chemical blood levels (normal, toxic, and lethal); and (3) blood levels of metals, metalloids, and inorganic substances (normal, toxic, and lethal). (HSRI)

8 refs

KEYWORDS: Drug Concentrations in Body Fluids; Tabulated Data.

UM-75-M0220

THERAPEUTIC AND TOXIC CONCENTRATIONS OF MORE THAN 100 TOXICOLOGICALLY SIGNIFICANT DRUGS IN BLOOD, PLASMA, OR SERUM: A TABULATION. R.C. Baselt; J.A. Wright; R.H. Cravey, Clinical Chemistry, v21 n1 p44-62 (Jan 1975)

This paper, which represents a comprehensive literature search, tabulates human blood, plasma, or serum concentrations of drugs important to the analytical toxicologist in order to aid in the interpretation of analytical toxicological results. Significant pharmacological factors are included such as dosage, route and frequency of administration, number and weight of subjects, and time of sampling. Data is tabulated for those drugs that are most likely to be encountered in cases of overdose. For the most part, only drugs acting on the central nervous system and several common street drugs are included. Multiple drug combinations are not included. (HSRI)

153 refs

KEYWORDS: Drug Concentrations in Body Fluids; Tabulated Data.

UM-72-M0221

SCREENING FOR DRUG ABUSE: THE RAPID DIAGNOSIS OF DRUGS OF ABUSE IN THE HOSPITAL EMERGENCY ROOM. D. Sohn; J. Simon; S. Sohn, Legal Medicine Annual: 1972, C.H. Wecht, ed., p107-19, New York: Appleton-Century-Crofts (1972)

This paper discusses drug analysis in terms of applicability in clinical situations, current methods of appraisal and treatment, the biological fluids to be used for specific analyses, the drugs to be identified, and the methods of analysis for diagnosis of psychopharmacologic agents.

In the clinical situation the physician is often faced with the comatose patient who can not be questioned. Simple, rapid, and fool-proof analytical methods must be available since both suicidal individuals and drug abusers are most often hospitalized during the early morning hours, holidays, and weekends when hospital staff is low.

Definite time limits, at most an hour or two, must be maintained if the analytical information is to be of use in treatment. The specimen should be checked for hyperglycemia; salicylates; alcohols; drugs of abuse (barbiturates, amphetamines, opiates, and psychedelic agents); tranquilizers; and stimulants.

Methods that can readily be used in the analysis of drugs can be classified into two categories: (1) those using thin-layer chromatography; and (2) those using gas-liquid chromatography. The author discusses both methods and concludes that, for clinical use, thin-layer chromatography methods are more practical for the routine drug screening of the comatose patient. They provide a basis for the simple, rapid, and reasonably accurate and specific determination of the presence of drugs of abuse. Gas-liquid chromatography can provide similar identification. However, the equipment is far more expensive and requires a much greater degree of sophistication in its operation. The instruments, columns, and techniques used in gas-liquid chromatography at this time do not as readily lend themselves for use in immediate screening on an around-the-clock basis. Gas-liquid chromatography can, however, be of significant aid in confirming the identity of specific compounds, particularly in the separation of the various long- and

short-acting barbiturates. It is essential for quantitation if drug levels are to be followed during the course of active treatment. (HSRI)

28 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-72-MO222

ANALYSIS FOR DRUGS OF ABUSE: CURRENT METHODS OF URINE SCREENING AND LEGAL CONSIDERATIONS, D. Sohn; J. Simon; M.A. Hanna; G.Z. Ghali; R. Tolba, Legal Medicine Annual: 1972, C.H. Wecht, ed., p123-35, New York: Appleton-Century-Crofts (1972)

This paper discusses the legal difficulties encountered during the course of urine screening for detection and analysis of drugs of abuse. The results of these techniques can have drastic consequences for the individual and society, especially when inaccurate testing is performed and either false-positive or false-negative results are reported.

There are many elements in routine drug screening that can be potential sources of error. Some of these are misidentification of a submitted specimen, dirty or contaminated glassware, incomplete separation of phases, incorrect use or inadvertant switching of standard solutions, and inconsistent storage procedures and record keeping. Other potential sources of error may be related to amount of time elapsed between sampling and testing, wrong storage temperature, and lack of knowledge concerning the operation of equipment.

All persons involved in urinalysis, therefore, must be responsible at all times. It is clear that the methods used for drug detection are not simple, easily reproducible, well-established procedures that can be performed haphazardly by any technician in every laboratory with accurate, unimpeachable results. Rather they are sophisticated procedures requiring a high degree of skill, experience, and judgment in their execution. Great care and attention must be given at every stage of the analysis. The slightest break in technique may render the results meaningless. In a situation where an incorrect analysis may keep an applicant unemployed, may cause him to lose his job, or may put him in prison, the social conscience and tradition of equity demands that adequate precautions be taken to ensure the accuracy of such a report. (HSRI)

22 refs

KEYWORDS: Other Sociolegal Study.

UM-71-MO223

DETECTION OF SOME PSYCHOTHERAPEUTIC DRUGS AND THEIR METABOLITES IN URINE, J.C. Garriott; A. Stolman, Clinical Toxicology, v4 n2 p225-43 (Jun 1971)

In this investigation several methods were used to determine some commonly used drugs in the urine of hospitalized mental patients. The methods described are those found to be most practical, and in most cases, provide sufficient sensitivity to identify the drug in small quantities of urine when taken after therapeutic dosage. Major metabolites were also observed, providing useful information in the identification of some drugs.

Thin-layer chromatography methods used to detect chlordiazepoxide, diazepam, imipramine, desipramine, amitriptyline, methadone, the phenothiazines, phenothiazine sulfoxides, haloperidiol, and amphetamines, are described in the paper.

The authors claim that the methods presented are those which yield the most efficient recovery for the drugs examined. In addition, these methods were designed so that groups of drugs could be tested by the same procedure. Combinations of procedures can also be used as a general extraction to cover most or all of the drugs in the groups studied.

With some drugs, such as amitriptyline, imipramine, diazepam, and some of the other phenothiazines, the drug may be present in the urine as a metabolite only, or with the metabolite as the major component of the extract. In these cases, it has been found that the application of the metabolite, when available, to the thin-layer chromatography plate along with the drug in question can be of great value in the identification of the original drug. (HSRI)

19 refs

KEYWORDS: General Drug Screening: Thin-Layer and Paper Chromatography.

UM-75-MO224

BLOOD CODEINE CONCENTRATIONS IN FATALITIES ASSOCIATED WITH CODEINE, J.A. Wright; R.C. Baselt; C.H. Hine, Clinical Toxicology, v8 n4 p457-63 (1975)

Little or no information can be found in the scientific literature on codeine concentrations in blood or plasma in toxic situations because there are apparently very few fatal mishaps with codeine and because it produces relatively low concentrations in the blood. This study details eight deaths attributed primarily to codeine overdose and one case of death by gunfire of a codeine user and provides blood codeine concentration data for them.

Codeine and morphine concentrations were determined by gas chromatography. Nalorphine was used as an internal standard. Urine was acid hydrolyzed before extraction. Urine concentration therefore represented both free and conjugated codeine and morphine. Norcodeine was not separated from codeine under the instrumental conditions used and codeine concentrations therefore represent both drugs. Confirmation was performed using thin-layer chromatography.

Results of analysis show that blood codeine concentrations ranged from 1.4 to 5.6 micrograms per ml. These concentrations can be expected to produce serious toxicity in the nontolerant person. Morphine was found in only two of the blood samples, at concentrations of 0.2 and 0.6 micrograms per ml, and may have resulted from heroin usage rather than codeine metabolism. Blood codeine concentration for the codeine user who died by violent means was 2.6 micrograms per ml.

The acutely lethal dose of codeine for an adult has been estimated at 0.5 to 1.0 grams. To attain a lethal amount of codeine through commercial preparations would require the ingestion of eight to fifteen 65mg tablets or one-half to one pint of cough syrup. (HSRI)

12 refs

KEYWORDS: Expectorant and Cough Preparations (Antitusive Agents): codeine*. Opiates and Related Agents: codeine*. Epidemiologic Research: Drug Concentrations in Body Fluids.

UM-75-MO225

PROPOXYPHENE AND NORPROPOXYPHENE CONCENTRATIONS IN BLOOD AND TISSUES IN CASES OF FATAL OVERDOSE, A.J. McBay, Clinical Chemistry, v22 n8 p1319-21 (Aug 1976)

This paper discusses two methods of determination of propoxyphene and its major metabolite, norpropoxyphene: in one method ultraviolet spectrophotometry is used; in the other, gas chromatography is used. Propoxyphene and norpropoxyphene have been quantitated in tissue specimens obtained from autopsies of people suspected of dying from propoxyphene overdosage. Gas chromatographic determination of both substances is essential because the blood concentration of the parent drug should be about 1.0 mg/liter or greater to attribute a death to the drug. The metabolite concentration in the blood may help to establish whether there is enough drug present to account for death and to indicate when the drug was taken.

Ultraviolet spectrophotometric methods have been inefficient because the drug absorbs ultraviolet light poorly, and because of molecular changes that occur in acidic or alkaline hydrolysis and heating. The ultraviolet method, when used alone, does not allow one to distinguish propoxyphene from norpropoxyphene, therefore gas chromatography should be used.

Concentrations in the blood after high oral therapeutic doses are about 0.3 mg of propoxyphene per liter, and norpropoxyphene concentrations may be as high as 3 mg/liter. (HSRI)

8 refs

KEYWORDS: Analgesics and Antipyretics: propoxyphene*. Metabolites of Drugs and Other Agents: norpropoxyphene*. Confirmatory/Quantitative Drug Analysis: Gas Chromatography. Confirmatory/Quantitative Drug Analysis: Optical Techniques. Epidemiologic Research: Drug Concentrations in Body Fluids. (2)

UM-73-MO226

AFFINITY CHROMATOGRAPHY, H.H. Weetall, Separation and Purification Methods, v2 n2 p199-229 (1973)

This paper describes the use of affinity chromatography, an approach to the isolation and purification of biologically active molecules based on the ability of a biological molecule to bind a ligand specifically and reversibly.

For the successful application of affinity chromatography the proper choice of ligand must be made. The ligand must meet two important criteria: (1) it must show affinity for the macromolecule to be isolated; (2) it must have a functional group useful for attachment to the carrier which when blocked will not destroy its affinity for the molecule to be purified.

Also described are the characteristics of carriers necessary for effective affinity chromatography. The carrier should: (1) interact weakly with proteins; (2) have good flow properties; (3) possess a reasonable number of functional groups which will allow chemical attachment of the ligand under reasonably mild conditions; (4) be physically and chemically stable under conditions of adsorption and desorption of the desired species; and (5) have particles relatively homogeneous in shape, preferrably spherical. The paper includes a table of several materials which have been used as carriers for affinity chromatography and the materials purified on them.

Other procedures described in the paper include preparation of agarose activated with cyanogen bromide and preparation of alkylamine porous glass. Methods of covalently linking ligands or other intermediates to water-insoluble carriers using carbodiimides, hydrazides, cyanogen bromides, isothiocynates, acid chlorides, and alkyl halides are also described.

The author concludes that this approach is simple, inexpensive, and in many cases, a one-step purification scheme potentially valuable for enzyme purification. (HSRI)

92 refs

KEYWORDS: Review. Review: Drug Analysis Methodology.

UM-75-MO227

THE DEVELOPMENT OF GAS CHROMATOGRAPHY, L.S. Ettre, Journal of Chromatography, v112 p1-26 (1975)

This paper traces the development of two major gas chromatography techniques--those based on adsorption and those based on partition--from their beginnings in the early 1950s to the present. In gas adsorption chromatography, the work of the pioneers is seen as a precursor to the development of real gas chromatography. After the invention of gas-liquid partition chromatography, the technique underwent very rapid growth, reaching maturity within a few years. Subsequent developments in theory, detectors, and columns made it possible for the technique to reach its present advanced stage.

Also discussed is the history of two special gas chromatographic techniques--process control and analysis, and preparative gas chromatography.

The author concludes that the application of gas chromatography will increase, especially in biochemistry and clinical chemistry. New developments in gas chromatography will most likely be in instrumentation in order to keep up with changes in the rapidly advancing field of electronics. A further significant development can be expected in data evaluation. The newest developments in computer science will result in increased speed, memory, and storage capacity, permitting more sophisticated data banks. (JAM)

211 refs

KEYWORDS: Review. Review: Drug Analysis Methodology.

UM-74-MO228

APPLICATION OF GAS CHROMATOGRAPHY-MASS SPECTROMETRY IN ROUTINE AND RESEARCH IN CLINICAL CHEMISTRY, L. Eldjarn; E. Jellum; O. Stokke, Journal of Chromatography, v91 p353-66 (1974)

Described here is a gas chromatography-mass spectrometry screening system used in a clinical chemistry laboratory in Oslo. This system concentrates mainly on the diagnosis of known and unknown inborn errors of metabolism as well as on the evaluation and etiological diagnosis of pronounced metabolic disturbances of other types. At present, this system provides information on five to eight hundred metabolites in samples from urine or serum. This screening procedure comprises at least four essential steps: (1) the clinical selection of the patients with special problems and pretreatment before the samples are taken; (2) a gross evaluation of the selected patients with ordinary clinical tests; (3) analysis of samples, usually urine or serum, by the gas chromatographic-mass spectrometric screening system; and (4) further biochemical studies of the abnormal metabolic conditions which may have been discovered.

The mass spectra are recorded by an on-line data system, which greatly facilitates interpretations of the data. An off-line library matching system further facilitates data interpretation by matching the unknown spectrum against 25,000 reference spectra stored in a central computer.

This system is able not only to help in confirming or excluding the diagnosis of well-known diseases or inborn errors of metabolism; it also facilitates the discovery of new inborn errors of metabolism in patients and the discovery of unexpected metabolites in clinically well-known disturbances of metabolism. The discovery and diagnosis of Refsum's disease, methylmalonic acidaemia, and pyroglutamic aciduria using this system are discussed. (JAM)

27 refs

KEYWORDS: General Drug Screening; Other Techniques.

UM-74-MO229

RAPID COMPUTERIZED IDENTIFICATION OF COMPOUNDS IN COMPLEX BIOLOGICAL MIXTURES BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY, C.C. Sweeley; N.D. Young; J.F. Holland; S.C. Gates, Journal of Chromatography, v99 p507-17 (1974)

This report describes a general procedure utilizing computer analysis of mass chromatography data to obtain retention indices and selected ion intensities for the qualitative analyses of the volatile timethylsilyl (TMS) derivatives of urinary acids. The method uses a gas chromatographic retention index in conjunction with a small set of discriminating ions to identify each compound. The retention index predicts to within 1% the location of a time-dependent "window" within which a specific compound may appear, while the accuracy of the peak identification is dependent primarily upon the specificity of the ion set chosen Optimum specificity is obtained by selecting ions which not only are characteristic of the compound to be identified, but which also differentiate it from other compounds likely to elute at similar retention times. Utilizing the data files created by repetitive scanning during a single elution by gas-liquid chromatography, the present algorithm permits the automated identification of approximately eight compounds per minute.

Examples of the identification of acidic urinary metabolites are given; however, the method is sufficiently general to be applied to any group of volatile compounds or any compound for which retention indices and differentiating ions can be assigned for use in the data reduction routine. (JAM)

16 refs

KEYWORDS: General Drug Screening; Other Techniques.

UM-74-MO230

DETECTION OF DELTA-9-TETRAHYDROCANNABINOL IN SALIVA OF MEN BY MEANS OF THIN-LAYER CHROMATOGRAPHY AND MASS SPECTROMETRY, W.W. Just; N. Filipovic; G. Werner, Journal of Chromatography, v96 p189-94 (1974)

Described here is a highly sensitive fluorometric method used to detect very small amounts of delta-9-tetrahydrocannabinol in human saliva after the smoking of marijuana. Male and female subjects each smoked 400 mg of hashish (1.5% delta-9-THC) within ten minutes. Before smoking and at various intervals afterwards, about 1 ml of saliva was collected from each person. The paper describes dansylation of saliva, chromatography of the dansylated saliva, and mass spectroscopy of the substance. The detection of dansylated-THC in the saliva under the conditions was positive in nearly all cases investigated within six hours after smoking. In all cases, enough THC was present one

hour after smoking to identify it as a form of DANS (1-dimethylaminonaphthatine-5-sulfonyl) derivative. In some cases mass spectrometric identification was possible even two or three hours after smoking.

Also reported in this paper is an autoradiographic study which investigated the localization of 14 c-tetrahydrocannabinol in the salivary gland of the monkey. The main activity of the injected radioactive THC was found in the walls of the secretory ducts. The results of this study seem to confirm the assumption of a possible secretion of THC into the saliva. (HSRI)

11 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-9-tetrahydrocannabinol. hashish. Drug Concentrations: Comparison of Body Fluids. Specific Drug Screening: Other Techniques.

UM-73-M0231

DETECTION AND IDENTIFICATION OF DELTA-8-(AND) DELTA-9-TETRAHYDROCANNABINOL IN THE SALIVA OF MAN AND AUTORADIOGRAPHIC INVESTIGATION OF THEIR DISTRIBUTION IN THE SALIVARY GLANDS OF THE MONKEY, W.W. Just; G. Werner; M. Wiechmann; G. Erdmann, Jugoslavica Physiologica et Pharmacologica Acta, v9 n2 p263-8 (1973)

This paper demonstrates a method for detecting delta-9-THC in human saliva by means of thin-layer chromatography (TLC) and mass spectrometry. Six male and four female student volunteers (all tobacco cigarette smokers) each smoked one cigarette containing 700 mg of cannabis (0.4% delta-9-THC content) corresponding to 2.8 mg of delta-9-THC. Volumes of 3 ml of saliva were collected before smoking and 5, 15, 30, 60, 90, and 120 minutes after smoking. Blood (2-3 ml) was taken from the arm veins before and one hour after smoking.

The methods for extraction, thin-layer chromatography, elution of delta-9-THC, and mass spectrometry are described. In all subjects, delta-9-THC could be detected in the saliva of the subjects within the first thirty minutes after smoking. At sixty and ninety minutes after smoking the saliva extracts showed the presence of delta-9-THC in 90% and 80% of the samples respectively. Delta-9-THC could still be detected in 50% of the saliva extracts two hours after smoking. However, delta-9-THC could be found in only two blood samples. When it was detectable in the blood, it was also detectable in the saliva two hours after smoking. These results suggest that excretion of delta-9-THC by the salivary glands may particularly contribute to the possible delta-9-THC detection after periods longer than one hour after smoking. (HSRI)

8 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: delta-8-tetrahydrocannabinol. delta-9-tetrahydrocannabinol. Specific Drug Screening: Optical Techniques.

UM-74-M0232

A SIMPLE, RAPID THIN-LAYER CHROMATOGRAPHIC DRUG SCREENING PROCEDURE, K.G. Blass; R.J. Thibert; T.F. Draisey, Journal of Chromatography, v95 p75-9 (1974)

This paper describes a rapid and sensitive thin-layer chromatography procedure for the screening of drugs of abuse. This procedure uses rapid silica gel coated glass fiber chromatography plates and a convenient application system, as well as a one-step drug extraction from urine with a pH 9.5 buffer. This is combined with consecutive spraying with detection reagents for amphetamines, barbiturates, and alkaloid drugs and their metabolites on one chromatogram. Identification of drugs and their metabolites is carried out by comparison of R_F values as well as by colors formed on reaction with the detection sprays. Such identification is used to detect the presence of methadone and its metabolites in the urine of patients and to eliminate the possibility of there being other drugs present. The system described is sensitive, rapid, and useful as a routine screening for monitoring outpatients of a methadone clinic or as a routine screening for other purposes. It is easily set up at a minimal cost per test for both large and small hospital laboratories. (AAM)

6 refs

KEYWORDS: Opiates and Related Agents: methadone. General Drug Screening: Thin-Layer and Paper Chromatography. Specific Drug Screening: Thin-Layer and Paper Chromatography.

UM-75-MO233

PROGRAMMED MULTIPLE DEVELOPMENT. BRIEF REVIEW AND STUDY OF EXTENDED PROGRAMS, J.A. Perry, Journal of Chromatography, v113 p267-82 (1975)

The purpose of this paper is to describe, evaluate, and review various aspects of programmed multiple development. Introduced in 1951, multiple development by repeated solvent advances improves the resolution available from a given chromatographic system. Repeated solvent advances compress the top-to-bottom width of a thin-layer chromatographic spot by the factor $(1-R_F)$, where R_F expresses the final location of the spot between the origin and the solvent front. Spots near the front become almost lines drawn parallel to the solvent front, but near the origin spot shapes change little.

In contrast, all spots developed by programmed multiple development (PMD) are line-like. PMD, introduced in 1973, adds solvent removals to solvent advances while, throughout, solvent flows constantly towards the front. Both advances and removals are carried out automatically and relatively rapidly. Used in thin-layer chromatography, PMD spots tend to be uniformly tight and do not reflect the characteristics of the origin. Therefore, PMD is currently used mainly to improve the separability and molecular density of spots.

The form of PMD that is called centered PMD compresses spots laterally as well as longitudinally, so that the molecules of a given spot are brought and held together during successive developments. This further improves trace detectability. It also allows separation to continue without spot spreading as long as necessary or desired.

It has been predicted that continued multiple development will change the proportion of the chromatographic bed devoted to components ultimately found slightly more than halfway toward the solvent front. Tests support the prediction but show that the effect is minor if only some dozens of multiple developments are involved. The principal result of extended programs is a steady improvement of resolution throughout the chromatogram. (AAM)

24 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-75-MO234

MODERN TECHNIQUES IN TLC, J.G. Kirchner, Journal of Chromatographic Science, v13 p558-63 (Dec 1975)

This paper reviews thin-layer chromatography, particularly recently developed techniques that increase its applicability and sensitivity. It also provides a brief historical survey of the basic techniques used in thin-layer chromatography. Automation devices such as automated coaters, multiple spot applicators, semiautomatic streakers, the Lightner Instrument, and multiple and stepwise development devices are discussed. Special emphasis is given to the programmed multiple development technique and to the use of a soft laser scanning densitometer that is reported to give better resolution and higher accuracy than densitometers using normal light sources. Also discussed is isoelectric focusing, an important new technique in thin-layer chromatography which is rapidly increasing in use. This technique is especially valuable wherever ampholytes appear in biological systems.

