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Psychological Effects of Severe Burn Injuries

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Severe burn injuries provide researchers with an opportunity to study the effects of painful but usually transient trauma on psychological functioning. To that end, this article presents a review of the 3 main areas of this body of literature: (a) premorbid characteristics of people who sustain severe burn injuries, (b) psychological reactions during hospitalization, and (c) long-term adjustment. The general implications of these studies are discussed and then used to illuminate the circumstances under which individuals suffer the most from this type of trauma, the effects of such injuries on personality function, and how meaningful units of measurements can be defined. Potential clinical applications are also described.

Since antiquity, burn injuries have been a major source of human trauma. Burn care through the centuries has run the gamut from primitive herbal medicines to sophisticated modern-day medical and surgical treatment. The psychological impact of this type of injury, however, has received attention in the literature only in the last few decades.

There are several reasons why the psychological effects of severe burn injuries warrant empirical attention. The effects of burn injuries are multifaceted in that they can cause extreme anxiety, pain, and disfigurement in victims. Treatment often involves prolonged hospitalization and technologically complex medical care. Furthermore, whereas many forms of trauma and illness are restricted to certain demographic groups, severe burn injuries and their effects may be experienced by all of the general population.

Another interesting aspect of burn injuries is that, in most cases, they have an initially severe impact on victims, often without producing many long-term effects. Thus, studying this form of trauma offers the opportunity to observe how people respond to a threatening and abnormal, but transient, life event.

In some cases burn injuries do result in drastic cosmetic or physical disfigurement. Such effects are indeed chronic and motivate the study of how such injuries influence the survivor's long-term adjustment and personality development. In short, investigating how people respond when they are severely burned presents the opportunity to study an array of psychological phenomena, including acute pain control, reactions to hospitalization and medical procedures, posttraumatic stress disorder (PTSD), and the influence of unusual life events on general adjustment.

Treatment, Demographics, and Epidemiology

Current burn care involves the use of topical antibacterial agents (Lee, Marvin, Heimbach, & Grube, 1988; MacMillan, 1982; Strock et al., 1990), skin substitutes (Bell, Ehrlich, Buttle, & Nakatsuji, 1981; Sakabu, Hansbrough, Cooper, & Greenleaf, 1990), early excision, and grafting (Burke, Quinby, & Bondoc, 1976; Engrav, Heimbach, Reus, Harnar, & Marvin, 1983; Tompkins et al., 1986). These treatments allow the wound to heal, or close the wound early, as in the case of deep-partial and full-thickness injuries. In addition, for the patient suffering from a severe burn injury or further complications such as smoke inhalation or other significant trauma, it has also become commonplace to provide sophisticated cardiovascular and respiratory support (Grube, Marvin, & Heimbach, 1988; Heimbach, 1983; Moylan, Mason, & Rogers, 1973), nutritional therapy (V. M. Peterson, Hansbrough, Wang, Zapata-Sirvent, & Boswick, 1985; Warden, Ninnemann, Stratta & Saffle, 1984), and fluid resuscitation (Baxter, 1974; Demling, 1983a; Monafo, Halverson, & Schechtman, 1984). These procedures have greatly decreased the mortality and morbidity of patients who have sustained burn injuries (Demling, 1983b; Peck & Heimbach, 1989; Thompson, Herndon, & Abson, 1986).

The incidence of burn injuries in the United States is difficult to estimate. Figures reported by Frank, Berry, Wachtel, and Johnson (1987) and applied to the current United States population suggest 731,000 emergency room visits and 60,900 hospital admissions annually for burn trauma. Burn injuries reportedly accounted for 2.4% of emergency room visits; 45% of such trauma reportedly occurred at home and 37% at work (Chatterjee, Barancik, Fratianne, Waltz, & Fife, 1986). In a similar study, 60% of all burn injuries occurred at work and 19% were work related (Palumbo & Budin, 1990). Young men with less

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education and lower incomes tended to be burned more often than others in the general population (Darko, Wachtel, Ward, & Frank, 1986a).

The sophistication and quality of burn care have improved dramatically over the past few decades (Currerie, Braun, & Shires, 1980; Jay, Bartlett, & Danet, 1977). A review of 37,442 burn injury case reports collected between 1965 and 1979 from 120 burn-care facilities found that survival rates consistently improved over time for every age group (Feller, Tholen, & Cornell, 1980).

The trend toward decreased morbidity has several implications for psychological research. First, because the early emphasis in burn care was survivability rather than psychological outcome, most of the literature on the adjustment of burn patients is restricted to studies undertaken within the past 3 decades. Second, it has only been since this relatively recent improvement in survivability that medical professionals have been able to focus more on psychological concerns such as the cosmetic outcome of surgeries. Consequently, the psychological picture medical professionals have today of a person burned is likely to be quite different from that of 40 years ago.

The literature we reviewed on the psychological impact of burn injuries in adults can generally be divided into three categories. One group of studies examined premorbid psychopathology in patients who sustained severe burn injuries. A second group focused on patients' psychological reactions during hospitalization. The third area of study examined the patients long-term adjustment after hospital discharge. Because the adjustment of children who have been burned is a specialty area deserving a separate review (see Tarnowski, Rasnake, Gavaghan-Jones, & Smith, 1991), the current discussion focuses primarily on adults.

Premorbid Psychopathology in Adult Burn Patients

Because it has been suspected that a proportion of people who sustain burns severe enough to be hospitalized are likely to have some type of preexisting dysfunction in their lives, several studies have been conducted to identify the incidence and type of premorbid psychopathology in this population (e.g., Kolman, 1983; MacArthur & Moore, 1975; Wilmore & Pruitt, 1972). In a review of the literature on psychopathology in adult burn patients, Kolman (1983) concluded that the incidence of mental illness and personality disorders was higher in burn-unit patients than in the normal population. The studies we found that examined the incidence and type of psychopathology common in burn victims are listed in Table 1. As can be seen, there is a significantly higher incidence of premorbid psychopathological disorders in the typical burn-unit population as compared with that anticipated in the general population. Specifically, reported estimates of the incidence of previous psychiatric illness range from 28% (Brezel, Kassenbrock, & Stein, 1988) to 75% (Davidson & Brown, 1985). The most prevalent diagnoses in this group of studies include depression, character disorder, and alcohol and drug abuse (e.g., Brezel et al., 1988; MacArthur & Moore, 1975; Noyes, Frye, & Slymen, 1979; Rockwell, Dimsdale, Carroll, & Hansbrough, 1988). Some of these reports indicate that patients with prior psychiatric diagnoses tend to stay in the burn unit longer (Berry, Wachtel, & Frank, 1982; Brezel et al., 1988) and develop more serious psychiatric complications after sustaining burn injuries (Steiner & Clark, 1977). Furthermore, once hospitalized, they are described as resorting to previously established dysfunctional modes of adaptation, including regression, depression, and poorly controlled hostility (Andreasen, Noyes, & Hartford, 1972).

