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16. Abstract

A literature review was undertaken to identify what indicators (if any) could be used to measure the social consequences of injuries. The objectives of the search were (1) to find out what different aspects of social life can be affected by injuries, (2) to learn what are the mechanism and risk factors leading to these effects, (3) to gather information on how much those aspects are affected, and (4) to identify the existing measurement tools to quantify these indicators.

Over 100 references were found using MEDLINE and cross references from papers on the topic. Three different types of references were found: (1) precise descriptions of different aspects of social life that get disrupted by an injury, (2) identification and quantification of the mechanisms that lead to the social consequences, and (3) measurement of more generic concepts such as quality of life, quality of well-being or the limitation in performing common activities.

The report includes a discussion of the main findings, abstracts of the papers, and some paper-specific comments.

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risk factors; MEDLINE; social consequences; quality of life, well-being; limitations

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What do you do when you can't bear it? There is only one thing to do: Bear it. Later, some people, some women, would ask me, how could you bear it? Answer: You bear it because what else are you going to do? What are the alternatives? Not to bear it? What does that mean? You bear it because not to bear it is to crack or to kill yourself. One can't choose to crack - you do or you don't - so that is not an alternative. To kill yourself is, but who would be crazy enough to do that?

Rollin, 1976

INDEX

SUMMARY

SUMMARY

The ultimate goal of the literature review described in this report was to identify what indicator(s) (if any) could be used in measuring the social consequences of injuries. Thus, the objectives of this search were: (1) to find out what different aspects of social life can be affected by injuries, (2) to learn what are the mechanism and risk factors leading to these effects, (3) to get information on how much those aspects are affected, and (4) to identify the existing measurement tools to quantify this/these indicator(s).

Three different types of references were found:

(A) Precise descriptions of different aspects of social life that get disrupted by the injury. Whether they refer to the bereavement processes or to the non-fatal injury consequences, the same problems seem to arise in the families: marriage disruption (separation or divorce), incapability of holding previous works, reduction of social interaction, failure at school (including dropping out of the educational system), drug and alcohol abuse, etc. Identification of these problems comes from case studies with open-ended interviews or autobiographical reports which bring a lot of insight in the understanding of the many aspects of the problem but that are anecdotal by nature. Although this approach constitutes one of the most frequently used by the researchers, none of the identified papers reported results on a big group of patients (and/or their relatives) neither did they use any control group.

(B) Identification and quantification of the mechanisms that lead to the social consequences. Family functioning levels, cognitive levels, abnormal behavioral symptoms, or copying styles were among the aspects most frequently investigated. Since the aspects to consider are so numerous (and peculiar in themselves), plenty of different measurement tools are used in this type of research. None of them include the whole array of psychological and psychosocial aspects that are involved in the development of social malfunctioning. This type of research is most frequently conducted on small and convenient samples of patients and/or their relatives and rarely there are controls against whom to compare the results. None of the reported studies have a preinjury/postinjury design to help elucidate the role of socially malfunctioning individuals and their proneness to suffer injuries.

(C) Measurement of more generic concepts, such as the quality of life, quality of well-being or the limitation in performing common activities. The underlying assumption is that any significant social changes affecting the individual will be reflected in the overall scores (or at least in some of their subscales). Currently, a number of scales are used to achieve the same purpose (such as the Quality of Well-Being Scale, the SF-36, or the Sickness Impact Profile). This approach is quite new to the injury field (although it has been extensively used over the past years to measure the effect of other diseases such as cancer or chronic conditions) and the validity of such scales in this field is currently a topic for discussion. Because of their more extensive application (in other health-related fields), researchers have available population-based data against which to compared their results. This is the only approach for which some bigger samples of patients have been used.

INTRODUCTION

There is no question that some injuries can represent a major life-event for both the people suffering them as well as for their families and friends. The variety of effects, magnitude and relevance of this life-event is a concept often used by injury-prevention professionals to highlight the importance of injury consequences and to reinforce the need for more and better prevention activities. But when one tries to get a better understanding of what these injury consequences are, several problems arise. It is not clear yet which consequences need to be identified, how to quantify them (so that we know their real magnitude) and what their relevance is in the context of another diseases' consequences and other life-events.

One possible way of classifying the short- and long-term consequences of illnesses and/or injuries is by categorizing them in: (1) physical: morbidity, impairment, disability; (2) psychological: cognitive (attention, knowledge acquisition and representation, reasoning, planning, and problem solving), behavioral, and emotional; and/or, (3) social. Although it may seem that we are still far from knowing everything about the short- and long-term physical consequences of injuries, extensive research on the topic has been conducted over the past years (and many more is currently undergoing) and a lot of progress has been made.

The ultimate goal of the research described in this report was to identify what indicator(s) (if any) could be used in measuring the social consequences of injuries. Thus, the objectives of this search were: (1) to find out what different aspects of social life can be affected by injuries, (2) to learn what are the mechanism and risk factors leading to these effects, (3) to get information on how much those aspects are affected, and (4) to identify the existing measurement tools to quantify this/these indicator(s).

It was clear, from the beginning of this research, that most literature on this topic brings together the psychological and psychosocial changes (and their relationship) sustained by individuals and their families after an injury. That is why the focus of this report broadened to a literature review on these two linked aspects.

An extensive review of the recent bibliography was conducted. The number of references that mentioned the psychological and social effects of injuries was huge, but finding which papers focused on these effects was a little more difficult. Next follows a discussion on the main findings of this literature review. The paper abstracts' and some paper-specific comments are presented as an Appendix.

RESULTS

Along the bibliographical research three big thematic areas were identified: the bereavement processes among relatives of a dead person, the definition and quantification of the Post Traumatic Stress Disorder (PTSD), and a big array of different psychological and social problems. These different thematic areas share aspects like the etiology (the disruption of normal life placed by a fatal or non-fatal injury), the symptomatology (with differences in intensity), and some risk factors (e.g., copying styles). Bereavement processes (injury- and disease-related) have been extensively identified and studied in the past and will be very briefly considered in this review. The discussion of the PTSD, a new clinical entity defined for injury/catastrophe survivors and that consists in the recollection of memories of the event, sleep disturbances, moodiness, emotional withdrawal, jumpiness, crying spells, depression, and guilt is beyond the goal of this review.

Thus, the results presented next apply mostly to the research dealing with the remaining array of different psychological and social problems. About 100 such papers were identified. The topics covered in this subset of papers ranged from description of symptoms of functional limitation to treatment evaluations, included scaling development. Also, there were a few papers discussing the mechanisms by which the psychological effects occur, and thus identifying some risk factors.

Although a few of the identified papers dealt with consequences of illness or disease (together), the majority of the reviewed research was specific for injured patients and/or their relatives. Most of the literature involved case reports (or case series) in which a lot and very detailed qualitative information about the psychological changes undergone and their social implications were described and discussed (either by patients or their relatives). Another big group of papers involved some quantification of symptoms (using some of the multiple scales listed in Table 1). In both quantitative and qualitative reports, convenient samples were the most frequent source of data and most of the studies lacked a control group against which to compare the results.

In the next paragraphs some of the main results are summarized. First, generic effects of injuries are discussed. Next, the non-fatal physical, psychological and psychosocial effects on the patients and later on their families are described. Last, risk factors associated with any of the effects previously discussed are presented.

Generic effects

Both fatal and non-fatal injuries constitute a challenge for the survivors. There is a need for adaptation in daily routines, relationships and environments. In words of Stratton (1995) injuries can have “devastating lifelong consequences.” It is well known that death of a beloved person is a major life-event stress factor. Non-fatal injuries are not any less devastating. Several of the reviewed papers incorporate qualitative in-depth descriptions of consequences of both fatal and non-fatal injuries to illustrate this, including anecdotal evidence on divorced parents after a child's severe injury, siblings dropping out of school and engaging dangerous activities life alcohol and/or drug abuse (Rubin, 1982; Quigley, 1995; Shaddinger, 1995; Stratton & Gregory, 1995; Cooper, 1994).

Some of the consequences described both for the injured person and his or her relatives are common to other illnesses like chronic conditions of cancer (Rivara et al, 1993). Dewar and Morse (1995) illustrate very well in their paper the psychological stages that all diseased or injured patients have to confront. According to their review of a series of interviews with 20 patients, psychological adaptation (or endurance) to the new situation encompasses the following stages: holding on the emotions and the expectations, building up (tension), one last straw, losing control and temper, learning to bear with the circumstances, and learning to manage them. This same concept is also formulated by Morse and O'Brien (1995) in the paper where they construct a theory of recovery for patients surviving a serious traumatic injury that involves four stages: vigilance, disruption, enduring the self and striving to regain the self. Other authors discuss the same topic and introduce other psychological and/or psychosocial implications (Sparks, 1995; Wineman et al, 1994).

Effects of fatal injuries

Anecdotal evidence of social disruption caused by the injury is presented by a number of authors (Lehman et al, 1987; Rubin, 1982; Byrne & Raphael, 1994; Lepore et al, 1996). Among the most common effects, they mention parental separation or divorce after one of their children dies, parental problems in getting back to their work and siblings dropping out of school. In a population-based study, Martinaken & Valkonen (1996) show how the mortality rates among widows/ers are higher than for the rest of the population. In their research they identify injuries as one of the most common causes of death among the widows/ers (but they do not provide data on the cause of death of the spouses).

Effects of non-fatal injuries

In the patient.

Non-fatal injuries represent "an assault on one's self and one's body" (Dewar et al 1995). Patients have to accommodate to a new situation. Morse et al, (1994) identified the different psychological stages that patients go through when adapting to the physical consequences of their injuries: the diseased body, the disobedient body, the vulnerable body, the violated body, the resigned body, the enduring body, the betraying body and the betraying (neurotic) mind. The relevance of the psychological impact of physical alterations is strengthened by Drench (1994) when he suggests that the loss or alteration in either of the following individual's aspect: body image, self-concept, identity, or ego leads to deleterious effects on the entire self. Quantitative-oriented research, using different scales or indexes to measure the quality of life after survival of severe trauma, point out the characteristics and magnitude of the injuries' effect.

Strohmyer and colleagues (1993) reported problems with psychosocial adaptation (as measured by the Psychosocial Adjustment to Illness Scale) among all interviewed patients with multiple trauma. The quality lowering effects of multiple trauma measured by the Quality of Well-being scale and a standard Activities of Daily Living scale are reported by Holbrook et al (1994). Ott et al (1996) found about 15% of patients having very poor Spitzer Index scores.

Sleep disturbance, nightmares, loss of concentration, intrusive thoughts, and increased anger (often diagnosed as anxiety or depression) are among the most common symptoms of "psychological injury" (Dooley et al, 1995; Hangstrom, 1995; Welch, 1995). Behavioral changes have been also reported as consequences of injuries (Vlanyen et al 1995).

Psychological and psychosocial effects on specific injuries are described in the next paragraphs:

(1) Head Injuries. Patients suffering a post-concussion syndrome self-reported deficits in intellectual, attention, memory, and language abilities and disturbances at the affective and cognitive level (Marsh et al, 1995, Stratton & Gregory, 1995). Depression and anxiety are reported for more than 50% of patients suffering traumatic brain injuries (Linn et al, 1994). Some patients sustaining brain injuries report to have paranormal/religious experiences after the injury event (Persinger, 1993). The long lasting psychological and/or psychiatric consequences of brain injuries have been well documented by Klonoff and colleagues (1993) creating also the term "catastrophic reaction" to better define their effects. Severe brain injuries affect academic functioning (Rivara et al, 1994). Head-injured patients experience significant psychosocial problems when measured by Sickness Impact Profile, the Head Injury Symptom Checklist, and the Modified Function Status Index (McLean et al, 1993).

(2) Burns. Burns have a major impact in patients' life. Gilboa et al, (1994) created the term "Continuous Traumatic Stress Disorder" to define the complex situation burn patients have to undergo (compared to the PTSD). Among burn adolescents, signs of depression or schizophrenic problems were detected in about a quarter of the patients; other findings reveal the presence of disturbed interpersonal relationship, low self-esteem, and increased anxiety (Holaday & Whittenberg, 1994). Meyer et al, (1995) found that children with burns have behavioral problems and lower levels of competence. Contrary to these results, research conducted by Blakeney and colleagues (1993) on a small sample of severely burn children showed no evidence of behavioral problems.

(3) Spinal Cord Injuries. About 30% of patients with a spinal cord injury showed an elevated level of distress (Tate et al, 1993). Compared to controls, patients suffering a spinal cord injury showed lower levels of self-esteem, they perceived their lives as externally controlled, and had a greater sense of helplessness/hopelessness and fatalistic attitude (Craig et al, 1994; Hancock et al, 1993; Yoshida, 1994).

(4) Others. Even a relatively "minor" injury, such as whiplash, has some negative effect on the attention abilities of patients (Di Stefano & Radanov, 1995). About 20% of survivors of motor vehicle crashes present significant levels of intrusive and avoidance symptomatology. (Bryant & Harvey, 1995).

The etiology of the psychological disability reported (for example in patients with brain injuries) is attributed to a combination of neuropsychological deficits plus one or more of four personal factors (negative thinking, tension-arousal, fatigue, physical symptoms) and three situational factors (demands for complex attention, demands for rapid processing, and external distraction) (Montgomery, 1995). Other authors (Moore & Stambrook, 1995) theorize that "long-lasting cognitive, behavioral, emotional psychiatric, and interpersonal after-effects on patients with traumatic brain injuries may create a real life sense of learned helplessness with consequent deficits in coping, and altered locus of control beliefs." It seems that feeling blameless for the accident that caused the injury decreases the ability of the patients to cope with their new situation (Stensman, 1994).

The psychosocial effects of the injuries on the patients are less frequently reported in the reviewed literature. Dawson & Chipman (1995) conducted a survey among patients with traumatic brain injuries. They report high levels of physical dependence (66%), low rates of return to work (25%), and low rates of social integration (90%) among patients reporting some limitations or dissatisfaction with their social integration. Head-injured patients reported poorer job security, higher migration rates, and less leisure activity (Thali, 1994). Disturbances at the social level after brain injuries are also reported by (Marsh et al, 1995, Stratton & Gregory, 1995). Mobility and position restrictions associated with spinal cord injuries interfered with the establishment of close personal relationships and the development of a fulfilling career (Bocazzo, 1993). Anecdotal evidence of social consequences is reported by Harris et al, (1989) and Molter (1993).

In the family

The role of family in improving the functional outcome after injury has been identified in several papers. Leaf (1993) provides an interesting perspective of the family as a system that needs to adapt to the new situation. As such system the families are characterized by four aspects: all members are interconnected, the system as a whole evolves over a life-span, changes in one part of the system affect the whole system, and every family is unique to itself. Thus, injuries (as many other possible life-event) constitute a threat to the equilibrium of that system and changes need to occur (at all levels) in order to achieve a new equilibrium.

Family adjustment (or lack of adjustment) to a non-fatal injury is well described in several papers (Sherrad, 1995; Martin, 1994; Resnick, 1993; Lapham-Randlow, 1994; Leach et al, 1994). Family functioning, defined by parameters such as psychological distress, unhealthy family functioning, and feelings of burden and alienation, is positively correlated with the number of neuro-behavioral problems of the brain-injured patient (Kreutzer et al 1994). The specific role of families after a traumatic brain injury is well covered by McLaughlin and Carey (1993). An overview of the most recent research on the topic has been summarized by Frank (1994) in an excellent editorial comment and Rivara (1994).

Specific members of the family may suffer different consequences. Four types of relationship are explored in further detail in the reviewed literature: the effect on spouses, parents, siblings and the children of injured parents.

(1) Spouses. Brain-injured husbands and their wives showed a decreased self-esteem and an increase in conflict than regular couples; the wives of brain-injured patients rated worse in the Marital Vulnerability scale (Kravetz et al, 1995). Depression and anxiety were common symptoms reported by spouses of brain-injured patients (Linn et al, 1994). Spouses of brain-injured individuals were more likely to report depression scores compared to parents of brain injured children (Kreutzer et al, 1994), and female spouses more likely to achieve higher levels of depression and anxiety than male spouses (Linn et al, 1994). It has also been reported (Moore et al, 1993) that previously normal families with young children may face unique challenges when the husband sustains a brain injury, particularly when financial strain exists.

Several papers were found regarding the emotional and sexual aspects of relationships where one of the partners has a spinal cord injury. Kreuter et al (1994) compared self-reports of couples that had been constituted before the injury (preinjury) with the reports of couples created after the injury. Overall, the relationships were considered satisfactory by more than 80% of the couples. Perceived deterioration of sex life was higher among the preinjury couples but satisfaction with current sex was equal among the two groups. Women with spinal cord injuries referred as a high priority the need to cope emotionally with their changes in sexual functioning and in helping their partners cope emotionally (White et al, 1993).

(2) Parents. Some papers show anecdotal evidence of marital relationships worsened (leading to separation or divorce) among parents of dead or severely injured children (Rubin, 1982; Verity, 1995). Parents of severely burned children showed high stress levels (Blackeney et al, 1993) and higher depressive symptoms (Blakeney et al, 1993).