The author concludes that in spite of the increased use of high-pressure chromatography, thin-layer chromatography will remain very much in use. The advantages of thin-layer chromotography are still its low cost, speed, and high resolving power. With thin-layer chromatography many samples can be run at one time, whereas with high-pressure liquid chromatography the cost of the equipment precludes the running of many samples at the same time. Furthermore, thin-layer chromatography can do the preliminary work of selecting the solvent system for high-pressure liquid chromatography. (HSRI)

60 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-75-MO235

RADIOIMMUNOASSAY OF DRUGS SUBJECT TO ABUSE: CRITICAL EVALUATION OF URINARY MORPHINE-BARBITURATE, MORPHINE, BARBITURATE, AND AMPHETAMINE ASSAYS, S.J. Mule; E. Whitlock; D. Jukofsky, Clinical Chemistry, v21 n1 p81-6 (1975)

The purpose of this paper is to provide an objective evaluation of radioimmunoassays for morphine-barbiturate (MOR-BARB), morphine, barbiturate, and amphetamine by comparing them with other analytical methods to assess the suitability of their use for routine analysis of urine for drugs subject to abuse. Radioimmunoassays were compared using differential elution extraction thin-layer chromatography, the enzyme multiplied immunoassay technique, and XAD-2 resin extraction thin-layer chromatography.

Statistically significant ($P<0.01$) concentrations for detection were the following: 50-100 micrograms per liter for MOR-BARB; 5 micrograms per liter for morphine; 10 micrograms per liter for barbiturate; and 500 micrograms per liter for amphetamine. Unconfirmed and unaccounted-for radioimmunoassay false positives were: 0% for morphine in the radioimmunoassay for MOR-BARB and that for morphine alone; 2.8% for barbiturates in the MOR-BARB assay and that for barbiturates alone; 0-6% when a combination of these drugs was present in the MOR-BARB, morphine, or barbiturate assay; and 2.4% in the amphetamine radioimmunoassay.

Less than 1% of all radioimmunoassay-negative samples were unconfirmed. Cross-reactivity was observed with drugs of a similar chemical structure in each of the radioimmunoassays tested. All of the radioimmunoassays were easy to use, highly sensitive, and extremely reliable for detecting drug use or abuse. (JAM)

12 refs

KEYWORDS: Barbiturates: secobarbital. Opiates and Related Agents: morphine. Stimulants: amphetamine. Barbiturates. Confirmatory/Quantitative Drug Analysis: Immunoassay. Confirmatory/Quantitative Drug Analysis: Other Techniques. Evaluation of Methods for Drug Analysis.

UM-74-M0236

THE DETERMINATION OF DRUGS IN BIOLOGIC SPECIMENS: A REVIEW, J.E. Wallace; K. Blum; J.M. Singh, Drug Addiction, J.M. Singh; H. Lal, eds., v4 p175-92, New York: Stratton Intercontinental (1974)

This paper presents a general review of the various aspects of drug analysis of biological fluids. Some of the topics discussed are the following: (1) the problem of laboratory accuracy and current methodology; (2) the need for specificity, speed, sensitivity, simplicity, and low cost in analysis systems; (3) the dependence of drug analysis upon molecular structure; (4) basic principles of the various analytical techniques, including the electron-spin resonance spectrometer, thin-layer chromatography, gas-liquid chromatography, ultraviolet and visible spectrophotometry, mass spectrometry, and nuclear magnetic resonance spectrometry; and (5) factors effecting erroneous results in drug analysis.

The paper also describes a procedure applicable for rapid analysis for a large number of drugs in biologic specimens. This procedure isolates the acid, basic, and neutral drugs with a minimal number of reagents. Confirmatory tests are presented for the more common pharmacologic agents which can be determined by ultraviolet spectrophotometry and gas-liquid chromatography either analyzing the original drug or a suitable oxidation product. (HSRI)

23 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-74-M0237

ELECTRON CAPTURE DETECTION IN GAS CHROMATOGRAPHY, E.D. Pellizzari, Journal of Chromatography, v98 p323-61 (1974)

The purpose of this review is to present a detailed discussion of electron capture detection (ECD), a selective detector used in gas chromatography. The electron attachment phenomenon is examined as a series of discrete events as it is presently understood. This is followed by a discussion of the total system with emphasis on operating parameters and their effects on overall ECD performance. The paper defines and describes terms such as response mechanisms, specificity, detection limit, sensitivity, detector noise, linearity, response time, and electron capture cell configurations.

Also discussed is the theoretical basis for electron attachment including its use of a radioactive source for primary radiation, electron capture processes, the kinetic theory

for dissociative and nondissociative processes, and electron affinity and attachment for organic compounds. Other topics discussed include the relationship of molecular structure to sensitivity in electron capture detection, characteristics of detector operating parameters, and estimation of electron capture detection limit.

In discussing these topics, the strengths and weaknesses of electron capture detection are exposed and thus areas for further research have been brought into focus. (HSRI)

93 refs

KEYWORDS: Review; Drug Analysis Methodology.

UM-73-MO238

THE MEASUREMENT OF CANNABINOLS IN THE BLOOD BY GAS CHROMATOGRAPHY, N.K. McCallum, Journal of Chromatographic Science, v11 p509-11 (Oct 1973)

Described here is a method for quantification of delta-9-THC and cannabinol in the blood. The method involves gas chromatographic separation of the compounds and flame photometric detection of phosphate ester derivatives. While this method lacks a high degree of sensitivity, it offers an exceptionally stable sensitivity and baseline, making it more amenable to routine analyses than electron capture detection.

The phosphate ester analysis was performed on a Tracor gas chromatograph with a Melpar flame photometric detector. A glass column filled with 3% OV-1 on Chromosorb W (100-120 mesh) was used at 240(R) C with a nitrogen flow rate of approximately 25 ml/min.

An aerograph Hy-Fi 600D gas chromatograph with a glass column filled with 1% SE 52 on Diatoport S (100-120 mesh) at 210(R) C and a nitrogen flow rate of approximately 15 ml/min was used for analyses requiring flame ionization detection.

Using the phosphate ester method, delta-9-THC could be detected to less than 500 picograms per injection and the minimum amount of delta-9-THC assayable practicably was less than 1 nanogram per ml when more than 10 ml of plasma was used. Blood taken only twenty-five minutes after subjects had smoked cannabis or delta-9-THC did not contain the high levels of delta-9-THC expected from the results of previous tests. Instead, abnormally high levels of cannabinol indicate that it has a biological activity of its own and can block the action of delta-9-THC. Therefore, it is possible that cannabinol is a major factor in cannabis intoxication. (HSRI)

8 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: cannabinol*, delta-9-tetrahydrocannabinol*. Confirmatory/Quantitative Drug Analysis: Gas Chromatography. Specific Drug Screening: Gas Chromatography.

UM-74-MO239

QUANTITATIVE DETERMINATION OF CLONAZEPAM AND ITS METABOLITES IN HUMAN PLASMA BY GAS CHROMATOGRAPHY, J. Naestoft; N.-E. Larsen, Journal of Chromatography, v93 p113-22 (1974)

The purpose of the present investigation was to develop a method by which clonazepam and its two metabolites (7-amino metabolite [ACNP] and 7-acetamido metabolite [AcACNP]) could be determined in plasma in order to correlate the plasma levels with the efficacy and side-effects of the treatment.

The three compounds and an added internal standard were extracted from plasma with ethyl acetate. The subsequent steps included evaporation, purification, and differential extraction of clonazepam and the metabolites. A gas chromatograph equipped with an electron capture detector was used. The limit of sensitivity was 3-5 ng/ml, which is sufficient to determine concentrations in plasma from patients being treated with clonazepam. The specificity of the method was confirmed by mass fragmentography. (JAM)

9 refs

KEYWORDS: Anticonvulsants (Anti-Epileptics): clonazepam*. Metabolites of Drugs and Other Agents: 7-acetamido clonazepam. 7-amino clonazepam. Confirmatory/Quantitative Drug Analysis: Gas Chromatography. Drug Concentration-Effect Study: Clinical Research. Drug Concentrations in Body Fluids: Acute Dose Study.

UM-74-MO240

PLASMA AND CEREBROSPINAL FLUID CONCENTRATIONS OF PENTAZOCINE IN PATIENTS: ASSAY BY MASS FRAGMENTOGRAPHY, S. Agurell; L.O. Boreus; E. Gordon; J.E. Lindgren; M. Ehrnebo; U. Lonroth, Journal of Pharmacy and Pharmacology, v26 p1-8 (1974)

This study attempts to determine low concentrations of pentazocine in blood plasma and cerebrospinal fluid (CSF) after intravenous administration of a 30 mg dose in eight patients undergoing neurosurgery under general anesthesia. Since one of the main routes for access to the central nervous system from the blood is via the CSF, the concentration of pentazocine in patients was measured using mass fragmentography, a technique which has been applied to the analysis of endogenous compounds and therapeutic drugs. Blood plasma concentrations of the drug were simultaneously measured by the same technique.

A pharmacokinetic analysis based upon mean plasma levels indicated a half-life of 134 minutes. Lumbar CSF levels of pentazocine increased rapidly with mean values from about 3 ng/ml at 5 minutes to 10 ng/ml at 30 minutes and to about 15 ng/ml at 90 to 120 minutes. The possibility of repeated analyses of drug concentrations in the CSF represents an important step toward the correlation of chemical data with clinical effects for centrally acting drugs. (JAM)

18 refs

KEYWORDS: Opiates and Related Agents: pentazocine*. Confirmatory/Quantitative Drug Analysis: Other Techniques. Drug Concentrations in Body Fluids: Acute Dose Study. Drug Concentrations: Comparison of Body Fluids. Pharmacokinetics: Acute Dose.

UM-75-MO241

INVESTIGATION OF DIRECT THIN-LAYER CHROMATOGRAPHY-MASS SPECTROMETRY AS A DRUG ANALYSIS TECHNIQUE, G.J. Down; S.A. Gwyn, Journal of Chromatography, v103 p208-10 (1975)

Many recent studies have combined the use of thin-layer chromatography (TLC) and mass spectrometry in the analysis of simple aromatics, alicyclic carboxylic acids, sugar derivatives, and acylated amino acids and peptides. The purpose of this study was to determine the conditions and limits for extension of this technique to more complex molecules such as mepyramine, phenazone, caffeine, methaqualone, amylobarbitone, diazepam, chlorpheniramine, amitriptyline, promethazine, trimipramine, propoxyphene, chlorpromazine, codeine, and methadone.

The combined TLC-mass spectrometry technique was found to be applicable to most of the drugs used, the notable exceptions being codeine and methadone. Both of these compounds failed to give useful spectra even using 60 ug and 350 degrees. To be useful as a routine analysis technique for drugs, a collection of spectra off silica gel for compounds which are most commonly encountered is required. However, in general, no inherent limitations were found that would prevent extension of the combined technique to a wider range of drugs and other complex molecules. (HSRI)

5 refs

KEYWORDS: General Drug Screening: Other Techniques.

UM-75-MO242

DETERMINATION OF PINAZEPAM AND ITS METABOLITES IN SERUM, URINE AND BRAIN BY GAS-LIQUID CHROMATOGRAPHY AND MASS SPECTROMETRY, A. Trebbi; G.B. Gervasi; V. Comi, Journal of Chromatography, v110 p309-19 (1975)

This paper describes a specific and sensitive assay involving electron capture gas-liquid chromatography for the indentification of pinazepam and its metabolites (demethyldiazepam, 3-hydroxypinazepam, and oxazepam) in serum, urine, and brain samples from dogs and rats after single or repeated oral administration of the drug. This study established that N-depropargylation and C-hydroxylation at position 3 were the major metabolic pathways of pinazepam. These pathways were confirmed by using gas-liquid chromatography (GLC) coupled with mass spectrometry (MS), the four benzodiazepines being identified and determined by GLC and the identity of the GLC peaks being confirmed by MS.

In blood serum and brain, only pinazepam and its N-depropargylated product (demethyldiazepam) were found; from urine, 3-hydroxypinazepam and oxazepam were also

recovered. The sensitivity of the gas-liquid chromatographic method is of the order of 5-10 ng of pinazepam and 15-20 ng of the three benzodiazepines per ml of serum. From the results of this study it can be concluded that oxazepam is the major urinary metabolite of pinazepam for all animal species tested. This is in accord with the known metabolism of all other benzodiazepines. (JAM)

7 refs

KEYWORDS: Metabolites of Drugs and Other Agents: oxazepam*, N-desmethyldiazepam*, 3-hydroxypinazepam*, Minor Tranquilizers (Anti-Anxiety and Ataractics): oxazepam*, pinazepam*, N-desmethyldiazepam*, Confirmatory/Quantitative Drug Analysis: Gas Chromatography-Mass Spectrometry, Drug Concentrations: Comparison of Body Fluids, Pharmacokinetics: Acute Dose.

UM-75-MO243

DETERMINATION OF PERPHENAZINE AND ITS SULPHOXIDE METABOLITE IN HUMAN PLASMA AFTER THERAPEUTIC DOSES BY GAS CHROMATOGRAPHY, N.-E. Larsen; J. Naestoft, Journal of Chromatography, v109 p259-64 (1975)

Until recently, the determination of neuroleptic drugs in human plasma was possible only after high doses. This paper describes a gas chromatographic method with a sensitivity sufficient to determine the concentrations of perphenazine and its main metabolite, perphenazine sulphoxide, that occur after conventional single doses.

The procedure involves the use of an electron capture detector. A glass column packed with 1% (w/w) OV-17 on celite JJ CQ, 100-120 mesh was used. The amount of column material was 12 grams. The column was conditioned at 350 degrees for sixty-five hours. The gas (argon-methane, 90:10) flow rate was 60 ml/min. This procedure permits the determination of perphenazine and its metabolite at concentrations down to 0.2 micrograms per liter in plasma, which is sufficient for analyzing plasma from patients being treated with perphenazine. Tests for specificity revealed no interference by nortriptyline or biperidine. (AAM)

6 refs

KEYWORDS: Major Tranquilizers (Antipsychotics and Neuroleptics): perphenazine*, Confirmatory/Quantitative Drug Analysis: Gas Chromatography, Drug Concentrations in Body Fluids: Acute Dose Study.

UM-76-MO244

GAS-LIQUID CHROMATOGRAPHIC DETERMINATION OF PERAZINE, THIORIDAZINE AND THIORIDAZINE METABOLITES IN HUMAN PLASMA, F.A.J. Vanderheeren; D.J.C.J. Theunis; M.T. Rosseel, Journal of Chromatography, v120 p123-8 (1976)

Several studies have proven the necessity of measuring the plasma levels of the active metabolites of thioridazine at the same time as the original compound. This paper describes a single method for the rapid determination of perazine, thioridazine, and the two pharmacologically active metabolites of thioridazine, sulforidazine and mesoridazine, in human plasma.

Repeated extraction, an internal standard, and a temperature program with flame ionization detection were used. Using this method, the lower limit of detection (using 5 ml plasma samples) is approximately 100 ng/ml for perazine and thioridazine and 150 ng/ml for mesoridazine and sulforidazine.

The method described here has several advantages over the original gas chromatographic method. Some of these are (1) its use of an internal standard in the extraction procedure which makes quantitation easier, more reproducible, and more accurate; (2) its use of a temperature program which makes it possible to determine the active metabolites as well as the original compound; (3) its ability to determine other phenothiazines; and (4) its adaptability in laboratories with gas-liquid chromatographic equipment. (HSRI)

6 refs

KEYWORDS: Major Tranquilizers (Antipsychotics and Neuroleptics): mesoridazine, perazine, sulforidazine, thioridazine, Specific Drug Screening: Gas Chromatography.

UM-77-MO245

THE USE OF BUFFERED CELITE COLUMNS IN DRUG EXTRACTION TECHNIQUES AND THEIR PROPOSED APPLICATION IN FORENSIC TOXICOLOGY, L.P. Hackett; L.J. Dusci, Journal of Forensic Sciences, v22 n2 p376-82 (Apr 1977)

This paper describes an extraction technique based on a simple solvent extraction of acidic, basic, and neutral drugs by elution through an acidic or basic buffered celite column. A gas chromatograph equipped with a flame ionization detector was used. The column was a four-foot by one-quarter inch glass coiled tube packed with 3% OV-17 on the Chrom Q 80-100 mesh. Quantitation was achieved by the addition of a standard cholesterol solution at the final stage and analysis by temperature-programmed gas-liquid chromatography.

Five extraction procedures were investigated: two for basic drugs; two for acidic drugs; and one for neutral drugs. The results are compared with standard solutions of the drugs under investigation containing the standard cholesterol solution.

The authors conclude that this method is superior to conventional extraction techniques, including direct extraction. The advantages of the technique described are the following: (1) little tissue manipulation or expertise is required; (2) small sample weights and small volumes of solvents are acceptable; and (3) rapid and good recoveries of a large number of drugs, including those that are volatile, are achieved. These assets make the method suitable for routine work in forensic toxicology. (HSRI)

11 refs

KEYWORDS: General Drug Screening; Gas Chromatography.

UM-76-MO246

RADIOIMMUNOASSAY, H.G. Eckert, Angewandte Chemie, International Edition in English, v15 n9 p525-33 (Sept 1976)

This paper reviews the general principles of radioimmunoassay technique. Some of the topics discussed in addition to basic theory include (1) isotopes and procedures used for radioactive labeling; (2) formation and properties of antibodies; (3) methods of separating antibody-bound and free antigen; (4) execution of measurement and evaluation of results; and (5) radioassay and immunoradiometric assay.

The author concludes that in recent years radioimmunological techniques have greatly improved the understanding of endocrine physiology. These methods are superior to most other analytical procedures both in diagnosis and in surveillance of therapy with regard to sensitivity, specificity, general applicability, and experimental simplicity. Routine applications of radioimmunoassay extend beyond biochemistry and clinical chemistry into microbiology, toxicology, virology, and studies on drug metabolism. Applications in early diagnosis of cancer and in monitoring of tumor diseases after therapeutic measures may also be possible. (AAM)

47 refs

KEYWORDS: Review; Drug Analysis Methodology.

UM-76-MO247

PRIMIDONE ANALYSES: CORRELATION OF GAS-CHROMATOGRAPHIC ASSAY WITH ENZYME IMMUNOASSAY, L. Sun; E.R. Walwick, Clinical Chemistry, v22 n6 p901-2 (1976)

Described here is a study in which serum specimens from patients on primidone therapy were assayed by two currently available procedures for the purpose of comparing the methods--a commercially available enzyme immunoassay (EMIT), and a published gas-chromatographic procedure. Both procedures were done with commercially available materials and equipment.

Results by the two procedures agreed well, which suggests that the methods could be used interchangeably. For the ninety-four specimens studied, the correlation coefficient was 0.98, and the least-square values of slope and intercept were, respectively, 0.97 and 0.51 mg/liter.

The authors conclude that the gas chromatographic procedure is highly reliable. It avoids problems encountered with other procedures relative to interfering plasma

constituents and solubility of primidone. However, the enzyme immunoassay is more rapid; because no concentration or extraction is required, the assay can be completed within fifteen minutes from receipt of the specimen. (JAM)

5 refs

KEYWORDS: Anticonvulsants (Anti-Epileptics); primidone. Evaluation of Methods for Drug Analysis.

UM-76-MO248

USE OF GAS CHROMATOGRAPHY AND MASS SPECTROMETRY TO ANALYZE UNDERIVATIZED VOLATILE HUMAN OR ANIMAL CONSTITUENTS OF CLINICAL INTEREST, I.R. Politzer; B.J. Dowty; J.L. Laseter, Clinical Chemistry, v22 n11 p1775-88 (1976)

This review summarizes for the clinician recent advances in the study of human and animal samples by gas chromatographic (GC) and mass spectrometric (MS) methods. A noncritical compilation of the systems currently used is provided, together with brief descriptions of the instruments used and the results obtained.

This review considers only naturally occurring volatiles, that is, materials reasonably volatile for direct analysis by GC without decomposition and without further derivatization. Only techniques using gas chromatographic and mass spectrometric methods combined with computer analysis are discussed (GC-MS-COMP).

The review first presents a section on technology which is subdivided to include discussions of general GC-MS usage and preparation methods of sample analysis. Clinical samples are then discussed in terms of normal profiling, aberrations associated with disease states, and specific compound analyses.

The authors conclude that the detection of specific compounds using GC-MS-COMP has been developed to the point where incorporation as a routine method in a laboratory is quite feasible. With the appropriate instrumentation and personnel, limited numbers of such assays can be performed routinely, easily, and rapidly for volatile materials. This method is valuable for the determination of blood concentrations for purposes of prescribing proper treatment, however, it also has potential value as a method for the regular monitoring of occupational health hazards. Volatile compounds such as trichloroethylene and other monomers used in the manufacture of industrial polymers are easily assayed by the GC-MS-COMP method without further derivatization. With the growing awareness and concern regarding safe worker-exposure limits, this method holds considerable promise for extended application. (HSRI)

97 refs

KEYWORDS: Review; Drug Analysis Methodology.

UM-76-MO249

MEASUREMENT OF DIPHENYLHYDANTOIN IN 0.1-ML PLASMA SAMPLES: GAS CHROMATOGRAPHY AND RADIOIMMUNOASSAY COMPARED, M.L. Orme; O. Borga; C.E. Cook; F. Sjoqvist, Clinical Chemistry, v22 n2 p246-9 (1976)

This study evaluates the use of a radioimmunoassay for diphenylhydantoin (DPH) in clinical practice which requires only 0.1 ml of plasma by comparing it with a gas-chromatographic micromethod used for the routine determination of plasma DPH concentrations. Concentrations of DPH in 364 plasma samples were measured by both methods. There was an excellent correlation between values obtained by the two methods (r=0.986); in only eleven plasma samples did the results differ by more than 20%. Of the investigated samples, 105 were obtained from uremic patients. For these, an equally good agreement was obtained between the two methods. Within-assay variance was 3.1% for the radioimmunoassay and 3.3% for the gas-chromatographic procedure. Without automatic pipetting equipment, the radioimmunoassay procedure took twice as long as the chromatographic assay, and the cost of chemicals was considerably higher. Nevertheless, the better sensitivity of the radioimmunoassay makes it of great value, especially in children, since plasma samples of 10 to 20 microliters can be used. (JAM)

10 refs

KEYWORDS: Anticonvulsants (Anti-Epileptics); phenytoin*. Evaluation of Methods for Drug Analysis.