Although burn injuries are not a direct indication of psychopathology, the causes of many burns have to be considered symptomatic of social ills or mental illness. Specifically, significant proportions of burn-unit admissions result from suicide attempts (Andreasen & Noyes, 1975; Skully & Hutcherson, 1983), some of which are repeat attempts (Davidson & Brown, 1985). In one study, adult batterings accounted for 10% of hospital burn admissions (Krob & Johnson, 1986). Furthermore, children have been shown to sustain nonaccidental burn trauma at even higher rates (Hight, Bakalar, & Lloyd, 1979). Juvenile fire setters, for example, often end up in burn units. Although no data on such admissions are available, such pathology accounts for 15% to 17% of children admitted to psychiatric outpatient clinics or residential facilities (Gruber, Heck, & Mintzer, 1981; Heath, Gayton, & Hardesty, 1976).

To summarize, not only are people with premorbid psychopathological disorders more likely to sustain burn injuries, they are prone to have longer, more costly recovery periods. These inferences are drawn from studies that suffer from significant limitations, however. With the exception of Kolman's (1983) review article, the studies in Table 1 can be divided into descriptive and retrospective methodological categories. In the descriptive studies, which account for the majority of these articles, the patients' psychiatric status, history, or both were established through the process of psychiatric interview on or shortly after admission to the hospital, or through the administration of a standardized psychological battery. In these studies, patients successively admitted to burn units were included. Although the inclusion criteria and characteristics of the sampled group of patients were stated clearly, information regarding the percentage of the total sample pool studied, the reasons why eligible subjects did not participate or dropped out, and the general characteristics of the eligible participants versus the eligible nonparticipants was usually not reported. As a result, it is not possible to determine confounding variables, such as occupational status, which may increase one's risk for burn injuries. Moreover, the retrospective studies used chart review to determine rates of psychopathology. An obvious problem with retrospective reviews of this nature is that records were not created with a psychiatric diagnosis in mind, and standardized measures were generally not used at any stage. The resulting lack of common measurements among these studies makes valid comparisons difficult. Yet, another common limitation is the absence of comparative data between the burn-unit population and a sample of people without burns. The true frequency of psychopathology in a targeted sample can only be understood through appropriate control-group comparison.

Despite the pervasive design limitation of these studies, however, we were still struck by the frequency and consistency with which various types of premorbid dysfunctional behavior were reported. Moreover, we noted that the causes of many burn

Table 1
Premorbid Psychological Correlates of Burns

Authors	Design	*N*	Incidence of premorbid factors found to correlate with burns
Andreasen et al. (1972)	Descriptive	32	Divided 32 patients into "good adjusters" and "bad adjusters" on the basis of psychological assessment during hospitalization. Patients who were good adjusters premorbidly adjusted better to burns.
Berry et al. (1982)	Retrospective	208	Character disorder, schizophrenia, and senility were predictive of longer hospitalizations.
Brezel et al. (1988)	Retrospective	180	28% of sample had prior alcohol or drug abuse, psychiatric disorder, or neurological disorder.
T. I. Davidson & Brown (1985)	Retrospective	42	75% of sample had a history of psychiatric illness. 25% had previously attempted suicide.
Kolman (1983)	Review	NA	Mental illness and personality disorders were correlated with burns.
MacArthur & Moore (1975)	Descriptive review	155	Senility, history of alcohol abuse, and history of psychiatric illness predisposed to burns. One third of patients sampled had a premorbid diagnosis of alcohol abuse, senility, or other psychiatric illness.
Noyes et al. (1979)	Descriptive	67	Psychiatric disorders, especially organic brain syndrome, alcoholism, and antisocial personality disorder predisposed to burns. 45% of the sample had preexisting psychiatric disorders.
Rockwell et al. (1988)	Descriptive	51	Psychiatric illness, including depressions, character disorder, and alcohol or drug abuse predisposed to burns. 50% of the sample had a preexisting diagnosis of depression, 33% had character disorder, and 25% had a preexisting condition of alcohol or drug abuse.
Steiner & Clark (1977)	Descriptive	35	Patients with a prior psychiatric history developed more serious complications after burn injuries.
Ward et al. (1987)	Descriptive	139	Unemployment, previous psychiatric history, and antisocial personality disorder predisposed to burns.

injuries (e.g., suicides and assaults) supported the suspicion that some type of psychosocial maladaption contributed to the hospital admissions. The limitations in the studies we reviewed make it impossible to determine the exact types and proportions of psychopathology that were present before burn injuries were sustained. Nevertheless, as we argue in subsequent sections, most people seem to undergo emotional adjustment to burn injuries relatively well. We conclude that the possible contributions of premorbid psychopathology to the trauma of a burn injury should be a matter of ongoing consideration and concern for both clinicians and researchers.

Psychological Reactions During Hospitalization

A number of studies have been focused on patients' psychological reactions during their hospitalization for burn injuries. The hospitalization period typically lasts from 1 week to several months, depending on burn severity and medical complications. The hospitalization phase can be divided into two broad stages: the critical stage of care, typically spent in the intensive care unit (ICU); and the acute care stage of recovery, which occurs when patients are medically stable and able to begin rehabilitation (Avni, 1980; Patterson, 1987).

A brief description of the medical, environmental, and psychological contexts of hospitalized burn patients will facilitate an understanding of their psychological reactions. The critical care phase is characterized by uncertainty regarding outcome and, in the case of severe burn injuries, a struggle for survival (Avni, 1980). This phase is one of repeated emergency medical procedures and severe physiological stresses, such as anoxia, electrolyte imbalance, infections, and edema (Steiner & Clark, 1977). The ICU environment is frighteningly strange to most patients, who are alternately overstimulated and understimulated (Steiner & Clark, 1977).

Once patients are medically stable and their survival is no longer threatened, they are typically moved into the acute care phase. At this point, patients perceive the environment to be more familiar and less intrusive, even as they continue to undergo painful dressing changes, plastic surgery, grafting, and rehabilitation. These procedures occur in the context of an increased awareness of both the physical and psychological impact of their injuries (Patterson, 1987).

A number of common psychological and psychiatric symptoms have been documented among hospitalized burn patients and are described in Table 2. The most common symptom is delirium, followed by anxiety (especially posttraumatic stress disorder), depression, psychosis, and various behavioral problems (Kolman, 1983; Patterson, 1987).