(3) Siblings. Only bereavement processes were defined among siblings of deceased children (Rubin, 1982).

(4) Children. The only paper focusing on the injuries of a parent on the childrens' lives is that by Pessar and colleagues (1993). In their research they focus on children of families in which one parent sustained a brain injury. They found the children to experience negative behavioral and

emotional changes after the parent's injury as well as a poor relationship between the children and the injured parent. Some of the more "biographic" papers provide some anecdotal evidence of temporal behavioral problems in children with injured parents (Lapham-Radlov, 1994).

Risk factors

Dawson & Chipman (1995) identified the following factors as determinant of handicaps: age, gender, level of education, living alone, physical environment, and specific disabilities. The effect of the injuries themselves is proven by Robson (1994). He explored the relationship between burns scars (size, location, and number of reconstructions required) with the patients' feeling of happiness and satisfaction. Other authors evaluated the effect on several health outcomes (pain, fatigue, mobility, symptomatology, etc.) that the age when the spinal cord injury occurred, the duration of the limitations, and the interaction both terms had (Pentland et al, 1995).

Some papers (Ott et al, 1996; Klonoff et al, 1993) identify the severity of injury, its nature (head and lower extremity injuries) and an older patient's age as factors that worsen the quality of life after trauma. Other researchers point out that it is neither the level of injury nor severity of injury nor other "organic" variables (such as age) that predicts poorer long-term psychological outcomes; instead, coping skills and social support[1] are better predictors of return or adaptation to "normal" life (Rider et al, 1995; Kennedy et al, 1995). Holbrook and colleagues (1994) research suggests that depression level after the injury is the only predictor of functional limitation (measured with generic indexes as Quality of Well-being or Activities of Daily Living) three-months postinjury.

Probably, it is a combination of both injury characteristics and other factors that determines the injury impact. This is discussed by Rivara and her colleagues (1994) whose research shows that most of the variation in behavioral outcomes is explained by the preinjury child or family factors and that injury severity is the third variable to explain most of the variation in child functioning after the injury. Some research event-oriented (i.e., focusing on traumatic events rather than in the injuries themselves) confirms the mix role of injury-related factors (such as the level of exposure to injury or the possibility of injury) and other factors (such as the losses of property damage, avoidant copying style, being a female, older and having a lower social support) in the development of psychological morbidity (Carr et al, 1995; Rider et al, 1995; Dooley & Guun, 1995).

Interestingly, the time in life (childhood vs. adulthood) where the disabling injury (in this case, spinal cord injury) occurred did not interfere with the psychological adaptation of the subjects. No differences were observed in self-esteem or self-perception of patients (Kennedy et al, 1995).

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[1] Social Support can be: instrumental, informational, and emotional (McColl et al, 1995).

The role of coping factors[2] is reinforced in the research by Malia et al, (1995) where they showed that the use of problem-oriented coping strategies predicts better psychosocial functioning in a group of brain injured patients. Bryant & Harvey (1995) identify avoidant coping styles and compensation as risk factors to present intrusive and avoidance symptoms after a motor vehicle crash. Emotion-focused coping styles resolved in greater ratings of depression among spinal cord injured patients (Moore et al, 1994). Psychologic distress has been proven to be higher among burn patients who have low expectations for further improvement but who attached high importance to the need for such improvement (Blalock, 1994).

Emotional support was found to be positively related to the outcomes of life satisfaction, adjustment to disability and absences of depressive symptomatology in these patients (McColl, 1994). Other authors, also focusing in patients with spinal cord injuries, suggest that patients may achieve psychological acceptance (adapting to society) by suppressing or denying their feelings and developing alexithymic features (Fukunishi et al, 1995). Previous research by Tate and colleagues (1993) had proven the positive effects on lowering the spine cord injured patients' stress level that the patients' occupational status before the injury, the patients' participation in an inpatient independent living program, the type of rehabilitation undergone, and the neurologic completeness had.

Several family characteristics (such as poor preinjury functioning and parental psychological disorder) have been identified as factors than increase the risk for long-term family disruption (Wade et al, 1995; Rubin, 1982). Seems that which factors help the family to adjust to the new situation vary over time. Immediately after the injury occurs, faith, family and friends and availabilities of services are the three key aspects that help families adjust. In the longer run, family and friends, professional support and availability of services, and information and education become the key elements for a coping with the injury. (Leaf, 1993). In her review of the topic, Rivara (1994) identifies what the characteristics of the "resilient families" (those who cope well with the situation) are: being a cohesive family unit (caring and supportive), with open and hones communication, flexible in family rules, roles and responsibilities, with clear familiar and professional boundaries, and functional coping resources.

Social supports, adaptative problem-solving behaviors, and positive reappraisal of the situation seem to be important elements in postinjury recover (Kwasnica & Heinemann, 1994). The role of community support is strengthened by the research conducted by Andon et al (1993) where they found that spinal cord injured patients with a supportive community (and who believe that they contribute to the community in some way) perceived themselves to be better adjusted and to have fewer health problems.

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[2] Coping strategies are usually defined as: problem-oriented, perception-oriented, and emotion-oriented. Other authors (Malia et al, 1995) use an alternative classification: problem-focused, emotion-focused, avoidance and wishful thinking. When applied to chronic conditions, coping behavior should be classified in a different manner: cognitive reframing, emotional respite, and direct assistance (Wineman et al, 1994).

The degree of personal and familiar psychological and psychosocial problems existing before the injury happened is very briefly treated in the research reviewed here. Only authors, like Kreutzer and colleagues (1994) and Dickmen et al, (1986) include in their discussion the concept that preinjury family, psychiatric and psychosocial problems are common among brain-injured patients injured. This may add more complications to the already complex task of measuring the effects of injury both in the patients and their families.

Table 1. List with selected scales identified in this literature review (classified by topics).

Topic	Scale(s)	Topic	Scale(s)
Quality of Life	Aachere Longtime Outcome Score (ALOS)	Behavior	Child Behavior Checklist (CBCL):
	Spitzer Index (SI)		Youth Self-Report
	Visual analogue scale Quality of Life		Parent Report Form
	SCI Quality of Life Index		Teacher Report Form
	Quality of well-being Scale		Locus of Control Behavior Scale (LCB)
	Sickness Impact Profile		Neurobehavioral Rating Scale
	SF-36		
	Canadian Health Activity Limitation Survey	Psychosocial	Motivational Structure Questionnaire
	Quality of Well-being scale		Adaptive Skills Battery
	Activities of Daily Living		Modified Function Status Index
			Psychosocial Adjustment to Illness Scale
Coping	Ways of Coping Questionnaire		
	Coping Style Questionnaire	Family consequences	Brief Symptom Inventory (BSI)
	Adapted Mental Adjustments to Cancer Scale		Family Assessment Device (FAD)
	Mishel Uncertainty in Illness Scale		Family Interview Rating Scale (FIRS)
			Family Environment Scale (FES)
Self-Concept	Tennessee Self-Concept Scale		Family Inventory of Life Events (FILE)
	Rosenberg's Self-esteem Scale		Parenting Stress Index
			Marital Vulnerability Scale
Personality	Karolinska Scale of Personality		Head Injury Family Interview
Cognitive	Cognitive Failures Questionnaire	Miscellaneous	SCL-90R
Attention	Digit Span		General Health Questionnaire
	Corsi Block-Tapping Test		Impact of Event Scale
	Trail Making Test		CES-D (depression)
	Number Connection Test		Roscharch
	Paced Auditory Serial Addition Task		Head-Injury Symptoms Checklist
	California Verbal Learning Test		Modified Barthel Index
			Community Integration Questionnaire
			Functional Disability Score
			Glasgow Outcome Scale
			Disability Rating Scale

CONCLUSION

The objective of this review was to identify what is currently known regarding the social consequences of injuries (including the identification of the tools required to measure them).

There seem to be three different approaches when describing social consequences of injuries:

(A) The first approach, predominant in the literature reviewed, provides precise descriptions of different aspects of social life that get disrupted by the injury. Whether they refer to the bereavement processes or to the non-fatal injury consequences, the same problems seem to arise in the families: marriage disruption (separation or divorce), incapability of holding previous works, reduction of social interaction, failure at school (including dropping out of the educational system), drug and alcohol abuse, etc. Identification of these problems comes from case studies with open-ended interviews or autobiographical reports which bring a lot of insight in the understanding of the many aspects of the problem but that are anecdotal by nature. None of the identified papers that use this approach reports results on a big group of patients and/or their relatives, neither do they use any comparison group.

(B) The second approach tries to identify and quantify the mechanisms that lead to the above described social consequences. Family functioning level, cognitive levels, abnormal behavioral symptoms, copying styles,... are among the many aspects that researchers try to "dissect." Since the aspects to consider are so numerous (and peculiar in themselves), plenty of different measurement tools are used in this type of research. None of them include the whole array of psychological and psychosocial aspects that are involved in the development of social malfunctioning. This type of research is most frequently conducted on small and convenient samples of patients and/or their relatives and rarely there are controls against whom to compare the results. None of the reported studies have a preinjury/postinjury design to help elucidate the role of socially malfunctioning individuals and their proneness to suffer injuries.

(C) The third approach considers measuring more generic concepts, such as the quality of life, quality of well-being or the limitation in performing common activities. In doing so, the researchers assume that any significant social changes affecting the individual are reflected in the overall score (or at least in some of their subscales). Currently, a number of scales are used to achieve the same purpose (such as the Quality of Well-Being Scale, the SF-36, or the Sickness Impact Profile). This approach is quite new to the injury field (although it has been extensively used over the past years to measure the effect of other diseases such as cancer or chronic conditions) and the validity of such scales in this field is currently a topic for discussion. Because of their more extensive application (in other health-related fields), researchers have available population-based data against which to compared their results. This is the only approach for which some bigger samples of patients have been used.

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APPENDIX. ANNOTATED BIBLIOGRAPHY

In these section, more than 100 references of papers that deal with some aspects of the psychological/psychosocial consequences of injuries are presented. Each reference if followed by its abstract (as written by the author(s)). Some references also include my personal remarks. These remarks are in *italics* and they are meant to clarify or highlight some of the findings discussed in the abstract and that caught my attention when reading the original paper.

The references are presented in a particular order so that similar topics are together and there is some sort of "continuity" between the different topics. The first group of papers deals with the consequences of injuries (of all injuries); the bereavement after the death of a relative is followed by the consequences of non-fatal injuries both for the patients and their families. The second group of papers deals with the psychological/psychosocial effects on particular injuries. Brain, spinal cord, low back injuries, burn and whiplash are among the injuries for which papers were found. Within each injury, the consequences on both the injured individual and on his or her relatives are explored. Also, papers that dealt with treatment implications of such consequences are presented within each group and injury. Lastly, some papers that deal with different scales meant to measure all or some of the aspects affected by the injury consequences are presented.

I PSYCHOLOGICAL/PSYCHOSOCIAL EFFECTS OF INJURIES

IA) EFFECTS OF INJURY-RELATED MORTALITY ON THE RELATIVES

Lehman D.R., Wortman C.B., Williams A.F. Long-term effects of losing a spouse or child in a motor vehicle crash. J Personality & Social Psychology 52:218-231; 1987.

In this article we examine the long-term effects of the sudden, unexpected loss of a spouse or child. In the spouse study, interviews were conducted with 39 individuals who had lost a spouse in a motor vehicle crash four to seven years ago and with 39 matched controls. In the parent study, interviews were conducted with 41 parents who had lost a child in a crash and with 41 matched controls. Control respondents were matched to bereaved respondents case-by-case on the basis of sex, age, income, education, and number and ages of children. Significant differences between bereaved spouses and controls were revealed on several indicators of general functioning, including depression and other psychiatric symptoms, social functioning, psychological well-being, reactivity to good events, and future worries and concerns. For the most part, these differences persisted when variables such as present family income and present marital status were statistically controlled. Comparisons between bereaved parents and control parents also revealed significant differences on some measures of general functioning (especially depression), but these were not as pervasive as the differences obtained in the spouse study. Responses to questions about current thoughts and feelings suggest that the deceased continued to occupy the thoughts and conversations of bereaved spouses and parents. Moreover, a large percentage of respondents (from 30% to 85%, depending on the question), continued to ruminate about the crash or what might have been done to prevent it, and they appeared to be unable to accept, resolve, or find any meaning in the loss. Taken together, the data provide little support for traditional notions of recovery from the sudden, unexpected loss of a spouse or child.

Case-Control study to evaluation of long-term consequences of the lost of a loved one (four to seven-years post-event). They surveyed 39 widows and 40 parents who lost their spouses or children in a motor vehicle crash. They also surveyed 39 and 40 controls respectively matched by sex, age, income (at the time of the event), educational level, and number and ages of children. They evaluated the nine outcome variables: mental health (measured by depression, psychiatric symptoms and alcohol & drug use), psychological well being, role performance/satisfaction/ strain, perceived physical health status, general state of life, employment history and financial status, rates of mortality, marital status and locability, current thoughts and feelings about the loss, and acceptance and resolution of the loss. The survey instrument contained a number of well known and validated scales and a number of scales/questions designed specifically for this study. The findings revealed that bereaved subjects had higher rates of depression (higher for spouses than for parents) than their controls, worse scores in the parent role performance scaling, higher mortality rates and a loss of income (even when adjusting for initial income and current marital status). Bereaved spouses reported more psychiatric symptoms, worse psychological well-being scores, worse general state of life scores and worse scores in the social facet of role performance. Compared to their matched controls, bereaved parents were harder to locate (lower locability), had higher rates of divorce, and they also were less likely to held their jobs. This study is the first one in demonstrating the long-term effect of the loss of a loved one and identifies a number of areas where the effects can be measured as well as the instruments that can be used for that.

Martikainen P., Valkonen T. Mortality after the death of a spouse: rates and causes of death in a large Finnish cohort. Am J Public Health 86:1087-1093;1996.

This study examines excess mortality among Finnish persons after the death of a spouse, by sex, the subject's cause of death, duration of bereavement, and age. The subjects were 1,580,000 married Finnish persons aged 35 through 84 years who were followed up from 1986 to 1991. Excess mortality among the bereaved was high from accidental, violent, and alcohol-related causes (50%-150%), moderate for chronic ischemic heart disease and lung cancer (20%-35%), and small for other causes (5%-15%). Excess mortality was greater at short (< 6 months) rather than long duration of bereavement and among younger rather than older bereaved persons for most causes of death; it was also greater among men than women. The results are consistent with the hypothesis that excess mortality after death of a spouse is partly caused by stress. The loss of social support or the inability to cope with stress may explain why men suffer from bereavement more than do women.

This study is a six-year follow-up of all married people, aged 34 to 84, living in Finland. The authors show that for those who widowed along this six-year period, the mortality rate for themselves is higher than for the people who did not widow in the same period. Although the *authors never control for the cause of death of the spouses (the initial event), they show an excess mortality of widowed men of 21% (which is more than twice the excess among women). This overall excess mortality rate, when desegregated by cause of death ranges is highest for accidental and violence-related deaths. Mortality rates tend to be higher in younger widows(ers) (which suggests the potential role of unexpected death of the spouses) and in the six-month period post bereavement. Three mechanisms leading from loss of the spouse to mortality have been proposed: (1) emotional stress and grief, (2) loss of social support, and (3) loss of material and task support.*

Rubin L.R. Children in automotive accidents: the effects on the family. DOT HS 806-316. National Highway Traffic Safety Administration. Washington, DC; 1982.

When a child dies, the surviving family members experience a myriad of changes within themselves and the family system. The purpose of this research is to explore the emotional cost following the death of a child in an automobile or pedestrian oriented crash and the resulting long-term consequences of the loss. Using the case study method, nine families were interviewed following the deaths of their children. The research describes both the qualitative and quantitative perspective to surviving family members and the social and psychological damage which ensues. The case studies reveal a high incidence of marital and family erosion, alcohol and drug abuse, psychological instability and prolonged disability as several resulting factors after the deaths.

Qualitative description of the struggle of nine families who lost at least one of their members (mostly children) in a motor vehicle crash. Refers to previous literature in the field that highlights the effects of the bereavement process in increasing the risk to pathological effects (depression, self-destruction), life-threatening and malignant diseases (heart attack, cancer), and life crisis disruptions and role transitions (job loss, divorce). All nine interviewed families underwent several important changes in their lives after the loss of the children: (1) in four of the families, the parents divorced or separated after the death of the child (another couple was previously divorced and in one couple the wife died in the crash too); (2) in five of the families, the siblings showed psychosomatic/psychiatric symptoms; (3) several siblings had school problems (including dropping school);and (4) in four of the families either the father or the mother had trouble in keeping their jobs.

Byrne G.J., Raphael B. A longitudinal study of bereavement phenomena in recently widower elderly men. Psychol Med 24:411-421;1994.