UM-74-M0250

STUDIES ON THE USE OF XAD-2 RESIN FOR DETECTION OF ABUSED DRUGS IN URINE. M.P. Kullberg; C.W. Gorodetzky, Clinical Chemistry, v20 n2 p177-83 (1974)

This paper describes a procedure for extracting weakly acidic, neutral, and basic drugs from urine using a column of XAD-2 resin. Adsorption of drugs from 20 ml of urine buffered at pH 8.5 ± 0.5 at a controlled flow rate of 2.5 ml/min was greater than 89% for all drugs tested except aspirin. On eluting the drugs tested with acetone and methanol/chloroform, recoveries ranged from 75 to 93%.. Overall recoveries of drugs from urine to a thin-layer chromatography plate were between 63 and 78%. The concentration of morphine added to normal urine that could be detected 99% of the time (95% confidence limits) by the method was 80(65-100) micrograms per liter.

The study also investigated three methods for recovering morphine from morphine glucuronide added to urine by using appropriate modification of the XAD-2 resin extraction method. since most of the morphine excreted by man is in conjugated form not detectable by commonly used extraction and thin-layer chromatographic methods. Hydrolysis of urine, hydrolysis of urine extracts absorbed on XAD-2 resin, and hydrolysis of urine extracts from the XAD-2 resin followed by a solvent extraction gave 75%, 40%, and 10% recoveries of morphine, respectively. (JAM)

14 refs

KEYWORDS: Opiates and Related Agents: morphine. General Drug Screening: Thin-Layer and Paper Chromatography. Specific Drug Screening: Thin-Layer and Paper Chromatography.

UM-74-M0251

CHROMATOGRAPHY AND FORENSIC CHEMISTRY, A.S. Curry, Journal of Chromatographic Science, v12 p529-34 (Oct 1974)

This paper reviews the role of gas chromatography in forensic science from its earliest use to the present. Four areas are discussed: (1) the need for sensitivity; (2) the need for reproducibility; (3) the need for rapid analysis; and (4) the need for positive identification. These aspects are illustrated by examples in the author's own experience as a forensic toxicologist.

Also discussed in this paper are the limitations of gas chromatography. Some of these are the long time required for separations and the problems of nonvolatile drugs, glass adsorption, solvent reactivity, and on-column reactions. The author concludes that high-pressure liquid chromatography may overcome many of these problems. This relatively new technique will be especially valuable for forensic scientists in the comparative analyses of illicit drugs and in separation procedures when combined with mass spectrometry, especially for cannabis, LSD, and the anabolic steroids. (HSRI)

11 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-76-M0252

HIGH-PRESSURE LIQUID CHROMATOGRAPHY OF CANNABIS. QUANTITATIVE ANALYSIS OF ACIDIC AND NEUTRAL CANNABINOIDS, R.N. Smith; C.G. Vaughan, Journal of Chromatography, v129 p347-54 (1976)

This paper describes a reversed-phase high-pressure liquid chromatographic (HPLC) method developed for the simultaneous analysis of the acidic and neutral cannabinoids in cannabis. A 2m x 0.4 cm glass column packed with 3% OV-17 on 100-120 mesh Gas-Chrom Q, a nitrogen carrier gas flow-rate of 60 ml/min, an oven temperature of 240 degrees C, and a flame ionization detector were used. Cannabigerol and cannabigerolic acid were located in the liquid chromatogram of cannabis.

Calibration values for each substance and factors affecting the chromatographic process are discussed. A method for quantitating one component in the presence of a second unresolved component is also described.

The authors conclude that this system has several advantages over gas-liquid chromatography (GLC). Many acidic and neutral cannabinoids cannot be quantitated by gas chromatographic methods. In addition, acidic cannabinoids cannot be run on GLC without preliminary derivatization, which can cause problems in quantitative analysis if the

reaction is incomplete or if silyl derivatives contaminate the detector. Many of these difficulties can be avoided by using HPLC. HPLC offers considerable potential not only in forensic work, but also in pharmacological and chemobotanic studies where it is necessary to know the detailed cannabinoid content of the material used. Although there are some variables that affect the results of reversed-phase HPLC, no long-term stability problems have been encountered in the analysis of a wide range of cannabis samples using the method described in this paper. (HSRI)

6 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: cannabidiol, cannabidiolic acid, cannabigerol, cannabigerolic acid, cannabinol, cannabinolic acid, delta-9-tetrahydrocannabinol, marijuana. Specific Drug Screening: Other Techniques.

UM-76-MO253

IMPORTANCE OF ASSAY SPECIFICITY FOR PLASMA PROTEIN BINDING DETERMINATIONS, A. Yacobi; G. Levy, Journal of Pharmacokinetics and Biopharmaceutics, v3 n6 p439-41 (1975)

Plasma or serum protein binding determinations of extensively bound drugs are subject to serious error if the analytical methods employed do not discriminate between such drugs and their degradation products, metabolites, and impurities. This paper presents experimental evidence to demonstrate the magnitude of this problem with respect to warfarin.

Blood was obtained from the abdominal aorta of ten ether-anesthetized adult male rats. 71 micro c/mg C-warfarin was added to produce concentrations of 0.5-1 microgram/ml. In this experiment the use of the nonspecific assay (total radioactivity) caused an almost twofold error.

The authors conclude that the magnitude of error introduced in plasma protein binding studies due to use of a nonspecific assay increases with increasing concentrations and decreasing protein binding of the degradation product, impurity, or metabolite, and with increasing protein binding of the drug. It is essential to use a specific analytical method for plasma protein binding studies, particularly of extensively protein bound drugs. (JAM)

4 refs

KEYWORDS: Anti-Coagulants: warfarin. Pharmacokinetics: Acute Dose.

UM-76-MO254

INTERACTIONS BETWEEN DRUGS AND SALIVA-STIMULATING PARAFILM AND THEIR IMPLICATIONS IN MEASUREMENTS OF SALIVA DRUG LEVELS, K. Chang; W.L. Chiou, Research Communications in Chemical Pathology and Pharmacology, v13 n2 p357-60 (Feb 1976)

In performing the indirect method of monitoring drug levels in blood through saliva, Parafilm has frequently been used to facilitate the collection of saliva samples. However, a hydrophobic interaction is suspected to take place between the drugs being analyzed and the Parafilm leading to the loss of drugs from their solutions. This investigation attempted to reveal the magnitude of such interactions.

The interaction between Parafilm and four tranquilizers (chlorpromazine hydrochloride, butaperazine maleate, diazepam, and chlordiazepoxide hydrochloride) in their neutral phosphate buffer solutions resulted in various degrees of loss of the drugs from the solutions The values of loss ranged from 15 to 34% for chlorpromazine and 8 to 42% for butaperazine at the initial concentration range of 2 to 20 microgram/ml at room temperature. Under the same conditions, the values of loss from saliva for these two drugs were fairly constant; about 25% and 17% respectively. For diazepam and chlordiazepoxide, the losses from the buffer solution were below 5%.

The authors conclude that in the light of the results of this experiment, one should be cautious when using Parafilm or other such devices to facilitate collection of saliva samples. (JAM)

6 refs

KEYWORDS: Anti-Emetics: chlorpromazine. Major Tranquilizers (Antipsychotics and Neuroleptics): butaperazine maleate, chlorpromazine. Minor Tranquilizers (Anti-Anxiety

and Ataractics): chlordiazepoxide. diazepam. Muscle Relaxants (Central): diazepam. Variables Influencing Drug Concentration Data.

UM-75-MO255

A RAPID AND COMPREHENSIVE SYSTEM FOR THE ROUTINE IDENTIFICATION OF DRUGS IN BIOLOGICAL MATERIAL BASED ON MICROPHASE EXTRACTION AND DRUG COLOUR PROFILES, W.J. Serfontein; D. Botha; L.S. DeVilliers, Journal of Chromatography, v115 p507-18 (1975)

The separation of basic, acidic, and neutral drugs from propanol-2 extracts of serum, urine, and tissue homogenates at different pH values using a microphase extraction technique is described. Following preliminary screening, the various drug-containing fractions obtained are further examined by two-dimensional thin-layer chromatography. The drugs present are identified with reference to documented standards with the aid of a drug color profile system and R_F values relative to three different reference standards.

By means of gas chromatographic analysis of the same extracts, semiquantitative estimates of the amounts of the drugs present, which are sufficiently accurate for clinical emergency purposes, can be made in many instances. The main advantages of the system are clean extracts with a minimum of background interference, rapidity (four to six hours for a complete analysis), and systematically documented and visually presented behavior of drugs after spraying with various chromogenic and fluorogenic reagents, allowing the systematic identification of unknown substances. (JA)

9 refs

KEYWORDS: General Drug Screening: Systems.

UM-76-MO256

RAPID DETECTION OF SOME BASIC DRUGS BY THIN-LAYER CHROMATOGRAPHY, J.C. Hudson; W.P. Rice, Journal of Chromatography, v117 p449-54 (1976)

This study was undertaken to provide thin-layer chromatography (TLC) data in solvent systems for phenethylamines and other basic drugs that exhibit a characteristic absorption at 257 nm in the ultraviolet (UV) region. Approximately 100 micrograms of each drug were added to a 10x75 mm test-tube followed by 0.2 of sodium bicarbonate solution. Each tube was shaken and 0.2 ml of a NBD-CL (4-chloro-7-nitrobenzo-2,1,3,) oxadiazole solution were added. The tubes were stoppered and placed in an oven for thirty minutes at 80 degrees C. Aliquots of 5 microliters of the upper (methyl isobutyl ketone) layer were spotted and each TLC plate was eluted to a distance of 15 cm. Spots were observed under visible light and UV light (254 nm). Each R_F value was recorded. The R_x values (relative to a standard mixture of 10 mg/ml of chlorpheniramine, methamphetamine, and amphetamine) were then calculated. The following five tables are presented, based on these results: (1) TLC data of NBBD-C1 derivatives in ethyl acetate-cyclohexane (2:3); (2) TLC data of NBD-Cl derivatives in ethyl-acetate-cyclohexane (3:2); (3) TLC data of NBD-Cl derivatives in diethyl ether-benzene (1:1); (4) comparative R_F values of NBD-Cl derivatives; and (5) sensitivities of selected compounds with NBD-Cl. (HSRI)

6 refs

KEYWORDS: Hallucinogens and Related Agents: phenethylamine (PEA). Specific Drug Screening: Thin-Layer and Paper Chromatography.

UM-76-MO257

IDENTIFICATION OF DRUGS USING A GAS CHROMATOGRAPHY-MASS SPECTROMETRY SYSTEM EQUIPPED WITH ELECTRON IMPACT-CHEMICAL IONIZATION AND ELECTRON IMPACT-FIELD IONIZATION-FIELD DESORPTION COMBINATION SOURCES, A. Zune; P. Dobberstein; K.H. Maurer; U. Rapp, Journal of Chromatography, v122 p365-71 (1976)

This paper discusses electron impact-chemical ionization and electron impact-field ionization in a gas chromatography-mass spectrometry system. In a case of accidental intoxication, gas chromatography-mass spectrometry analysis in the electron impact mode can be speeded up by supplementary information obtained in the chemical ionization and field ionization modes. Use of these combined data are shown to lead rapidly to assignments for all significant GC peaks. Valuable data include not only full spectra in the three ionization modes, but also exact mass measurements in the field ionization

and chemical ionization mode. Such measurements, obtained by a dynamic peak-matching technique, lead to the elemented composition of the compounds of interest. This knowledge makes the assignment of key gas chromatography peaks unequivocal and provides an extremely high level of confidence regarding the identity of the whole metabolite series. It is also shown that the nature of the field ionization information is very similar to that obtained from chemical ionization data. (JAM)

12 refs

KEYWORDS: General Drug Screening: Other Techniques.

UM-76-MO258

PROGRESS TOWARDS A COMPREHENSIVE PLASMA ASSAY FOR THE TRICYCLIC AND TETRACYCLIC ANTIDEPRESSANTS. L.A. Gifford, Postgraduate Medical Journal, v52 suppl 3 p69-71 (1976)

Accurate dose-response data for psychotropic drugs are difficult to obtain because of the lack of reliable criteria for measuring their effects. Studies of the relationships between the pharmacokinetics and the pharmacological effects of these drugs are therefore particularly important. This paper reviews recent advances in analytical techniques that facilitate investigation of these relationships. Recent developments in gas chromatography making possible routine assay procedures capable of measuring therapeutic levels of tricyclic and tetracyclic antidepressants in common use are emphasized.

One of the most significant advances in pharmaceutical analysis has been the improvement in gas chromatographic instrumentation and techniques. Improvements have been made in column packings and silicone elastomers. Development of the nitrogen specific detector and the alkali thermal ionization detector (ATID) have greatly increased sensitivity and selectivity in the assay procedure.

The authors conclude that the combination of an all-purpose column and an alkali thermal ionization detector lends itself ideally to use in a comprehensive antidepressant assay. A single calibration curve of one of the drugs can be used to estimate plasma concentrations of any of the tricyclic or tetracyclic compounds once a relationship between extraction coefficients and detector sensitivity for the standard and the other drugs has been established. In this way, plasma concentrations can be obtained in a single run for samples containing any of the drugs. (HSRI)

9 refs

KEYWORDS: Antidepressants. Review: Drug Analysis Methodology.

UM-75-MO259

ISOLATION OF DRUGS WITH MACRORETICULAR RESINS. DETERMINATION OF PHENTERMINE IN BLOOD. W. Vycudilik, Journal of Chromatography, v111 p439-42 (1975)

This investigation attempts to determine the relationship between the concentration and time of excretion of phentermine in the blood using a combination of an isolation method using Amberlite XAD-4 with GC detection by means of a nitrogen detector. The method, instrumentation, and gas chromatography used in this procedure are described.

The extraction of phentermine was studied by determining its recovery from spiked blood samples within the range 1-10 micrograms. The range of extractability extends to 100 micrograms. Approximately 2 ng/ml of phentermine in blood was determined to be the limit of detection. The blood levels were obtained from four male patients after oral administration of 30 mg of phentermine in different preparations. Dwing to variations in physiological conditions, wide deviations of the concentrations must be assumed, but in each case the phentermine taken could be detected even after twenty-four hours. Thus this method is valuable for detecting therapeutic doses of phentermine in the blood. (HSRI)

5 refs

KEYWORDS: Anorectic (Appetite Control) Agents: phentermine*. Sympathomimetic (Adrenergic) Agents: phentermine*. Confirmatory/Quantitative Drug Analysis: Gas Chromatography. Drug Concentrations in Body Fluids: Acute Dose Study. Pharmacokinetics: Acute Dose.

UM-75-M0260

APPLICATION OF AMBERLITE XAD-2 RESIN FOR GENERAL TOXICOLOGICAL ANALYSIS. G. Ibrahim; S. Andryauskas; M.L. Bastos. Journal of Chromatography. v108 p107-16 (1975)

This paper discusses the use of Amberlite XAD-2 resin for the extraction of drugs and processing of either direct aliquots of blood and stomach contents or aqueous dialysates of the latter, as well as aqueous Stsas-Otto deproteinated extracts of tissue. A two-step elution provides the subsequent recovery of standard acid, neutral, and basic compounds as well as the more polar, water soluble drugs and drug metabolites. Inorganics may be recovered from the eluate resulting from passage of the original solution through the resin. Extraction with columns of 1-2 g of Amberlite XAD-2 resin is shown to provide the best general approach for separations in pure form of nearly all toxic compounds from up to 500 g of tissue as well as from biological fluids and stomach contents.

Because of its affinity for a wide variety of organic compounds and the simplicity and efficiency, the authors conclude that the use of XAD-2 resin columns is a potentially important new tool for both routine toxicological screening and special extraction purposes. In addition, the overall retention characteristics of the resin may be applied to a general scheme of analysis for unknown compounds. (JAM)

25 refs

KEYWORDS: Evaluation of Methods for Drug Analysis. General Drug Screening: Other Techniques.

UM-76-M0261

ION-PAIR PARTITION CHROMATOGRAPHY IN THE ANALYSIS OF DRUGS AND BIOGENIC SUBSTANCES IN PLASMA AND URINE. B.A. Persson; P.-O. Lagerstrom. Journal of Chromatography. v122 p305-16 (1976)

This paper discusses high-performance ion-pair partition chromatography as it is used in the routine bioanalysis of therapeutic levels of drugs, drug metabolites, and biogenic substances. Typical counter ions in the stationary phase were methanesulphonate and perchlorate for ammonium compounds, and tetrabutylammonium for the separation of organic anions. Determinations by liquid chromatography were demonstrated for quindine and dihydroquinidine, metanephrine and normetanephrine, and for imipramine and its demethyl metabolite in plasma. A quaternary ammonium compound, QX-572, was determined in urine. Chromatograms are shown for the isolation of indoleacetic and hydroxyindoleacetic acid in urine.

Liquid-liquid chromatography based on the ion-pair partition technique gives separation systems of high efficiency when silica microparticles are used as the support for the stationary phase. With 10 micrometer particles, plate heights of the order of 40-70 micrometers have been achieved with a linear velocity of 0.25 cm/sec. The retention in ion-pair partition systems is determined by the nature and concentration of the counter ion, and the properties of the mobile phase also have a major influence. It is often possible to predict the selectivity, and this can be controlled by varying the composition of the mobile phase.

The authors conclude that the application of ion-pair partition chromatography within the biomedical area will increase. The use of suitable counter ions will be utilized in combination with high-efficiency chromatographic columns in order to increase the sensitivity for ionizable organic compounds. (JAM)

23 refs

KEYWORDS: General Drug Screening: Other Techniques.

UM-76-M0262

SYSTEMATIC IDENTIFICATION OF DRUGS OF ABUSE II: TLC. A.N. Masoud. Journal of Pharmaceutical Sciences. v65 n11 p1585-9 (Nov 1976)

The purpose of this study was to develop systems, reagents, and specific techniques suited for the identification of the most commonly encountered street drugs using multiple TLC identity tests. Forty-three drugs were considered. An attempt was made to limit the number of spray reagents needed, to reduce the number of thin-layer

chromatography (TLC) plates run per sample, and to limit the number of solvent systems to a minimum.

The paper reports a new reagent and new uses for well-known reagents.

A flowsheet for the systematic utilization of the spray reagents is provided. The use of this sequence makes it possible to identify systematically an unknown drug using only two to four TLC plates. This TLC system also can be used to complement and confirm results obtained from spot tests. (JAM)

17 refs

KEYWORDS: General Drug Screening: Thin-Layer and Paper Chromatography.

UM-76-MO263

APPLICATIONS OF HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY IN THE PHARMACEUTICAL INDUSTRY, F. Baily, Journal of Chromatography, v122 p73-84 (1976)

Presented here is a survey of the literature covering pharmaceutical applications of high-performance liquid chromatography (HPLC) from 1972-1975. Seven areas are discussed: (1) alkaloids; (2) antibiotics; (3) nitrogen-containing compounds; (4) steroids; (5) sulphur-containing compounds; (6) formulations; and (7) general analytical techniques. For each topic a brief description of recent developments is provided, as well as a summary of the amount of literature available.

The paper also contains fourteen chromatograms covering the spectrum of more novel activities being done in high-performance liquid chromatography in the pharmaceutical industry. Some of these are (1) the chromatogram of a test mixture for checking the efficiency of home-packed microparticulate columns; (2) the chromatogram of a synthetic prostaglandin mixture; (3) spectra of peaks trapped in the flow cell of a double-beam spectrophotometer by the "stop-flow" technique for several drugs; and (4) chromatograms of chlorhexidine standard and duplicate injections of sample from a patch testing kit.

The author suggests after his review of the literature that there are some aspects of HPLC which are potentially valuable and need continued development. These include: (1) development of more permanently bonded stationary phases on silica and alumina; (2) a more general acceptance of variable wave length; and (3) an appreciation of the contribution of ultraviolet spectra. Finally, because of the high cost of capital equipment, existing equipment and instruments must be updated through automated injection and data handling. (HSRI)

93 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-74-MO264

USE OF CHARCOAL TO CONCENTRATE DRUGS FROM URINE BEFORE DRUG ANALYSIS, J.M. Meola; M. Vanko, Clinical Chemistry, v20 n2 p184-7 (1974)

A simple efficient method is described for detecting various drugs in urine such as barbiturates, glutethimide, ethchlorvynol, amphetamines, phenothiazines, quinine, morphine, cocaine and its metabolites, diazepam, and chlordiazepoxide. The drugs are adsorbed from urine onto charcoal, selectively eluted with small amounts of ethyl ether or chloroform-isopropanol, separated, and identified by thin-layer chromatography. Sequential spraying of the chromatographic plates with conventional reagents (except for fluorescamine, which is used to detect d-amphetamine) makes the drugs visible. The average detection limit for all drugs is 1.0 micrograms per ml of urine.

This procedure is fast, economical, and adaptable to any urine screening program. No emulsions are formed and water washings are not required as with the use of resins. The preliminary charcoal-adsorption step permits excellent thin-layer chromatographic resolution of the drugs, with low background of interfering compounds. (JA)

13 refs

KEYWORDS: General Drug Screening: Thin-Layer and Paper Chromatography.

UM-77-MO265

A COMPARISON OF THE BORATE-CELITE COLUMN SCREENING TECHNIQUE WITH OTHER EXTRACTION METHODS IN FORENSIC TOXICOLOGY, L.J. Dusci; L.P. Hackett, Journal of Forensic Sciences, v22 n3 p545-9 (Jul 1977)

The purpose of this paper is to compare several commonly used extraction techniques in the analysis of postmortem liver tissue. A column chromatography technique with buffered celite which has proved to be rapid and efficient, gives good recoveries of a wide range of drugs, and provides clean extracts, was used as the standard of comparison. The methods used for the comparison of analysis of acidic drugs included: (1) borate-celite column; (2) direct extraction; (3) acid hydrolysis; and (4) tungstate precipitation. The methods used for the basic drugs included: (1) borate-celite column; (2) direct extraction; (3) acid hydrolysis; and (4) ammonium sulfate precipitation.

Results indicate that the borate-celite method provided clean, emulsion-free extracts, gave excellent recoveries for acidic and basic drugs, and therefore was a suitable screening method for postmortem tissues. This method worked equally well with blood, urine, and bile. Protein precipitation methods, on the other hand, were cumbersome and time-consuming, and the yields of most drugs were quite low. Direct extraction provided a rapid and highly efficient technique but occasionally suffered from solvent emulsion. For acid drugs, direct extraction of old and putrified tissue resulted in dirty extracts, unsuitable for analysis by gas chromatography. Although acid hydrolysis gave relatively clean extracts and good recoveries, it could not be used as a general screening method because some drugs are acid or heat labile and break down under these conditions. Generally, the ammonium sulfate procedures gave very poor results.