Some investigators have described adjustment in global terms to facilitate an understanding of overall rates of psychopathology. Two early descriptive studies suggested that poor adjustment or psychiatric complications occurred in 50% to 65% of hospitalized burn patients (Andreasen et al., 1972; Steiner & Clark, 1977). In both studies, poor hospital adjustment was associated with premorbid psychopathology and the total body surface area (TBSA) burned. The type and frequency of complications varied according to the stage of recovery (Steiner & Clark, 1977). A number of other reports have been focused on

Table 2
Psychological Adjustment During Hospitalization

Authors	Design	*N*	Method	Results
Andreasen et al. (1972)	Descriptive, case controlled	32: 20 M & 12 F, >7% TBSA	Standardized psychiatric history	50% adjusted well, 19% severe depression, 31% delirious, 22% severe regression, 16% management problems.
Bereni-Marzouk et al. (1981)	Descriptive	53: 26 M & 27 F, 30–40% TBSA	Psychological examination & weekly interview ratings	61% depressed Week 1, 55% depressed Week 2, 23% depressed Week 3, 41% depressed Week 4; % anxious decreased from 46% to 13% over hospitalization course.
Blumenfield & Reddish (1987)	Descriptive, case controlled	16 SBBP, 52 controls	Clinical interviews & ratings	SBBP had greater sleep problems, used more regression and displacement, had more loss of control issues, had more concern regarding disfigurement.
Choiniere et al. (1989)	Descriptive	42: 34 M & 8 F, 1.5–60% TBSA	Structured interview & self-report measures	Anxiety level comparable with medical–surgical norms, average patient mildly depressed on short-form BDI, 30% moderate to severe depression, resting pain positively correlated with anxiety and depression.
Hamburg et al. (1953)	Descriptive	12: 10 M & 2 F, 24–45% TBSA	Repeated interviews	3 psychotic, 7 depressed; adjustment: 5 good, 4 fair, 3 poor.
Klein & Charlton (1980)	Descriptive, case controlled	16: 14 M & 2 F, 7–70% TBSA	Clinical diagnosis & behavior observation	38% depressed, 38% psychotic episode, 44% very significant pain problem, well behavior greater than complaints, criticism greater than praise.
Patterson et al. (1990)	Descriptive, case controlled	54: 42 M & 12 F, 1–60% TBSA	Weekly screening & structured diagnostic interview	16/54 (29.6%) met criteria for PTSD. None met criteria at discharge. PTSD positively related to TBSA. Longer hospital stay, female patients and lack of culpability for the injury.
Perry et al. (1987)	Descriptive, case controlled	104	Structured diagnostic interview	41% met PTSD criteria. PTSD had > procedural and resting pain, > TBSA (23 vs 19%), > guilt about burn event, < responsibility for burn. PTSD were more likely to be employed, married, and delirious.
Perry & Blank (1984)	Descriptive, case controlled	36 delirious, 40 nondelirious, 1–87% TBSA	Semiweekly screenings, mental status exam, semistructured interview	19% met DSM-III criteria for delirium and a medical cause was found in all cases. Delirium associated with men, greater TBSA, history of alcohol or drug abuse, and greater mortality. Two types of delirium found: preoccupation vs. unconcern regarding burn events—unconcerned patients used more psychological defenses, were less anxious and depressed, and had greater premorbid psychopathology.
Steiner & Clark (1977)	Descriptive	35: 16 M & 19 F	Standardized psychiatric interview	65% psychiatric complications, 57% delirious.
Tempereau et al. (1989)	Retrospective, descriptive	156	Unclear	17/156 (11%) patients developed loss of will to live lasting more than 48 hours.

Note. M = male; F = female; TBSA = total body surface area; SBBP = small burn, big problem; PTSD = posttraumatic stress disorder.

distinct psychological reactions to burn injuries, each of which is discussed in the following sections.

Delirium and Psychosis

Delirium and transient psychotic reactions are combined here because these syndromes are clinically similar and may have common etiologies. Mild disorientation, confusion, illusions, or hallucinations may represent functional conditions caused by sensory overload, sensory deprivation, sleep deprivation, or the shock of extremely threatening events (Patterson, 1987). Delirium and psychotic reactions may even be seen as adaptive psychological defense mechanisms during extreme stress (Hamburg, Hamburg, & deGoza, 1953). Distinct changes in mental status, however, are more likely to result from pathophysiologic causes, such as infections, alcohol withdrawal, or metabolic complications (Perry & Blank, 1984).

There is considerable variability in the reported incidence of delirium among burn patients. The earlier descriptive studies reported rates of delirium between 30% and 57% (Andreasen et al., 1972; Hamburg et al., 1953; Steiner & Clark, 1977). Delirium was associated with earlier phases of recovery, larger TBSA burned, and older age. In the most methodologically sound study to date, however, Perry and Blank (1984) found that only 36 of 189 patients (19%) met *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., *DSM-III,* American Psychiatric Association, 1987) criteria for delirium. In this study, 189 consecutive burn patients were screened twice weekly for delirium. Assessments included specific diagnostic criteria, standardized mental status examinations, and widely accepted self-report measures. Delirious patients in the study, when compared with 40 burn-injured controls, were more likely to be male (81% vs. 53%). They were also more likely to be alcohol or drug abusers (50% vs. 18%). Furthermore, patients showing delirium

had larger burns (31% vs. 16% TBSA) and were more likely to have a fatal outcome (31% vs. 8%). Thus, delirium may be more likely when patients have greater than 30% TBSA burned and a history of psychopathology, especially alcohol abuse. No relationship was found between delirium and age in this study. At least one medical cause for the delirium was identified in all cases: sepsis, 50%; alcohol withdrawal, 30%; and hypoxia or electrolyte imbalance, 27%.

Delirium is usually an early reaction that occurs during the immediate postburn phase when patients may be intubated, heavily medicated with narcotic analgesics, overstimulated, or sleep and sensory deprived. These factors make reliable diagnoses of delirium difficult. To date, studies suggest that true delirium may occur in roughly one fifth of burn patients. True delirium is likely to indicate important medical complications that warrant rapid diagnosis and treatment. Milder, transient, mental-status changes may occur in about one third of burn patients (Klein & Charlton, 1980). All but one of the studies reviewed are limited by small sample sizes, lack of standard diagnostic criteria, or repeated assessments. Questions remain regarding the reliability of diagnoses of delirium among burn patients and whether there are clinically distinct psychological reactions to delirium. It remains unclear whether delirium leads to any residual neuropsychological impairments.

Depression

The literature classifies depression according to its severity, as mild, moderate, or severe. Studies suggest that mild depression occurs in about 58% of burn patients (Hamburg et al., 1953). Moderate depression occurs in about 23% to 61% of burn patients (Bereni-Marzouk, Giacalone, Thieulard, & Wasserman, 1981; Klein & Charlton, 1980). The prevalence of severe depression is 19% to 30% (Andreasen et al., 1972; Choiniere, Melzack, Rondeau, Girard, & Paquin, 1989). The average of self-reported depressive symptoms falls into the mildly depressed range on the short form of the Beck Depression Inventory (Choiniere et al., 1989). Depression severity correlates with resting pain (Choiniere et al., 1989) and family or marital problems (Andreason et al., 1972). Anecdotal observations suggest that increased depressive symptoms are associated with a length of stay longer than 1 month (Andreason et al., 1972) and medical setbacks (Hamburg et al., 1953). These observations, however, have yet to be confirmed by empirical tests.

The incidence and severity of depression is difficult to estimate because of the differing criteria used by various investigators and the variability of depressive symptoms experienced by hospital patients (Kolman, 1983). Moreover, studies have failed to distinguish between the syndrome of depression and depressive symptoms. Thus far, no study has used specific diagnostic criteria (e.g., Research Diagnostic Criteria and *DSM–III–R*) to assess depression among burn patients. This points to a need for studies that are longitudinal, use standardized diagnostic assessments, and provide estimates of interrater reliability.