A three-phase longitudinal design was used to study bereavement phenomena in a cohort (n=78) of recently widowed elderly Australian men. One group of 57 widowers was compared with a second group of 21 widowers on a waiting list. A brief, interviewer-administered, structured questionnaire was used to rate the frequency of 22 self-reported bereavement phenomena. The prevalence and temporal evolution of these phenomena are described. Half of a subgroup of elderly widowers reporting high levels of bereavement phenomena at six weeks post-bereavement went on to exhibit persistent or chronic grief at 13 months post-bereavement. The prevalence of persistent or chronic grief throughout the first 13 months post-bereavement was 8.8%. Income, education and expectedness of the death were all negatively correlated with frequency of self-reported bereavement phenomena at six weeks post-bereavement. In a multiple regression analysis only expectedness of death contributed significantly to prediction of the frequency of bereavement phenomena at six weeks post-bereavement. Widowers who were unable to anticipate their wife's death, even when their wife had suffered a long final illness, had a more severe bereavement reaction.

Lepore S.J., Silver R.C., Wortman C.B., Wayment H.A. Social constraints, intrusive thoughts, and depressive symptoms among bereaved mothers. J Pers Soc Psychol 70:271-282; 1996.

The study examined how social constraints on discussion of a traumatic experience can interfere with cognitive processing of and recovery from loss. Bereaved mothers were interviewed at three weeks (T1), three months (T2), and 18 months (T3) after their infants' death. Intrusive thoughts at T1, conceptualized as a marker of cognitive processing, were negatively associated with talking about infants' death at T2 and T3 among socially unconstrained mothers. The reverse associations were found among constrained mothers. Controlling for initial level of distress there as a positive relation between T1 intrusive thoughts and depressive symptoms over time among socially constrained mothers. However, higher levels of T1 intrusive thoughts were associated with a decrease in T3 depressive symptoms among mothers with unconstrained social relationships.

IB) EFFECTS OF INJURY-RELATED MORBIDITY ON THE INJURED

Ott R., Holzer U., Spitzenpfeil E., Kastl S., Rupprecht H., Hennig F.F.. [Quality of life after survival of severe trauma]. Unfallchirurg 99:267-274;1996.

Quality of life (QoL) was analyzed in 73 patients with severe multiple trauma (PTS > or = 40 patients) between one and 13 years after injury. QoL was assessed by the Aachen Longtime Outcome Score (ALOS), the Spitzer Index (SI) and individual self-assessment. The patients were asked about further social, financial, psychological and physical items. According to the ALOS, 81% of the patients showed moderate, 14% severe and 5% no disability. In 66% of the patients a favorable Spitzer index (eight-10 points) was found. Only 14% had poor SI scores (zero-four points). Also, two out of three patients regarded the current state of their health as good or very good. Predominantly, handicaps resulted from permanent physical disability, in particular the lower extremities, whereas psychosocial and financial problems were reported infrequently. Besides injuries to the head or extremities, low QoL correlated with severity of injury and increasing age. Within the first four post-traumatic years SI and ALOS, as well as individual self-assessment, improved with time after injury. The rate of patients who returned to work (69%) was similar to other multiple trauma series, including series with less severe injuries. The reasonable long-term outcome even after severe multiple trauma seems to justify the enormous staff and economic expense required to manage these patients. Further improvement in QoL may be achieved by professional psychological support and early fracture treatment.

Stewart A.L., Greenfield S., Hays R.D., Wells K., Rogers W.H., Berry S.D., McGlynn E.A., Ware J.E. Functional status and well-being of patients with chronic conditions. JAMA 262:907-913;1989.

Enhancing daily functioning and well-being is an increasingly advocated goal on the treatment of patients with chronic conditions. We evaluated the functioning and well-being of 9,385 adults at the time of office visits to 362 physicians in three United States (U.S.) cities, using brief surveys completed by both patients and physicians. For eight or nine common chronic medical conditions, patients with the conditions showed markedly worse physical, role, and social functioning; mental health; health perceptions' and/or bodily pain compared with patients with no chronic conditions. Each condition had a unique profile among the various health components. Hypertension had the least overall impact; heart disease and patients-reported gastrointestinal disorders had the greatest impact. Patients with multiple conditions showed greater decrements in functioning and well-being than those with only one condition. Substantial variations in functioning and well-being within each chronic condition remain to be explained.

According to the authors, the health care goal in patients with chronic conditions should be the maximization of their functioning in everyday life and the achievement of the highest possible level of Well-being. The scale used in measuring the effect of the chronic condition on these two parameters should: (a) have a comprehensive set of measures (in terms of outcomes that is important to the patients), (b) have measures that are short and easy to administer, (c) be sensitive enough to detect different scores between patients with and without the condition, identify different scores in patients with different severities within the same condition, and reflect beneficial or harmful effects of treatments over time. Patients with chronic conditions were compared with patients without chronic conditions and a representative sample of healthy population in several health-related domains using the MOS Short-Form General Health Survey (SF-36). SF-36 captures behaviourial dysfunction at the physical, role and social level and Well-being (by measuring Well-being, health perception and bodily pain). The impact of chronic conditions on health was substantial. No matter which chronic condition the patient had it tended to be associated with adverse effects on most aspects of functioning and well-being.

Morse J.M., O'Brien B. Preserving self: from victim, to patient, to disabled person. J Adv Nurs 21:886-896;1995.

Open-ended, unstructured interviews were conducted with patients who had survived serious traumatic injury, and their experiences from impact to recovery were analyzed using grounded theory. A four-stage process of 'vigilance', 'disruption', 'enduring the self', and 'striving to regain the self' was delineated. The basic social psychological process of 'preserving self' explained the strategies used in each stage, and required deliberate action, focused energy and tremendous effort and will. The strategies used to preserve self changed in each stage of the model. At the beginning, when physical survival was in jeopardy, the strategies were primarily physical. Protecting self was a process of 'taking time out' and of shutting down, in the stage of disruption.

In the stage of enduring the self, it was passively learning to 'take it' and to bear the treatments. Finally, in the stage of striving to regain the self, preserving the self was the work of regaining and redefining the self as a disabled person.

Strohmyer L.L., Noroian E.L., Patterson L.M., Carlin B.P. Adaptation six months after multiple trauma: a pilot study. J Neurosci Nurs 25:30-37;1993.

This pilot study investigated the functional and psychosocial adaptation of 18 survivors of multiple trauma who were in the home setting six months after discharge from a tertiary trauma center. Seventeen subjects reported complete functional independence and one reported the need for assistance with self-care activities as measured by the Modified Barthel Index. All subjects reported problems with psychosocial adaptation as measured by the Psychosocial Adjustment to Illness Scale (PAIS). Subjects with high PAIS scores (worst adaptation) reported problems in all domains of the PAIS, whereas those with low PAIS scores (best adaptation) reported most problems in health care orientation. Mann-Whitney U tests were significant for gender, household composition and employment status when compared with low PAIS scores ($p < 0.05$). An analysis of variance confirmed employment status was the best predictive factor for low PAIS scores.

Drench M.E. Changes in body image secondary to disease and injury. Rehabil Nurs 19:31-36;1994.

This article describes the relationship between body image and self-concept, discusses responses to changes in body image secondary to disease and injury, and explores strategies for adjustment to alterations in body image. Sociopsychological aspects of body image form a complex framework by which an individual understands the self and perceives how he or she is understood by others. As body image, self-concept, identity, and ego are closely associated, a loss of or alteration in any one of these factors can have deleterious effects on the entire self. Rehabilitation professionals assume an important role in helping people adjust to and accept alterations in body image by facilitating the grieving process; addressing loss, anxiety, and depression; and empowering individuals to emphasize and use their assets.

Welch M. Clients' experiences of depression during recovery from traumatic injury. Clin Nurse Spec 9:92-98;1995.

The purpose of this study was to examine experiences and coping strategies of 30 patients who had experienced traumatic injury. A prospective design documented the process of change that occurred over 14 months and identified factors that facilitated and impeded recovery. Seventeen of the informants viewed themselves as recovered. This group did not experience any permanent disabilities or scars and resumed their preaccident activities, including return to work. Thirteen of the informants describe themselves as not recovered; they all experienced episodes of depression and had more severe injuries. Several had permanent disabilities. The experience of depression was identified as a serious impediment to recovery. CNSs working with trauma patients can help them recover by organizing support groups and discussing with them the possible experience of depression and how to seek treatment.

Shepherd J.P., Qureshi R., Preston M.S., Levers B.G.H. Psychological distress after assaults and accidents. Br Med J 301:849-850;1990.

Two interviews (at time of injury and three months later) were conducted in 122 patients being treated for jaw fractures at a given hospital. The goal of the study was to measure the psychological consequences of the injury event. The questionnaires provided to the patients contained questions regarding anxiety, depression, psychiatric symptoms and personality trait (hospital anxiety and aggression scale, Beck depression inventory, General Health questionnaire and Eysenck personality questionnaire). Results among patients suffering an unintentional injury were compared to those of patients suffering from an intentional injury. There were no differences in personality between the two groups. At time of injury, both intentional and unintentional injured cases had higher and similar levels of anxiety and depression (and unintentional patients had also higher levels of psychiatric symptoms). Three months after the injury, cases involved in unintentional injuries showed lower levels of anxiety, depression and psychiatric symptoms that patients involved in intentional injuries.

Dewar A.L., Morse J.M. Unbearable incidents: failure to endure the experience of illness. J Adv Nurs 22:957-964;1995.

Inherent in the illness experience are multiple assaults on one's self and one's body. These assaults may be interpersonal (such as an unwitting remark made from another), or intra personal (such as unrelenting symptoms that are a part of illness, injury or treatments). These assaults may accumulate until the situation becomes unbearable, the person can no longer 'take it', and the person loses control. In this paper, the authors examine the circumstances that resulted in the breakdown of endurance, and noted that while some of the factors remained unbearable, others are managed. The authors suggest that the patient's response, that is 'losing it', may be beneficial. 'Losing it' is a means of ensuring changes in care for a patient, or aids in the relinquishment of unrealistic expectations of one's self and one's future. In all instances, however, the patient's plan of care should be carefully examined and, if necessary, modified.

After review of 36 interviews on 20 patients (with chronic diseases, cancer or injuries), the authors identify a series of psychological states that patients typically undergo since the time of their disease/injury onset. Understanding these different natural stages in the patients' enduring process is very relevant to better identify what is "normal" and what it is not as psychological changes (temporal and/or permanent) in the patient and to educate families.

IC) EFFECTS OF INJURY-RELATED MORBIDITY ON THE PATIENTS & RELATIVES

Harris B.H., Schwaitzberg S.D., Seman T.M., Herman C. The hidden morbidity of pediatric trauma. J Pediatric Surgery 24:103-106;1989.

In an attempt to characterize the emotional and behavioral consequences of severe multi-system injuries on pediatric trauma patients and members of their immediate family, 54 trauma patients and their families were studied at least one year after discharge. Of those in a home setting, 60 % had residual personality changes. Physical and cognitive handicaps, often multiple, were present in 50%; and social, affective, and learning disabilities were present in like number. Only 20% of the 50 children are in a regular school class; the other 80% required special-needs education. An unexpected finding was the effect of the accident on uninjured siblings, 66% of whom were reported to have developed emotional disturbances, school problems and aggressive personality changes. Parents reported a worsening of their marital relationship in 32% of cases, and new social and financial problems in 60%. Twenty-one mothers who were previously employed have stopped working to care for their child and 20% of families have exhausted their savings or gone into debet. Although a variety of support services were available to these families, they reported little use of extended care facilities, visiting nurses, and counselors. There is a hidden morbidity in pediatric trauma. It manifests years after injury, not only as physical disability but also as changes in cognition, personality and behavior, and as family stress. Since success in pediatric trauma care is the restoration of the child as nearly as possible to his premorbid state, these data suggest that more attention and resources should be directed to the late consequences of multi-system injury in children.

This is a follow-up study of 73 patients with a Trauma Score ≤ 13 and multiple injuries discharged from a Pediatric Level-1 Trauma Center (1993-1996). They could locate and interview 50 children and their parents (self-report telephone interview using a questionnaire developed for the study). The interviews revealed that patients were still suffering cognitive (attention, memory, learning capability), behavioral (reduction of social interaction with peers), emotional (depression, mood swings) and social problems. The answers from their parents highlighted changes in the marital relationships (16 estranged mother/father return home, four marriages divorced), changes in their working status (21 mothers quit their jobs to take care of the children) and a worsening of their financial status (exhaustion of savings or borrowing of money). Even the siblings suffered of emotional disturbances, school problems and aggressive personality changes.

Carty E., Conine T., Holbrook A., Riddell L. Childbearing and parenting with a disability or chronic illness. Midwifery Today Childbirth Educ 28:17-9, 40-2;1993.

ID) TREATMENT IMPLICATIONS

McIntosh D.N., Silver R.C., Wortman C.B. Religion's role in adjustment to a negative life event: coping with the loss of a child. J Per Soc Psychol 65:812-821;1993.

Parents (n=124) who had lost an infant to sudden infant death syndrome were interviewed three weeks and 18-months postloss. Two components of religion (religious participation and religious importance) were assessed, and their relations with three coping-process variables (perceived social support, cognitive processing of the loss, and finding meaning in the death) were examined. Greater religious participation was related to increased perception of social support and greater meaning found in the loss. Importance of religion was positively related to cognitive processing and finding meaning in the death. Furthermore, through these coping-process variables, religious participation and importance were indirectly related to greater well-being and less distress among parents 18-months after their infants' deaths. Results suggest that further study of the social and cognitive aspects of religion would be profitable.

Morse J.M., Bottorff J.L., Hutchinson S. The phenomenology of comfort. J Adv Nurs 20:189-195;1994.

From patient narratives, the phenomenological literature and reflection of patients' autobiographical accounts of illness, nine themes reflecting the phenomenological concept of corporeality were used to identify the ways patients achieve comfort. The themes were: the diseased body, the disobedient body, the vulnerable body, the violated body, the resigned body, the enduring body, the betraying body and the betraying (neurotic) mind. The process of achieving comfort is based on the patients' needs to live with illness or injury without being dominated by their bodies. The authors argue that while the role of nursing is to provide comfort to the sick, the goal of total comfort is unattainable in patient care. However, if the goal is to enhance comfort, to ease and to relieve distress, comfort remains central to the role of nursing.

Catindig Agne R.A. Rehabilitating a loved one: a personal story. Rehabil Nurs 18:23-25;1993.

Fortunately, during their professional lives, only a small percentage of nurses will face the traumatic task of helping a loved one overcome a major physical handicap. In this article, an experienced rehabilitation nurse relates her experience in helping her aged mother cope with the reality of a severe injury and amputation.

This article constitutes an in-depth description of the author's mother rehabilitation process after a foot injury that required amputation. Apart of dealing with the physical limitations, the author strengthens the need to understand the mood changes (irritability) and depressive symptoms that patients suffer after sustaining the injuries.

II) PSYCHOLOGICAL/PSYCHOSOCIAL EFFECTS OF EVENTS THAT CAUSE INJURIES

Carr V.J., Lewin T.J., Webster R.A., Hazell P.L., Kenardy J.A., Carter G.L. Psychosocial sequelae of the 1989 Newcastle earthquake: I. Community disaster experiences and psychological morbidity six months post-disaster. Psychol Med 25:539-555;1995.

A stratified random sample of 3,007 Australian adults completed a screening questionnaire six months after the 1989 Newcastle earthquake. Information was obtained on initial earthquake experiences and reactions, use of specific services, social support, coping strategies and psychological morbidity. This questionnaire was the first phase of the Quake Impact Study, a longitudinal project investigating the psychosocial impact of the earthquake. Two weighted indices of exposure were developed: a threat index, which measured exposure to injury or the possibility of injury; and a disruption index, which measured experiences of property damage, displacement and other losses. Levels of exposure to threat and disruption events were significant predictors of morbidity on both the General Health Questionnaire and Impact of Event Scale, as were coping style and gender. Effects of exposure to threat and disruption were largely additive, with higher exposure being associated with greater use of support services, higher perceived stressfulness and more severe psychological morbidity. Use of avoidance as a coping strategy, female gender, lower social support and being older were also associated with higher post-disaster psychological distress. It was estimated that 14.8% of the population was exposed to high levels of threat or disruption, of whom approximately 25% experienced moderate to severe psychological distress as a direct result of the disaster. It was further estimated that 18.3% of those exposed to high levels of threat were at risk of developing post-traumatic stress disorder, representing approximately 2% of the city's adult population.

Dooley E., Gunn J. The psychological effects of disaster at sea. Br J Psychiatry 167:233-237;1995.

In March 1987, the P&O car ferry Herald of Free Enterprise capsized killing 193 passengers. Seventy-five survivors and relatives were referred by their solicitors to the authors for assessment of psychological injury. Information was gathered retrospectively and systematically from clinical notes and legal reports. The commonest symptoms suffered were sleep disturbances, loss of concentration and increased anger. The commonest diagnoses were post-traumatic stress disorder, other anxiety states and depression. Depressive symptoms were commoner in those who had been bereaved, anxiety symptoms were commoner in those who had not. Reluctance to discuss symptoms and to attend a psychiatric clinic was a common feature. As expected, bereavement led to grief and depressive symptoms, whilst passengers who were not bereaved were more likely to suffer anxiety symptoms. Contrary to expectations, the degree of immersion during the accident did not influence the type or degree of symptoms. Those with worse symptoms were more likely to attend the clinic. Women showed more affective symptoms and men more substance abuse.