The authors conclude that, in view of its superior performance here, the borite-celite procedure is a reliable, efficient, and rapid technique for the screening of unknown drugs in biological material. (HSRI)

17 refs

KEYWORDS: Evaluation of Methods for Drug Analysis.

UM-75-MO266

FLUOROMETRIC SCREENING METHOD FOR DETECTING BENZODIAZEPINES IN BLOOD AND URINE, J.C. Valentour; J.R. Monforte; B. Lorenzo; I. Sunshine, Clinical Chemistry, v21 n13 p1976-9 (1975)

Reported here is a fluorometric method for detecting diazepam, chlordiazepoxide, oxazepam, chlorazepate, and their major metabolites in blood, urine, or gastric contents at low therapeutic concentrations. The drugs are first hydrolyzed to their respective benzophenones and converted to highly fluorescent 9-acridanones.

Total benzodiazepines (parent plus metabolites) in blood and gastric contents are semiquantitatively evaluated and compared to results of gas-chromatographic determination by analyzing with both techniques blood samples from deceased persons or hospitalized patients known to have taken diazepam or chlordiazepoxide.

In most instances, the method described here yields results nearly equal to the sum of the active components as determined by the gas-chromatographic method. Benzodiazepines were readily detected in urine after low therapeutic doses, although the time between drug ingestion and the appearance of detectable amounts in the urine varied considerably for the various benzodiazepines. The authors conclude that the method is especially valuable when the relative number of specimens containing benzodiazepines is low and the total number requiring analysis is high. (JAM)

16 refs

KEYWORDS: Metabolites of Drugs and Other Agents: oxazepam. Minor Tranquilizers (Anti-Anxiety and Ataractics): chlordiazepoxide, clorazepate, diazepam, oxazepam. Muscle Relaxants (Central): diazepam. Specific Drug Screening: Optical Techniques.

UM-75-MO267

GAS-CHROMATOGRAPHIC MEASUREMENT OF CODEINE AND NORCODEINE IN HUMAN PLASMA, M.K. Brunson; J.F. Nash, Clinical Chemistry, v21 n13 p1956-60 (1975)

This report describes a specific, sensitive, and reproducible gas-chromatographic method for determination of codeine and norcodeine in human plasma. The method was developed for use in bioavailability studies of therapeutic doses of codeine sulfate. Two studies are discussed which demonstrate the usefulness of this method for determining codeine and norcodeine in plasma. In one study, one hour after ingestion of a 60 mg codeine sulfate tablet, mean peak codeine concentration in plasma was 107 ug/liter. It was positively identified by use of a quadrupole mass spectrometer with chemical ionization, a gas chromatograph, and a data system. Ov-17 packing was used in the mass-spectrometric analysis. By the method described, as little as 5 micrograms of codeine and 25 micrograms of norcodeine per liter could be measured in plasma. No norcodeine was found in any subject's plasma in either study using this method. Norcodeine evidently is not present in human plasma in any clinically significant concentration after administration of codeine sulfate. (HSRI)

11 refs

KEYWORDS: Expectorant and Cough Preparations (Antitusive Agents): codeine*. Opiates and Related Agents: codeine*. norcodeine*. Specific Drug Screening: Gas Chromatography.

UM-75-M0268

THIN-LAYER CHROMATOGRAPHIC METHOD FOR DETERMINING CARBAMAZEPINE AND TWO OF ITS METABOLITES IN SERUM, H.K.L. Hundt; E.C. Clark. Journal of Chromatography, v107 p149-54 (1975)

A sensitive and highly specific thin-layer chromatographic method for determining simultaneously serum levels of carbamazepine and two of its major metabolites, carbamazepine-10, 11-epoxide and 10, 11-dihydroxycarbamazepine is presented. This method requires only 2 microliters for duplicate determination, and no extraction procedure is involved.

Serum (1 microliter) is spotted directly onto the thin-layer plate. After irrigation the separated spots are converted into fluorescing compounds by exposing the plates to hydrogen chloride gas for five minutes and then to strong ultraviolet radiation from a mercury lamp for twenty minutes. The fluorescence is measured quantitatively using a spectrofluorimeter equipped with a thin-layer chromatogram scanning attachment.

The authors conclude that the reproducibility is good and the method is sufficiently sensitive and specific for therapy control purposes. The very small amounts of sample required for the assay make the method ideally suitable for study of carbamazepine and its two metabolites, which can usually be obtained only in small amounts. (JAM)

12 refs

KEYWORDS: Analgesics and Antipyretics: carbamazepine*. Anticonvulsants (Anti-Epileptics): carbamazepine*. Metabolites of Drugs and Other Agents: carbamazepine-10,11-epoxide*. 10,11-dihydroxycarbamazepine*. Specific Drug Screening: Thin-Layer and Paper Chromatography.

UM-75-M0269

GAS-CHROMATOGRAPHIC ANALYSIS FOR COCAINE IN HUMAN PLASMA, WITH USE OF A NITROGEN DETECTOR, P.I. Jatlow; D.N. Bailey, Clinical Chemistry, v21 n13 p1918-21 (1975)

This paper describes a procedure for measuring the concentration of cocaine in human plasma by gas chromatography using a nitrogen detector. The procedure was tested on twenty surgery patients who as part of their regular medication received intranasally 1.5 mg of cocaine per kilogram body weight.

The propyl ester of benzoylecgonine was used as an internal standard. The relationship between relative peak area and plasma concentration of cocaine was found to be linear over a range of 5 to 40 micrograms per liter. Although the detection limit for pure cocaine was less than 200 pg, eighteen drug-free plasmas gave a signal corresponding in retention time to cocaine, which was equivalent to 0 to 2 micrograms per liter. Therefore, the detection limit of cocaine in plasma by this procedure was considered to be 5 micrograms per liter of plasma. The coefficients of variation are 5.3% and 3.0% for concentrations of 50 and 100 micrograms per liter, respectively. Norcocaine, a metabolite of cocaine in humans, was able to be readily resolved from the parent drug over a range of concentrations using this method. Other drugs and contaminants which may cause potential interferences are also discussed.

The authors conclude that, as compared with conventional flame ionization, the nitrogen detector sufficiently increased the sensitivity and selectivity to permit measurement of cocaine in plasma in the concentrations expected in humans after topical or intravenous use. (JAM)

8 refs

KEYWORDS: Local Anesthetics: cocaine*. Stimulants: cocaine*. Drug Concentrations in Body Fluids: Acute Dose Study. General Drug Screening: Gas Chromatography.

UM-74-MO270

GAS-CHROMATOGRAPHIC SIMULTANEOUS ANALYSIS FOR GLUTETHIMIDE AND AN ACTIVE HYDROXYLATED METABOLITE IN TISSUES, PLASMA, AND URINE, A.R. Hansen; L.J. Fischer, Clinical Chemistry, v20 n2 p236-42 (1974)

Reported here is a gas-chromatographic method for the simultaneous quantitative analysis of both glutethimide and 4-hydroxy-2-ethyl-2-phenylglutarimide (4-HG), an active metabolite of glutethimide, in tissues, plasma, and urine. The assay was used to examine postmortem tissues from overdose fatalities and plasma samples from an individual hospitalized with acute, nonfatal glutethimide intoxication.

Results of the analysis confirm that 4-HG accumulates in plasma and tissues during glutethimide intoxication. Therefore, because 4-HG has been shown previously to be at least as potent as glutethimide itself, its accumulation may play an important role in the acute toxicity of glutethimide. As little as 5 ng of glutethimide and 10 ng of 4-HG could be detected by direct injection. The practical limits of sensitivity for the assay as described were about 0.2 micrograms of glutethimide and 0.5 micrograms of 4-HG per milliliter of plasma, or 0.4 micrograms of glutethimide and 10 micrograms of 4-HG per gram of tissue.

The authors conclude that the gas-chromatographic assay for glutethimide and its active metabolite 4-HG described here has proven satisfactory for the quantitative analysis of both of these materials in plasma and tissues and is, therefore, a significant improvement over previously published analyses designed to detect glutethimide alone. The method has proven accurate, sensitive, and specific. (JAM)

32 refs

KEYWORDS: Metabolites of Drugs and Other Agents: 4-hydroxy-2-ethyl-2-phenylglutarimide*. Nonbarbiturates: glutethimide*. Drug Concentrations in Body Fluids: Acute Dose Study. Drug Concentrations: Comparison of Body Fluids. Specific Drug Screening: Gas Chromatography.

UM-76-MO271

DETERMINATION OF CHLOROIMIPRAMINE AND ITS DEMETHYL METABOLITE IN PLASMA BY ION-PAIR PARTITION CHROMATOGRAPHY, P.-O. Lagerstrom; I. Carlsson; B.-A. Persson, Acta Pharmaceutica Succica, v13 p157-66 (1976)

A method to determine the level of the tricyclic antidepressant chloroimipramine and its demethyl metabolite DMCL in plasma by ion-pair partition chromatography is presented. The procedure involves extraction from plasma, back-extraction to an aqueous phase, and a reextraction to a small organic phase, which is injected on the chromatographic column. Methanesulfonic acid is used as the stationary phase and a mixture of hexane, methylene chloride, and butanol as the mobile phase.

This method can be used with acceptable precision down to 10 ng of an amine in a plasma sample for chloroimipramine and its metabolite DMCL. When the amine concentration is lower than 10 ng/ml, 2-4 ml of plasma can be used without any disturbances in the chromatograms. The method has been applied to the analysis of a great number of plasma samples from patients.

This method can also be used in the determination of imipramine and its metabolite desipramine. The only difference is a minor change of the composition of the mobile phase in the chromatographic process. DMCL is used as the internal standard and the sensitivity is the same as for chloroimipramine. (JAM)

20 refs

KEYWORDS: Antidepressants: clomipramine*. Metabolites of Drugs and Other Agents: demethylchloroimipramine*. Pharmacokinetics: Acute Dose. Specific Drug Screening: Other Techniques.

UM-75-MO272

PROGRAMMED MULTIPLE DEVELOPMENT IN THIN LAYER CHROMATOGRAPHY, J.A. Perry; T.H. Jupille; L.J. Glunz, Separation and Purification Methods, v4 n1 p97-165 (1975)

Presented here is a detailed discussion of programmed multiple development in thin-layer chromatography (TLC). The paper begins with a description of conventional thin-layer chromatography and discusses polyzonal TLC, two-dimensional TLC, successive solvents, and unidimensional multiple chromatography. The second section of the paper discusses programmed multiple development. Topics discussed include (1) instrumentation and programming; (2) solute lability and solvent removal; and (3) application areas. Emphasis is given to applications of spot reconcentration and alignment. Precision of spot position, independence of spot position from origin position, broadened origins, narrow spots, extraneous material in the origin, and sensitivity enhancement are discussed in this context. Finally, the application of programmed multiple development to complex mixture separation is discussed, particularly centered programmed multiple development. (HSRI)

26 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-77-MO273

IDENTIFICATION OF DRUGS, DRUG METABOLITES, AND OTHER COMPOUNDS IN URINE BY PERMETHYLATION AND GAS-PHASE ANALYSIS, R.M. Thompson, Research Communications in Chemical Pathology and Pharmacology, v16 n1 p145-54 (Jan 1977)

This paper describes a study in which the derivatization technique permethylation was combined with gas chromatography and mass spectrometry to analyze the metabolites of several different drugs in urine. In this method, a small aliquot of urine (50-200 microliters) is evaporated to dryness. The residue is permethylated with the methylsulfinylmethide carbanion and methyl iodide, and the product mixture separated and analyzed by gas chromatography and gas chromatography-mass spectrometry. Certain drugs (especially the anticonvulsants), drug metabolites, monosaccharides, disaccharides, trisaccharides, and organic acids, including fatty acids and glucuronides, can be identified in the mixture.

This method is probably most useful for screening for the presence of any detectable metabolites in normal or excess quantities, although with the use of appropriate internal standards, more quantitative interpretations can be made. (JAM)

16 refs

KEYWORDS: General Drug Screening: Systems.

UM-77-MO274

PROFICIENCY TESTING IN FORENSIC TOXICOLOGY, K.L. McCloskey; B.S. Finkle, Journal of Forensic Sciences, v22 n4 p675-8 (Oct 1977)

This letter to the editor has a twofold purpose: (1) to criticize a government investigation of methods and results of various forensic toxicology laboratories; and (2) to emphasize the need for competency in the forensic sciences where serious individual and social consequences often hang in the balance.

The authors criticize the government report on the grounds that: (1) the differences in analytical values found between laboratories could be due to poor manufacture, storage, or shipment of test specimens rather than problems in the analytical techniques used as the study claims; (2) the report fails to recognize that variations in measurements are a fundamental and basic phenomenon of all quantitative biological values, and these variations are not necessarily the results of careless procedures; (3) the study places statistical significance over practical significance, failing to recognize that the world of forensic toxicology does not fit into neat mathematical formulas; and (4) the investigators who conducted the study not only were careless and lacked a firm

scientific basis for their conclusions, but used biased and prejudicial language in reporting their results.

The authors conclude that if the standards of practice in forensic toxicology laboratories are to be raised, three areas must be emphasized and developed: (1) a board certification program standardizing professional qualification must be established; (2) a mechanism for careful evaluation of current analytical practices with a view to establishing substantiated methods appropriate to postmortem analytical toxicology must be developed; and (3) a meaningful and efficient proficiency testing must be established. (HSRI)

3 refs

KEYWORDS: Proficiency Testing. Review: Drug Analysis Methodology.

UM-77-MO275

APPLICATIONS OF COMBINED LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY, W.H. McFadden; D.C. Bradford; D.E. Games; J.L. Gower, American Laboratory, v9 n10 p55-6, 58-60,62,64 (Oct 1977)

This paper discusses several aspects of combined liquid chromatography-mass spectrometry (LC-MS) including its general theory, mechanisms, instrumentation, the various interface systems used, and applications of the method. Several examples are cited that illustrate the versatility and flexibility of the process: (1) Many aflatoxins or related mycotoxins that cannot be analyzed by gas chromatography or gas chromatography-mass spectrometry are readily amenable to LC/MS analysis since their vapor pressure and stability are generally sufficient for fast vaporization without excessive decomposition. (2) LC/MS usually permits trace analysis below the nanogram level, although there is usually some instability using the method. (3) LC/MS is a potentially important technique in metabolite identification since many drugs and metabolites are polar materials not readily amenable to gas chromatography-mass spectrometry study. (4) By applying LC/MS, triglycerides can be analyzed at the nanogram level, while triglycerides of the higher molecular weight fatty acids are extremely difficult to handle by gas chromatography-mass spectrometry. (HSRI)

13 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-72-MO276

COMPOSITION OF ILLICIT DRUGS AND THE USE OF DRUG ANALYSIS IN ABUSE ABATEMENT, J.B. Hart; J.D. McChesney; M. Grief; G. Schulz, Journal of Psychedelic Drugs, v5 n1 p83-8 (Fall 1972)

This paper reports the results of an analysis program of street drugs collected in Kansas. The study qualitatively analyzed 237 different samples using thin-layer chromatography and spectral analysis. A comparison of the determined composition of the drug samples with their alleged composition indicated a considerable discrepancy: more than half did not contain the alleged ingredient as the only psychoactive agent.

The implications of this discrepancy are relevant to both research and treatment. First, information about the prevalence of the use of various drugs in a community gathered by interview or questionnaire is open to question since the users are often unaware of the actual composition of drugs being used. Second, as rational treatment of adverse drug reactions depends on a knowledge of what drug or drugs the patient has taken, it is evident that emergency medical treatment of these reactions cannot be based solely on statements by the patient or his peers about the identity of the drug. Third, the results of the analysis program indicate that any socio-psychological explanation for the use of specific drugs based upon their psychopharmacological effects must take into account the possibility of misinformation as to drug identity on the part of the user. The observed discrepancy between actual and alleged contents suggests that expectation of the effects makes a very important contribution to the nature of effects reported by users. (HSRI)

6 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns. General Drug Screening: Other Techniques. General Drug Screening: Thin-Layer and Paper Chromatography.

UM-72-MO277

A RAPID THIN LAYER CHROMATOGRAPHIC SCREENING PROCEDURE FOR VARIOUS ABUSED PSYCHOTROPIC AGENTS, S.H. Schnoll; R.D. Cohn; W.H. Vogel, Journal of Psychedelic Drugs, v5 n1 p75-8 (Fall 1972)

This paper describes a rapid thin-layer chromatographic screening procedure for the tentative analysis of some frequently abused drugs and commonly found substitutes or impurities. The compounds which can be tentatively identified by this method include amphetamine, atropine, cannabidiol, cocaine, dimethyltryptamine (DMT), diethyltryptamine (DET), lysergic acid diethylamide (LSD), mescaline, methamphetamine, phencyclidine, scopolamine, and strychnine. The procedure requires no sophisticated instrumentation and can be used in any laboratory. Using this method allows only tentative identification of a particular drug since it is possible that several compounds might share the same R_F values, fluorescence, and color reactions. However, since only a limited number of drugs and chemicals are for sale, the identification of a particular compound is relatively certain.

The paper also provides the results of the analysis of fifty-three street drug samples obtained in Philadelphia and at various rock festivals. Less than 50% of the illicit substances were what they were reputed to be.

The implications of the survey are three-fold: (1) the buyer never knows what he is buying; (2) the physician treating a patient with an adverse drug reaction cannot rely on the patient's account of what drug he took since he might have ingested a different drug than what he thought; and (3) the scientist cannot make any valid correlations between clinical reactions or biochemical changes in the user and a particular street drug ingested since he never can be certain that the drug under investigation had been taken. (HSRI)

5 refs

KEYWORDS: General Drug Screening; Thin-Layer and Paper Chromatography.

UM-74-MO278

STREET DRUG ANALYSIS AND COMMUNITY BASED DRUG PROGRAMS, D.E. Smith, Journal of Psychedelic Drugs, v6 n2 p153-9 (Apr-Jun 1974)

This paper discusses present street drug analysis and community based drug programs in the United States. Particular emphasis is given to the Haight-Ashbury Free Medical Clinic in San Francisco, a medical and psychological community based agency that attempts to deal with neglected health problems and delivers medical services to youth of the counterculture.

Street drug analysis and information dissemination has become widespread in the United States. The nature of the programs ranges from the very traditional law enforcement drug analysis programs that analyze samples primarily with a view toward prosecution, to counterculture agencies that regularly analyze street drug samples. The greatest technical accuracy relative to drug analysis appears to occur in university based facilities run by professionals.

Unfortunately, it appears that a large segment of the dominant culture including many physicians still feels that by witholding accurate information about street drugs people will cease to abuse drugs. The author feels that good, high quality street drug analysis programs coupled with adequate information delivery systems will not only reduce the number of adverse drug reactions but will also decrease in certain situations the spread of destructive drug practices which are based on inaccurate or dishonest information obtained from both the street and from the medical profession. (HSRI)

13 refs

KEYWORDS: Review.

UM-77-MO279

THE TOOLS OF BIOCHEMISTRY, T.G. Cooper, New York: John Wiley and Sons (1977)

This book deals with basic techniques used in contemporary biochemical and molecular biological studies. The techniques examined are the ones most frequently encountered in current research laboratories. These techniques include: (1) potentiometric techniques;

(2) spectrophotometry; (3) radiochemistry; (4) ion exchange; (5) gel permeation chromatography; (6) electrophoresis; (7) affinity chromatography; (8) immunochemical techniques; (9) centrifugation; and (10) protein purification. Each of these ten techniques is discussed in terms of theory, instrumentation, variations, advantages, and disadvantages. For each technique, experimental applications are described in detail with a computer program type format. The experimental results are recorded in graphs and tables. The book concludes with four appendices: (1) concentration of acids and bases: common commercial strengths; (2) international scale of refractive indexes of sucrose solutions at 20 degrees C; (3) density at 25 degrees C of CsCl solution as a function of refractive index; and (4) periodic table of elements. (HSRI)

423 pages 215 refs

KEYWORDS: Review. Review: Drug Analysis Methodology.

UM-77-M0280

QUALITY CONTROL IN CLINICAL CHEMISTRY, T.P. Whitehead, New York: John Wiley and Sons (1977)

This book is part of a series which attempts to demonstrate how to set up quality control in a clinical laboratory and how to act on the information obtained in the laboratory. The book attempts to ensure that the results produced have the precision and accuracy necessary to aid diagnosis and treatment of patients. Some of the topics discussed include: (1) the need for quality control in routine and research clinical chemistry; (2) types of variance in analytical results; (3) preventive measures in quality control: sources of variance in specimen collection and analysis; (4) use of cumulative sum techniques; (5) assessing the accuracy of analytical techniques; (6) acceptable variances for analytical techniques; (7) the quality control officer; (8) interpreting results of interlaboratory surveys schemes; and (9) the United Kingdom National Quality Control Scheme.

Also discussed are techniques of quality control in terms of optimal conditions variance, routine conditions variance for both known and unknown values, statistical calculation of patients' results, and interlaboratory comparisons. The book concludes with a glossary of technical terms. (HSRI)

130 pages

KEYWORDS: Review.

UM-75-M0281

WESTERN MICHIGAN DRUG ANALYSIS PROGRAM, D.J. McCoy; W.D. Meester, Substance Abuse Scientific Forum Research Report, Lansing: Michigan Department of Public Health (14 Oct 1975)

This paper describes the operation of the Western Michigan Drug Analysis Program and presents the results of a study done under the program. The objectives of the program were (1) to analyze specimens from drug abuse agencies, health departments, emergency rooms, and schools throughout Western Michigan for the identification of dangerous drugs present; (2) to inform physicians, drug abuse agencies, and other community based agencies concerning the identity and nature of substances analyzed; (3) to provide periodic laboratory statistical reports for information and distribution; and (4) to provide a permanent record of all drug data for the purpose of epidemiological analysis to determine patterns of drug use and abuse.

Specimens received are analyzed qualitatively for the identity of dangerous or controlled drugs as well as for contaminants. The laboratory procedures include (1) recording of physical data; (2) microscopic examination; (3) separation procedures such as paper, thin-layer, and gas chromatography; and (4) spectrophotometric analysis.