Anxiety

The research on anxiety among hospitalized burn patients is affected by the same limitations as with depression. Nevertheless, in the area of anxiety, greater progress has been made toward diagnostic specificity. The prevalence of anxiety symptoms seems to decrease over the course of the hospital stay, from 47% of the patients being anxious during Week 1 to 13% remaining anxious by Week 4 (Bereni-Marzouk et al., 1981). Self-reported state anxiety symptoms among burn patients are comparable with that reported by medical and surgical patients, but less severe than those reported by psychiatric patients (Choiniere et al., 1989). In this study, only 27% of the 33 patients had state anxiety scores on the State–Trait Anxiety Inventory greater than those of neuropsychiatric patients. Anxiety was positively correlated with resting pain, but not with the pain of medical procedures.

Two studies evaluated burn patients for PTSD. Forty-one percent of 104 patients hospitalized for burn care met *DSM–III–R* criteria for PTSD (Perry, Cella, Falkenberg, Heidrich, & Goodwin, 1987). Compared with burn patients without this syndrome, PTSD patients had more severe pain, had larger burn injuries, and expressed more guilt about the precipitating event even though they were less likely to have been directly responsible for their burn. PTSD patients were also more likely to have experienced an episode of delirium. Men, married patients, and patients who were employed were also overrepresented among PTSD sufferers. Patterson, Carrigan, Robinson, and Questad (1990) assessed 54 consecutively admitted burn patients for symptoms of PTSD on a weekly basis. Sixty-three percent of the patients reported intrusive, recurrent memories of the burn event, but only 30% met full *DSM–III–R* criteria for PTSD during their hospital stay. Notably, no patients were diagnosed with PTSD at discharge, and only one showed recurrence of PTSD symptoms after discharge. PTSD was positively correlated with TBSA, length of stay, being female, and not being directly responsible for the burn injuries.

To date, studies of anxiety disorders among burn patients are among the most methodologically sophisticated. The best studies have used large sample sizes, consecutively admitted patients, standardized diagnostic criteria, and repeated assessments. PTSD appears to be a common but transient psychological complication of burn injuries. More research is needed to clarify risk factors for PTSD, to examine the possible longer term consequences of anxiety disorders, and to test treatment interventions.

Death

Several studies have related psychological factors to mortality. Ideas such as a "death wish" (Andreason et al., 1972) or "loss of will to live" (Temperau, Grossman, & Brones, 1989) have been attributed to some burn patients who died. The loss of will to live syndrome is defined as a period of apathy, during which the patient may neglect grooming, fail to cooperate with caregivers, and experience widespread devaluation and social disengagement lasting greater than 48 hours (Temperau et al., 1989). In a retrospective descriptive study, Temperau et al. found that 17 of 156 (11%) patients demonstrated this syndrome. Of these 17 patients, 5 died. No diagnostic criteria or validity studies are available in this area of research.

Pain

Because pain often plays a significant role in the psychological adjustment of patients in the burn unit, this variable merits discussion. The pain of a burn patient has been described as "acute and severe at first, following burn injuries and later continuous with exacerbations gradually declining" (Mersky, 1986, p. 543). As wounds heal, the pain gives way to sensations of tingling and itching (Marvin, 1987). It is important to understand acute pain because it can hinder recovery (Chapman, 1985; Chien, 1967); however, there have been few attempts to document the degree to which hospitalized burn patients suffer from this complication. Perry, Heidrich, and Ramos (1981) reported that 84% of the patients they studied reported feeling severe to excruciating pain during therapeutic procedures despite receiving morphine on a routine basis. Therapeutic procedures, rather than the burn itself, cause the most intense pain (Choiniere et al., 1989; Perry et al., 1981; Szyfelbein, Osgood, & Carr, 1985).

Summary

Many people who are hospitalized for burn care show a variety of symptoms suggesting various levels of distress. But few of these symptoms reach levels sufficient to become identifiable as a specific psychiatric or psychological disorder that can be diagnosed and treated with specific treatment strategies (e.g., psychiatric hospitalization or medication). Rates of depression and generalized anxiety parallel those found among other hospitalized patients (Choiniere et al., 1989). Delirium and PTSD, however, seem to occur more frequently in burn patients than in comparable samples. Nevertheless, even these conditions seem to be relatively transient and closely linked to the acute effects of burn-related trauma and early treatment procedures. Severe depression seems to be a non-disease-specific complication of burn injuries in about 20% of both burn patients and hospitalized medical patients generally (Rodin & Voshart, 1986). Patient-selection biases and the absence of reliable diagnostic procedures in early descriptive studies seem to have resulted in overestimates of psychopathology. Still needed are studies that use standardized diagnostic criteria to determine the prevalence of and risk factors for specific psychiatric syndromes. The next generation of studies should examine consecutive patients over multiple time periods and compare burn patients with other hospitalized patients who are in the same phase of recovery. Additional work might also enhance our understanding of the most common psychological outcome, relatively good adjustment. Standardized assessments of defensive style and coping behavior may help shed light on how people manage to adjust well after such painful, traumatic events.

Long-Term Effects of Burn Injuries in Adults

Investigations of long-term effects of burn injuries involve assessment periods ranging from a few months to several years after hospitalization. It is commonly observed, however, that the first year after hospitalization is a psychologically unique period during which patients report greater dysfunction than they do afterward (Andreasen et al., 1972; Blades, Jones, & Munster, 1979; Chang & Herzog, 1976; Sheffield et al., 1988). During this lst year, patients may still be coping with secondary stressors, such as vivid memories of the accident, family strains, or the general daily-life disruption caused by the injury. Whatever the reason, the literature suggests that many of these first-year symptoms are transient. To avoid describing a poorer long-term prognosis than actually exists, we have limited our discussion to studies with follow-up periods of approximately 12 months or more after the incidence of the burn. Those studies are described in Table 3. The methodological characteristics of most of these studies have been critiqued in further detail by Eyles et al. (1984) and Malt (1980).

Anxiety and Depression

Anxiety and depression are the two most frequently reported psychological disturbances following burn injuries. These symptoms commonly occur together (Andreasen, Norris, & Hartford, 1971; Andreasen et al., 1972; Tucker, 1987; White, 1982), with prevalence rates ranging from approximately 25% to 65% at 1 year or more postburn (Adler, 1943; Andreasen et al., 1971; Andreasen et al., 1972; Tucker, 1987; Ward et al., 1987; White, 1982). Most reports indicate that symptoms subside with time, especially after 1 year postinjury (Adler, 1943; Chang & Herzog, 1976; Tucker, 1987). One exception submitted by Ward et al. (1987) noted an increase with time for clinically significant depression. However, these authors also reported that premorbid psychopathology was the best indicator of postburn depression, suggesting that for much of their sample, postburn depression was a continuation of a premorbid and chronic condition rather than sequelae of burn injuries. The relation of physical burn characteristics to anxiety and depression in these studies is unclear. One report found that anxiety and depression increased with hand and facial burns (Chang & Herzog, 1976), whereas two others (Andreasen et al., 1971; Andreasen et al., 1972) found no relation of anxiety or depression to TBSA burned or deformity. In addition, Adler (1943) found that postburn psychiatric problems were negatively related to loss of consciousness and the absence of traumatic memories. This suggests that decreased awareness and recollection of circumstances surrounding the burn injury may provide a buffer against development of adverse psychological sequelae.