Hagstrom R. The acute psychological impact on survivors following a train accident. J Trauma Stress 8:391-402;1995.

Sixty-six passengers surviving a collision of two trains were investigated concerning relevant background data, degree of personal injury, experience of a threat to life, symptoms and problems immediately after the accident, and thoughts about difficulty in coping. The most obvious impact on the survivors was the experience of being close to death. One result of this was that they developed a new coping strategy to minimize emotional pain. Some survivors also suffered problems of re-living the accident. This is important for the coping process. The process includes psychological integration of the accident as an important life event. The findings indicate that re-living of the accident through nightmares and intrusive thoughts are responsible for problems in carrying out ordinary tasks. The observations are in accordance with those made after other types of accidents and disasters.

Bryant R.A., Harvey A.G. Avoidant coping style and post-traumatic stress following motor vehicle accidents. Behav Res Ther 33:631-635;1995.

Predictors of post-traumatic intrusive symptomatology were studied in 56 motor vehicle crashes (MVC) survivors 12-months after their MVC. Measures were obtained on Ss' subjective response to the trauma, objective indices of injury severity, coping response (Coping Style Questionnaire), and post-traumatic stress (Impact of Event Scale; IES). Significant levels of intrusive and avoidance symptomatology were reported by 20% of MVC survivors. An avoidant coping style and compensation accounted for 41% of variance of IES-Intrusion scores. Findings are discussed in terms of the role of avoidance behavior in post-traumatic adjustment.

Rider S.P., Hicks R.A. Stress, coping, and injuries in male and female high school basketball players. Percept Mot Skills 81:499-503;1995.

Past research has identified a positive relationship between life-event stress and football injuries, but research in other sports has yielded more ambiguous results. It seems, then, that the relation of life stress and injury may be sport-specific and that different sports must be studied separately before such a relationship is assumed. The present investigation examined the relationships among life-event stresses, coping skills, social support, and injuries of male and female high school basketball players. Contrary to the hypothesis, the number of days missed due to injury was not significantly related to life-event stress. As expected, the injury measure was negatively correlated with both the coping-skills and social-support variables, but these correlations did not reach statistical significance. Recommendations for research are discussed.

IIA) TREATMENT IMPLICATIONS

Galante R., Foa D. An epidemiological study of psychic trauma and treatment effectiveness for children after a natural disaster. J Am Ac Child Psych 25:357-363; 1986.

Approximately 300 Italian elementary school children who were victims of a devastating earthquake were surveyed in an epidemiological study. The measure used was the Ruter Behavioral Questionnaire for Completition by Teachers. In one village a treatment program was developed and implemented. A frequencies count of the expressed earthquake-related fears and anxieties was taken during every treatment session. Treatment consisted of a gradual series of steps that led to a replaying of the earthquake. It was hypothesized that the number of children shown to be at risk for developing neurotic or antisocial problems would be positively correlated with the amount of destruction in a village. This was not verified. It was also hypothesized that treatment would reduce earthquake fears and the number of children at risk. This was verified. The village where treatment was carried out for 12 academic years showed a significant drop in the at-risk scores. Conclusions were that treatment alleviates symptoms but that the number of children at risk seems to be more related to the length of time needed for the community to reorganize after the disaster.

III) PSYCHOLOGICAL/PSYCHOSOCIAL EFFECTS OF SPECIFIC INJURIES

IIIA) BRAIN INJURIES

IIIA_1) EFFECTS ON THE PATIENTS

Dikmen S., McLean A., Temkin N. Neuropsychological and psychosocial consequences of minor head injury. J Neurology, Neurosurgery & Psychiatry 49:1227-1232;1986.

Twenty subjects with minor head injury were compared to an uninjured group at one and 12 months after injury on a battery of neuropsychological and psychosocial measures. The results indicate that single minor head injury in persons with no prior compromising condition is associated with mild but probably clinically non-significant difficulties at one month after injury. Disruption of everyday activities, however, is extensive with other system injuries significantly contributing to these problems. Recent reports in the literature may represent overestimation of head injury related losses due to the lack of control for the effects of pre-injury characteristics and other system injuries.

The authors conducted this case-control study with evaluations of neuropsychological and psychosocial disruptions one month and one year post-minor head injury. Nineteen cases and 19 uninjured controls matched by age, gender and educational level were evaluated using the

Halstead-Reiten Neuropsychological test battery (to assess Neuropsychological impact) and a combination of the Sickness Impact Profile, the Head Injury Symptom Checklist, and a modification of the Function Status Index (to assess the psychological impact).

Neuropsychological and psychosocial consequences are known to be present within days of minor head injury. Although performance of the minor head injured were not impaired statistically significantly in a clinical sense, their scores were slightly lower than those of the uninjured group. Psychosocial results showed significant dysfunctions one month post injury in several aspects: emotional behavior, alertness behavior, and social interaction) and to major activities (such as home management and work). The worst problems were identified in the work and sleep and rest areas) There was an improvement in all functions one year after. Eleven of the 19 injured cases had some other injuries (orthopaedic or soft tissue injuries). Seems that other system injuries do contribute to limitations to psychosocial functioning.

Dikmen S.S., Temkin N.R., Machamer J.E., Holubkov, Frase R.T., Winn R. Employment following traumatic head injuries. Arch Neurol 51:177-186;1994.

Determine rates of, and factors predictive of, return to work in patients with civilian traumatic head injuries. Inception cohort study with one to two-year follow-up. Hospitalized patients in a level-I trauma center. Three hundred sixty-six hospitalized head-injured patients who were workers before injury and 95 comparison subjects participated in prospective, longitudinal investigations of employment following head injury. Head-injured and comparison subjects were similar on basic demographic and preinjury employment status. The comparison subjects consisted of patients who sustained traumatic injury to the body but not to the head. The main outcome measure was the time taken to return to work following head injury. Survival methodology was used for analysis. Whether patients returned to work and when related to both the characteristics of the injured patients (e.g., education, preinjury work history), the severity of head injury and associated neuropsychologic problems, and severity of other systems injuries. More precise predictions were possible using the multivariate model. The present study provides a means of assessing employment potential predictively. This can be useful for clinical and research purposes. The results should be used cautiously and should stimulate discussions of appropriate use of services and resources to meet individual patients' needs.

The authors conducted a survival analysis to build a proportional hazard model that identifies factors associated with return to work (and length to return to work) for people suffering head injuries. Three hundred and sixty-six injured people (workers at the time of injury) and 95 controls (non-head injured workers at the time of injury) were identified out of three different head injury studies being performed at the time. Multiple factors were evaluated: demographics (age, gender, race, educational level, marital status), preinjury work history (stability and income), preexisting conditions (prior CNS diseases, previous head injury requiring hospitalization, psychiatric disease requiring hospitalization, and alcoholism under treatment), head injury severity (GCS,..), other systems injury (AIS, modified ISS), and neuropsychologic status at one month after injury. The highest rate of return to work occurs between one-six *months after the injury occurred. Age, educational level, stability of preinjury work, head injury severity and other injuries severities were the factors significant in the prediction of time from injury until return to work.*

Moore A.D., Stambrook M. Cognitive moderators of outcome following traumatic brain injury: a conceptual model and implications for rehabilitation. Brain Inj 9:109-130;1995.

This paper presents a conceptual model describing the relationships between quality of life outcomes following traumatic brain injury (TBI), coping patterns, and beliefs regarding self-efficacy to assist health-care professionals in understanding the complexity of social and psychological sequelae of TBI. The mode hypothesizes that long-lasting cognitive, behavioral, emotional psychiatric, and interpersonal after-effects of TBI may create a real life 'learned helplessness' with consequent deficits in coping, and altered locus of control beliefs. As a result, TBI patients are at risk for developing self-limiting belief systems about their effectiveness in altering significant events that may result in over-generalizing the effects that TBI has in their day-to-day lives. Subsequently, a feedback loop may be set up where their beliefs in not being able to influence outcomes are not tested, life chances are further restricted, outcomes are suboptimal, and quality of life is reduced. The clinical and theoretical implications of this model are discussed, and an expanded model with future research directions is suggested.

This is a review article with 99 references.

Malia K., Powell G., Torode S. Coping and psychosocial function after brain injury. Brain Inj 9:607-618;1995.

A total of 74 brain-injured patients and 46 non-neurological matched controls consecutively admitted to a specialist medical rehabilitation unit were administered the 'Ways of Coping' checklist and the 'Headley Court psychosocial rating scale'. The relatives of all participants were sent the psychosocial rating scale. An analysis of the 'Ways of Coping' checklist showed the brain-injured patients used four strategies for coping, namely problem-focused, emotion-focused, avoidance, and wishful thinking. Correlations between these four factors and the responses on the 'Headley Court psychosocial rating scale' showed that less use of emotion-focused, avoidance, and wishful thinking coping strategies predicts better psychosocial functioning in the brain-injured group, a result similar to those reported for a wide variety of other health problems. The implications for treatment and management are discussed.

Dawson D.R., Chipman M. The disablement experienced by traumatically brain-injured adults living in the community. Brain Inj 9:339-353;1995.

The disablement that occurs following TBI can be extensive and severe and consequently has been difficult to report on in a comprehensive and thorough manner. We were able to address this difficulty by analyzing a subgroup of data from the Canadian Health and Activity Limitation Survey (HALS) using the theoretical framework of disablement developed by the World Health

Organization, the International Classification of Impairment, Disability and Handicap (ICIDH). There were 454 survey respondents (representing 12,290 in the Canadian population) with disability resulting from a TBI and a mean time post-injury of 13 years. Three handicaps identified in the ICIDH were the focus of the study: physical independence, work, social integration. The prevalence of long term handicap was very high with 66% of the sample reporting the need for ongoing assistance with some activities of daily living, 75% not working, and 90% reporting some limitations or dissatisfaction with their social integration. Multivariate regression analysis was used to investigate the determinants of the handicaps. The determinants included: age, gender, level of education, living alone, physical environment, and specific disabilities. The implications of these findings are discussed in relation to rehabilitation issues, the usefulness of the ICIDH as a model to investigate outcomes, and directions for future research.

Marsh N.V., Smith M.D. Post-concussion syndrome and the coping hypothesis. Brain Inj 9:553-562;1995.

Neuropsychological functioning and level of subjective symptomatology was assessed in 15 adults at two weeks, one month, and three months post-concussion. Performance by the concussion subjects was compared to the results obtained by a matched group of normal controls. At two weeks post-injury the concussion subjects had deficits in intellectual, attention, memory, and language abilities. Visuospatial constructional abilities were relatively preserved. Concussed subjects also reported high levels of disturbance in affective, cognitive, and social functioning. By three months post-injury the concussed subjects were still displaying deficits in attentional and language functioning. The level of subjective symptoms reported by the concussed subjects was not significantly different from that reported by controls. Results provide some support for the 'coping hypothesis' explanation of post-concussion syndrome.

Montgomery G.K. A multi-factor account of disability after brain injury: implications for neuropsychological counseling. Brain Inj 9:453-469;1995.

Persons with brain injuries demonstrate an inconsistency in functioning over time and circumstances that requires a consideration of factors in addition to the size and location of the acquired brain lesions. A multi-factor account is presented in which neuropsychological disability on any occasion is attributed to some combination of neuropsychological deficits plus one or more of four personal factors (negative thinking, tension-arousal, fatigue, physical symptoms) and three situational factors (demands for complex attention, demands for rapid processing, external distractions). Citing pertinent research the paper discusses the development of, and possible mechanisms of influence by, these seven factors. It then broadly prescribes clinical interventions that might assist clients to reduce their adverse effects. It is suggested that the scope of brain injury rehabilitation be extended to include training clients to identify and manage non-organic conditions that may combine with direct brain injury effects to compromise productive work, complicate social relationships, or render the affected person less able to cope with stress.

This is a review article with 45 references.

Persinger M.A. Personality changes following brain injury as a grief response to the loss of sense of self: phenomenological themes as indices of local lability and neurocognitive structuring as psychotherapy. Psychol Rep 72(3 Pt 2):1059-1068;1993.

Both theoretical and empirical observations suggest that significant alterations in self-concept should occur following most closed head injuries because of diffuse synaptic modification within the temporo-frontal regions; this loss of the sense of self should evoke a grief-like response sequence and should encourage paranormal/religious experiences during the subsequent months to years. The marked consistency between phenomenological experiences and the results of neuropsychological assessments of 56 adults who had sustained brain injuries supported this hypothesis. Subsequent reports by these patients indicated that clinical translation of posttraumatic experiences into rational neurobehavioral terms and interventions tailored for the individual's specific pattern of brain dysfunction may facilitate adaptation during the grieving period.

Goran D.A., Fabiano R.J. The scaling of the Katz Adjustment Scale in a traumatic brain injury rehabilitation sample. Brain Inj 7:219-229;1993.

Based on the KAS-R1 ratings completed by 88 relatives of clients who had enrolled in a post-acute rehabilitation programme, the 10 component groups discerned by Fabiano and Goran [1] were submitted to a classical analysis of tests. Seventy-nine items were found to contribute to the internal consistency of their respective component groups, resulting in alpha values ranging from 0.75 to 0.93 for the component groups. Intercorrelations between components suggested that while some degree of overlap existed between groups, they represented discrete categories of neurobehavioral functioning. Second-order components, as determined by principal-component analysis, discern two significant component groups. These two components correlated moderately, yielding a value of 0.49. The findings indicate that the revised KAS-R1 exhibits considerable potential for clinical utility. Further research is needed to investigate the validity of this instrument in accurately depicting behavioral manifestations of those who have incurred TBI.

Klonoff P.S., Lage G.A., Chiapello D.A. Varieties of the catastrophic reaction to brain injury: a self psychology perspective. Bull Menninger Clin 57:227-241;1993.

Patients with TBI sometimes manifest varieties of what Goldstein (1952) called the catastrophic reaction. Recognizing the particular form of catastrophic reaction is important both to determine proper behavioral management and to help patients accept the effects of the brain injury. Applying Kohutian theory and self psychology constructs, they autorepresent several case studies to show how the patients shared the same underlying experience of shame and anxiety over their injury-related impairments. These patients participated in an outpatient, milieu-oriented rehabilitation program intended to increase their independence at home and to facilitate their return to productive work. The rehabilitation therapist's role was to help patients move from a state of being unable to accept their deficits to one of setting and pursuing attainable goals. The authors discuss ways of managing these catastrophic reactions.

Kwasnica C.M., Heinemann A. Coping with traumatic brain injury: representative case studies. Arch Phys Med Rehabil 75:384-389;1994.

This case report compares the use of social supports and vulnerability to substance abuse for two rehabilitation clients after TBI. Using a psychosocial assessment, the Motivational Structure Questionnaire, Adaptive Skills Battery, and Ways of Coping Checklist within a representative case method, we studied two individuals in depth to understand differences in postinjury drinking behaviors. We also examined differences in availability and use of social supports and how support was related to coping efforts. Finally, we illustrated goal-setting and the relationship between long-term planning and follow-through on goals. Social supports, adaptive problem-solving behaviors, and positive reappraisal of situations seem to be important elements in postinjury abstinence. Clinically, this research supports the need for fostering use of both social supports and substance use prevention and treatment services when working with both inpatient and outpatient TBI clients.

Klonoff H., Clark C., Klonoff P.S. Long-term outcome of head injuries: a 23-year follow up study of children with head injuries. J Neurol Neurosurg Psychiatry 56:410-415;1993.

The purpose of the 23-year follow up study was to determine the relationship between trauma variables including measures of head injury and very long-term sequelae. The study included 159 individuals with a mean age 31.40 years, of whom approximately 90% were admitted to the hospital with a mild head injury during childhood (mean age 7.96). Extent of head injury was determined by unconsciousness, neurological status, skull fracture, EEG, post-traumatic seizures and a composite measure. The composite measure of neurological variables was the best predictor of long-term outcome. In addition, IQ recorded in the post-acute phase was a reliable predictor of long-term outcome. Of the sample, 32.7% reported physical complaints and 17.6% reported current psychological/psychiatric problems unrelated to the head injury. Subjective sequelae (physical, intellectual and emotional) specified as due to the head injury were reported by 31% of the sample, and the sequelae were found to be related to the extent of the head injury and initial IQ. There were no discernible relationships between attribute variables including premorbid status and age with subjective sequelae. There were, however, significant relationships between subjective sequelae and objective, psychosocial measures of adaptation including educational lag, unemployment, current psychological/psychiatric problems and relationships with family members. Finally, there appeared to be continuity of complaints elicited during the five years follow up of the original project and current sequelae. The severity of the head injury was identified as the primary contributory factor in the reconstitution process and in the prediction of long term outcomes.