Results of the study indicate that of 856 drug samples, hallucinogens comprised 2%; depressants, 20%; stimulants, 19%; narcotics, 2%; and miscellaneous, 15%. This distribution of substances is very similar to that of both the east and west coast areas. The study also found that 54% of the samples were misrepresented or adulterated with unsuspected but pharmacologically active compounds. Mescaline and THC were the most commonly misrepresented stimulants. An analysis of 323 alleged unknown samples showed that 17% contained no drug. Many of the unknown samples were actually aspirins, vitamins, antibiotics, and other miscellaneous type drugs. (HSRI)

0 refs

KEYWORDS: Epidemiology: Regional or Local Survey of Drug Use Patterns. General Drug Screening: Systems.

UM-77-MO282

QUANTITATIVE DETERMINATION OF AMITRIPTYLINE AND ITS PRINCIPAL METABOLITE, NORTRIPTYLINE, BY GLC-CHEMICAL IONIZATION MASS SPECTROMETRY, W.A. Garland, Journal of Pharmaceutical Sciences, v66 n1 p77-81 (Jan 1977)

This paper describes a quantitative gas-liquid chromatography (GLC) mass spectrometry assay developed for the determination of the tricyclic antidepressant amitriptyline and its desmethyl metabolite nortriptyline in human plasma. The assay utilizes selective ion detection to monitor in a GLC effluent the MH+ molecular ions of amitriptyline and nortriptyline generated by isobutane chemical ionization. The procedure, which utilizes deuterated analogs of amitriptyline and nortriptyline as internal standards, requires 1 ml of plasma and can measure 1 ng/ml of amitriptyline and 0.5 ng/ml of nortriptyline.

The curves relating the amounts of amitriptyline and nortriptyline added versus the amounts found over a 100-fold range of amitriptyline and nortriptyline concentrations are straight lines with intercepts of approximately zero and slopes of unity.

Analyses of plasma samples from three subjects receiving 50 mg of amitriptyline orally, three times a day, gave an average plasma concentration 115 $\pm$ 42 ng/ml for amitriptyline and 109 $\pm$ 20 ng/ml for nortriptyline. Similar analyses of the plasma of three subjects who had received a single 50 mg oral dose of amitriptyline showed an average maximum plasma concentration of 25 $\pm$ 10 ng/ml for amitriptyline and 10 $\pm$ 4 ng/ml for nortriptyline. Seventy-two hours after administration, the average plasma amitriptyline and nortriptyline levels were 3$\pm$1 and 3$\pm$2 ng/ml respectively. (JAM)

18 refs

KEYWORDS: Antidepressants: amitriptyline*, nortriptyline*. Confirmatory/Quantitative Drug Analysis: Other Techniques. Drug Concentrations in Body Fluids: Acute Dose Study. Drug Concentrations in Body Fluids: Chronic Dose Study.

UM-75-MO283

GAS CHROMATOGRAPHIC-MASS FRAGMENTOGRAPHIC DETERMINATION OF "STEADY-STATE" PLASMA LEVELS OF IMIPRAMINE AND DESIPRAMINE IN CHRONICALLY TREATED PATIENTS, G. Belvedere; L. Burti; A. Frigerio; C. Pantarotto, Journal of Chromatography, v111 p313-21 (1975)

A sensitive and specific method for the separation and the simultaneous determination of imipramine and desipramine in the blood plasma of depressed patients under treatment is described. This method involves separation by gas chromatography and detection by mass fragmentography. Concentrations were determined by focusing the mass spectrometer upon the ions at m/e 280 and 235 for imipramine and 308,236, and 114 for desipramine (N-acetyl derivative), while promazine was used as the internal standard (ions at m/e 284 and 238). Determinations were possible at levels as low as 10 ng/ml in plasma.

According to the mass fragmentographic technique the mass spectrometer is used as a detector for the effluent from the gas chromatographic column. The mass spectrometer can be set to detect one or more characteristic fragment ions of the compounds under study, thereby introducing a further parameter of identification in addition to the retention time in the gas chromatograph. Thus the method combines the high resolving power of the gas chromatograph with the high sensitivity and specificity of identification provided by the mass spectrometer. Endogenous compounds were found not to interfere in the analysis, and no interference was observed from concomitant treatment with benzodiazepines or barbiturates. Thus, the technique described appears to be a satisfactory method for the efficient monitoring of imipramine and desipramine plasma levels in depressed patients undergoing chronic treatment. (JAM)

28 refs

KEYWORDS: Antidepressants: desipramine*, imipramine*. Confirmatory/Quantitative Drug Analysis: Gas Chromatography-Mass Spectrometry. Pharmacokinetics: Acute Dose. Pharmacokinetics: Chronic Dose.

UM-75-MO284

A REPRODUCIBLE GAS CHROMATOGRAPHIC MASS SPECTROMETRIC ASSAY FOR LOW LEVELS OF METHYLPHENIDATE AND RITALINIC ACID IN BLOOD AND URINE, R.M. Milberg; K.L. Rinehart; R.L. Sprague; E.K. Sleator, Biomedical Mass Spectrometry, v2 p2-8 (1975)

This paper describes a rapid, sensitive method of analysis for methylphenidate and ritalinic acid in blood and urine using gas chromatography-mass spectrometry and selected ion monitoring for separation and detection. The methylphenidate is isolated by solvent extraction into chloroform, and the ritalinic acid is isolated by salting out into isopropyl alcohol, followed by methylation and subsequent solvent extraction.

This method is especially applicable to the study of methylphenidate metabolism and excretion in adults and hyperactive children undergoing treatment with methylphenidate. Although the drug is widely used in treating hyperkinetic children, very little work has been carried out to correlate blood and urine levels of methylphenidate and ritalinic acid. Because blood levels vary widely for different individuals on the same dose, it is possible that monitoring levels of methylphenidate would increase understanding of why some children respond dramatically to stimulant medication while others do not. The technique described in this paper is extremely important in this area. (JAM)

18 refs

KEYWORDS: Metabolites of Drugs and Other Agents: ritalinic acid*. Stimulants: methylphenidate*. Confirmatory/Quantitative Drug Analysis: Other Techniques. Drug Concentrations: Comparison of Body Fluids. Pharmacokinetics: Acute Dose.

UM-74-MO285

DETERMINATION OF FLURAZEPAM (DALMANE(R)) AND ITS MAJOR METABOLITES IN BLOOD BY ELECTRON-CAPTURE GAS-LIQUID CHROMATOGRAPHY AND IN URINE BY DIFFERENTIAL PULSE POLAROGRAPHY, J.A.F. de Silva; C.V. Puglisi; M.A. Brooks; M.R. Hackman, Journal of Chromatography, v99 p461-83 (1974)

This paper describes a sensitive and specific electron-capture gas chromatographic (EC-GLC) assay for the determination of flurazepam and its major blood metabolites with a sensitivity limit of 5-10 ng/ml of each compound. The EC-GLC assay employs a fluorosilicone liquid phase that completely resolves flurazepam from the metabolites present, thus permitting the specific and sensitive quantitation of these compounds utilizing the nitrogen electron capture detector. The EC-GLC assay was applied to the determination of blood levels in man following single and multiple 30 mg oral doses of Dalmane(R). The differential pulse polargraphic assay was used to determine the urinary excretion in humans who received a single 90 mg oral dose of the drug.

This method is specific because it measures the intact 1,4-benzodiazepin 2-ones without derivatization. In addition, it lends itself readily to automation and is as sensitive as the fluorometric assay. (JAM)

27 refs

KEYWORDS: Metabolites of Drugs and Other Agents: didesethylflurazepam*. flurazepam-N-1-acetic acid*. monodesethylflurazepam*. N-1-desalkyl-3-hydroxyflurazepam*. N-1-desalkylflurazepam*. N-1-hydroxyethylflurazepam*. Minor Tranquilizers (Anti-Anxiety and Ataractics): diazepam. Muscle Relaxants (Central): diazepam. Nonbarbiturates: flurazepam*. Confirmatory/Quantitative Drug Analysis: Gas Chromatography. Confirmatory/Quantitative Drug Analysis: Other Techniques. Drug Concentrations: Comparison of Body Fluids. Pharmacokinetics: Acute Dose. Pharmacokinetics: Chronic Dose.

UM-76-MO286

SIMULTANEOUS DETERMINATION OF MEPERIDINE AND NORMEPERIDINE IN BIOFLUIDS, H.H. Szeto; C.E. Inturrisi, Journal of Chromatography, v125 p503-10 (1976)

The purpose of this report is to describe a specific and sensitive method for the simultaneous determination of meperidine and its N-demethylated metabolite normeperidine in biofluids. This method employs solvent extraction and gas-liquid chromatography. Normeperidine is analyzed as the heptafluorobutyryl derivative. Using a flame ionization detector, the lower limit of sensitivity of the method is 0.02 micrograms per ml of biofluid for both compounds.

This method was employed in the determination of the plasma and amniotic fluid concentration of meperidine and normeperidine in obstetrical patients after a single dose of meperidine. Samples of plasma from these patients were found to contain higher levels of meperidine than concurrent samples of amniotic fluid. Normeperidine could not be detected in either biofluid after a single dose. There is, however, a gradual accumulation of normeperidine in plasma after repeated doses as determined in samples from cancer patients.

This method was also used to study the disposition of meperidine and normeperidine in the plasma of a cat who received four doses of meperidine. The results from the cat are similar to those that were found in preliminary studies in human subjects. The data indicate that N-demethylation is a major pathway of biotransformation of meperidine in both cat and man. Also both cat and man show an accumulation of normeperidine when given meperidine in repeated doses at the usual therapeutic dosing interval. The development of a specific and sensitive method for the quantification of meperidine and normeperidine like the one described here will allow further study of pharmacokinetics of meperidine and normeperidine in man and in an animal model, the cat. (JAM)

17 refs

KEYWORDS: Metabolites of Drugs and Other Agents: normeperidine*. Opiates and Related Agents: pethidine*. Confirmatory/Quantitative Drug Analysis: Gas Chromatography. Drug Concentrations: Comparison of Body Fluids. Pharmacokinetics: Acute Dose. Pharmacokinetics: Chronic Dose.

UM-78-MO287

RECENT ADVANCES IN AUTOMATION OF HPLC, H. Kern; K. Imhof, American Laboratory, v10 n2 p131-9 (Feb 1978)

This paper discusses three approaches in automation of different liquid chromatographic systems: (1) the single pump system; (2) the dual-pump system; and (3) the automatic gradient system. For each system instrumentation, method, disadvantages, and advantages are discussed.

In comparing the three approaches, the single pump system is the most economical. In addition, this system incorporates the possibility that nearly any liquid chromatograph, and also existing systems, can be updated later to such an automatic instrument. All three systems offer drastic increase of sample throughput combined with higher credibility.

The automated gradient system offers the most flexibility. More than a hundred analyses can be run unattended in the isocratic or solvent-programmed mode. Up to eight different gradient profiles can be stored in the data system and called up by the autosampler.

All three systems show increased precision compared with manually operated instruments. The degree of repeatability of retention times and peak areas facilitates accurate qualitative identification of peaks as well as quantitative LC analysis. With an automated liquid chromatography system, the sources of variability originating with the analyst are removed. All operations are carried out more systematically and the results are much more reproducible. The quality of the results is significantly improved, and sample throughput is increased. (AAM)

0 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-78-MO288

ROUTINE ANALYSIS OF DRUGS OF ABUSE BY GC/IR, R. Saferstein; J.J. Manura, American Laboratory, v10 n2 p125-9 (Feb 1978)

This paper describes an analytical technique for rapid separation and specific identification of drug components using a gas chromatograph (GC) combined with an infrared spectrophotometer (IR). One of the problems with this method in the past has been the low sensitivity and slow scanning speeds of the infrared spectrophotometer which have made it incompatible with any type of GC. Discussed in this paper is CIRA(R) 1C1, a chromatographic infrared analyzer recently developed to overcome this mismatch of the gas chromatograph and the infrared spectrophotometer. The CIRA(R) is a gas chromatograph integrated with an infrared cell. It is compactly designed to fit into

the sample compartment of any standard infrared spectrophotometer. It contains a set of flow valves that permits the carrier gas flow to be stopped and the compounds eluting from the gas chromatograph to be trapped and analyzed in the infrared cell. Individual components are detected by a thermal conductivity detector while chromatograms are recorded on a strip-chart recorder.

The authors conclude that CIRA(R) represents a major contribution to drug analysis in view of its ability to identify illicit drug preparations and to separate the drug from numerous and often unpredictable diluents and additives. This method combines the speed and resolving power of the gas chromatograph with the specificity of the infrared spectrophotometer. The relatively low cost of this system as compared to other systems expands its potential for routine drug identification. (HSRI)

0 refs

KEYWORDS: Barbiturates; amobarbital, secobarbital, General Drug Screening; Other Techniques.

UM-77-M0289

RADIOIMMUNOASSAY OF HYDROMORPHONE IN PLASMA, I.L. Honigberg; J.T. Stewart; W.J. Brown; H.W. Jun; T.E. Needham; J.J. Vallner, Journal of Analytical Toxicology, v1 p70-2 (Mar-Apr 1977)

This paper describes a radioimmunoassay for hydromorphone in plasma at the 10-40 ng/ml range using 0.1 ml of sample. This method is based on a commercially available radioimmunoassay procedure for the detection of morphine. The procedure uses a small sample size (100-500 microliters) with no prior extraction. Data of an analysis of authentic clinical samples from human patients administered therapeutic doses of hydromorpohone are presented. Accuracy of the procedure using spiked human plasma samples is plus or minus 20%. The results suggest that this method is able to detect therapeutic levels of the drug. The methodology is simple and straightforward, and the ready availability of the commercial radioimmunoassay makes the procedure easily accessible to most clinical and toxicology laboratories. (HSRI)

5 refs

KEYWORDS: Opiates and Related Agents: hydromorphone*, Drug Concentrations in Body Fluids: Chronic Dose Study, Specific Drug Screening: Other Techniques.

UM-77-M0290

DIPHENYLHYDANTOIN. A COMPARISON STUDY OF THE ENZYME IMMUNOASSAY AND A CHEMICAL METHOD, J. Vasiliades; D. Shettlesworth; K. Owen, Journal of Analytical Toxicology, v1 p73-4 (Mar-Apr 1977)

This report compares two methods for monitoring diphenylhdantoin serum levels. The methods compared are a chemical method and the commercially available homgeneous enzymatic immunoassay method (EMIT). A comparison of the EMIT and the chemical method was obtained by determining thirty-eight patients' serum by the two methods. Using least square analysis, a slope of 1.09 was obtained with an intercept of -1.28. The correlation coefficient was 0.98 with a standard error of Syx=1.99. The EMIT and the chemical method, therefore, show good correlation and can be interchangeably used for routine analysis. (JAM)

10 refs

KEYWORDS: Anticonvulsants (Anti-Epileptics): phenytoin, Evaluation of Methods for Drug Analysis.

UM-75-P0001

THE EFFECT OF WATER ON THE ABSORPTION OF DRUGS FROM THE GASTRO-INTESTINAL TRACT, G. Williams; J.L. Maddocks, British Journal of Clinical Pharmacology, v2 p543-6 (1975)

Water is commonly used to facilitate the swallowing of drugs, but its effect on absorption of drugs from the gastrointestinal tract in man is unknown. It has been hypothesized that "solvent drag" increases the rate at which a substance crosses a membrane. To study this effect, the absorption of drugs from the gastrointestinal tract in seven male and female medical students was compared after oral administration of

sodium salicylate (1g) and phenol red (60 mg) in both aqueous solution and in isotonic saline. Urine was collected and the phenol red concentration in the urine was measured spectrophotometrically. Plasma salicylate levels were measured photometrically.

Results showed no significant difference between the mean plasma salicylate levels at fifteen, thirty, and sixty minutes after oral administration of sodium salicylate in water and in isotonic saline in the seven subjects. These results indicate that the use of isotonic saline for gastric lavage has no advantage over water in treatment of patients with salicylate overdose.

On the other hand, the mean weight of phenol red excreted in the urine in the first hour after oral administration in water was 0.64 mg while the mean weight after the same dose dissolved in isotonic saline was 0.35 mg. No significant difference was found between the urinary excretion of phenol red following an intravenous dose of phenol red after oral administrations of water and isotonic saline, indicating that taking water or saline orally did not affect the partition of excretion of phenol red between urine and bile.

The increased rate of absorption of phenol red from aqueous solution suggests that solvent drag plays a significant role in its absorption. It appears that the absorption of phenol red from the gastrointestinal tract may be increased by the absorption of water. Future studies of the gastrointestinal absorption of lipid insoluable drugs should therefore consider the marked effect of the drug solvent on absorptions. (HSRI)

13 refs

KEYWORDS: Analgesics and Antipyretics: salicylate*. Pharmacokinetic Factors: Drug Absorption and Distribution.

UM-76-P0002

PHARMACOKINETIC ENGINEERING APPROACH TO DRUG DELIVERY SYSTEM DESIGN AND THE OPTIMIZATION OF DRUG EFFECTS, V.F. Smolen, IEEE Proceedings of the International Conference on Cybernetics and Society, Nov. 1-3, 1976, Washington, D.C., p340-56 (1976)

This paper presents a brief qualitative overview of "pharmacokinetic engineering" and exemplifies some applications of engineering principles to the design, development, evaluation, and use of optimal drug delivery systems and the pharmacological criteria on which their performance may be judged. The pharmaceutical sciences and the drug industry are concerned with the marketing of economical drug delivery systems which are either chemical drug products or electromechanical devices that elicit optimally desirable drug effects. These devices input the drug into the systematic circulation or to specific target sites in the body at predetermined controlled rates in order to control the time course of the pharmacological effects that will ensue. The quantitative description of drug activities and their relationship to the manner in which drugs can be made available to the body by drug delivery systems is the practical concern of pharmacokinetics. These problems are best approached through the direct application of engineering control theory, signals analysis, and optimization techniques.

The concepts of absolute (drug input) bioavailability and comparative (drug output) response bioequivalency are defined and contrasted. The development of optimally predictive in vitro drug bioavailability tests which can substitute for a panel of human subjects in evaluating drug products is discussed. The establishment of quantitative relationships between drug inputs and pharmacological response outputs is also described. The design and operation of "automated, feedback controlled, drug delivery devices" which administer a drug in response to a patient's momentary needs are discussed and exemplified for chlorpromazine. An approach to the development of optimal drug products is also presented. (AAM)

21 refs

KEYWORDS: Anti-Emetics: chlorpromazine. Major Tranquilizers (Antipsychotics and Neuroleptics): chlorpromazine. Variables Influencing Drug Concentration Data.

UM-76-P0003

NORTRIPTYLINE AND 10-HYDROXYNORTRIPTYLINE PLASMA CONCENTRATIONS, V.E. Ziegler; T.A. Fuller; J.T. Biggs, Journal of Pharmacy and Pharmacology, v28 p849-50 (1976)

Although the major nortriptyline metabolite in human cerebrospinal fluid, plasma, and urine has been identified as 10-hydroxynortriptyline, there are no published quantitative reports of 10-hydroxynortriptyline in plasma. To examine the relation between nortriptyline concentrations, therapeutic response, and side effects, it is necessary to quantitate the amount of 10-hydroxynortriptyline in patients' plasma concentrations. The purpose of this investigation was to determine if significant levels of 10-hydroxynortriptyline are present in plasma. This paper describes an experiment in which heparinized plasma from patients undergoing treatment for at least one week with a level dose of nortriptyline was assayed.

In the thirty-six patients the mean total plasma 10-hydroxynortriptyline concentration (as measured by gas chromatrography-mass fragmentography) was 3.64 times greater than that for nortriptyline. However, the much smaller ratio (0.80) of free 10-hydroxynortriptyline to nortriptyline makes it unlikely that 10-hydroxynortriptyline plays a significant biological role in patients undergoing treatment with nortriptyline unless the 10-hydroxy compound is more potent. The evidence presented here demonstrates that hydroxylation is the major determinant of plasma steady-state nortriptyline concentrations even when other factors such as individual differences in weight, body mass, and other routes of degradation are not considered. (HSRI)

6 refs

KEYWORDS: Antidepressants: nortriptyline. Metabolites of Drugs and Other Agents: 10-hydroxynortriptyline*. Variables Influencing Drug Concentration Data.

UM-76-P0004

PATHOPHYSIOLOGICAL AND DISEASE-INDUCED CHANGES IN DRUG DISTRIBUTION VOLUME: PHARMACOKINETIC IMPLICATIONS. U. Klotz. Clinical Pharmacokinetics, v1 p204-18 (1976)

This review attempts to highlight the factors influencing the distribution of drugs, especially pathophysiological and disease-induced changes, in the distribution volume in man. The volume of distribution of a drug (Vd) is a useful pharmacokinetic parameter for relating drug concentration in the plasma to the total amount of drug in the body. Disease-induced changes in Vd may well result in a change in the therapeutic or toxic significance of a given plasma level. For the different factors under consideration, especially plasma protein binding, the weight and the age of the patient play an important role. Plasma binding of many drugs is lower in patients with renal or liver disease, and binding capacity can be decreased in neonates and elderly individuals. Since the heart, liver, and kidney are the major organs determining the distribution and elimination of drugs, it is not surprising that alterations in their function will influence the pharmacokinetic properties of drugs.

When comparing the Vd in different groups of patients one should use the volume of distribution at steady state [Vd (ss)], since this is the only meaningful term as it is independent from elimination processes. Drugs which are strongly bound to plasma constituents (e.g. phenytoin, diazepam) demonstrate an increased Vd in patients with liver or kidney disease, since plasma binding is lowered. A reduced Vd seems to be a general phenomenon associated with renal failure, and pronounced changes are most likely for drugs that are eliminated by a renal excretory mechanism (e.g. digoxin).

From these disease-induced changes in Vd it follows that plasma level monitoring should be done more extensively in patients with kidney, liver, or heart disease, and that arbitrary dosing regimens are only of limited value in these patients. It is also recommended that dosage should be adjusted according to the severity of the disease. (JAM)

89 refs

KEYWORDS: Pharmacokinetic Factors: Drug Absorption and Distribution.

UM-76-P0005

THEORETICAL AND COMPUTATIONAL BASIS FOR DRUG BIOAVAILABILITY DETERMINATIONS USING PHARMACOLOGICAL DATA. I. GENERAL CONSIDERATIONS AND PROCEDURES. V.F. Smolen. Journal of Pharmacokinetics and Biopharmaceutics, v4 n4 p337-53 (1976)

The purpose of this paper is to provide a qualitative overview of the theoretical basis of and to describe a systematic approach to performing bioavailability studies with the use of pharmacological data. The various methods of computing rates and extents of absolute drug bioavailability are briefly reviewed. The use of data derived from

monitoring the time variation of the intensity of pharmacological effects following dosing can often present an advantageous alternative to the more conventional approach of using chemical or radiological assay of blood or urine level data for bioavailability evaluations of drug products: bioavailability studies can be performed with drugs where no assay exists. In contrast to blood sampling, pharmacological sampling can generally be done more frequently to obtain many more data points; also, complicated and time-consuming analytical procedures can be avoided. Pharmacological data can also be obtained by noninvasive methods. The author concludes that the use of pharmacological data should be considered as an alternative or in addition to performing chemical bioavailability studies whether or not a sensitive chemical assay for the drug exists. (HSRI)

29 refs

KEYWORDS: Variables Influencing Drug Concentration Data.