An apparent difficulty in interpretation of these studies is the wide variety of methods by which depression and anxiety were assessed. In studying depression, only one group of investigators (Ward et al., 1987) used a standardized measure (Beck Depression Inventory), and the others used such methods as chart review, mailed questionnaires, and interviews. Perhaps even more varied were the ways in which different studies assessed and described symptoms of anxiety. These include the use of such descriptors as *anxiety* (Tucker, 1987; White, 1982), *anxiety neurosis* (Adler, 1943), and *traumatic neurosis* (Andreasen et al., 1971; Andreasen et al., 1972). It is likely that inconsistencies in assessment methodology in part explain some of the varied results. In addition, as was the case with the other outcome areas reviewed, the potential influence of sampling bias cannot be overlooked.

Intellectual Functioning and Personality

Generally, there is no reason to suspect that burn injuries affect intellectual or personality functioning. Two studies using

Table 3
Long-Term Effects of Burns

Author	*N*	Follow-up period	Measures	Main findings
Adler (1943)	46: 26 M & 20 F	11 months	Psychiatric interview	26 developed psychiatric complications; unconciousness during accident related to positive psychiatric outcome.
Andreasen et al. (1971)	20: 11 M & 9 F	1–5 years, *M* = 2.3 years	Interview, MMPI	20% mild emotional problems, 10% moderate emotional problems; emotional problems not related to extent of burn or deformity; negatively related to time since injury.
Andreasen & Norris (1972)	20: 11 M & 9 F	1–5 years postburn	Standardized interview, MMPI, assessment of physical deformity	70% well-adjusted, 30% mild or moderate anxiety and/or depression; 6 showed elevated MMPI depression scores; sexual problems primarily among women.
Blades et al. (1979)	32	4.5–25.5 months, *M* = 9.3 months	Quality of Life Index	Quality of life related to burn size; improvement did not occur until after 1 year postburn.
Blumenfield & Reddish (1987)	68	3 years	Structured patient and family interview	16 patients experienced postburn physical and psychological symptoms and social–occupational problems related to defense mechanisms of displacement and regression and experience of narcissistic conflict from burn injury; dysfunction not related to TBSA or disfigurement.
Bowden et al. (1980)	320	20 years	519-item questionnaire, Coopersmith Self-Esteem Inventories	Most patients had adequate to high self-esteem; self-esteem negatively related to age when burned and positively related to time since burn. Disfigured women lower in self-esteem than disfigured men.
Browne et al. (1985)	340	12 years	Coping Scale, Participation in Social and Recreational Activities Index, Social Support Questionnaire, Psychosocial Adjustment to Illness Scale	10–15% maladjustment rate related to socioeconomic and psychosocial variables and coping style, not related to severity of burn.
Chang & Herzog (1976)	51: 37 M & 14 F	25.6 months	Chart review, mailed questionnaire	79% returned to work or school, 45% required job change, 25% educational setbacks.
Cobb et al. (1990)	245	10 years	Mailed questionnaire	Burn severity negatively related to quality of life. In younger patients, decreased social–psychological functioning; in older patients, decreased physical and economic functioning.
Davidson et al. (1981)	314: 24% F & 76% M	20 years	Structured interview, questionnaires	Social support positively related to postburn life satisfaction, social activity, recreational activity level, and self-esteem.
Korloff (1966)	264	Minimum 4 years postburn	Interview	40% dissatisfied with appearance, 28% psychic problems, 65% required job changes, & 19% marital difficulties.
Miller et al. (1976)	25	1 year	Structured interview, WAIS verbal tests, MMPI	General slight improvement in IQ scores; decreased depression, self-criticalness, & bodily preoccupation.
Mlott et al. (1977)	25: 16 M & 9 F	11–12 months postburn	MMPI, 6 WAIS verbal subtests	Essentially normal scores, little change compared with 3 days postburn.
Sheffield et al. (1988)	212	0–1,980 days, *M* = 246 days	Physical variables, Quality of Life Index, Impact of Event Scale	10–15% experienced diminished quality of life related to noncompliance, psychiatric problems, and limited range of motion.
Tucker (1987)	9 M	*M* = 53 weeks	Psychological Adjustment to Illness Scale, Diagnostic Interview for PTSD, State–Trait Anxiety Inventory, Eysenk Personality Questionnaire, Self-Esteem Inventory, Illness Behavior Questionnaire, Social Support Questionnaire	Small improvements in anxiety, depression and self-esteem compared with predischarge patients.

Table 3 (*continued*)

Author	*N*	Follow-up period	Measures	Main findings
Tudahl et al. (1987)	54	*M* = 10.2 months	Questionnaire	Men reported 82.5% of preinjury sexual satisfaction level, women reported 52.6%; for women, strong negative relation of physical dysfunction and body image to reported sexual satisfaction.
Wallace & Lees (1988)	15: 11 M & 4 F	2 years	Interview, Hospital Anxiety Depression Scale, Psychosocial Adjustment to Illness Scale	40% presented psychological distress sufficient to require specialist attention.
Ward et al. (1987)	139	1–8 years	Chart review, structured interview, BDI	77.7% not depressed, 9.4% mildly depressed, 12.9% severely depressed; younger age and premorbid emotional status strongest predictors of postburn depression.
White (1982)	76: 47 M & 29 F	1 year	Clinical assessment, structured questionnaire	Two thirds of patients reported psychological symptoms positively related to duration of hospitalization and preinjury psychiatric status; not related to burn location.
Williams (1969)	42 M	1–3 years postburn	Interview	Increased family involvement, decreased social interaction, lower self-perceptions of functionality, especially for men with visible scarring.

Note. M = male; F = female; MMPI = Minnesota Multiphasic Personality Inventory; TBSA = total body surface area; WAIS = Wechsler Adult Intelligence Scale; PTSD = posttraumatic stress disorder; BDI = Beck Depression Inventory.

the Wechsler Adult Intelligence Scale and the Minnesota Multiphasic Personality Inventory showed no evidence of deterioration in these areas (Miller, Gardner, & Mlott, 1976; Mlott, Lira, & Miller, 1977). Neuropsychological testing for patients with burns is perhaps warranted in those instances when the injury involves electrocution or inhalation (Larkin, Brahos, & Moylan, 1976; Smith & Brandon, 1973).

Social Adjustment

Family/nonfamily interaction. Tendencies reported in postburn social interaction are toward increased family interaction and decreased relations with nonfamily members (Andreasen et al., 1972; Browne et al., 1985; Williams, 1969). These tendencies are most apparent among men with visible scarring and disfigurement (Andreasen et al., 1972; Browne et al., 1985). Also following burns, there is less involvement in social roles such as work and time spent with friends, increased performance of self-care activities (Browne et al., 1985) and decreased involvement in activities that emphasize physical appearance (e.g., dancing and swimming; Andreasen et al., 1972).