McLean A. Jr, Dikmen S.S., Temkin N.R. Psychosocial recovery after head injury. Arch Phys Med Rehabil 74:1041-1046;1993.

Psychosocial recovery after head injury was prospectively examined at one and 12 months postinjury in a group of 102 hospitalized adult head-injured patients representing a broad range of head injury severity. For comparison purposes, 102 friend controls were used. Outcome was assessed with a battery of psychosocial measures including the Sickness Impact Profile, the Head Injury Symptom Checklist, and the Modified Function Status Index. The results indicate that head-injury patients experience significant psychosocial problems (e.g., ability to return to work, resume leisure activity, concentrate and remember information, feelings of irritability) at both one and 12 months postinjury but these difficulties improve over time. Whereas improvements occur in both psychosocial and physical areas of functioning, improvements are greater in the physical area. The nature and extent of difficulties seen vary as a function of head injury severity, and time from injury to observation. Finally, the results suggest that not all problems reported by head-injured patients are solely related to the injury (e.g., irritability, anxiety, fatigue, or headaches).

Stratton M.C., Gregory R.J. What happens after a traumatic brain injury?: four case studies. Rehabil Nurs 20:323-327;1995.

This article reports on four women with TBI. It describes what happened to the women during their initial trauma and what life was like for them following their injuries. TBI can have devastating lifelong consequences because the brain is the body's central functioning unit. Damage from a TBI trends to be comprehensive, extending beyond physical injuries and changing the way a person behaves and feels. It can even bring about a total change in personality and often leads to psychosocial problems. Family and friends of the person with TBI may have difficulty understanding and coping with these changes. The authors suggest nursing interventions to help both the patient and others deal with TBI.

In-depth interviews of a convenient sample of four women who suffered traumatic brain injuries some years before. The women describe the physical, psychological and social changes that the brain injury sequelae made in their lives. Among the most common alterations mentioned by these women are: changes in mood (irritability, impatience) and personality (bipolar disorders, depression), cognitive changes (reading abilities, memory problems, slow speech), and reduction and/or deterioration of social interaction.

IIIA_2) EFFECTS ON PATIENTS & RELATIVES

Kravetz S., Gross Y.,Weiler B., Ben-Yakar M., Tadir M., Stern M.J. Self-concept, marital vulnerability and brain damage. Brain Inj 9:131-139;1995.

The present study investigated the influence of a man's brain injury on both his and his wife's self-concept and perception of marital vulnerability. Thirty-six couples in which the husbands had brain damage and 29 couples without disability filled out the Tennessee Self-concept Scale [1], and the Marital Vulnerability Scale [2]. Marital vulnerability of husbands with brain damage was found not to differ from that of the husbands in the control group. However, the marital vulnerability of the wives of the former husbands was lower than that of the other wives. Both men with brain damage and their wives exhibited a decrease in self-esteem and an increase in conflict and pathology. Brain damage appears to affect both the extent and direction of the relations between aspects of the self-concept and marital vulnerability differentially for husbands with brain damage and their wives. Practical and theoretical implications of the negative impact of brain damage upon the person with the damage, upon his wife, and upon their marital relationship are discussed.

Wade S., Drotar D., Taylor H.G., Stancin T. Assessing the effects of traumatic brain injury on family functioning: conceptual and methodological issues. J Pediatr Psychol 20:737-752;1995.

Reviewed empirical literature published since 1975 on the effects of pediatric TBI on the family. Few systematic, hypothesis-driven investigations of the impact of TBI on family functioning have been conducted. However, existing findings indicate that severe TBI can adversely affect families and individual family members. Certain factors, such as poor preinjury functioning and parental psychological disorder, appear to place families at greater risk for long-term disruption. Issues associated with the conceptualization of the impact of TBI on various aspects of family functioning are discussed and methodological considerations are outlined. Special attention is given to novel strategies for studying these complex, multifaceted issues. Finally, a framework is proposed for examining the processes of family adaptation after pediatric TBI to guide future research directions.

McLaughlin A.M., Carey J.L. The adversarial alliance: developing therapeutic relationships between families and the team in brain injury rehabilitation. Brain Inj 7:45-51;1993.

Families of individuals who have survived brain injuries experience significant distress, and may resist accepting their relative's neurobehavioral deficits. Staff who work with brain-injured patients and their relatives are charged with the seemingly paradoxical task of helping families support rehabilitative efforts and be goal-oriented, while simultaneously communicating often negative realities about prognosis. In the midst of what may be an intermittently conflict-laden relationship, families and staff must become synergistically involved in a therapeutic partnership. This paper defines aspects of this 'adversarial alliance' which is often established between families and staff. The relationship between patient discharge outcome and perceived family stress and satisfaction with the rehabilitation program was reviewed. Data analyses yielded the following conclusions: families evaluated retrospectively to have been 'highly stressed' were also perceived to experience more conflict with the rehabilitation team; family stress was related to poorer adjustment to the patient's disability (at admission); greater family/team conflict correlated with lower cognitive and physical functioning at admission, longer length of stay, younger patient age, and lower programme satisfaction. Implications for program development and treatment guidelines are discussed.

Rivara J.B. Family functioning following pediatric traumatic brain injury. Pediatr Ann 23:38-44;1994.

This paper is a literature review of the effects of pediatric head injuries in family functioning. It also reviews the basic principles of family functioning. Characteristics of the families that cope favorably with the injury consequences are presented and discussed. The authors also provide some tips for the health providers as to how to manage the families along the recovery process and how to identify and help families that may have less resilience.

Leach L.R., Frank R.G., Bouman D.E., Farmer J. Family functioning, social support and depression after traumatic brain injury. Brain Inj 8:599-606;1994.

Functional outcome after TBI is thought to be dependent upon effective social support and avoidance of depressive episodes. Research indicates that post-injury changes often occur in the family's functioning, hence impacting the family's ability to provide the needed social support. Social support, in turn, has been hypothesized to work as a buffer between a significant life event and levels of depressive symptoms. Thus poor social support after a TBI, due to changes in family functioning, could result in depressive episodes for the person with a TBI. This paper empirically examines this question by investigating whether social support is predictive of depression in persons who have sustained a TBI. Thirty-nine persons who had sustained TBI were interviewed to assess their family functioning, perceived social support, and current depressive symptomatology. The results showed that the effective use of problem-solving and behavioral coping strategies by the family in response to TBI was significantly related to lower levels of depression in the person who sustained the TBI. However, perceived social support was not predictive of depression.

Martin K.M. Loss without death: a dilemma for the head-injured patient's family. J Neurosci Nurs 26:134-139;1994.

Family members of a person suffering head injury are confronted with permanent alterations in the person they love. The change in the individual is experienced as a loss which must be grieved. This grieving process can be difficult since the presence of the head injury survivor serves as a constant reminder to the family of what they have lost. With an understanding of the concept of loss without death, nurses caring for the families of head-injured individuals may be better equipped to assist them through this difficult process.

Kreutzer J.S., Gervasio A.H., Camplair P.S. Patient correlates of care givers' distress and family functioning after traumatic brain injury. Brain Inj 8:211-230;1994.

This study examined the relationship of patient variables to care giver distress and family functioning after TBI in 62 families. An extension of Kreutzer et al 1994 (in press), the present investigation used four categories of predictor variables: indices of injury severity, neuropsychological tests, neurobehavioral problem checklist scales, and kinship of care giver (i.e., spouse vs. parent). Care giver distress and family functioning were measured by the Brief Symptom Inventory (BSI) and Family Assessment Device (FAD), respectively. Regression analyses revealed that indices of injury severity did not predict BSI scores. Time post-injury predicted several FAD subscales. The number of the patient's neurobehavioral problems predicted BSI subscale scores most consistently, particularly the Global Severity Index, Somatic, Obsessive-Compulsive and Depression scales. Scores on the behavior problem subscale predicted BSI scores better than other kinds of problems, and also had some relation to several FAD subscales. Of the 10 neuropsychological test scores, those which measured verbal abilities were more predictive of care givers' BSI scores. Kinship (i.e., being a spouse) predicted depression scores, even when other variables were partialled out. Research findings are integrated with European studies and clinical implications for understanding care giver distress are discussed.

Kreutzer J.S., Gervasio A.H., Camplair P.S. Primary care givers' psychological status and family functioning after traumatic brain injury [see comments]. Comment in: Brain Inj 8:193-195;1994. Brain Inj 8:197-210;1994.

This study investigated the prevalence of psychological distress and unhealthy family functioning among primary care givers of 62 adult outpatients with TBI, using the BSI and the FAD. Approximately half of the care givers reported elevated distress as indicated by scores on the BSI General Stress Index. Elevations on the anxiety scale were evident among one-third of the sample, and one-fourth demonstrated elevations on the depression subscale. Elevated scores on the Paranoid Ideation and Psychoticism scales suggested that feelings of burden and alienation were commonly reported. As indicated by the FAD, care givers showed greater levels of unhealthy functioning relative to published norms for non-patient and medical patient samples, but showed better functioning than psychiatric samples. Spouses were significantly more likely to report elevated depression scores compared to parents. There was also a trend for spouses to report greater unhealthy family functioning than parents. Findings are consistent with those reported by European researchers. Experience indicates that the BSI and FAD are potentially valuable clinical and research tools.

Probably, this study represents the first quantification of family functioning after brain injury. Sixty-two care givers (spouses and parents) were interviewed and asked to complete two questionnaires, one regarding themselves (to assess the impact of the relative's injury in them) and the other regarding family function. The results were compared to normalized data from the literature.

Linn R.T., Allen K., Willer B.S. Affective symptoms in the chronic stage of traumatic brain injury: a study of married couples. Brain Inj 8:135-47;1994.

A convenient sample of 60 brain-injured subjects and their spouses was evaluated cross-sectionally in the chronic stage of recovery on self-rated measures of sensory, motor, cognitive and behavioral disability and on the SCL-90-R depression and anxiety subscales. A majority of the brain-injured subjects, who were on average almost six years post-injury, demonstrated elevations on the affective symptom scales, with almost 70% showing depression and 50% showing anxiety. The spouses of the brain-injured individuals also demonstrated significantly elevated affective symptom scales, with 73% acknowledging symptoms of depression and 55% demonstrating symptoms of anxiety. For the individuals with brain injury, those with higher self-ratings of cognitive disability and social aggression had higher self-ratings of depression and anxiety. In contrast, spouse gender appeared to have the greatest association with the presence of elevation affective responses, with female spouses having higher levels of depression and anxiety than male spouses. These findings are discussed in terms of the reactionary nature of affective disturbances in the chronic stage of recovery.

Resnick C. The effect of head injury on family and marital stability. Soc Work Health Care 18:49-62;1993.

TBI is a public health concern with implications for injured persons, families, and society. This study examines how TBI affects family and marital relationships. A retrospective survey was conducted that requested responses from relatives of head injured individuals. The mean interval between the occurrence of head injury and survey response was eight years. Responses revealed the need for support, information, and education. The implementation of a case-management system, incorporating significant roles and functions for social workers can assist families in coping with TBI.

Moore A., Stambrook M., Peters L. Centripetal and centrifugal family life cycle factors in long-term outcome following traumatic brain injury. Brain Inj 7:247-255;1993.

The family life cycle model categorizes stresses on family systems in terms of their source and their effects on family members. Centripetal forces bring members together while centrifugal forces lead to loosened intra familial ties. This study examined the association of normative, developmental and centripetal illness-related family forces with patient outcomes. Hypothesized centripetal and centrifugal forces acting on 65 families of married male TBI patients were used as independent variables in stepwise multiple regressions with criterion measures of quality of life outcomes used as dependent measures. Centripetal variables included measures of family coping, marital adjustment, and number of years married. Centrifugal variables included number of children, age of oldest child, and amount of perceived financial strain. Regression equations obtained had multiple R's ranging from 0.623 to 0.407 (p values < 0.017). Results suggest that families normatively dealing with the developmental stage of the family with young children may face unique challenges when a husband sustains a TBI, particularly when financial strain exists. Stages in family development involving conflict between centripetal and centrifugal forces may be most problematic for families to resolve, and potentially the most effective periods for intervention.

Pessar L.F., Coad M.L., Linn R.T., Willer B.S. The effects of parental traumatic brain injury on the behavior of parents and children. Brain Inj 7:231-240;1993.

Little is known about the effects of a parent's brain injury and subsequent disabilities on the children in the family. This study examines 24 families in which one parent is brain injured. In each family the children were born before the parent's injury and still lived at home at the time of interview. Reports of the uninjured parent indicate that most of the children experienced some degree of negative behavioral change after the parent's injury. In 10 of the families, significant and problematic changes occurred. Types of problems included poor relationship with the injured parent, acting-out behavior and emotional problems. Correlates of poor outcomes for the children were: (1) injured-parent's gender, (2) compromised parenting performance of the injured parent, (3) compromised parenting performance of the uninjured parent and (4) depression in the uninjured parent. This study points to the importance of recognizing TBI as a major family stressor.

Leaf L.E. Traumatic brain injury: affecting family recovery. Brain Inj 7:543-546;1993.

Ongoing interest in how families adjust to traumatic events has encouraged much research, with varying results. Viewing the family process of adjustment from a systems perspective provides a workable model. The current article explores basic system tenets and provides data on varying adjustment issues for families. Results are consistent with current research trends and family data.

Placing the family in a new perspective, as a group of people that evolve together over time, the author strengthens the need to better understand what is the interrelation between the injured patient, his or her relatives and how the needs and requests of one of them affects the others and vice versa.

Rivara J.B., Jaffe K.M., Fay G.C., Polissar N.L., Martin K.M., Shurtleff H.A., Liao S. Family functioning and injury severity as predictors of child functioning one-year following traumatic brain injury. Arch Phys Med Rehabil 74:1047-1055;1993.

This study examined changes in children's functioning in the year following TBI and the preinjury family and injury factors most predictive of children's overall adaptive functioning and social competence at one-year. Ninety-four children with TBI (mild = 50, moderate = 25, severe = 19) and their families were consecutively enrolled from two regional medical centers. The age range was from six years to 15 years. Interviewer ratings and standard measures of family and child functioning were completed within three weeks of injury (measuring preinjury status), at three months and one-year. Mean preinjury parent and teacher ratings of child functioning were within normal range. Older children (> or = 12 years) had worse preinjury functioning than younger children. Declines in child functioning were significantly associated with injury severity. Mild and moderately injured children had few declines in overall functioning. Severely injured children had the most dramatic early declines and improved only slightly between three months and one-year; however, older children from poorly functioning families deteriorated in the same period. Injury severity and preinjury family functioning explained from 25% to 39% of the variation in child functioning at one-year and up to 57% when the child's preinjury status was included. Children at risk for poorer adaptation following TBI can be identified and for optimal recovery should receive appropriate support services for optimal recovery.

Follow-up study of 94 brain-injured children with assessments at discharge, three weeks, three months and one-year postinjury. Parents and teachers evaluated the childrens performance and family performance was measured by one of the researchers using several scales. Pre-injury family functioning of younger children was better than that of older injured children; although the mean change in functioning between preinjury and one-year postinjury was not different between younger and older children. Injury severity and a strong overall preinjury family functioning score, a high level of family cohesion, positive family relationships, and a low level of control were predictive of good child adaptative functioning, social competence and global functioning one-year postinjury. The study compares these findings with other researchers results in brain injury and functional limitation and chronic illnesses and functional limitation.

Rivara J.B., Jaffe K.M., Polissar N.L., Fay G.C., Martin K.M., Shurtleff H.A., Liao S. Family functioning and children's academic performance and behavior problems in the year following traumatic brain injury. Arch Phys Med Rehabil 75:369-379;1994.

This study examined the roles of preinjury family and child functioning and injury severity in predicting one-year outcomes and changes in academic performance and behavioral problems following childhood TBI. Families of 94 children (ages six to 15) with TBI (mild = 50, moderate = 25, severe = 19) were consecutively enrolled from emergency departments of two regional medical centers. Standardized measures of family and child functioning and interviewer ratings were completed within three weeks of injury (measuring preinjury status), at three months, and one-year. Mean ratings of preinjury child functioning were within normal range. Whereas injury severity was associated with substantial declines in academic functioning, there was no association of injury severity with change in behavior problems. Interview ratings showed declines at all severity levels, however. Poor academic and cognitive outcomes at one-year were associated with injury severity and, to a lesser degree, poor preinjury family and child functioning. In contrast, most of the variation in behavioral outcomes was explained by preinjury child or family factors. Preinjury functioning must be assessed and support services provided for optimal academic and behavioral outcomes following childhood TBI.

IIIA_3) TREATMENT IMPLICATIONS

Mooney G.F., Haas L.J. Effect of methylphenidate on brain injury-related anger. Arch Phys Med Rehabil 74:153-160;1993.