UM-76-P0006

THEORETICAL AND COMPUTATIONAL BASIS FOR DRUG BIOAVAILABILITY DETERMINATIONS USING PHARMACOLOGICAL DATA. II. DRUG INPUT RESPONSE RELATIONSHIPS, V.F. Smolen, Journal of Pharmacokinetics and Biopharmaceutics, v4 n4 p355-75 (1976)

Some new, relatively simple computational approaches to performing deconvolution for bioavailability studies are discussed, and their implementation on analog and digital computers is described. Although the derivations are illustrated for second order (two-compartment) systems, they can be extended to higher order systems without major modifications.

The equivalency is shown of performing bioavailability calculations on the assumption of a compartment model to using a weighting function empirically determined from observed data. Some advantages of the latter approach are discussed. Except for the additional step of converting observed drug response intensities via a dose-effect curve into corresponding biophasic drug levels, bioavailability calculations using pharmacological data are performed in a manner nearly identical to the use of direct assay data. The equations and analog computer schemes presented here can be readily adapted to compute preabsorption (gastrointestinal bioavailability) and biophasic availability. Similarly, through appropriate redefinition of what constitutes input, output, and transfer functions, they can also be used to perform the computations needed to predict in vivo response versus time profiles from the results of in vitro dissolution. (AAM)

30 refs

KEYWORDS: Variables Influencing Drug Concentration Data.

UM-72-P0007

BIOAVAILABILITY, CLINICAL EFFECTIVENESS, AND THE PUBLIC INTEREST, G. Levy, Pharmacology, v8 p33-43 (1972)

This author urges members of the medical and pharmaceutical professions to consider seriously their responsibility to develop the means to set into motion those procedures which will assure that drug products not only contain the designated amount of active ingredient within established limits, but also that this ingredient is biologically available within defined limits.

In the past few years, it has become apparent that there are bioavailability problems with many important drugs and that these problems have caused, or have the potential of causing, considerable harm to patients.

The author believes that the time has come to undertake a review of the bioavailability status of all those marketed drugs which have not been assessed previously in this regard. A policy of full disclosure should be adopted whereby manufacturers are required to include an appropriate statement in their product literature if the bioavailability of their product has not been established.

The author proposes that the bioavailability testing of generically equivalent drug products and the periodic retesting of innovator's products be carried out in patients who require the drug for a sufficiently long time to permit determinations of so-called steady state or plateau plasma or serum concentrations in crossover fashion. Bioavailability studies can be carried out effectively with no additional expense in conjunction with this kind of drug monitoring or clinical pharmacokinetics. Products

would thereby be evaluated under realistic conditions, in the appropriate population, and without exposing normal subjects to unnecessary risk. (HSRI)

19 refs

KEYWORDS: Other Sociolegal Study. Review.

UM-76-P0008

INDUSTRY'S ROLE IN BIOAVAILABILITY, M. Weiner, Journal of Clinical Pharmacology, v16 n10 pt1-2 p550-3 (Oct 1976)

Presented here is a discussion of the pharmaceutical industry's role in bioavailability. It is in the enlightened self-interest of industry to take every possible measure to ensure the appropriate bioavailability of its products. Because of the high demand on scientific manpower and equipment, it is incumbent on those involved with bioavailability studies to define the prime objectives of each study and to select methodology and protocols accordingly. Within this framework, there are some important and highly individual factors that should influence the selection of methodology, the design of protocols, and most important, the interpretation of results. Several factors influencing the evaluation of bioavailability deserve review: methodology; in vitro and animal models; tracer dose studies; "area under the curve" as index of bioavailability; pharmacokinetic evidence of deficient bioavailability; and mechanisms of drug action.

If there is an apparent conflict in observations of drug levels and physiologic response, the physiologic response must prevail as the guide to action. Since drug levels are more accurate and objective, they often represent a shortcut to quantitative bioavailability information. In the last analysis, however, nothing supersedes clinical results as evidence that a product is getting to its site of action as desired. (HSRI)

6 refs

KEYWORDS: Variables Influencing Drug Concentration Data.

UM-72-P0009

AN OVERVIEW OF THE ANALYSIS AND INTERPRETATION OF BIOAVAILABILITY STUDIES IN MAN, J.G. Wagner, Pharmacology, v8 p102-17 (1972)

Presented here is a summary of different types of bioavailability studies. Various methods of analysis and interpretation of data are provided in several tables and figures. Some of the areas covered are: (1) methods of estimation of bioavailability based on clinical studies in man where blood levels and urinary excretion are measured; (2) the pharmacokinetic principle which allows the comparison of blood levels in single and multiple doses at the equilibrium state; (3) the pharmacokinetic principle behind estimation of drug availability by measuring unchanged drug excreted in urine following single and multiple doses of drug in crossover studies; (4) measurement of a metabolite of the drug in urine; (5) methods of estimation of bioavailability based on area measurement; and (6) some of the pitfalls of pharmacokinetic methods.

The author concludes by stressing the importance and significance of bioavailability testing. He opposes the indiscriminate prescription and use of generic drugs in place of brand name drugs. (HSRI)

8 refs

KEYWORDS: Pharmacokinetic Factors: Drug Absorption and Distribution.

UM-72-P0010

PHYSIOLOGICAL AND PHARMACOKINETIC COMPLEXITIES IN BIOAVAILABILITY TESTING, S. Riegelman, Pharmacology, v8 p118-41 (1972)

The purpose of this paper is to point out the many factors that can play a critical role in modifying the relative rate and amount of drug that can reach the site of action and therefore influence the onset, intensity, and duration of clinical response.

Many factors involved in the physical state and in methods of combining the active components and excipients during the manufacturing of the dosage form cause marked changes in rate of disintegration and dispersion of the granules into the individual

particles of drug substance, causing a change in the rate at which the surface becomes available for dissolution. Gastrointestinal fluids can further interact with the drug molecules on the surface of the particle, in some cases solubilizing a drug and in other cases causing precipitation on the surface of the particle of a slowly dissolving form of the drug. The intensity of peristalsis and the exposure of the drug to bacteria and tissue enzymes can also influence bioavailability.

The first-pass effect (in which the drug is affected by the metabolism in the gut wall as well as during the initial pass through the liver) and subsequent enterohepatic cycling can also influence bioavailability. It is also necessary to realize that the drug itself or some of its metabolites can directly or indirectly modify its rate of metabolism. Several disease states, such as hyperthyroidism, uremia, and congestive heart failure can markedly affect the distribution and the metabolism. The author concludes that no drug has been adequately studied until the effect of food and bed rest on its bioavailability has been examined. (HSRI)

20 refs

KEYWORDS: Pharmacokinetic Factors; Drug Absorption and Distribution.

UM-72-P0011

DESIGN OF IN VIVO STUDIES OF BIOAVAILABILITY--BIOMETRICAL CONSIDERATIONS. J.E. Bearman; R.B. Loewenson, Pharmacology, v8 p44-54 (1972)

These authors believe that unless basic definitions and foundations of bioavailability are established, little progress can be made in the field. They list several areas in biometrics in which there are pitfalls that must be avoided if any experiment dealing with bioavailability is to be valid.

The first and most basic step in an experiment is to determine which parameters will be studied and what measurements are appropriate to study them. Once it has been decided which measurements are to be made and that these measurements are relevant to the problem at hand, the experimenter must choose a method that will make his measurements reliable and valid. Next, an appropriate experimental model must be found -- one which is relevant, ethical, practical, and objective.

The collection of data also presents several potential pitfalls. Caution must be used when dealing with placebos, blind and double-blind techniques, random assignments of subjects, and determination of number of subjects. Data must be collected uniformly and be comparable over time and space. It must be recorded accurately and in an organized manner.

Only if great care is taken in each of these areas can data be analyzed accurately and interpreted correctly. A final but essential step in an experiment in bioavailability is the follow-up of the subjects who were in the studies to determine adverse reactions or side effects. (HSRI)

0 refs

KEYWORDS: Variables Influencing Drug Concentration Data.

UM-76-P0012

FACTORS AFFECTING DRUG BINDING IN PLASMA OF ELDERLY PATIENTS. S. Wallace; B. Whiting; J. Runcie, British Journal of Clinical Pharmacology, v3 p327-30 (1976)

It has been established that the elderly are particularly prone to drug toxicity. This is probably due to reduction in protein binding. This paper reports on an investigation of one of the factors that may be responsible for changes in protein binding by assessing the contribution made by both decreased albumin levels and multiple drug therapy.

Plasma protein binding studies were performed on four groups of subjects: (1) sixteen healthy volunteers taking no drugs, aged 19 to 40 years; (2) fifteen surgical and gynecological patients, aged 14 to 39 years, not acutely ill, but taking a variety of drugs; (3) sixteen elderly patients taking no drugs, aged 69 to 85 years; (4) twenty-two elderly patients aged 74 to 92 years, taking one or more drugs. Blood samples (10 ml) were withdrawn from hospital patients approximately two hours after the first morning drug administration round. Albumin was measured on the Technicon Autoanalyzer. Protein binding studies were carried out by ultrafiltration. Aliquots of plasma were incubated

for thirty minutes at room temperature with salicyclic acid (280-400 micrograms/ml), sulphadiazine (300-500 micrograms/ml), and phenylbutazone (75-200 micrograms/ml). Ultrafiltration was then carried out, and samples of the original plasma-drug solution and ultrafiltrate were analyzed for total and free drug.

Results showed that elderly patients had significantly reduced concentrations of plasma albumin compared with subjects under forty years of age. Significant increases in free levels of all three drugs were found in elderly patients receiving multiple drug therapy on drug binding. The clinical implications of these observations are discussed. If elderly patients must be given more than one drug at a time, and if any of these are known to be highly protein bound, it may be advisable to test each individual's plasma for its ability to bind the drug in question. (HSRI)

10 refs

KEYWORDS: Pharmacokinetic Factors: Drug Absorption and Distribution.

UM-75-P0013

PHYSIOLOGICAL DISPOSITION OF CAFFEINE. A.W. Burg. Drug Metabolism Reviews, v4 n2 p199-228 (1975)

In spite of the great number of papers which deal with the pharmacological activity of caffeine, there are very few valid studies on the metabolism and physiological disposition of caffeine. This review summarizes the available data and attempts to resolve some of the contradictory information in the literature. An attempt was made to relate existing information to the metabolism of caffeine in man. Attention has been given both to oral administration of experimental doses of caffeine and to other experimental conditions which more adequately correspond to the dietary or clinical situation. Caffeine's effects on hepatic microsomal enzymes are also briefly discussed.

The paper is divided into four sections: (1) kinetics of caffeine, including absorption, plasma half-life, tissue distribution, and excretion of caffeine; (2) metabolism; (3) significance of the research; and (4) an appendix which provides the structures of caffeine and some of its metabolites. (HSRI)

55 refs

KEYWORDS: Stimulants: caffeine. Pharmacokinetic Factors: Drug Absorption and Distribution. Pharmacokinetic Factors: Drug Metabolism.

UM-76-P0014

COCAINE: PLASMA CONCENTRATIONS AFTER INTRANASAL APPLICATION IN MAN. C. Van Dyke; P.G. Barash; P. Jatlow; R. Byck. Science, v191 p859-61 (27 Feb 1976)

Despite its long history and wide usage, little is known about the systemic effects of cocaine in man. In an effort to elucidate its pharmacology in man, plasma concentrations were measured in thirteen surgical patients who were given cocaine as a vasoconstrictor prior to nasal intubation. A 10% solution of cocaine hydrochloride (1.5 mg per kilogram of body weight) was applied topically to the nasal mucosa. Blood samples of 10 ml were obtained before application of cocaine, and ten, fifteen, twenty, and sixty minutes after application. Plasma concentrations of cocaine were determined by a GLC equipped with a nitrogen detector.

The cocaine persisted in the plasma for four to six hours and reached peak concentrations of 120 to 474 nanograms per milliliter at fifteen to sixty minutes. The presence of cocaine on the nasal mucosa for three hours after application suggests that prolonged absorption of cocaine, perhaps as a result of its vasoconstrictive action, might explain its persistence in plasma.

The peak concentrations in plasma occurred later than the time of maximum euphoria reported by street users. In this study, the peak concentrations in plasma occurred about sixty minutes after application. It is possible that the intense euphoria from cocaine may be related to the rapidly increasing concentration of cocaine in plasma and not to peak values. (HSRI)

20 refs

KEYWORDS: Local Anesthetics: cocaine*. Stimulants: cocaine*. Drug Concentrations in Body Fluids: Acute Dose Study. Pharmacokinetic Factors: Drug Absorption and Distribution.

UM-75-P0015

THE EFFECT OF AGE ON PLASMA LEVELS OF PROPRANOLOL AND PRACTOLOL IN MAN, C.M. Castleden; C.M. Kaye; R.L. Parsons. British Journal of Clinical Pharmacology, v2 p303-6 (1975)

Large areas of drug pharmacokinetics in the elderly remain largely unexplored at the present time. The goal of this experiment was to elucidate further the influence of age on the metabolism and excretion of commonly used drugs. In order to do this, plasma levels of propranolol and practolol were measured in groups of elderly and young subjects after the oral administration of propranolol (40 mg) and practolol (200 mg) on separate occasions. Subjects for the propranolol study were five men and four women with a mean age of 27 years, and three men and six women with a mean age of 77 years. In the practolol study there were thirteen young subjects (seven men and six women) with a mean age of 27 years, and eight elderly subjects (three men and five women) with a mean age of 80 years.

After an overnight fast, propranolol (40 mg) or practolol (200 mg) was taken orally on separate occasions. Venous blood samples were collected prior to dosing, and at 0.5, 1, 1.5, 2, 4, 6, and 8 hours after dosing. Propranolol was measured by a fluorometric method, while practolol was measured spectrophotometrically.

At all sampling times the mean plasma propranolol level in the group of elderly subjects was substantially and significantly greater than the corresponding level in the group of young subjects, there being a fourfold difference in the mean peak levels.

After practolol, there was no significant difference between the mean plasma concentrations of the drug in the two groups for the first two hours. After two hours the mean plasma levels in the group of elderly subjects was somewhat higher than the corresponding levels in the young group, the differences between the two reaching statistical significance.

It is suggested that there is a need to substantially reduce the dose of propranolol given to elderly patients. With practolol, however, no reduction is necessary providing renal function is normal for the patient's age. (AAM)

22 refs

KEYWORDS: Anti-Anginal Agents: propranolol*. Anti-Arrhythmia Agents: practolol*, propranolol*. Hypotensive (Antihypertensive) Agents: propranolol*. Drug Concentrations in Body Fluids: Acute Dose Study. Variables Influencing Drug Concentration Data.

UM-75-P0016

METHADONE PLASMA LEVELS IN MAINTENANCE PATIENTS: THE EFFECT OF DOSE OMISSION, K. Verebely; H. Kutt. Research Communications in Chemical Pathology and Pharmacology, v11 n3 p373-86 (Jul 1975)

This study investigated whether or not the apparently rapid loss of cross tolerance in methadone maintenance patients is related to rapid changes in the methadone plasma levels following dose omission. The stability of methadone plasma levels during steady drug intake and the effects of a single dose omission on the methadone plasma level were studied in three patients (Group I) who did not use drugs and in a nonselected group of eleven methadone clinic patients (Group II). The plasma levels of methadone were determined by gas-liquid chromatography. In Group I where patients received an average dose of 1.13 mg/kg (range 0.45-1.6 mg/kg), little day to day variation was seen; the average plasma level was 0.358 micrograms/ml with a variance of ± 3.6% measured on four different days. Forty-eight hours after the last dose (after omission of a single dose), methadone plasma levels declined on the average by 0.179 micrograms/ml, which represents a 50% decrease from the preomission average level.

In Group II patients, during the presumed steady methadone intake (average dose 1.25 mg/kg, range 0.57 - 1.75 mg/kg) the average plasma level of methadone was 0.377 micrograms/ml with a variance of 48.5% measured on four different days. A fall in methadone plasma levels occurred mainly after weekends in some of the Group II patients, suggesting possible nonconsumption of the prescribed dose of medication. The rapid and substantial decline of methadone plasma levels following a single dose omission is apparently a parallel to the observed rapid loss of methadone-induced cross tolerance. (AAM)

11 refs

KEYWORDS: Opiates and Related Agents: methadone*. Drug Concentrations in Body Fluids: Chronic Dose Study.

UM-73-P0017

APPLICATION OF PHARMACOKINETIC PRINCIPLES TO THE ELUCIDATION OF POLYGENICALLY CONTROLLED DIFFERENCES IN DRUG RESPONSE, E.S. Vesell, Journal of Pharmacokinetics and Biopharmaceutics, v1 n6 p521-40 (Dec 1973)

The application of pharmacokinetics to the elucidation of polygenic factors involved in drug disposition is discussed in the context of three questions: (a) How extensive is the variation among individuals in rate of plasma clearance for commonly used drugs? (b) If appreciable variation occurs, what are the relative contributions of genetic and environmental factors to its maintenance? (c) What role is played by polygenic factors in maintaining this variation?

Large variance in plasma decay rates for phenylbutazone, ethyl biscoumacetate, antipyrine, isoniazid, and nortriptyline is noted throughout the general population. However, these large variations appear to be controlled predominately by genetic rather than by environmental factors on the basis of studies run on identical and fraternal twins. At the present time, an individual's capacity to metabolize drugs and the effects of various conditions in altering that basal, genetically determined capacity seem to be best indicated by measurements of the plasma antipyrine half-life. The theoretical advantages of obtaining blood concentrations of drugs as a guide to their more rational administration are evident. However, many problems remain. Some of these are the following: (1) Patients take many medications, often at different intervals, making decisions concerning the timing of drug concentration determinations difficult. (2) Some drugs cannot be assayed conveniently in biological fluids. (3) Some drugs reach high tissue concentrations although present in low or undetectable concentrations in biological fluids. (4) For many compounds, sufficient experimental work has not been performed to establish quantitatively clear ranges between ineffective, therapeutic, and toxic drug concentrations in biological fluids.

The author stresses that, like all other clinical chemical determinations, drug concentrations are maximally useful when they are placed in the broad clinical context of a particular patient's problem. Taken out of this context, such measurements may prove of limited value or be misleading. (JAM)

41 refs

KEYWORDS: Variables Influencing Drug Concentration Data.

UM-73-P0018

THE IMPORTANCE OF TISSUE DISTRIBUTION IN PHARMACOKINETICS, J.R. Gillette, Journal of Pharmacokinetics and Biopharmaceutics, v1 n6 p497-520 (Dec 1973)

The concentration of a drug at its site of action will be affected by the ability of the drug to distribute to and pass through various membranes and tissues. Mechanisms of drug distribution are summarized in this paper. These include the differences between intracellular and extracellular pH, active transport systems for drugs, distribution of drugs between fat and water in adipose tissues, and the reversible binding of drugs to phospholipids and to various macromolecules including proteins, nucleic acid, and melanin. These mechanisms usually tend to decrease the concentration of unbound drugs at their sites of action, but usually not to the extent one would predict on the basis of in vitro binding studies. The effects of drug distribution altering the biological half-lives of drugs in the body are discussed as well as the interrelationship between the kinetic volumes of distribution for drugs and blood flow rates through the organs that eliminate these drugs. These concepts are illustrated for corticosterone levels following intravenous bolus injections and infusions into rats. (JA)

33 refs

KEYWORDS: Adrenals: corticosterone. Pharmacokinetic Factors: Drug Absorption and Distribution.

UM-73-P0019

KINETICS OF DRUG-DRUG INTERACTIONS, M. Rowland; S.B. Matin, Journal of Pharmacokinetics and Biopharmaceutics, v1 n6 p553-67 (Dec 1973)

The intent of the present review is to illustrate how pharmacokinetic analysis provides further insights regarding the causes, possible mechanisms, and design of future experiments aimed at elucidating various facets of drug interactions. It also illustrates how predictive pharmacokinetic models of drug interactions can be developed and the potential utility of such models in deciding appropriate dosage regimens when a combination of drugs is deemed a therapeutic necessity. Since many drug-drug pharmacokinetic interactions are dependent on the concentrations of the interacting species, the degree of interaction should be a graded phenomenon varying with drug and metabolite concentration and thus drug administration and time. Hence one should be able to develop predictive kinetic models for such interactions. A change in drug plasma levels when a compound is administered as a single dose together with another drug can arise from a changed drug clearance, displacement from binding sites, a change in elimination rates, or a combination of any or all of these possibilities. The interaction of phenobarbital and the sparingly soluble oral antifungal agent, griseofulvin, is one example. Analysis shows that there is no change in the elimination half-life of griseofulvin but that phenobarbital reduces the extent of griseofulvin absorption rather than enhances its elimination. Sulfaphenazole inhibits the metabolism and markedly prolongs tolbutamide plasma levels. An anticipated sudden drop in the excretion rate of the tolbutamide metabolites at maximum sulfonamide plasma levels is associated with an almost complete block of tolbutamide oxidation. The inhibitor constant for this interaction has been calculated, allowing one to predict tolbutamide and metabolite levels when the inhibitor is administered.

Drug-drug interaction resulting from protein displacement has been hypothesized by a number of authors. However, the potentiation of the anticoagulant warfarin in patients receiving phenylbutazone is more complicated than has been envisioned previously. While displacement occurs, data suggest that phenylbutazone primarily acts through selective inhibition to alter the isomeric composition and potency of the racemic warfarin administered. The warfarin-phenylbutazone interaction study stresses the importance of measuring metabolites as well as intact drug. (JAM)

35 refs

KEYWORDS: Pharmacokinetic Factors; Drug Absorption and Distribution.