Employment. Five studies have investigated the effects of burn injuries on posthospitalization employment status (Andreasen et al., 1972; Blades et al., 1979; Chang & Herzog, 1976; Korloff, 1966). Following injuries, desire to work appears unchanged (Andreasen et al., 1972), and when given sufficient time to recover and rehabilitate, the majority of patients do return to work (Blades et al., 1979; Chang & Herzog, 1976). However, 50% to 60% of burn survivors require some sort of change in employment status (e.g., hours worked and job status). This is generally necessitated by acquired physical limitations (Blades et al., 1979; Chang & Herzog, 1976; Korloff, 1966). More recently, Helm and Walker (1992) reported that TBSA burned was the most significant predictor of time that would elapse before a return to work.

Marital relations. Reports on how burn injuries affect marital relations have yielded equivocal results. Korloff (1966) found a 19% rate of "marital difficulties" attributed to burn injuries, whereas Andreasen et al. (1972) reported no divorces and only one separation among a group of 20 burn patients. In contrast, Chang and Herzog (1976) reported a higher divorce rate (26%) than did Korloff that was unrelated to TBSA burned or burn location. This latter study involved a somewhat younger population, however, suggesting that such individuals may be more vulnerable to the disruption caused by burn injuries.

Sexual functioning. Decreased sexual satisfaction is a common phenomenon among burn patients, especially women (Andreasen et al., 1972; Tudahl, Blades, & Munster, 1987). In a study by Tudahl et al. (1987), men reported an 82.5% level of sexual satisfaction as compared with their ideal level of satisfaction (i.e., 100%), and women reported only a 52% satisfaction level. For women, level of sexual satisfaction was strongly and negatively related to physical dysfunction and body image, yet not related to burn size or location. Similarly, Andreasen et al. (1972) reported that decreased sexual satisfaction was common among women, whereas only two men reported difficulty in this area.

Factors Influencing General Adjustment

A number of investigators have examined adjustment to burn injuries by assessing patients' self-reports of adjustment or quality of life following burn injuries (Blades et al., 1979; Blumenfield & Reddish, 1987; Browne et al., 1985; Sheffield et al.,

1988). The majority of burn survivors appear to adjust quite well to their injuries. Browne et al. (1985) found only a 10% maladjustment rate among adult burn survivors. Similarly, a group evaluated by Blades et al. (1979) reported an 89.9% quality-of-life rating, compared with preinjury baseline ratings of 100%. In general, adjustment to burn injuries and quality of life are reported to improve with time, independent of size or severity of burn injuries (Blades et al., 1979; Browne et al., 1985). This is consistent with Rubonis and Bickman's (1991) review of the disaster literature, which indicates that psychopathology decreases with the passage of time after major disruptive life events. One study found a negative relation between range-of-motion limitations resulting from burns and quality of life (Sheffield et al., 1988). Other factors reported as detrimental to adjustment or quality of life include noncompliance with medical staff during hospitalization (Sheffield et al., 1988) and avoidance coping styles (Blumenfield & Reddish, 1987; Browne et al., 1985). Finally, although Cobb, Maxwell, and Silverstein (1990) also attempted to look at intervening variables, their results are difficult to interpret because of methodological limitations and a 13.1% return rate on a nonstandardized questionnaire.

The maintenance of burn survivors' self-esteem appears to be a factor in long-term adjustment. As is the case with general adjustment to burn injuries, self-esteem remains high for a majority of burn survivors. For example, 85% of a group of burn survivors studied by Bowden, Feller, Tholen, Davidson, and James (1980) reported adequate to high levels of self-esteem. Additionally, self-esteem tends to increase with time (Blades et al., 1979) and is not related to burn size or location (Bowden et al., 1980). Burn injuries were more detrimental to the self-esteem of disfigured women and individuals who were young when burned (Bowden et al., 1980).

Social support is another variable that has an apparently positive influence on adjustment to burn injuries (Bowden et al., 1980; Browne et al., 1985; Davidson, Bowden, Tholen, James, & Feller, 1981). One possible reason is that strong support networks have a positive influence on burn survivors' self-esteem (Bowden et al., 1980; Davidson et al., 1981). Additionally, Davidson et al. (1981) identified what appears to be the buffering effect of support from family members. A stronger positive relation was found between social support and levels of self-esteem and life satisfaction for patients with more severe burns than for less severely burned individuals. However, Blumenfield and Reddish (1987) demonstrated that social support does not guarantee good postburn adjustment. These authors identified a group of patients with minor to moderate burns, an absence of premorbid physical problems or psychopathology, and adequate financial and social support. Although a majority of this group appeared to be well adjusted, some of the group continued to experience difficulties in various areas (e.g., sleep problems and sexual dysfunction) up to several years postburn.

Although health-care professionals may tend to assume that severely burned individuals experience long-term, permanent declines in several areas of functioning, we feel that the studies reviewed here suggest that this is not the case. Commonly reported emotional problems such as anxiety and depression tend to be transitory and negatively related to time since injury (Andreasen et al., 1971; Andreasen et al., 1972; Chang & Herzog, 1976; Ward et al., 1987), and there is no evidence that burn injuries necessarily result in intellectual deficits (Miller et al., 1976; Mlott et al., 1977). Our view is consistent with what Tarnowski et al. (1991) reported in their recent review of pediatric burns. The misconception that functional deficiencies in burn victims are permanent may be attributed to the fact that professional caretakers' interactions with such patients occur primarily during the time immediately after the accident and up to the point the patients leave the hospital. This is the period during which the physical and psychological effects of a recent new injury are most severe. Furthermore, relying on studies that evaluate burn patients less than 1 year after hospitalization may also result in an emotional prognosis that is overly bleak. Several researchers have observed that after a year or so postinjury, the majority of patients rebound to premorbid levels of functioning and, in some cases, to even higher levels (Bowden et al., 1980; Davidson et al., 1981).

The majority of patients who sustain burn injuries return to work, although about half require job changes (Andreasen et al., 1972; Blades et al., 1979; Chang & Herzog, 1976). With regard to socializing, there is a strong tendency for survivors, especially men with visible scarring, to increase socializing within the family and to spend less time interacting with nonfamily members (Andreasen et al., 1972; Browne et al., 1985; Williams, 1969). There is little evidence that people who are married before being burned experience marital difficulties to a greater extent than their nonburned counterparts (Andreasen et al., 1972; Korloff, 1966). However, one of the more common complaints heard from burn patients, especially women, is decreased sexual satisfaction (Andreasen et al., 1972; Blades et al., 1979; Blumenfield & Reddish, 1987; Tudahl et al., 1987).

General Implications

A review of the three components of the psychological research on burn injuries (i.e., before the burn, during hospitalization, and long-term follow-up) suggests some conclusions that might be relevant to treatment and prevention. We considered the implications of these studies as we examined the patient populations that seem to suffer the most from burn injuries and whether such trauma has long-term effects on personality. We also use these implications to suggest the ways in which future approaches to measurement should be modified.