Anger and temper outbursts can be serious clinical problems after brain injury. This study used a randomized, pretest, posttest, placebo control group, single-blind design to evaluate the therapeutic usefulness of methylphenidate to control brain-injury-related anger. The 38 subjects in the study were young adult males who had sustained serious brain injuries and who were beyond the period of rapid, spontaneous recovery. The subjects were divided into two groups, one that received 30 mg of methylphenidate per day and the placebo control group. A comparison of the drug group with the placebo group before and at the end of the six-week treatment period on all the anger outcome measures analyzed simultaneously with multivariate analysis indicated a significant drug-by-time interaction effect, $F(4.33) = 5.29$, $p = .002$, demonstrating the therapeutic effect of methylphenidate on anger. The study found that drug responders could be predicted by pretreatment level of anger with a .09 probability of misclassification. Methylphenidate also significantly reduced impairment on all of the general psychopathology outcome measures ($F[3.31] = 5.42$, $p < .01$). The drug improved memory for those subjects in the treatment response group but did not result in changes on measures of attention, nor did it have an effect on a checklist of subjective side effects, suggesting that it has minimal or absent cognitive toxicity and is likely to be tolerated well by individuals with brain injuries.

Mittenberg W., Burton D.B. A survey of treatments for post-concussion syndrome. Brain Inj 8:429-437;1994.

A survey of the members of the National Academy of Neuropsychology and the International Neuropsychological Society was conducted on current treatment approaches for post-concussion syndrome. The interventions that were found useful most frequently included education about the effects of head injury, reassurance that the symptoms are part of the normal recovery process, and support in coping with reactions to the symptoms. Graded resumption of activity, antidepressant medication, and cognitive restructuring were also regarded as useful. The relationships between type of treatment, factors contributing to the syndrome, ratings of treatment effectiveness, and duration of treatment were discussed.

IIIB) SPINE CORD INJURY

IIIB_1) EFFECTS ON THE PATIENTS

Kennedy P., Lowe R., Grey N., Short E. Traumatic spinal cord injury and psychological impact: a cross-sectional analysis of coping strategies. Br J Clin Psychol 14 (Pt4):627-639;1995.

Many studies have suggested a relationship between coping strategies used to deal with stressors and levels of psychological well-being. To explore this further the current study examined such relationships in people who have sustained a spinal cord injury. Measures of psychological impact and coping strategies were taken from those in their sixth week post-injury (N = 41) and those between four and seven years post-injury (N = 30). The results were analyzed using stepwise multiple regression. This provided a number of models containing coping strategies that accounted for a certain proportion of the variance in each of the psychological impact variables. While the results help to identify specific coping strategies associated with better adjustment, they also highlight the need to adopt a longitudinal approach in the investigation of psychological responses to spinal cord injury.

Kennedy P., Gorsuch N., Marsh N. Childhood onset of spinal cord injury: self-esteem and self-perception. Br J Clin Psychol 34 (Pt 4):581-588;1995.

The effects of spinal cord injury in childhood upon later psychological adjustment were investigated by comparing a group of 86 people injured as children with a control group (matched for time since injury and level of injury) of people injured as adults. It was hypothesized that adolescence is a crucial period in psychological development and that the effect of spinal cord injury on body image, self-concept and social relationships during adolescence will have a long-term negative effect on psychological well-being. However, on overall measures of depression, self-esteem and self-perception, there were no significant differences between the experimental and control groups. Furthermore, there were no significant differences between paraplegics and tetraplegics, between men and women, or between those who were involved in a significant intimate relationship and those who were not. These findings support previous research which has suggested that organic variables, such as age at injury and level of injury, are not predictive of long-term psychological adjustment.

Tate D.G., Maynard F., Forchheimer M. Predictors of psychologic distress one-year after spinal cord injury. Am J Phys Med Rehabil 72:272-275;1993.

This study investigated predictors of psychologic distress at one-year after injury. The brief symptom inventory, a symptom checklist that provides an overall index of distress, was administered to 119 spinal cord-injured patients. All patients had diagnoses of recent, traumatic SCI and had been admitted for initial inpatient rehabilitation between 1985 and 1990. Results showed levels of psychologic distress to be significantly higher one-year after injury when compared with results obtained on admission and at discharge from the inpatient rehabilitation program. The prevalence rate for elevated distress after injury was 28%. Significant predictors of psychologic distress one-year after injury included level of distress at admission, neurologic completeness of SCI, type of rehabilitation insurance payor (catastrophic vs. noncatastrophic), occupational status before SCI and participation status in an inpatient independent living program. A multiple regression model with nine independent variables was specified that explained 63% of the variance in psychologic distress measured after injury.

Craig A.R., Hancock K., Chang E. The influence of spinal cord injury on coping styles and self-perceptions two-years after the injury. Aust N Z J Psychiatry 28:307-312;1994.

This study is a two-year follow-up of previous longitudinal research which investigated the effects of spinal cord injury (SCI) on perceptions of control, self-esteem and coping styles over the first year of SCI. Persons with SCI and a demographically matched able-bodied control group completed standardized questionnaires on four occasions over two-years. The instruments included the Locus of Control of Behavior Scale (LCB), Rosenberg's Self-Esteem Scale, and an adapted Mental adjustment to Cancer Scale (MAC), which measures coping styles, including fighting spirit, helplessness/hopelessness and fatalism. Results obtained in the first year were replicated in the two-year data, except for the LCB Scale. After one-year, the SCI group were found to perceive their life to be externally controlled, to be lower in self-esteem, and have more helpless/hopeless and fatalistic attitudes than the controls. There were no differences in self esteem and coping styles after two-years for the SCI group. However, locus of control fluctuated over the two-years, though there was a trend for the SCI group to be more externally focussed. There were no significant interactions between group and time. Implications for the adjustment of SCI persons are discussed.

Stensman R. Adjustment to traumatic spinal cord injury. A longitudinal study of self-reported quality of life. Paraplegia 32:416-422;1994.

In order to meet a long expressed need for a longitudinal study on personal adjustment to traumatic spinal cord injury, 17 consecutively treated persons with complete traumatic spinal cord injury were interviewed 0.5-five years after the injury on six occasions, with a total of 102 interviews. The variables studied were age at injury, social status, the cause of the accident, spinal level of injury and physical complications. The subjective quality of life (QOL) was reported on a 0-10 scale at all interviews and showed four patterns during the five-year period. Five subjects reported that they were coping very well, with an almost unchanged QOL after the injury. Six reported good coping after an initially low QOL in the first years. Two subjects reported an unstable QOL, and four persons reported a continually low QOL without improvement. Variables related to unsatisfactory coping were severe pain, age above 35-years at the time of trauma, and being blameless for the accident.

Thali A., Stern S., Rothenbuhler B., Kraan K. [The role of psychosocial factors in a chronic course after injuries of the lower spine]. Z Unfallchir Versicherungsmed 87:31-44;1994.

Clinical experience has often demonstrated the inadequate relationship between degree of injury and rehabilitation outcome. The aim of this study is to investigate the importance of different psychosocial factors in coping behavior after lower back injury. One hundred and ninety-four patients of three nationalities (Swiss, Italian, Yugoslavian) were examined, 70 in an acute and 124 in a chronic phase of injury. A semistructured interview, followed by a physical examination, was used to gather the needed information; a follow-up examination was done one-year afterwards. Factors shown to contribute to poor outcome were: reduced sense of well-being, pessimistic self-prognosis of outcome, poor job security, migration, social status, insufficient doctor-patient relationship, lack of social support and limitations in certain physical parameters. The most reliable predictor for poor outcome was the patients evaluation of job security. In addition to diagnosis of existing chronification, resumption of work for therapeutic purposes after thorough preparation of the patient and conclusion of cases within the shortest possible time with definitive settlement of insurance payments were proposed as concluding steps.

McColl M.A., Rosenthal C. A model of resource needs of aging spinal cord injured men. Paraplegia 32:261-270;1994.

It has always been understood that those who deal effectively with a disability call upon special resources that members of the able bodied population are not required to develop. However, the nature and relationship of these resources to aging outcomes is as yet only superficially understood. The present study provides further information and clarification about the resources needed for aging with a spinal cord injury. The sample consists of 70 individuals who have had a spinal cord injury for at least 15-years, and who are currently over the age of 45, and are therefore either anticipating or experiencing aging. Data from the sample were examined to produce a model of resources empirically associated with positive outcomes in aging. Emotional support was found to be positively related to the outcomes of life satisfaction, adjustment to disability and the absence of depressive symptomatology. Further, health concerns, financial security and instrumental support were also related to specific outcomes. These findings send a clear message to rehabilitation and community service providers to be watchful of survivors with limited social support, concerns about their health and an apparent lack of financial resources. The findings underline the need for better access to health services, and improved knowledge and attitudes of community health care providers working with older disabled individuals.

Yoshida K.K. Institutional impact on self concept among persons with spinal cord injury. Int J Rehabil Res 17:95-107;1994.

This article discusses how experiences during rehabilitation may influence self concept among individuals who have sustained a traumatic SCI. Specifically, experiences during rehabilitation may promote an 'inculcation' of the disabled self coupled with loss of the nondisabled self. These experiences are illustrated by personal accounts of individuals with SCI. These data indicate that aspects of the rehabilitation process may need to be restructured to provide better services for persons with disabilities.

Moore A.D., Bombardier C.H., Brown P.B., Patterson D.R. Coping and emotional attributions following spinal cord injury. Int J Rehabil Res 17:39-48;1994.

Ways of Coping Checklist-Revised protocols gathered from 35 persons with spinal cord injuries on admission to an inpatient rehabilitation unit were clustered analyzed using Ward's method. A two-cluster solution was produced reflecting patterns of coping similar to Lazarus and Folkman's (1984) emotion- and problem-focused dichotomy. These patterns of coping were validated against sets of demographic/medical and emotional adjustment/attribution variables gathered on discharge. Results showed that a group of subjects using emotion-focused coping styles reported greater ratings of depression. These subjects focused less on physical and therapy progress to promote positive feelings and focused more on thoughts about the accident. There was also a trend for physical setbacks to contribute to negative mood in these patients. This pattern was associated with having been readmitted to hospital. The clinical and research implications of the study are discussed.

This is a review article with 20 references.

Sparks S.M. Survivors: relationship between persons with cancer and spinal cord injury [editorial]. SCI Nurs 12: inside front cover;1995.

Wineman N.M., Durand E.J., Steiner R.P. A comparative analysis of coping behaviors in persons with multiple sclerosis or a spinal cord injury. Res Nurs Health 17:185-194;1994.

Coping behaviors in individuals with multiple sclerosis (MS) or an SCI were compared. Data were collected on 433 subjects with MS and 257 with SCI. Coping and illness uncertainty were measured by the Ways of Coping Checklist (revised) and the Mishel Uncertainty in Illness Scale. Results of the multivariate analysis of covariance indicated that there was no significant difference between the groups for the use of emotion-focused coping (EFC) or problem-focused coping (PFC). However, there was a significant difference in coping depending on illness uncertainty and the appraisal of life with a disability. Subjects used more EFC at high uncertainty and more PFC at no uncertainty compared to the other levels. When situations were appraised as dangerous, EFC was used more often, and when situations were appraised as an opportunity, PFC was used. The construct of vulnerability emerged as an important antecedent variable. When vulnerability was not included in the analysis, a spurious difference in EFC was found between the groups. Multiple regression results indicated that, for both groups, the choice of coping strategies had no significant effect in explaining emotional well-being while controlling for selected sociodemographic and disability-related variables.

Fukunishi I., Koyama I., Tobimatsu H. Psychological acceptance and alexithymia in spinal cord injury patients. Psychol Rep 76:475-481;1995.

We examined psychological acceptance and alexithymia in a sample of 45 patients with spinal cord injury. Approximately 86% of patients regarded their prognosis for spinal cord injury as favorable. Seven-years after the onset of injury, however, complete psychological acceptance of injury had not occurred in many patients. Patients who had achieved psychological acceptance tended to show alexithymia. These results suggest that patients may achieve psychological acceptance in the context of adapting to society by suppressing or denying their feelings and finally developing alexithymic features.

Quigley M.C. Impact of spinal cord injury on the life roles of women. Am J Occup Ther 49:780-786;1995.

This qualitative study was conducted to explore and describe the role experience of five women whose lives were disrupted by a traumatic spinal cord injury and who later returned to their communities after completing intensive rehabilitation programs. In-depth interviews and participant observations were used to examine the experiences of these women. The findings exemplify how the women's use of adaptation and negotiation and the development of a new role as self-advocate facilitated the reestablishment of their life roles. As the women's occupational roles were redefined, the processes of adaptation and negotiation were evident in three aspects of their lives: daily routines, relationships, and environment. Through their new role of self-advocate, architectural and attitudinal barriers were negotiated and adapted so that roles could be explored. These findings indicate that community reentry involves the ongoing process of negotiation and adaptation of life roles. The use of life histories during the rehabilitation phase is suggested as a way for therapists to develop meaningful treatment plans that stimulate patients' adaptation process and ultimately enhance community reentry.

Pentland W., McColl M.A., Rosenthal C. The effect of aging and duration of disability on long term health outcomes following spinal cord injury. Paraplegia 33:367-373;1995.

The purpose of the study was to discover the independent and combined effects of age and duration of injury on selected long term health outcomes of 83 SCI men (age range 21-79 years; duration of SCI three-52 years). Specifically, the study examined a multivariate model which specified that age, duration, the interaction of age and duration, and level of lesion were related to the following health outcomes: pain, fatigue, functional independence, mobility, illness and symptomatology, perceived overall health, social support, life satisfaction, and economic stability. Age had significant main effects on three outcomes. With increasing age, the sample experienced more fatigue, decreased activity (due to pain), and more overall satisfaction with their lives. Duration of SCI showed significant main effects on two outcomes. As subjects lived longer with their SCI, they felt less financially secure and experienced more symptoms and illnesses. Significant interaction effects of age and duration of SCI were found for two outcomes. Older age combined with longer duration of SCI amplified subjects' perceptions of financial insecurity, and threats to health. The findings send a clear message to service-providers and policy makers about the added vulnerability of older disabled individuals, about the need for extra vigilance in health care issues, and about the necessity of a social-economic safety net for already disadvantaged individuals.

Cooper L. Rehabilitation from the other side: a patient's perspective. Rehabil Nurs 19:96-103, discussion 103-104;1994.

Many rehabilitation nurses deal regularly with SCI patients, but rarely are those patients themselves nurses. This article offers a frank and realistic view of the rehabilitation process from the perspective of its author, a nurse who sustained a spinal cord injury in December 1977.

Although most of the paper is focused on the physical rehabilitation of this SCI it offers some insight of the frequency and magnitude of emotional swings that the patient underwent during the first eight-months postinjury.

Maness J.E. The impact of spinal cord injury on older adults' growth and development: a case study. Rehabil Nurs 20:29-31;1995.

In this case study, the author discusses how an SCI affected the achievement of developmental goals by a 73-year-old man for whom the usual coping mechanisms were not effective. Nurses on a neurosurgical unit, under the guidance of a rehabilitation nurse, learned how to incorporate considerations of the psychological aspects of the injury into the patient's plan of care. Strategies to intervene with growth and developmental issues had a positive impact on the patient's rate of progress in the rehabilitation setting.

McColl M.A., Lei H., Skinner H. Structural relationships between social support and coping. Soc Sci Med 41:395-407;1995.

Relationships between social support and coping were examined over a one-year period in a sample (n = 120) exposed to a specific stressor (i.e., a spinal cord injury). Two issues were evaluated: (1) patterns of social support and coping over time; and (2) the direction of the effects of coping on social support or vice versa. Subjects had incurred a spinal cord injury within the preceding year, completed their rehabilitation, and returned to the community. They were assessed at one, four and 12-months post-discharge to capture possible changes in patterns of social support and coping. Covariance structure modeling indicated a single-factor construct based on three measured subscales for social support (instrumental/informational/emotional), and for coping (problem-oriented/perception-oriented/emotion-oriented). While the factor structure of coping was invariant over time, the structure of social support changed from a high concentration of informational support at one-month to a higher saturation of emotional support at four and 12 months, potentially reflecting changes in the salience of different components of the network. The perceived availability of social support was seen to have direct effects on future coping. At one month, social support had a direct positive effect on coping at four months. However, at four-months social support had a negative effect on coping at 12-months, which may reflect a change in the structure of the social support construct itself. That is, as the factor structure of social support varied with time, coping may also have been influenced by differing perception of one's needs and circumstances. Thus, the study provides evidence for the dynamic effects of social support on coping, depending on one's stage in the process of long-term adjustment. The findings underscore the interplay between social support and coping, and the need for future research and practical applications to recognize temporal effects on the relationships between these two complex constructs.

Anson C.A., Stanwyck D.J., Krause J.S. Social support and health status in spinal cord injury. Paraplegia 31:632-638;1993.