UM-76-P0020

PLASMA AND TISSUE PROTEIN BINDING OF DRUGS IN PHARMACOKINETICS, W.J. Jusko; M. Gretch, Drug Metabolism Reviews, v5 n1 p43-140 (1976)

Recognition of the importance of protein binding in pharmacokinetics and the relative ease of measuring drug-protein interactions have led to an extensive accumulation of literature in this field. Although much of this information is only descriptive, many developments have occurred to lend physiological and quantitative insight into the role of protein binding in determining drug effects. This review focuses largely on the function of drug-protein binding in pharmacokinetics. It also extends two earlier extensive tabulations of drug-protein binding studies and gives particular attention to the types and effects of tissue proteins in determining drug action.

Areas included in this literature review are the dynamics of albumin, especially the distribution and the factors affecting the albumin content of body compartments; quantitation of the role of protein binding in pharmacokinetics including the use of pharmacokinetic simulations; the role of protein binding in steady-state drug distribution; the role of protein binding in physiological pharmacokinetics; tissue binding of various drugs; and the role of protein binding in the pharmacokinetics of selected compounds. Propranolol, phenytoin, corticosteroids, anticoagulants, antibiotics, bilirubin, and other drugs are examined in terms of their binding capacity. Factors which alter drug-protein binding, including diseases, protein concentration, age, species differences in binding, antibodies, and drug interactions, are also discussed. The report concludes with an appendix which summarizes major studies involving interaction between drugs and proteins. (HSRI)

432 refs

KEYWORDS: Pharmacokinetic Factors; Drug Absorption and Distribution.

UM-76-P0021

BLOOD LEVELS OF METHAQUALONE IN MAN FOLLOWING CHRONIC THERAPEUTIC DOSES, A.F. DeLong; R.D. Smyth; A. Polk; R.K. Nayak; N.H. Reavy-Cantwell, Archives internationales de Pharmacodynamie et de Therapie, v222 n2 p322-31 (Aug 1976)

The purpose of this study was to determine if blood methaqualone metabolites accumulate in significant amounts during multiple therapeutic dosing by comparing and contrasting the blood methaqualone metabolite profile following therapeutic and high dose administration. Therapeutic doses of methaqualone were given to eight normal adult institutionalized males ranging in age from 23 to 44 years and weighing from 68 to 84 kg. Subjects received one 300 mg methaqualone tablet approximately three hours after the evening meal. Serum samples from the subjects were pooled at various hourly intervals. These samples were compared to serum samples from two subjects, one of whom received 1.8 g of methaqualone over a four-hour period, the other 3.0 g during a five-hour period.

The serum was analyzed for methaqualone and hydroxylated metabolites by gas-liquid chromatographic, ultraviolet spectrophotometric, and spectrofluorimetric procedures. Intact methaqualone was found to be the major circulating drug component after administration of multiple 300 mg daily doses over a twenty-eight day period. Hydroxylated methaqualone metabolites, if present, were estimated to be in extremely low concentrations. After acute ingestion of large quantities of methaqualone (2.4-3.0 g) at least one methaqualone metabolite, {2-methyl-3-(2' hydroxymethylphenyl)-4(3H) -quinazolinone} was present in serum obtained from subjects with a history of chronic drug abuse. (JAM)

17 refs

KEYWORDS: Nonbarbiturates: methaqualone*. Pharmacokinetics: Acute Dose. Pharmacokinetics: Chronic Dose.

UM-76-P0022

PHARMACOKINETICS IN THE ELDERLY, J. Crooks; K. O'Malley; I.H. Stevenson, Clinical Pharmacokinetics, v1 p280-96 (1976)

The elderly are generally considered to be quite different from young people in terms of drug response. This applies particularly to quantitative differences. While altered drug handling is a major potential source of difference in responsiveness to drugs, the relative contribution of pharmacokinetics and pharmacodynamics to this difference is not clear. This paper reviews available data on pharmacokinetics in the elderly.

In the past, data pertaining to animal models have been extrapolated to man; in the absence of human experimentation these assumptions have tended to hold sway. This is best exemplified by studies on drug absorption. The absorption of actively transported substances may in fact be diminished in the elderly as animal studies suggest. However, most drugs are absorbed by passive diffusion. The recently available evidence in man indicates that there is no age-dependent change.

While definitive data on the effect of old age on drug metabolizing ability in animals is available, no direct assessments have been made in man. Many of the studies carried out using drug plasma half-life and clearance assessments are complicated by changes in distribution. This is best illustrated by a definitive study with diazepam, in which marked prolongation of plasma half-life was accompanied by an increase in apparent volume of distribution in the elderly. This later change influences plasma drug clearance and possibly drug concentration at its site of action. Thus, the implications for drug effects of such changes in volume of distribution remain to be clarified.

In theory, the rate of elimination of antipyrine should provide a good index of drug metabolizing ability. Both plasma half-life and clearance values suggest a decrease in metabolism in the elderly. No other drug has been studied as intensively as antipyrine, and the evidence for a diminished metabolism of other drugs in the elderly is less definite. Thus, while it is likely that the metabolism of some drugs is impaired in old age, it is not possible at this time to generalize with regard to the effect of age on drug metabolizing ability in man.

It is also difficult to generalize about age related changes in plasma protein binding of drugs. With some drugs, binding to plasma protein does not appear to be altered and for two drugs, warfarin and phenytoin, the findings of different investigations conflict.

Diminution of glomerular filtrations rate, renal plasma flow, and associated tubular function with age have been well documented. Drug clearance comparisons between old and young have been carried out for only three renally excreted drugs--digoxin, propicillin, and sulphamethizole. With digoxin and sulphamethizole the evidence shows that renal excretion is diminished in the elderly. With propicillin, changes in volume of distribution predominate, resulting in higher plasma levels in the elderly but similar percent recovery in urine. In the remaining studies, drug plasma levels and plasma half-life values indicate that older patients are exposed to higher plasma concentrations of drugs. While the data is insufficient to explain the findings in kinetic terms, it is likely that diminished renal excretion is mainly responsible.

In conclusion, with the exception of renally-excreted drugs, there is at present insufficient data on which to make recommendations with respect to doses of drugs in the elderly. The importance of changes in volume of distribution are not clear, and data obtained from single dose studies are not necessarily pertinent to multiple dose continuous therapy. In addition, many elderly patients have multiple pathology and the findings from studies on healthy subjects may not be applicable. Future studies must combine pharmacokinetic and pharmocodynamic aspects in the relevant clinical setting so that the practical significance, if any, of altered kinetics emerges. (JA)

50 refs

KEYWORDS: Pharmacokinetic Factors: Drug Absorption and Distribution.

UM-76-P0023

THE UTILITY OF PHARMACOKINETICS TO THE PHARMACEUTICAL INDUSTRY. R.L. Nelson, Journal of Clinical Pharmacology, v16 n10 pts 1-2 p565-9 (Oct 1976)

Pharmocokinetic data can be very useful in the development stages of pharmaceutical research. This discussion highlights a few examples in which knowledge of the kinetics of a new compound influences its future preclinical development and provides a rational basis for the formulation of appropriate dosage forms and dosage regimens for initial clinical trials, as well as alerting the clinical pharmacologist to potential problems. Pharmacokinetic data also can be useful in the design of rational clinical drug research, thereby expediting clinical trials and saving research costs. Thus, in addition to their value in the area of comparative bioavailability, pharmacokinetic studies carried out by the pharmaceutical industry are useful economically as well as scientifically. (HSRI)

23 refs

KEYWORDS: Review.

UM-76-P0024

PHARMACOKINETIC MODEL FOR SIMULTANEOUS DETERMINATION OF DRUG LEVELS IN ORGANS AND TISSUES. C.N. Chen; J.D. Andrade, Journal of the Pharmaceutical Sciences, v65 n5 p717-24 (May 1976)

An extension of the Bischoff-Dedrick pharmacokinetic model is presented. This model is derived from basic considerations of drug distribution with physiological and anatomical meaning. The Bischoff-Dedrick model can simultaneously predict drug distribution with time in blood, organs, and tissues of pharmacological interest. The parameters are applied to a 15 kg standard dog. The experimental kinetic data of thiopental in brain, plasma, liver, lean tissue, and adipose tissue in a dog are used to demonstrate the feasibility of the model. Allowable variations in the parameters are determined.

In general, the kinetics of drug distribution in blood, organs, and tissues depend on the drug dosage, lipid solubility, partition coefficients, metabolism rate, excretion rate, protein binding, route of administration, size of organs and tissues, and blood flow rates through organs and tissues. These factors enter the kinetic model separately and explicitly so their effects on the kinetics of drug distribution can be studied to provide valuable information for optimal therapy.

One potential application of this model is that it can be applied to predict human pharmacokinetics with certain modifications in physiological and biochemical parameters. It can provide, therefore, valuable information for optimal therapeutic regimens. Another potential application of this model is that the pharmacokinetics of some critical substances such as uric acid, creatinine, and urea in patients suffering from

renal failure or of exogenous poisons in acutely intoxicated patients can be analyzed with respect to extracorporeal device treatments. (JAM)

21 refs

KEYWORDS: General Anesthetics: thiopental. Pharmacokinetic Factors: Drug Absorption and Distribution.

UM-77-P0025

FORENSIC TOXICOLOGY OF SOME DEATHS ASSOCIATED WITH THE COMBINED USE OF PROPOXYPHENE AND ACETAMINOPHEN (PARACETAMOL). A.E. Robinson; H. Sattar; M. Phil; R.D. McDowall; A.T. Holder; R. Powell, Journal of Forensic Sciences, v22 n4 p708-17 (Oct 1977)

This paper presents toxicological data for autopsy cases occurring from 1972 through 1976 in the United Kingdom in which death was associated with ingestion of Distalgesic(R) tablets (acetaminophen) alone or in combination with alcohol or other drugs. Determination was made of acetaminophen, propoxyphene, and norpropoxyphene. Gas chromatography was used to determine alcohol, barbiturates, salicylic acid, dihydrocodeine, chloroquine, chlorpromazine, and nitrazepam.

The results for the acetaminophen-only autopsy cases show that the drug is widely distributed; its secretion in the bile may be significant in relation to hepatic necrosis, particularly if the drug exerts a direct effect on the liver cells. The results also indicate that while the rates of metabolism and excretion of propoxyphene taken in toxic doses may vary, it seems probable that the properties of drug and metabolite may provide a more suitable basis for the interpretation of autopsy data than the drug concentrations per se. Alcohol appears to facilitate drug absorption of many of the drugs discussed in the paper and combinations of these drugs. (HSRI)

17 refs

KEYWORDS: Analgesics and Antipyretics: acetaminophen*. propoxyphene*. Distalgesic(R) (dextropropoxyphene + acetaminophen)*. Metabolites of Drugs and Other Agents: norpropoxyphene*. Drug Concentrations in Body Fluids: Tabulated Data. Epidemiologic Research: Drug Concentrations in Body Fluids.

UM-77-P0026

COCAINE AND BENZOYLECGONINE EXCRETION IN HUMANS, H.E. Hamilton; J.E. Wallace; E.L. Shimek; P. Land; S.C. Harris; J.G. Christenson, Journal of Forensic Sciences, v22 n4 p697-707 (Oct 1977)

Knowledge concerning the extent of rate of metabolism and excretion of cocaine and its metabolite benzoylecgonine in man is almost nonexistent. This report presents urinary cocaine and benzoylecgonine concentration data for three males and three females, ranging in age from 23 to 34 years, who received acute administrations of 1.5 mg cocaine hydrochloride per kilogram of body weight via nasal inhalation. Six urine collections were made within the initial twenty-four hours, and collections continued for seven days following administration. Principle means of analysis was the gas chromatographic procedure. TLC, EMIT, and RIA were also used. Particular emphasis was placed on determining the duration with which cocaine or its metabolites may be detected with confidence, therefore, this study has major forensic implications.

Maximal urinary excretion of unchanged cocaine occurred within two hours of the intranasal absorption of 1.5 mg/cg of body weight of cocaine hydrochloride, and diminished rapidly thereafter. Excretion of benzoylecgonine was maximal four to eight hours following administration of the drug and diminished slowly over an interval of several days. Peak cocaine and benzoylecgonine concentrations observed were 24 and 75 micrograms per ml respectively. Benzoylecgonine/cocaine ratios were too varied to allow estimation of cocaine concentrations from benzoylecgonine concentration data or vice versa. Benzoylecgonine concentrations generally exceeded the corresponding cocaine values by a wide margin, but excretion of free cocaine in the absence of benzoylecgonine was observed in one subject.

Cocaine was generally detected for only 8 to 12 hours, whereas benzoylecgonine could be detected with chromatographic or enzyme immunologic assays for 48 to 72 hours. Benzoylecogonine was positively identified in urine by radioimmunoassay for 96 to 144 hours after dosing. (AAM)

13 refs

KEYWORDS: Local Anesthetics: cocaine*. Metabolites of Drugs and Other Agents: benzoylecgonine*. Stimulants: cocaine*. Pharmacokinetics: Acute Dose.

UM-77-P0027

ZUM NACHWEIS THERAPEUTISCHER KONZENTRATIONEN CHLORMETHIAZOL IM BLUT [THERAPEUTIC CONCENTRATIONS OF CHLORMETHIAZOL IN BLOOD AND THEIR DETECTION], R. Iffland, Zeitschrift fur Rechtsmedizin, v80 p27-33 (1977)

This paper describes a method for detection and determination of therapeutic concentrations of chlormethiazol in blood. Chlormethiazol in body fluids and tissues was measured with a sensitive gas chromatographic method. The blood concentration was used as a reference point for calculating the dosage and effect of chlormethiazol. The blood levels after both single and also long-term dosages were determined. This method has potential value for determining drug levels in drivers with impaired driving behavior. (JAM)

8 refs German

KEYWORDS: Nonbarbiturates: chlormethiazole*. Pharmacokinetics: Acute Dose. Pharmacokinetics: Chronic Dose. Specific Drug Screening: Gas Chromatography.

UM-77-P0028

A COMPENDIUM OF THERAPEUTIC AND TOXIC CONCENTRATIONS OF TOXICOLOGICALLY SIGNIFICANT DRUGS IN HUMAN BIOFLUIDS, R.C. Baselt; R.H. Cravey, Journal of Analytical Toxicology, v1 p81-103 (Mar-Apr 1977)

Presented here are tables of both therapeutic and toxic concentrations of drugs in human blood, plasma, and serum. Drugs are listed alphabetically. Entries for each drug are representative of the available information in the literature and include other pharmacological factors necessary to the proper utilization of the data. Many of the drugs studied yield active metabolites in vivo, and these concentrations have also been noted where applicable. Information for each drug includes dosage; route; frequency; number of subjects; average weight of the subjects; average blood, plasma, or serum concentration; time after the last administration; and clinical condition of the subjects.

This paper is an updated version of an earlier paper. An additional sixty therapeutic entries and forty-two toxic entries are included in this latest compendium. (HSRI)

238 refs

KEYWORDS: Drug Concentrations in Body Fluids: Tabulated Data.

UM-76-P0029

CLINICAL PHARMACOKINETICS OF CHLORDIAZEPOXIDE, D.J. Greenblatt; R.I. Shader; J. Koch-Weser, Pharmacokinetics of Psychoactive Drugs: Blood Levels and Clinical Response, L.A. Gottschalk; S. Merlis, eds., p127-139, New York: Spectrum Publications, Inc. (1976)

Chlordiazepoxide is a widely used benzodiazepine tranquilizer, with American retail pharmacies filling 22.7 million prescriptions for it in 1973. This report describes current studies on the clinical pharmacokinetics of chlordiazepoxide. Healthy male and female volunteers aged 23 to 39 years participated in studies using intravenous infusion and intramuscular and oral administration. Both chronic and acute dosages were studied, as was the effect of antacids on chlordiazepoxide bioavailability. Subjects received 25 or 50 mg of chlordiazepoxide hydrochloride (Librium(R)).

The results of these studies show that patients vary unpredictably in their clinical response to agents such as chlordiazepoxide. In the antacid study, results show considerable between-subject variation in the effect of Maalox(R) on chlordiazepoxide bioavailability.

The authors conclude that knowledge of the pharmacokinetics of these drugs does not solve all problems and uncertainties related to their clinical use. However, the safety and effectiveness of antianxiety drug treatment can probably be enhanced by using pharmacokinetic considerations to guide therapy. This paper also describes preliminary results o. studies attempting to contribute clinically useful pharmacokinetic data on chlordiazepoxide. The need for more extensive study is evident. (HSRI)

43 refs

KEYWORDS: Metabolites of Drugs and Other Agents: desmethylchlordiazepoxide*. Minor Tranquilizers (Anti-Anxiety and Ataractics): chlordiazepoxide*. Pharmacokinetics: Acute Dose. Pharmacokinetics: Chronic Dose.

UM-73-P0030

PRODUCTION AND PRESENTATION OF REFERENCE VALUES, R. Dybkaer, Reference Values in Human Chemistry. Effects of Analytical and Individual Variations, Food Intake, Drugs and Toxics, G. Seist, ed. p2-12, 2nd International Colloquium "Automatisation and Prospective Biology" Pont-a-Mousson, 10-14 Oct. 1972. Basel: S. Karger A.G. (1973)

One of the largest and most important tasks in clinical chemistry is to produce and present reference values with which observed values can be compared and be made more meaningful. This paper discusses the concept of the reference group, examining factors which must be taken into account when using it.

A comparison between an observed value and reference values is meaningful only if the test individual sufficiently resembles the reference individuals in respects other than the condition(s) under investigation. Physiological factors must be taken into account when a reference group is chosen. These factors include race, sex, and age. They interact with environmental factors (geography, society, diet, etc.). Care must also be taken in determining methods of collection, storage, and measurement of specimens. A statistically adequate randomly chosen number of individuals for the reference group must also be carefully chosen.

Once a reference group has been chosen, the data must be treated statistically. The author discusses the classical statistical approach, especially the problems inherent in the approach. He stresses the importance of examining the appropriateness of reference intervals before using them indiscriminately.

The author concludes that in view of the complexity of the concept of reference values, better experimental results cannot be expected until more coordinated national and international research is instituted, especially in the fields of coordinated analytical methods, quality control, and theory of reference values. (HSRI)

23 refs

KEYWORDS: Review: Drug Analysis Methodology.

UM-76-P0031

VALUE OF THE DETERMINATION OF DRUGS AND METABOLITES IN BIOLOGICAL FLUIDS IN PHARMACOLOGY AND THERAPY, G. Olive, Drug Interference and Drug Measurement in Clinical Chemistry, G. Seist; D.S. Young, eds., p146-52, Third International Colloquium on Prospective Biology, Pont-a-Mousson, 6-10 Oct. 1975. Basel, Switzerland: S. Karger A.G. (1976)

This paper discusses individual variability in response to drugs and how knowledge of this variability can be useful in maximizing therapeutic effectiveness. The clinical response to drugs administered according to accepted therapeutic regimens may vary considerably from individual to individual. However, the correlation between the dose, the plasma level, and the clinical effect in the same patient is remarkably stable. Therefore determination of the blood levels of a drug can be an excellent guide for taking precautions against unwanted effects. It is possible to calculate for each patient at the beginning of a course of treatment the dose to be given to obtain plasma levels as close as possible to the effective threshold. The dose can be adjusted in response to changes in the patient's clinical state or concentration of drug in blood.

Drug monitoring is only practical, however, if a number of theoretical and practical conditions are fulfilled. There must be a sensitive and selective method of determining blood levels. The pharmacokinetics of the drug to be determined must be well known, as well as the variations of pharmacokinetic constants according to physiological and pathological parameters. It is necessary to use constant conditions so that the level measured can be correlated with the dose given at all times. It is also necessary that a correlation between the plasma level and the pharmacological therapeutic or toxic effects exists.

These determinations must be considered for all drugs. However, in practice, the indications restrict themselves to certain drugs and clinical situations, which are

discussed here. Also discussed are the limitations of drug determination in body fluids that must be known to avoid errors. (HSRI)

5 refs

KEYWORDS: Variables Influencing Drug Concentration Data.

UM-76-P0032

CONCENTRATIONS OF PHENYTOIN IN PLASMA CNS INTOXICATION, J.L. Schelling; T. Deonna; G. de Crousaz; S. Blanc, Drug Interference and Drug Measurement in Clinical Chemistry, G. Seist; D.S. Young, eds., p159-63, Third International Colloquium on Prospective Biology, Pont-a-Mousson, 6-10 Oct. 1975. Basel, Switzerland: S. Karger AG (1976)

This report briefly discusses some cases of phenytoin toxicity in epileptic patients. In a thirty-month study of blood levels in epileptic patients, 20 out of 231 patients (9%) had signs of CNS intoxication and blood levels above 20 micrograms per ml, the upper limit of the accepted therapeutic serum concentration.

These cases support the theory that the kinetics of phenytoin are dose-dependent. Slight changes in dosage can induce severe intoxications. There appears to be a dose relationship between low blood levels of phenytoin and reappearance of seizures, and between high blood levels and signs of CNS toxicity. The use of drug monitoring could prevent such errors of dosage. (HSRI)

6 refs

KEYWORDS: Anticonvulsants (Anti-Epileptics): phenytoin*. Epidemiologic Research: Drug Concentrations in Body Fluids.

UM-76-P0033

PLASMA CONCENTRATIONS OF ANTIEPILEPTIC DRUGS--CLINICAL IMPORTANCE, P. Tridon; M. Weber; R. Khodjet El Khil; A.M. Batt; G. Siest, Drug Interference and Drug Measurement in Clinical Chemistry, G. Seist; D.S. Young, eds., p164-9, Third International Colloquium on Prospective Biology, Pont-a-Mousson, 6-10 Oct. 1975. Basel, Switzerland: S. Karger AG (1976)

This study investigates the clinical use of plasma levels of phenobarbital (PB) and diphenylhydantoin (DPH). One hundred fifty-six epileptic patients were studied, some treated with PB alone, some with PB and DPH, some with PB associated with a drug other than DPH, and some with PB, DPH, and another drug. Of these patients, 50 were hospitalized children and 106 were hospitalized or ambulatory adults.

Blood samples were collected at different times of the day to observe the variation of plasma level with time. A gas chromatographic method was used to measure the plasma concentration.

Results showed large interindividual variations for PB and especially for DPH, and decrease in PB and DPH metabolism when combined with other drugs. These determinations provide clinicians with information (1) on the lack of therapeutic effectiveness shown by low blood levels due either to the patient not taking the product or to individual metabolic variations; (2) detection of overdosage responsible for clinical abnormalities; (3) better monitoring of drug intake; and (4) screening for overdosage or underdosage in the case of combining with various other drugs. The author concludes by stating that whereas the measurement of plasma concentration of antiepileptic drugs is important, it does not provide answers to all the problems of treatment of epileptic patients, particularly because of interference of genetic factors and drug interactions with the metabolism of drugs. (HSRI)

7 refs

KEYWORDS: Anticonvulsants (Anti-Epileptics): phenobarbital*, phenytoin*. Barbiturates: phenobarbital*. Epidemiologic Research: Drug Concentrations in Body Fluids.