When Do People Suffer the Most From Burn Injuries?

Enough studies have been done in the three areas reviewed to discern trends regarding those patients who demonstrate the greatest psychological distress during their recovery. Obvious concerns arise regarding patients whose emotional dysfunction precedes their hospitalization. A proportion of those people have been afflicted with severe burns at least partly because their lives were unstable (e.g., they have a major form of psychopathology or demographic vulnerability). Among this subpopulation, major burn injuries often appear to be other than merely random occurrences and may be suggestive of social circumstances that breed trauma (e.g., alcoholism and abusive relationships). Psychological interventions with populations who show such vulnerability emphasize prevention. Unfortu-

nately, conventional prevention programs (e.g., smoke alarms and education) will have little influence on the incidence of burn injuries in many of these subgroups. For example, the incidence of burn injuries caused by alcohol-related accidents, child abuse, assault, and suicide attempts is likely to be only minimally influenced by conventional prevention programs. Intervention with such groups would require the correction of complex social problems.

Once patients are hospitalized for burn care, many show relatively high rates of transient distress independent of their premorbid status. Patients in a burn unit have numerous reasons to report symptoms of anxiety, delirium, depression, and pain. First, hospitalization itself is enough to cause psychological symptoms. Fordyce (1971) views such behavioral reactions as a normal response to the sudden loss of rewarding activities of everyday life. Second, the lack of activity inherent in most types of hospitalization (independent of burn care) can have a negative impact on physiological functioning, which can, in turn, affect emotional functioning. Bortz (1984) argues that such disuse of the body can result in cardiovascular vulnerability, obesity, musculoskeletal fragility, depression, and premature aging. Third, independent of their being restricted to the hospital setting, patients may demonstrate typical psychological responses to the abnormal stressor (i.e., burn trauma) they have recently experienced. As described in the *DSM-III-R*, PTSD involves a constellation of symptoms in response to an event that is outside the range of usual experience and would be markedly distressing to anyone. Thus, severe burn injuries and their circumstances, by their very nature, will meet some of the diagnostic criteria for PTSD. Finally, because typical burn care involves daily dressing changes, wound debridement, restricted range of motion, and often, repeated surgeries, some negative emotional reactions during hospitalization should be expected.

The final area of potential suffering we reviewed involved long-term adjustment. This area showed the fewest patients with burn-related psychological problems. For the majority of people hospitalized, a burn represents a temporary, albeit painful, disruption from life's routine; one after which they will eventually resume their normal preinjury functioning. Nevertheless, a minority of the burn population, falling into a variety of subgroups, clearly does not fare as well (Patterson et al., 1987). The outcome studies demonstrated some consistency in finding that some patients withdraw socially after being burned, many change their jobs, and others demonstrate a diminished physical capacity. These are the groups of patients who might benefit from long-term psychotherapy, vocational counseling, intensive outpatient physical rehabilitation, and other services designed to help them to cope with secondary effects of burn injuries.

Can Burn Injuries and Resulting Disfigurement Change People?

Because burn injuries are an infrequent source of trauma, investigators may be inclined to assume that the injuries will lead to novel adjustment patterns or special, predictable stages in victims. For example, a person who has never undergone a major depression may do so after sustaining a severe burn injury. Although in some instances this level of change may indeed occur, most burn survivors, even those with large TBSA burn injuries, do not suffer from a major depression or other specific psychiatric problems. It will be useful to address the question of whether a single experience, such as a burn injury, can alter subsequent personality development.

One view of the long-term impact of burn injuries is that the resulting cosmetic defects disrupt underlying personality function. This outlook is based largely on the value that society places on appearance. Large TBSA burn injuries, particularly in visible areas of the body, are thought to make people less attractive, decrease the value of their role in society, and eventually alter the way in which personality develops. This argument was made by Bernstein (1976) on the basis of his extensive clinical work with people who survived massive burn injuries. Bernstein discussed the importance of attractiveness in society and the relationship between personality and self-representation. He concluded that burn survivors have "a need to come to terms with the changed balance of forces, accompanied by constriction of psychological awareness and experience, to adjust body image and self-concept and to reestablish a sense of personal worth" (p. 124). He further argued that disfigurement from burn injuries impairs social and personality functioning. It should be noted, however, that the patients Bernstein described in his case reports were injured during the decade preceding his writing, at a time when the cosmetic outcome of burn surgical care was rather primitive and disappointing.

Studies specifically addressing the psychological effects of burn disfigurement are few and of questionable quality. An understanding of this area consequently requires a look at the research literature on other etiologies of disfigurement. In this respect, the literature on the psychological effects of cleft palates is unparalleled in terms of the number of articles published. The findings of many of these studies are reviewed by Clifford (1987). It is interesting that Clifford's conclusions are similar to ours. First of all, he found this literature to be basically flawed and misleading. As he put it, "the cleft palate literature is replete with studies overtly or covertly assuming that having a cleft results in a behavioral deficit . . . no specific personality patterns are exclusively associated with cleft lip and palate" (Clifford, 1987, p. 175). Second, he was continually impressed by the absence of pathology in the population: "In general it is virtually impossible to refute the conclusion that those born with clefts tend to demonstrate behaviors within the normal range and that this occurs at every level of development" (Clifford, 1983, p. 83). Clifford (1988) further questioned why no writer had posited that a cleft palate may have a positive effect on interpersonal relationships and problem solving rather than a negative one.

The process of overattributing depression and personality change to recently acquired disability is not unique to burn injuries. The literature on adjustment to spinal cord injuries (SCIs) demonstrates a trend similar to that described in this review. A number of studies have been conducted on the emotional outcome of this population and have been reviewed by Trieschmann (1988, p. 79). She stated:

> Consequently we must conclude that spinal injury does not necessarily lead to depressive reactions in most people soon after onset and the absence of depression does not imply denial of injury or poor adjustment to disability. Each study noted the individual

differences in emotional response to the disability, which is further evidence for the heterogeneity of the population with SCI.

It is interesting that even hospital staff show a tendency to overestimate depression in traumatized patients. Cushman and Dijkers (1990) asked rehabilitation staff members to complete the Depressive Adjective Checklist according to how they presumed the typical patient with a spinal cord injury would complete it. The staff Depressive Adjective Checklist estimated mean score was far higher than the average score of the patients themselves. This finding suggests that the staff tended to perceive far more distress in the patients than was actually present.

When the burn outcome literature is carefully considered, the findings suggest that major depression and loss of self-esteem are the exception rather than the rule. These findings are consistent with the personality literature. Most developmental models emphasize the extent to which childhood experiences set the course of later development (Freud, 1953; Goslin, 1969; Piaget & Inhelder, 1969). It is particularly noteworthy that Tarnowski et al.'s (1991) recent review of the psychosocial sequelae of pediatric burn injuries arrived at essentially the same conclusion. The authors indicated that it is a "commonly held belief" that most children with burns demonstrate some sort of serious follow-up adjustment problem (p. 390). However, their careful review found no evidence that the majority of children who are burned exhibit severe adjustment problems in the long run. Thus, it appears that our failure to find evidence for personality changes following burn injury is not a function of the developmental stage (e.g., adulthood) we examined.