In a mailed survey, 125 persons with SCI responded to questions on the SCI Quality of Life Index (QOLI), and the Reciprocal Social Support Scale. The results indicated that people with SCI who believe that they receive support from the community, compared to those who believed they received less support (1) perceived themselves to be better adjusted to their injury, and (2) had significantly fewer health problems (fewer spinal cysts, lower blood pressure, shorter recovery time from decubitus ulcers, less pain below the level of injury, and fewer hospital admissions). The results also showed that people who believe that they contribute to the community in some way, compared to those who believed they contributed little or nothing (1) perceived themselves to be better adjusted to their injury, and (2) had significantly fewer health problems (fewer urinary tract infections, fewer decubitus ulcers, less severe decubiti, less pain above the level of injury, and fewer hospital admissions). A community support score, a summary score of support given and received, was also related to adjustment and health.

Bozzacco V. Long-term psychosocial effects of spinal cord injury. Rehabil Nurs 18:82-87;1993.

SCI typically occurs in males during late adolescence or young adulthood. These individuals face the developmental challenges of adulthood with significant restrictions in mobility and position. The purposes of this study were to examine how spinal cord injured male experience these imitations and to identify how they fulfill adult developmental tasks/expectations. Interviews on this topic were conducted with a convenience sample of five SCI men between the ages of 30 and 45 who had been injured at least 10-years. The findings of this study indicated that the impairment of mobility and position that resulted from the SCI did have a significant impact upon the developmental tasks/expectations of adulthood. Mobility and position restrictions delayed and/or interfered with the establishment of close personal relationships and the development of a satisfying career. Information also was obtained about the process of coping with the paralysis of an SCI over time.

Hancock K., Craig A., Tennant C., Chang E.. The influence of spinal cord injury on coping styles and self-perceptions: a controlled study. Aust N Z J Psychiatry 27:450-456;1993.

Well-controlled research investigating psychological responses following SCI is lacking. In addition, much of the literature is based on depression following SCI and is dominated by data from the U.S. The effects of SCI on perceptions of control, self-esteem and coping styles over the first year of SCI were investigated. Forty-one acute spinal injured patients and 41 able-bodied controls matched for age, sex and education completed a variety of standardized questionnaires on three occasions over one-year. The instruments included the Locus of Control of Behavior Scale, Rosenberg's Self-Esteem Scale, and an adapted Mental Adjustment to Cancer (MAC) Scale which measures coping styles, including fighting spirit, helplessness/hopelessness and fatalism. The SCI group were found to be more external in their perceptions of control, lower in self-esteem, and more helpless/hopeless and fatalistic in attitude than the controls. The majority of the SCI group had scores reflecting adaptive coping styles and intact levels of self-esteem but there were still a substantial proportion who displayed maladaptive coping styles (e.g., external locus of control, fatalism, helplessness). No differences in scores across time were found for either group. Implications for psychological rehabilitation are discussed.

IIIB_2) EFFECTS ON PATIENTS & RELATIVES

Shaddinger D.E. An acute spinal cord injury: my family's story. J Neurosci Nurs 27:236-239;1995.

An acute SCI has been described as one of the most devastating traumatic types of neurological impairment. Twelve-years ago, I had the misfortune of experiencing this first hand. From the day of my brother's initial injury I began keeping a diary of what this experience was like. The concept of entitlement and indebtedness has been applied to my family's experience.

Lapham-Randlov N. How the family copes with spinal cord injury: a personal perspective. Rehabil Nurs 19:80-83;1994.

SCI is devastating both to the injured person and the person's family. Physical, social, emotional, and vocational implications have an impact on everyone in the family. Emergence from SCI is slow and painful, but it can also offer opportunities for personal growth and family coalescence.

A biographic review of the family problems, concerns and evolution after the father suffered a spine cord injury which left him paraplegic. It helps to understand some of the major adaptations that the family as a whole had to undertake to overcome the new situation.

Kreuter M., Sullivan M., Siosteen A. Sexual adjustment after spinal cord injury-comparison of partner experiences in pre- and postinjury relationships. Paraplegia 32:759-770;1994.

This study compared the emotional and sexual aspects of relationships before and after spinal cord injury, from the partner's point of view. In addition, the personality characteristics of the partners were investigated. Twenty-six relationships were established before the injury and 23 after. The couples in preinjury relationships had been married or cohabiting for 3.5-51 years (median 24-years), while postinjury relationships ranged from one to eight-years (median two-years). There were substantial differences in age between preinjury and postinjury partners, 21-79 years (median 51-years) and 18-45 years (median 28-years), respectively. Data collection included an 80-item questionnaire, designed to determine different aspects of sexuality, a visual analogue scale Quality of Life (VAS QL) measure and an established inventory of personality characteristics, the Karolinska Scales of Personality (KSP). Eighty-eight per cent of the partners in preinjury and 86% in postinjury relationships considered their overall relationship to be satisfactory. Concerning the sexual aspects of the relationships, several differences were revealed, all favoring postinjury relationships. Some of these held true even when age was treated as a significant factor and statistically controlled. Although the frequency of sexual activity and the variety of sexual expressions used were lower in the preinjury relationships, and perceived deterioration of sex life due to the injury was higher among preinjury partners, there was no significant difference between the two groups in satisfaction with current sex life. Thus, age seems to be a more important factor for sexual adjustment after a spinal cord injury, rather than whether the relationship is established before or after injury. The partners' personality characteristics differed only slightly from those of a sex and age matched reference group and not at all between partners in pre- and postinjury relationships.

White M.J., Rintala D.H., Hart K.A., Fuhrer M.J. Sexual activities, concerns and interests of women with spinal cord injury living in the community. Am J Phys Med Rehabil 72:372-378;1993.

A representative sample of 40 women selected from a community-based sampling frame of 661 men and women with SCI were studied for sexual activities, concerns and interests. Participants responded to a questionnaire and rating scales and were physically examined to establish their neurologic status. With respect to 11 other areas of life, sex life ranked tenth in importance and tenth in satisfaction. In the sample, 65% reported having had a physical relationship (not necessarily including intercourse) in the past 12 months. Areas of greatest concern were problems associated with urinary and bowel accidents and not satisfying a partner. Regarding topics of interest related to sexual activity, highest priorities were assigned to coping emotionally with changes in sexual functioning and helping a partner cope emotionally with limitations on sexual activity. Compared with a previously studied group of men with spinal cord injury, the women in the sample exhibited distinctive needs that were not being addressed sufficiently by rehabilitation professionals.

Sherrard I. Love and duty: issue of concern for nurses when newly physically disabled persons are discharged into the care of families. Nurs Prax N Z 10:29-34;1995.

Richmond (1990, P.65) writes SCI occurs not just to the individual but to the entire family. There exists during crisis the potential for growth for individual family members and the entire family system. This article is written from both personal experience and professional interest because little appears to be written in the nursing literature about the family adjustment following discharge from hospital of a person who has a permanent disability following damage to the spinal cord.

This is a review article with 11 references.

IIIB_3) TREATMENT IMPLICATIONS

Dollfus P. Rehabilitation following injury to the spinal cord. J Emerg Med 11 Suppl 1:57-61;1993.

There are several key aspects in the rehabilitation of patients with traumatic spinal cord injury, including the delivery of lifelong resources and services. Rehabilitation must commence as early as possible after the injury and encompass secondary and tertiary prevention efforts in order to minimize the personal and social consequences associated with neurotrauma. Recent advances in molecular neurobiology and new information gained from randomized clinical trials may help reduce the consequences of this type of injury. These advances need to be extended and research must be encouraged.

This is a review article with 25 references.

IIIC) BURNS

IIIC_1) EFFECTS ON THE PATIENTS

Meyer W.J. 3rd, Blakeney P.E., Holzer C.E., Moore P., Murphy L., Robson M.C., Herndon D.N. Inconsistencies in psychosocial assessment of children after severe burns. J Burn Care Rehabil 16:559-568; discussion 557-558;1995.

Health care providers usually except children with severe burns to have psychosocial problems due to the severity of the injuries and resulting deformities. To test the validity of that expectation, 72 children (43 boys, 29 girls) who had suffered severe burns were assessed at least one-year after burn injury for behavior problems and competence, by use of the 1991 Achenbach questionnaires: Child Behavior Checklist (CBCL), Youth Self-Report, and Teacher Report Form. The scores on each questionnaire then were compared by use of paired t tests. Also, the scores of the patient population were compared with those of the nonreferred reference populations provided by Achenbach. Compared with the Teacher Report Form and Youth Self-Report, the CBCL revealed a statistically significant ($p < 0.05$) greater number of behavior problems and lower level of competence for all age groups and both sexes. Item analysis revealed in most instances excess endorsement of specific items on all scales for the patient population compared with their respective reference populations, but more items were endorsed on the CBCL. These results could be explained by increased parental sensitivity to problem behavior or decreased competence of their children after severe burns. Further studies are needed to understand the discrepancies between the CBCL and the other scales.

Blalock S.J., Bunker B.J., DeVellis R.F. Psychological distress among survivors of burn injury: the role of outcome expectations and perceptions of importance. J Burn Care Rehabil 15:421-427;1994.

This study examined factors associated with psychologic distress among survivors of burn injury. The study tested hypotheses derived from Scheier and Carver's model of behavioral self-regulation and focused on two primary predictor variables: expectations concerning rehabilitative outcomes and the importance attached to those outcomes. The study used a cross-sectional research design. Two hundred sixteen people who had sustained major or moderate thermal burn injuries within two-years of study entry served as subjects. Data were collected via mailed questionnaire and chart review. Consistent with study hypotheses, we found that participants who had low expectations for further improvement but who attached high importance to the need for improvement exhibited the most psychologic distress. Study findings lend support to Scheier and Carver's model and suggest that application of this model within the context of burn rehabilitation may increase our understanding of the rehabilitation process. Directions for future theory-based research are discussed.

Molter N.C. When is the burn injury healed?: psychosocial implications of care. AACN Clin Issues Crit Care Nurs 4:424-432;1993.

The psychosocial and economic effects of burn trauma are profound, not only for the patients, their families, and the burn unit staff members, but also for society as a whole. Understanding the perception of stresses experienced by patients, families, and staff is discussed, and related strategies to assist in reducing the stress are presented. A comprehensive psychosocial support system can assist the nurse in reducing the psychosocial morbidity of severe burn trauma.

Blakeney P., Meyer W., Moore P., Murphy L., Broemeling L., Robson M., Herndon D. Psychosocial sequelae of pediatric burns involving 80% or greater total body surface area. J Burn Care Rehabil 14:684-689;1993.

Important questions for pediatric burn care specialists relate to the quality of life for those children who survive the most severe burn injuries. This study examines the psychological adjustment of 25 children who survived injuries > or = 80% total body surface area and the impact of such injury on the families. Data were analyzed from the most recent assessment, with the Child Behavior Checklist, Teacher Report Form, Piers-Harris Children's Self-Concept Scale, Parenting Stress Index, and a parental questionnaire designed by the authors. As a group, the children's behavioral problems as reported by both parents and teachers were within normal limits. Measures of parental stress, however, clearly differentiated the burn population. These parents attributed more stress to characteristics of their children. Children with > or = 80% TBSA burns develop positive feelings about themselves and appear no more troubled than a comparable group of nonburned children. The impact on the families is significant, however, and must be considered of consequence in the rehabilitation of the burned child.

Moore P., Blakeney P., Broemeling L., Portman S., Herndon D.N., Robson M. Psychologic adjustment after childhood burn injuries as predicted by personality traits [see comments]. Comment in: J Burn Care Rehabil 14:58-64;1993. J Burn Care Rehabil 14:80-82;1993.

The purpose of this study was to examine the nature of psychologic adjustment in persons who have survived childhood burn injuries. It was hypothesized that survivors who were well-adjusted psychologically would possess specific personality traits that would differentiate them from their poorly adjusted peers. Thirty-two subjects were given a standardized assessment of psychologic adjustment and a standardized personality inventory. The subjects were assigned to either a poorly adjusted group or a well-adjusted group, on the basis of each subject's score on a standardized measure of adjustment. There were no significant differences between the two groups in variables of gender, age, time since burn, or age at time of burn injury. The results indicate three personality traits that seem to be related to psychologic adjustment after a severe burn injury in pediatric patients.

Gilboa D., Friedman M., Tsur H. The burn as a continuous traumatic stress: implications for emotional treatment during hospitalization. J Burn Care Rehabil 15:86-91; discussion 91-94;1994.

Relating to the patient with burns as being posttraumatic calls for specific guidelines in emotional therapy. But it seems that burn injury differs from other posttraumatic situations in that it confronts the patient with a much more complex situation, including not only the actual burn experience but also the ensuing difficult period of hospitalization and the subsequent renewed encounter with the social environment. That is why we see the patient with burns as suffering from a Continuous Traumatic Stress Disorder rather than from a Posttraumatic Stress Disorder. Although both disorders confront the patient with the same symptoms and with the experience of shattering the stimulus barrier and that of the basic assumptions, like the concept of self, invulnerability, and the world, they still differ in duration of the trauma. This calls for dos and don'ts as treatment principles at the time of the hospitalization, which help the patient's ability in coping with the continuous trauma.

Holaday M., Whittenberg T. Rorschach responding in children and adolescents who have been severely burned. J Pers Assess 62:269-279;1994.

Psychological consequences of surviving thermal injury in children and adolescents were examined through their Rorschach responding. Participants were 98 reconstructive patients aged six through 21 from Shriner's Burns Institute in Galveston, Texas. Percentages of patients with positive clinical indices were: 49%, Coping Deficit Index; 26%, Depression Index; and 23%, Schizophrenic Index. These results were interpreted as learned helplessness, depressive feelings, and inner struggle to master trauma. Other findings indicate poor perceptual accuracy (X + %), disturbed interpersonal relationships (T), low self-esteem (3r + 2/R), and increased anxiety (m). When the group was divided by high and low lambda, age, and time in years from burn, significant differences were revealed. There were no significant differences between groups when the sample was divided by facial scarring, gender, or severity of burn. This sample of young patients gave Rorschach responses that were similar to those given by other groups of traumatized youngsters.

IIIC_2) EFFECTS ON PATIENTS & RELATIVES

Blakeney P., Moore P., Broemeling L., Hunt R., Herndon D.N., Robson M. Parental stress as a cause and effect of pediatric burn injury [see comments]. Comment in: J Burn Care Rehabil 14:58-64;1993. J Burn Care Rehabil 14:73-79;1993.

The current study reports assessments of stress for parents of children with acute burns at the time of hospital admission and during the first five-years after injury. At each assessment, parents of children with burns report neither more nor less stress than a normal population. At the time of admission, parents of children with acute burns do not differ from the normal sample on any of the measures of parenting stress. Parents of recovering children with burns do report significant changes. They report significantly higher depressive symptoms at year two after the child's burn injury and lower than normal levels of depression in years four and five after the child's injury. During the recovery period, these parents also attribute their stress more often to the child with burns, whereas other parents more evenly divide blame among their children and their personal characteristics.

Verity P.A. Burn injuries in children. The emotional and psychological effects on child and family. Aust Fam Physician 24:176-178, 180-181;1995.

Attention to the total care of the patient and family is needed to promote emotional as well as physical healing. This paper looks at the grief process as experienced by the parents of a burn injured child. Mention is made of non-accidental injuries, accident prevention and the rehabilitation stage of a burn injury. Emphasis is on scalds to toddlers between the ages of one to two-years.

IIIC_3) TREATMENT IMPLICATIONS

Bishop B., Gilinsky V.. School reentry for the patient with burn injuries: video and/or on-site intervention. J Burn Care Rehabil 16:455-457;1995.

The student who has sustained a burn injury, the school's personnel, and the student's peer groups benefit from a school reentry program. Concrete, factual information about the burn injury assists to open lines of communication between the returning student and peers. Also, the concerns and expectations of school personnel are addressed.

Abdullah A., Blakeney P., Hunt R., Broemeling L., Phillips L., Herndon D.N., Robson M.C. Visible scars and self-esteem in pediatric patients with burns. J Burn Care Rehabil 15:164-168;1994.

The supposition is often made that visible scarring is more psychologically damaging than are hidden burn scars, but little evidence exists to support that idea. We compared the self-evaluations of 28 male and 21 female pediatric patients with burns to the amount and visibility of scars. Males were six to 18-years old at the time of burn and sustained 15% to 99% total body surface area burns. They were evaluated one to six-years after their burn injury. Females constituted a similar group. They were five to 18-years old at the time of burn, sustained 15% to 94% total body surface area burns, and were evaluated one to seven-years after their burn injury. All of the children underwent evaluation with the Piers-Harris Children's Concept Scale, evaluating themselves on intellectual and school status, physical appearance, anxiety, happiness and satisfaction, and behavior and popularity. Scores from these parameters were compared against each child's visible scars as seen on the face, head, neck, and hands. Also, comparisons were made with the numbers of reconstructive needs in these areas. Significant inverse correlations were found in the males. As the number of scars increased in these areas, the patient's scores for physical appearance and happiness and satisfaction decreased ($p < 0.001$). Other psychologic parameters were not affected. There was no effect by age of patient, and no significant correlations were found for the female group. The results emphasize the importance of the burn team's awareness that pediatric survivors of burns may appear superficially to be adjusting well, while harboring grave self-deprecating feelings. Those with visible scars will need special support to enhance self-esteem.