UM-76-P0034

PLASMA DIGOXIN AND DIGITOXIN LEVELS AS THERAPEUTIC GUIDES, E. Albengres-Moineau; J.P. Tillement, Drug Interference and Drug Measurement in Clinical Chemistry, G. Seist;

D.S. Young, eds., p175-81, Third International Colloquium on Prospective Biology, Pont-a-Mousson 6-10 Oct. 1975. Basel, Switzerland: S. Karger AG (1976)

This study investigates the plasma levels of digoxin and digitoxin levels, their relationship to reactions in the cardiac muscle, and the therapeutic significance of their variations. Therapeutic concentrations of digitoxin and digoxin measured by radioimmunoassay are 20-40 ng/ml and 0.5-2.5 ng/ml, respectively. Monitoring concentrations of digoxin and digitoxin are of clinical value because the therapeutic activity of digitalis depends on the concentration in the myocardium which is in turn related to the plasma level. The individual variability of the dose-effect relationship among patients is due to genetic and environmental factors as well as to the effect of diseases and concomitant administration of other drugs.

The serum levels of both digitoxin and digoxin correlate well with toxicity. The concentrations of drugs must be interpreted in the context of all clinical data. Measurements are only valuable if performed regularly during treatment and if initial conditions of clinical effectiveness are strictly defined. Drug measurement must be considered as important as the classical methods for monitoring effectiveness of treatment such as pulse, blood pressure, and EEG. (AAM)

14 refs

KEYWORDS: Cardiac Glycosides: digitoxin*, digoxin*, Variables Influencing Drug Concentration Data.

UM-76-P0035

WHY MEASURE DRUGS AND THEIR METABOLITES? G. Olive; J. DeGraeve; C. Heusghem, Drug Interference and Drug Measurement in Clinical Chemistry, G. Seist; D.S. Young, eds., p198-207, Third International Colloquium on Prospective Biology, Pont-a-Mousson, 6-10 Oct. 1975. Basel, Switzerland: S. Karger AG (1976)

Presented here is an informal round table discussion which focuses on identification of problems arising from the determination of drugs in biological fluids within the scope of therapeutic monitoring surveillance and the modification of therapy. This panel was intended to be informative for the general public. Three main therapeutic categories are discussed: (1) cardiovascular drugs (cardiotonics, antiarrhythmics, diuretics, and hypocholesterolemic drugs); (2) drugs acting on the central nervous system (antiepileptics, L-dopa, lithium); and (3) antibiotics. An attempt is made to determine the optimal practical conditions for drug dosage and the interpretation of these results with respect to subsequent therapeutic behavior.

A survey of the methodological problems is presented by each participant, as well as an indication of the essential criteria regarding the correlation between doses and effects. The significance of the quantitative determinations in therapeutic survey and in clinical pharmacology are also considered. (HSRI)

0 refs

KEYWORDS: Antibiotics, Cardiovascular Agents, Central Nervous System (CNS) Agents, Variables Influencing Drug Concentration Data.

UM-78-P0036

DRUG CONCENTRATION IN SALIVA, J.C. Mucklow; M.R. Bending; G.C. Kahn; C.T. Dollery, Clinical Pharmacology and Therapeutics, v24 n5 p563-70 (Nov 1978)

The concentration of certain drugs in saliva has been shown to provide a reliable index of their concentration in plasma. Single or repeated measurements can provide information about the rate of drug metabolism and about compliance with medication. Using a selection of weakly acidic and basic drugs, this study found predictions from saliva reliable for drugs largely nonionized at normal plasma pH (phenytoin, phenobarbital, antipyrine) but unreliable for ionized drugs (chlorpropramide, tolbutamide, propranolol, and meperidine).

Normal subjects and patients taking drugs in the course of treatment provided simultaneous samples of blood and saliva. Each drug was tested separately, using from one to nineteen subjects aged 17 to 75.

The study shows that deliberate alteration of saliva flow rate and pH using different stimuli produce twofold changes in saliva drug concentrations. Wide interindividual

variablity of saliva pH is the likely explanation for the inconstancy of saliva to plasma concentration ratios for ionized drugs. Caution should be exercised in attempting to predict plasma concentrations from ionized drugs from measurements in saliva, unless salivary flow rate and pH can be standardized. This is practical only when repeated samples are obtained from the same individual. Within these limitations saliva sampling remains a useful technique in pharmacokinetic research where repeated samples are required, in routine measurement of drug concentrations, as a guide to therapy, and as a noninvasive method for determining compliance with medications. (HSRI)

27 refs

KEYWORDS: Analgesics and Antipyretics: antipyrine*. Anti-Anginal Agents: propranolol*. Anti-Arrhythmia Agents: propranolol*. Anticonvulsants (Anti-Epileptics): phenobarbital*. phenytoin*. Barbiturates: phenobarbital*. Hypotensive (Antihypertensive) Agents: propranolol*. Opiates and Related Agents: pethidine*. Oral Hypoglycemics: chlorpropamide*. tolbutamide*. Drug Concentrations in Body Fluids: Chronic Dose Study. Drug Concentrations: Comparison of Body Fluids.

UM-78-P0037

POSTMORTALE ALKOHOLKONZENTRATIONEN I. DIE ALKOHOLKONZENTRATIONEN IM BLUT UND IN DER GLASKORPERFLUSSIGKEIT [POST-MORTEM ALCOHOL CONCENTRATIONS I. THE ALCOHOL CONCENTRATIONS IN THE BLOOD AND VITREOUS HUMOR], H.-P. Gelbke; P. Lesch; B. Spiegelhalder; G. Schmidt, Blutalkohol, v15 n1 p1-10 (Jan 1978)

Simultaneous determinations of blood alcohol concentrations (BAC) and vitreous humor alcohol concentrations (VAC) were carried out in 592 autopsy cases in which either one or both of these fluids was present. The least square regression analysis gave a coefficient of correlation, r=0.936, and the equation for the regression line: VAC=1.24 x BAC-0.18.

From this a conversion factor F_{v-b} of 0.81 is derived for the calculation of the BAC from VAC. This value is higher than the theoretically determined range of 0.744-0.777 for postmortem material. Hence it may be inferred that the VAC is lower than that expected at diffusion equilibrium between blood and vitreous humor. Data of other authors which took the water content of the fluids into account confirm the hypothesis. The magnitude of the conversion factor F_{v-b} and its range expressed as standard deviation was independent of the BAC at levels above 0.10%. (JA)

18 refs German

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol)*. Drug Concentrations: Comparison of Body Fluids. Epidemiologic Research: Drug Concentrations in Body Fluids.

UM-78-P0038

POSTMORTALE ALKOHOLKONZENTRATIONEN II. DIE ALKOHOLKONZENTRATIONEN IM BLUT UND LIQUOR CEREBROSPINALIS [POST-MORTEM ALCOHOL CONCENTRATIONS II. THE ALCOHOL CONCENTRATIONS IN THE BLOOD AND CEREBRO-SPINAL FLUID], H.-P. Gelbke; P. Lesch; B. Spiegelhalder; G. Schmidt, Blutalkohol, v15 n1 p11-17 (Jan 1978)

Simultaneous determinations of alcohol concentrations in blood (BAC) and cerebrospinal fluid (CAC) were carried out on samples from 509 bodies containing alcohol in one or both of these fluids. The least square regression analysis gave a coefficient of correlation, r=0.943, and the equation for the regression line: CAC=1.35 x BAC-0.11.

From this conversion factor F_{c-b} of 0.74 is derived for the calculation of the BAC from the CAC. This value lies within the theoretically determined range of 0.737-0.767 for postmortem material. Similar values for the F_{c-b} and the coefficient of correlation were obtained from the statistical evaluation of the data of other authors. From these results it may be inferred that the diffusion equilibrium between blood and cerebrospinal fluid occurs rapidly. The magnitude of the conversion factor F_{c-b} and its range expressed as standard deviation were independent of the height of the blood alcohol concentration over a wide range. (JA)

15 refs German

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol)*. Drug Concentrations: Comparison of Body Fluids. Epidemiologic Research: Drug Concentrations in Body Fluids.

UM-78-P0039

POSTMORTALE ALKOHOLKONZENTRATIONEN III. DIE ALKOHOLKONZENTRATIONEN IM LIQUOR CEREBROSPINALIS UND IN DER GLASKORPERFLUSSIGKEIT [POST-MORTEM ALCOHOL CONCENTRATIONS III. THE CONCENTRATION OF ALCOHOL IN THE CEREBRO-SPINAL FLUID AND VITREOUS HUMOR]. H.-P. Gelbke; P. Lesch; G. Schmidt. Blutalkohol. v15 n2 p115-24 (Mar 1978)

Simultaneous determinations of alcohol concentrations in blood (BAC), vitreous humor (VAC), and cerebrospinal fluid (CAC) were carried out on samples from 440 bodies having alcohol in these body fluids. The least square regression analysis for VAC and CAC gave a coefficient of correlation, r=0.954, and the equation for the regression line: VAC=0.90 x CAC-0.04.

From this a conversion factor F_{c-v} of 0.90 is derived for the calculation of the VAC from CAC. This value lies clearly below the theoretical expected value of F_{c-v}=0.99. It may hence be inferred that diffusion equilibrium of alcohol between blood and cerebrospinal fluid occurs rapidly, but in comparison more slowly between blood and vitreous humor. Similar results were obtained with the analysis of cases in which the VAC and the CAC were lower than the BAC. (JA)

24 refs German

KEYWORDS: Nonbarbiturates: ethanol (ethyl alcohol)*. Drug Concentrations: Comparison of Body Fluids. Epidemiologic Research: Drug Concentrations in Body Fluids.

UM-78-P0040

CAPACITY-LIMITED ELIMINATION OF PROCAINAMIDE IN MAN. W.J. Tilstone; D.H. Lawson. Research Communications in Chemical Pathology and Pharmacology. v21 n2 p343-6 (Aug 1978)

The purpose of this paper was to investigate the hypothesis that the acetylation of procainamide in man is capacity-limited. Procainamide pharmacokinetics were studied at steady state in nineteen patients admitted to the hospital with a diagnosis of recent myocardial infarction. Procainamide was given in a low dose,(L) 1.0, or in a high dose,(H) 1.5 g, every eight hours. Acetylator phenotype was determined from sulphadimidine acetylation and was classified as slow or fast (S or F). Thus, four groups were categorized (HF, LF, HS, and LS) with seven, five, three, and four patients in each respective group.

Overall, the mean steady state plasma concentration of procainamide expressed as a fraction of dose did not depend on dose or on acetylator status; however, the HS group had significantly higher plasma concentration per gram dose (6.3 micrograms per ml) than the LS (2.7 micrograms per ml) or HF (2.3 micrograms per ml) groups. Clearance of procainamide by acetylation was 23.8% of the total in fast acetylators and 16.5% in slow acetylators. Clearance was not dose-dependent in the HF or LF groups (mean 177.9 ml/min and 168.4 ml/min), but was dose-dependent in the HS group (74.6 ml/min), which differed significantly from the LS group (mean 113.4 ml/min). These results indicate that the acetylation of procainamide is capacity limited. (JAM)

9 refs

KEYWORDS: Anti-Arrhythmia Agents: procainamide*. Pharmacokinetics: Chronic Dose. Variables Influencing Drug Concentration Data.

UM-78-P0041

CORRELATION OF ANTEMORTEM AND POSTMORTEM DIGOXIN LEVELS. T.E. Vorpahl; J.I. Coe. Journal of Forensic Sciences. v23 n2 p329-34 (Apr 1978)

The purpose of the present study was fourfold: (1) to determine the discrepancies that exist between antemortem and postmortem digoxin levels; (2) to learn if such differences can be related to the postmortem interval; (3) to substantiate variation in postmortem blood values between samples taken from different sites; and (4) to establish the most accurate way of estimating digoxin from postmortem specimens.

Twenty-seven autopsy cases were studied in which all patients had been receiving therapeutic doses of digoxin by various routes of administration for at least one week prior to death. Postmortem samples from the left ventricular cavitary blood and vitreous humor were centrifuged and refrigerated. Assays were performed within seventy-two hours.

Results indicated that postmortem digoxin levels taken from cardiac blood, venous blood, or vitreous humor do not mirror the antemortem levels. Substantial increases in serum levels occurred following death, irrespective of the source of the sample. Variation resulting from site of sampling gave a mean postmortem to antemortem ratio of 1.96 for heart, 1.63 for subclavian vein, and 1.42 for femoral vein samples. Conversely, vitreous levels were usually below the true antemortem values. No correlation could be made between the postmortem interval and the increase in postmortem serum values, irrespective of the site of sampling. A combination of femoral venous serum and vitreous humor values gave the best information for determining possible antemortem digoxin toxicity.

A striking finding of this study is that fourteen of the twenty-seven (52%) had toxic levels at the time the antemortem samples were drawn in spite of the fact that digoxin toxicity was thought to be a possible contributing factor in only four deaths. This investigation raises suspicion regarding many studies in postmortem toxicology. If indeed a new blood-tissue equilibrium is established with digoxin after death, a similar situation may exist for many compounds studied during autopsy. (HSRI)

15 refs

KEYWORDS: Cardiac Glycosides: digoxin*. Drug Concentrations in Body Fluids: Chronic Dose Study. Drug Concentrations: Comparison of Body Fluids. Variables Influencing Drug Concentration Data.

UM-78-P0042

SERUM DIGOXIN AND EMPIRIC METHODS IN IDENTIFICATION OF DIGITOXICITY, S. Waldorff; J. Buch, Clinical Pharmacology and Therapeutics, v23 n1 p19-24 (Jan 1978)

Few investigations have evaluated serum digoxin measurement in studies securing representative patient selection so as to establish the epidemiology of digitalis intoxication. The purpose of this study was to compare serum digoxin concentration with digoxin dosage related to kidney function and total body weight in patients admitted to a medical service in order to evaluate the value of these parameters in the diagnosis of digoxin toxicity and to clarify the epidemiology.

Of the 711 patients admitted, 109 were treated with digitalis on admission. 16 of the patients developed cardiac arrhythmias consistent with digitalis intoxication. Five of these, none with serum digoxin above 1.6 ng/ml, were not toxic. The remaining 11 patients, all with serum digoxin levels above 1.6 ng/ml, were either definitely or possibly toxic. A similar borderline between intoxicated and nonintoxicated patients could not be established on the basis of calculations based on body weight and renal functions. In all cases in which suspicion of digitalis intoxication was raised, serum digoxin measurements could discriminate between the toxic and the nontoxic patients. (JAM)

19 refs

KEYWORDS: Cardiac Glycosides: digitalis*. digoxin*. Drug Concentrations in Body Fluids: Chronic Dose Study. Epidemiologic Research: Drug Concentrations in Body Fluids. Variables Influencing Drug Concentration Data.

UM-78-P0043

CONSTITUENTS OF CANNABIS SATIVA L. XIII: STABILITY OF DOSAGE FORM PREPARED BY IMPREGNATING SYNTHETIC (-)-DELTA-9-TRANS-TETRAHYDROCANNABINOL ON PLACEBO CANNABIS PLANT MATERIAL, G.S. Lewis; C.E. Turner, Journal of Pharmaceutical Sciences, v67 n6 p876-8 (Jun 1978)

The potency of cannabis preparations varies significantly according to cannabinoid ratios. To overcome these variations, researchers use placebo cannabis plant material impregnated with synthetic (-)-delta-9-trans-tetrahydrocannabinol. However, this procedure also has disadvantages: (a) several months are required for even a simple preclinical or clinical study; (b) storage conditions in laboratories are not standardized; (c) several solvent systems may be used in the impregnation procedure; and (d) synthetic I and I in natural cannabis preparations decompose at different rates under different storage conditions.

In view of these disadvantages and other considerations, this paper reports findings on the stability of a dosage form prepared by impregnating synthetic I on placebo cannabis material.

Results indicate that syntnetic (-)-delta-9-trans-tetrahydrocannabinol impregnated on placebo cannabis decomposed only 6.3% after being stored for one year at -18 degrees. Storage at 5 degrees and at room temperature under various conditions led to severe decomposition. Therefore, it appears that placebo material, impregnated and stored at 18 degrees, is stable for at least one year and can be used in experimental designs. However, impregnated cannabis plant material not stored under freezer conditions should not be used, and any data published on cannabis impregnated with I where storage freezer conditions are not specified should be suspect. Temperature seems to be the most critical factor in initiating the decomposition of I.

The amount of cannabinol observed when (-)-delta-9-trans-tethahydrocannabinol decomposed indicates that cannabinol is not the only decomposition product. (HSRI)

8 refs

KEYWORDS: Cannabis Sativa L. and Related Agents: cannabinol, delta-9-tetrahydrocannabinol, marijuana. Variables Influencing Drug Concentration Data.

UM-78-P0044

PSYCHOTOMIMETIC PHENALKYLAMINES AS SEROTONIN AGONISTS: AN SAR ANALYSIS, L.B. Kier; R.A. Glennon, Life Sciences, v22 n18 p1589-94 (8 May 1978)

This paper is part of a series of studies investigating various theoretical aspects of hallucinogenic agents in an attempt to elucidate their mechanism of action. This paper examines the structure-activity relationships (SAR) of a series of psychotomimetic phenethylamine and phenylisopropylamine analogs using a molecular connectivity analysis.

A relating equation was obtained between the hallucinogenic potency and structural variation of a series of phenylisopropylamine analogs. Molecular indices or descriptors (chi terms) were computed for each of the compounds in the study. A multivariable search for connectivity terms was conducted in a regression analysis using a program which considered all possibilities of variables. A prime consideration of the study was whether stimulation of 5-HT receptors in the sheep umbilical artery prepartion is a valid model for hallucinogenic potency.

The logarithm of the relative biological response was compared with the logarithm of hallucinogenic activity in mescaline units. Linear regression analysis resulted in a correlation coefficient of r=.88, a correlation that suggests the possibilities of using the sheep umbilical artery as an easily obtainable correlate of hallucinogenic potency for a valid model for investigation. An investigation of the SAR of these data should afford further insight as to the importance of various structural features effecting 5-HT agonists activity. The relating equation generated in this study includes data on both phenethylamines and phenylisopropylamines, and explains greater than 90% of the variance in 5-HT agonist activity. (HSRI)

11 refs

KEYWORDS: Hallucinogens and Related Agents: phenethylamine (PEA). Stimulants: amphetamine. Hallucinogens and Related Agents. Variables Influencing Drug Concentration Data.

UM-79-P0045

CONCENTRATIONS OF PHENOBARBITAL, FLURAZEPAM, AND FLURAZEPAM METABOLITES IN AUTOPSY CASES, S.D. Ferrara; L. Tedeschi; M. Marigo; F. Castagna, Journal of Forensic Sciences, v24 n1 p61-9 (Jan 1979)

This paper studies five cases of death which have resulted from acute intoxication with phenobarbital and flurazepam. The blood, urine, brain, lung, liver, and kidney levels of these drugs as well as the levels of N-1 hydroxyethyl, N-1 desalkyl, and N-1-desalkyl-3-hydroxy flurazepam metabolites were determined, using newly developed gas chromatographic conditions employing a selective detector for nitrogen-containing substances and a column of 1% SP-1000. In addition, the EMIT technique was also employed on blood and urine samples and the results compared with GLC data.

The gas chromatographic conditions employed resolved satisfactorily the problem related to the assay of flurazepam and its metabolites. The results of the EMIT assay of urinary benzodiazepine compounds in all cases were negative with the exception of one where a positive finding corresponding to 0.9 mg/ml of oxazepam was obtained.

A critical analysis of the phenobarbital concentrations found in two cases excludes the conclusion that the deaths were due to a overdose; in addition, as reported by others, a higher concentration of phenobarbital in the liver compared to plasma was confirmed. The distribution of flurazepam and its metabolites in the various fluids and organs was similar in all the cases examined.

In conclusion, from an analysis of the cases presented, the indispensable role of toxicologic examination clearly emerges. In fact, in the absence of circumstantial evidence or significant pathological findings, the suspicion of intoxication as the sole case of death or as concurring cause of death may be confirmed. (JAM)

36 refs

KEYWORDS: Anticonvulsants (Anti-Epileptics): phenobarbital*. Barbiturates: phenobarbital*. Metabolites of Drugs and Other Agents: N-1-desalkyl-3-hydroxyflurazepam*. N-1-desalkylflurazepam. N-1-hydroxyethylflurazepam*. Nonbarbiturates: flurazepam*. Drug Concentrations in Body Fluids: Acute Dose Study. Drug Concentrations in Body Fluids: Chronic Dose Study. Drug Concentrations: Comparison of Body Fluids.

UM-79-P0046

IMPLANTABLE DRUG-DELIVERY SYSTEMS. P.J. Blacksnear, Scientific American, v241 n6 p66-73 (Dec 1979)

Presented here is a review of the concept of implantable drug-delivery systems. After a brief discussion of the theory of implantable drug-delivery systems, a brief summary of their historical development is presented.

The techniques of implanting capsules containing drugs have now reached the stage of practical application both in experimental and in clinical settings. Several uses of these techniques are described, such as their use in the treatment of prostate cancer, in the prevention of conception, and in the treatment of opiate addiction. Special emphasis is given to an implantable infusion pump designed to provide a means of continuously delivering heparin to ambulatory patients with severe clotting problems. The paper discusses the devices used in this delivery system and the results of its use in the treatment of twenty patients.

Among the advantages of implantable drug-delivery systems are their ability to deliver a drug to a specific target area or organ, their lack of inconvenience to the patient, their ability to adjust the rate of delivery of the drug, and their versatility.

The author concludes that while implantable drug-delivery systems are still in their embryonic stages, they have limitless possibilities for use in drug therapy. They are potentially able to release nearly any drug from a capsule into subcutaneous tissue or other tissues, can be injected repeatedly into the cerebrospinal fluid, or can be infused slowly into a vein, artery, or cavity of the body. Such systems could be of great value particularly in diseases such as Parkinson's disease where delivery of dopamine to deficient areas of the brain is crucial to the control of the disease. (HSRI)

0 refs

KEYWORDS: Anti-Coagulants: heparin. Insulins: insulin. Sympathomimetic (Adrenergic) Agents: dopamine. Pharmacokinetic Factors: Drug Absorption and Distribution.