IIID) LOW BACK INJURIES

IIID_1) EFFECTS ON THE PATIENTS

Vlaeyen J.W., Kole-Snijders A.M., Boeren R.G., van Eek H. Fear of movement/(re)injury in chronic low back pain and its relation to behavioral performance. Pain 62:363-372;1995.

Two studies are presented that investigated 'fear of movement/(re)injury' in chronic musculoskeletal pain and its relation to behavioral performance. The first study examines the relation among fear of movement/(re)injury (as measured with the Dutch version of the Tampa Scale for Kinesiophobia (TSK-DV)) (Kori et al, 1990), biographical variables (age, pain duration, gender, use of supportive equipment, compensation status), pain-related variables (pain intensity, pain cognition, pain coping) and affective distress (fear and depression) in a group of 103 chronic low back pain (CLBP) patients. In the second study, motor, psychophysiologic and self-report measures of fear are taken from 33 CLBP patients who are exposed to a single and relatively simple movement. Generally, findings demonstrated that the fear of movement/(re)injury is related to gender and compensation status, and more closely to measures of catastrophizing and depression, but in a much lesser degree to pain coping and pain intensity. Furthermore, subjects who report a high degree of fear of movement/(re)injury show more fear and escape/avoidance when exposed to a simple movement. The discussion focuses on the clinical relevance of the construct of fear of movement/(re)injury and research questions that remain to be answered.

Bowman J.M. Experiencing the chronic pain phenomenon: a study. Rehabil Nurs 19:91-95;1994.

The purpose of the study described in this article was to examine the experience of chronic pain. Using a phenomenological approach, 15 individuals who were being evaluated for admission to, or were being treated in, a pain management center were interviewed and asked to describe their life with chronic low back pain. Data were gathered from the subjects in interviews and then analyzed. The phrase experiencing the chronic pain phenomenon describes a process that individuals with chronic low back pain undergo, starting with the initial injury. They must deal with the uncertainty of the cause of pain; eventually, some recognize the inevitable nature of the pain. The findings indicate that chronic low back pain is a multidimensional problem that can affect every aspect of an individual's life.

IIIE) WHIPLASH INJURIES

IIIE_1) EFFECTS ON THE PATIENTS

Di Stefano G., Radanov B.P. Course of attention and memory after common whiplash: a two-years prospective study with age, education and gender pair-matched patients. Acta Neurol Scand 91:346-352;1995.

Attentional functioning and memory of common whiplash patients were evaluated during the first two-years after experiencing injury. The study was based on a non-selected sample of 117 whiplash patients referred from primary care and recruited according to a strict injury definition. All patients had a similar socioeconomic background, all being injured in automobile crashes and fully covered by insurance plans. Two-years following initial trauma, 21 patients remained symptomatic. For each of these 21 patients, a counterpart matched by age, educational attainment and gender was selected from the group of patients who had fully recovered during the follow-up period. Symptomatic patients and matched controls were compared with regard to baseline, six-months and two-years findings. Examinations included testing of different aspects of attention (i.e., Digit Span, Corsi Block-Tapping Test, Trail Making Test, Number Connection Test, Paced Auditory Serial Addition Task) and memory functioning (California Verbal Learning Test). Cognitive functioning was assessed in conjunction with self-ratings of cognitive abilities (Cognitive Failures Questionnaire), well-being (Well-being Scale), headache and neck pain intensity, utilized medication and subjective complaints. Results show no impairment of memory in symptomatic patients. In attentional functioning, different levels of improvement were found for symptomatic patients and matched counterparts, with the former showing difficulty at follow-up with tasks of divided attention. Utilized medication and pain intensity could not explain this difference in recovery of attentional functioning between the groups.

These findings suggest problems in selective aspects of attentional functioning after common whiplash, which under real life circumstances may explain these patients' cognitive complaints and cause adaptational problems in daily life.

IV) POST TRAUMATIC STRESS DISORDER

Bryant R.A. Predictors of post-traumatic stress disorder following burns injury. Burns 22:89-92;1996.

Burns patients were assessed 12-months following their injury to determine the factors that predict development of post-traumatic stress disorder (PTSD). Among 35 patients, 31% suffered PTSD, 29% suffered subclinical PTSD reactions and 40% displayed no PTSD symptoms. Concern over scarring and an avoidant coping style accounted for 61% of the variance in post-traumatic stress symptomatology. Only half of the patients reporting PTSD had sought professional assistance. The results indicate that postinjury adjustment factors are critical determinants of PTSD development following burns. Implications for therapeutic interventions are discussed.

V) SCALES TO MEASURE INJURY PSYCHOLOGICAL/PSYCHOSOCIAL CONSEQUENCES

VA) GENERIC INJURIES

Wineman N.M., Durand E.J., McCulloch B.J. Examination of the factor structure of the ways of Coping questionnaire with clinical populations. Nurs Res 43:268-273;1994.

The purpose of this study was to examine the construct validity of the Ways of Coping Questionnaire in a clinical population. The questionnaire, designed to measure coping behaviors in a community-residing well population, contained eight empirically constructed factors. Confirmatory factor analysis with LISREL was used to validate this original eight-factor model with 655 community-residing adults with multiple sclerosis or a spinal cord injury. The hypothesized model was not a good fit to the data. Subsequent analyses, using both exploratory and confirmatory factor analysis procedures, identified three different coping factors: Cognitive Reframing, Emotional Respite, and Direct Assistance. These factors appeared to have greater applicability to people with chronic conditions. The kinds of coping behaviors used to manage stressful situations by individuals who are well may be quite different from those used by community-residing populations with long-term chronic conditions.

Schaefer A., Neugebauer E., Bouillon B., Tiling T., Troidl H. [Instruments for measuring the quality of life of severely injured patients]. Unfallchirurg 97:223-229;1994.

Trauma can be defined as either a somatic injury or a psychological reaction in the person affected. The emotional disturbances and psychosocial problems of trauma patients in particular, though still measurable a year or even longer after the event, have rarely been taken into account in surgical studies. Quality of life is a relevant endpoint in multiple trauma patients, insofar as rehabilitation seems to be complicated by non-efficient psychological coping. With reference to the prerequisites for a scientifically sound measuring method four instruments are described that seem to be suitable for measuring quality of life in multiple trauma patients. In addition, practical advice is given for the design of longitudinal studies focused on quality of life in trauma patients.

This is a review article with 44 references.

Kopjar B. The SF-36 health survey: a valid measure of changes in health status after injury. Injury Prevention 2:135-139; 1996.

The aim of this study is to evaluate the criterion validity and responsiveness to changes over time of the Medical Outcome Study Short-Form 26 (MOS SF-36) measures. A consecutive sample of 775 patients 16 to 78-years treated for an unintentional injury at the hospital or emergency clinic in Drammen, Norway, was selected for the study. Data about activity restrictions and health status measured by SF-36 were obtained by a postal questionnaire six-10 weeks after the injury. A follow up survey was sent 24-28 weeks later to all who reported activity restrictions at the time of the first survey. Fifty-two of these replied (63%). Four hundred and sixty nine patients responded to the survey questionnaire and of these, 82 experienced some restriction of activity. These scored lower ($p<.01$) on all eight SF-36 health dimensions (physical functioning, social functioning, role limitation (physical), role limitation (emotional), bodily pain, mental health, vitality, and general health) than the 387 patients without activity restriction. Scores on physical functioning, social functioning, role limitation (physical), bodily pain, and vitality significant improved ($p<.01$) among the 52 patients who were followed up. Scores on the dimensions, however, showed no significant changes over time. The MOS SF-36 appears to be a valid instrument, responsive to changes in health status over time among unintentionally injured adult people. Thus it may be possible to use SF-36 to describe changes in health due to injury. The applicability of this or similar measures for injured children remains to be established.

Holbrook T.L., Hoyt D.B., Anderson J.P., Hollingsworth-Fridlund P., Shackford S.R. Functional limitation after major trauma: a more sensitive assessment using the quality of well-being scale--the trauma recovery pilot project. J Trauma 36:74-8;1994.

Little is known about the degree of disability and quality of life of patients after major trauma. We conducted a prospective study to examine the incidence and predictors of functional limitation (FL). Between January 1, 1990 and March 30, 1990, 61 eligible trauma patients were enrolled in the study (admission GCS score > or = 12, LOS > 24 hours). Functional limitation after trauma was measured at discharge and three-months after discharge using the Quality of Well-being (QWB) scale, a more sensitive index to the well end of the functioning continuum (range, 0 = death to 1.000 = optimum functioning). Functional limitation was also measured using a standard ADL ale (range, 17 = full function to 41 = maximum dysfunction). Risk factors measured were injury severity, body region, depression (CES-D) scale, and social support. Follow-up was achieved in 42 patients (70%). The mean age was 30-years, 74% were male, 52% white, 41% hispanic, and 3% other. The mean ISS was 15, with 69% blunt injuries and a mean LOS of 12 days. The QWB scores improved between discharge and follow-up; discharge mean = 0.457 (+/- 0.048), follow-up mean = 0.613 (+/- 0.118), but the mean QWB score at follow-up still reflected a significant degree of functional limitation. The mean percentage of change in QWB scores was 34.5% (+/- 25.5%) with a range of -6.34% to 103.8%. The discharge mean FDS was 29 (+/-6.2) while the follow-up FDS mean was 17 (+/- 3.8), reflecting that most patients at follow-up reported near-perfect ADL functioning. Injury severity, body region, and social support were not associated with FL. Depression was significantly associated with FL; discharge rate =81% and follow-up rate = 43%. The relative risk for depression for the lowest versus highest tertile of QWB% change was 1.9 ($p<.05$). Functional limitation as assessed by the QWB was much greater at follow-up. The ADL scale did not adequately measure FL; the follow-up mean was close to full ADL function. The high incidence of posttrauma depression may be an important predictor of FL.

This is a short-term follow-up study (three-months post discharge) of a small sample (n=42) of injured individuals. Activity Daily Living, Quality of Well-Being, Functional Disability Score, depression, and socio-demographic factors (age, gender, education, social support) of patients were recorded both at discharge and three-months later. Quality of Well-Being scores were the most sensitive to changes over time; and although there was an improvement between discharge and follow-up, a significant number of patients still had some functional limitations three months postinjury. Only the predischarge depression score was significantly predictive of outcome (even when adjusting for all other factors).

VB) INJURY SPECIFIC

VB_1) BRAIN INJURY

Clifton G.L., Levin H.S., Michel M.E. Outcome Measures for Clinical Trials Involving Traumatically Brain-Injured Patients: Report of a Conference. Neurosurgery 31:975-978;1992.

A conference was held in Houston, TX, on October 8-9, 1991, to develop recommendations for outcome measures for clinical trials in TBI. Participants, all experts in this area, discussed and agreed on treatments for patients with severe brain injury (GCS ≤ 8) and moderate brain injury (GCS 9-12). A parallel trial design was recommended rather than a factorial, sequential or crossover design. It was agreed that stratifying randomization based on motor score alone or on a combination of motor score and age would result in increased power. Acute stage measurements, such as cerebral blood flow, cerebrospinal fluid biochemistry, and evoked potentials, were recommended only when they satisfied a specific hypothesis. Functional outcome measures were recommended as the primary outcome measure for severe brain injury (GCS 3-8). Either Glasgow Outcome Scale or Disability Rating Scale, measured at six months after injury, were recommended as the primary outcome measure for severe brain injury (GCS ≤ 8). For patients with moderately severe brain injury (GCS 9-12) the Disability Rating Scale at three-months after injury was recommended as the primary outcome measure. The Neurobehavioral Rating Scale appears to be a satisfactory instrument for measuring behavioral changes. Specific neuropsychological measures were recommended as supplementary outcome measures for both severe and moderate brain injury, consistent with a 1.5-hour period available for testing.

A panel of experts developed recommendations for outcome measures for clinical trials in TBI. Among their conclusions, they insisted in the use of:
- Functional Outcome Measures in severely brain-injured patients (GCS 3-8) with the use of GCS and the Disability Rating Scale six months post-injury.
- Functional Outcome Measures in severely brain-injured patients (GCS 9-12) with the use of the Disability Rating Scale three months post-injury.
- Neurobehavioral Rating Scale.
- Neuropsychosocial (five different tests according to the domain affected).

Kay T., Cavallo M.M., Ezrachi O., Vavagiakis P. The head injury family interview: a clinical and research tool. J Head Trauma Rehabil 10:12-31;1995.

This article described the Head Injury Family Interview (HI-FI), a five-part structured interview designed to gather clinical and research data on persons with head injury and their family members. The HI-FI was developed over a 10-year period at the Research and Training Center on Head Injury and Stroke of New York University Medical Center to track outcomes of persons recovering from TBI, with input from both the injured person and significant others, and to document the impact of the injury on the family system. The structure, contents, rationale and development of the interviews are described, as well as its clinical utility and research potential. In addition, the statistical properties of one particular instrument within the interview, the Problem Checklist, are detailed and data presented form a multi-center study.

This paper describes the development and characteristics of a scale designed to track outcomes of persons recovering from TBI (with the input of the injured person and their significant others) to document the impact of injury on the injured and the family system. It is a long instrument (1.5-2 hours) that collects information on multiple aspects with some sections completed by the injured patient ("interview for the person with head injury"), the significant other(s) ("Significant other interview" and "Impact of the family interview") and both ("Demographic and preinjury form" and "Follow-up interviews").

Rappaport M., Hall K.M., Hopkins L., Belleza T., Cope D.N. Disability rating scale for severe head trauma: coma to community. Arch Phys Med Rehabil 63:118-123;1982.

The objective of this study was to develop one instrument for assessing quantitatively the disability of severe head trauma patients so their rehabilitative progress could be followed from coma through different levels of awareness and functioning to their return to the community. This disability rating (DR) instrument was designed to be easily learned, quickly completed, valid, predictive of outcome and to have a high inter-rater reliability. The DR Scale consists of eight items, divided into four categories: 1. Arousal and awareness; 2. Cognitive ability to handle self care functions; 3. Physical dependence upon others; 4. Psychosocial adaptability for work, housework, or school. Completed independently by several raters for more than 88 serious head injuries patients, inter-rater correlations were highly significant. The admission DR was significantly related to clinical outcome at one-year after injury and as significantly related to electrophysiologic measures of brain dysfunction as reflected in degree of abnormality of evoked brain potential patterns. The DR Scale is more sensitive than the Glasgow Outcome Scale in detecting and measuring clinical changes in individuals who have sustained severe head trauma. Also it can be used to help identify patients most likely to benefit from intensive rehabilitation care within a hospital setting. It provides a shorthand global description of head injury patient's condition that facilitates understanding and communication.

The eight-item scale reflects changes in levels of: arousal and awareness, cognitive ability to deal with problems of feeding, toiletting and grooming, degree of physical dependence on other, and psychosocial adaptability (defined as the ability to do useful work as independently possible in a socially relevant context). The values range from 0 (no limitation) to 30 (extreme vegetative scale). The scale was built to be easy to learn and quick to complete, lead to a high inter-rater reliability and to be valid.

Willer B., Ottenbacher K.J., Coad M.L. The community integration questionnaire. A comparative examination. Am J Phys Med Rehabil 73:103-111;1994.

The community integration questionnaire (CIQ) was designed to assess home integration, social integration and productive activity in persons with acquired brain injury. The instrument consists of 15 items and can be completed by self report or with the assistance of a family member or care giver familiar with the person's health status and social activities. Previous research has demonstrated adequate test-retest reliability and internal consistency. This study was designed to examine further, the psychometric characteristics of the CIQ and begin the process of establishing the instrument's validity. The CIQ was administered to 341 persons with TBI and 210 persons without TBI or any other apparent disabilities. The results indicate that the total scores are normally distributed for both persons with and without TBI. A statistically significant difference ($P < 0.01$) was found between subjects with TBI and those without TBI for all three subscales of the CIQ and for total scores. Data analysis also revealed that the total CIQ scores statistically differentiated among subjects with TBI living in three different settings: (1) living independently; (2) living in a supported community situation and (3) living in an institution. Intercorrelations among the three subscales (home, social and productivity) demonstrated that the CIQ provides unique information in the assessment of community integration for persons with TBI. Areas of future research necessary to expand the research and program evaluation usefulness of the CIQ are identified.

VB_2) ORAL AND FACIAL INJURIES

Sheperd J.P. Strategies for the study of long term sequelae of oral and facial injuries, based on anatomical, functional, social and psychological assessment. J Oral & Maxillofacial surgery [mimeo];1991.

Comprehensive review of all scales available to assess oral and facial injuries' consequences. It provides some generic references about social/psychological injury consequences and the scales to measure them that may be helpful to explore. Provides copies of the following scales: Perceived Stressfulness of Trauma, General Health Questionnaire (GHQ-28), Impact of Event Scale, Traumatic Index Scale, Criteria for Post-Traumatic Stress Disorder, Post-Traumatic Symptom Scale, Late Effect of Injury Scale, Inventory Questionnaire for Trauma, Agency Effectiveness Scale.