When people suffering burn injuries develop long-term forms of psychological disability, it is likely that the circumstances of the burn and characteristics of the survivor are in some way interacting to prolong what are usually transient emotional reactions. The syndrome of PTSD may serve as a useful example here. Our work suggests that PTSD is a frequent, though transient, phenomenon among burn survivors (Patterson et al., 1990). This is contrasted by the frequently long duration of PTSD seen among Vietnam veterans and victims of rape and major disasters (Gleser, Green, & Winget, 1981; Keane, 1989; Kilpatrick, Veronen, & Resick, 1979). In the case of Vietnam veterans, there is often repeated exposure to the abnormal stimuli, among other factors (Kulka et al., 1988). In burn injuries, there may be frequent reminders of the injury as a result of repeated medical procedures and, occasionally, cosmetic disfigurement. We would argue, however, that the emotional salience of a burn injury seldom rivals that of those who typically suffer from long-term PTSD. When patients with burns are also assaulted or witness the death of others, the pattern of their symptoms may rival those of rape or disaster victims.

Severe burn injuries undoubtedly lead to chronic psychological conditions in some survivors. Cosmetically devastating burn injuries that interact with the way a survivor is viewed by others may result in increased withdrawal, for example. Nevertheless, the contention that a burn, in itself, can be a source of major personality change must be seriously questioned.

Defining Units of Measurement

A major difficulty of research on the psychological effects of burn injuries has been that researchers have defined outcome in terms that are too insensitive to the impact of burn injuries and in ways that do not provide useful guidelines for intervention. One example of this difficulty is the use of depression as a barometer of psychological state. A person who has sustained facial scarring as the result of a burn may be unhappy about his or her appearance and angry that the event occurred. However, if this person does not have other psychological or biological risk factors, a depressive episode is unlikely. Thus, it is possible that by using depression as the outcome variable, a person with facial scarring will be defined in a study as "not depressed" (by virtue of not meeting full diagnostic criteria) even though he or she is still bitter or unhappy about his or her appearance. If depression is the only adjustment measure used, the suffering of this person may be overlooked.

The term *distress* used by Albee (1980) in his conceptualization of mental health offers a variable that is more likely to capture the experience of most burn survivors. Certainly, almost every patient who has been burned will experience some degree of distress, and this variable is broad enough to capture the spectrum of emotional response likely to be seen in this population. The term *suffering* used by Cassell (1982) provides another useful alternative to more typical outcome variables. Using distress or suffering as an outcome also moves conceptualization away from a psychopathology versus nonpsychopathology model. A burn is a traumatic event that is usually treated medically. Even though it often may represent an abnormal life stressor, defining its psychological impact psychopathologically may represent the application of an inaccurate model. Although many patients evidence premorbid psychopathology, the majority of people who are burned do not carry prior psychiatric diagnoses. It is, therefore, desirable to substitute variables such as distress or suffering that represent the normal range of human experience for terms that should be restricted in their use to psychiatric populations.

Admittedly, we are arguing for a means of conceptualizing burn outcome that is couched less in terms of psychopathology, even though we have emphasized that psychiatric symptoms are often present in patients before they sustain burns. Although we maintain that the presence (or absence) of psychopathology provides useful information for predicting how patients will respond to their injuries, we also contend that the presence or absence of pathology will not be useful for defining what that response might be. Although a burn may result in social withdrawal or increased distress, it will seldom, in itself, cause the constellation of symptoms necessary for a diagnosis of major depression. A burn injury victim with virtually any type of Axis I psychiatric disorder, however, will likely show more distress and, possibly, social withdrawal. Thus, recognize that defining the presence of premorbid psychopathology is important, even though we are recommending that outcome be defined in nonpsychiatric terms.

Other important considerations in defining outcome variables are to avoid restricting conceptualization to one dimension and to include outcomes that emphasize functional domains. A severe burn has the ability to influence both the physical and emotional well-being of a victim. Furthermore, problems may appear in functional areas such as work, recreational activities, or social relationships that are not effectively described by variables used to measure physical or emotional

impact. Blades et al. (1979) provided a useful multidimensional measure of outcome in her study that included work, dependence, joint function, and psychosocial adjustment, as well as subjective measures of internal function. Tucker (1987) addressed this issue in the treatment of patients with burn injuries by using the Psychosocial Adjustment to Illness Scale, an assessment tool measuring the impact of illness on psychosocial functioning (Derogatis, 1976). Patterson et al. (1987) used the Sickness Impact Profile as a way to avoid restricting the measurement of burn outcome to a unitary variable. The Sickness Impact Profile is a 12-scale measure that includes assessments of physical, emotional, vocational, and recreational functioning, as well as other variables relevant to adjustment to illness (Bergner, 1985; Gilson et al., 1975). An extensive review of potential outcome measures for patients with burns was recently published by Pruzinsky, Rice, Himel, Morgan, and Edlich (1992).

In virtually every study on the psychological impact of burn injuries, outcome variables have been designed with the implicit assumption that the effects of burn injuries are negative. The possibility that a person's psychological functioning might improve as a result of this form of trauma was not taken into account, yet this is not a far-fetched notion. In their interviews of 29 survivors of traumatic accidents, Janoff-Bulman and Wortman (1977) found that all but one of the subjects were able to produce an answer to the question, "Why me?" Furthermore, two of the six categories of responses they received could be construed as perceived positive benefits. For example, 10 of those interviewed felt that "God had a good reason for the accident," and 6 regarded their outcome after illness as a positive one. Westbrook and Viney (1982) found that patients suffering from a variety of chronic illnesses reported more positive and more negative psychological reactions than did a comparison group. In a study reported by Hambra and Shontz (1978), patients with life-threatening cancer perceived more positive effects from their illness than did comparison groups of their relatives or hospital employees. In a study of cancer patients, Taylor et al. (1984) found that of 78 patients interviewed, 60% reported positive life changes attributable to their illness. If measurement strategies with burn patients allowed for the possibility, investigators might find that some positive changes occur as a result of this trauma as well.

Research Design and Theoretical Issues

The studies we reviewed on long-term adjustment suffered from a number of research design problems. Some of the more salient limitations in this body of research include poor identification of premorbid symptomotology, problems with assessment, lack of control groups, inconsistent inclusion criteria, low participation rates, and varied specification of postburn assessment periods. There is substantial room for improvement with respect to how psychological studies in this area are designed and conducted.

The poor quality of long-term burn injury adjustment studies is likely due, in part, to the paucity of adequate theory behind the research. Most of the studies reviewed lacked any type of theoretical structure. Those having a theoretical framework were usually driven by a medical model. A medical model assumes that an underlying pathogen is responsible for symptoms and that it must be treated to resolve the illness (Fordyce, 1982). Not only is this model inadequate for describing the dynamic fluctuation of variables that occurs as a person recovers from a burn injury, it often leads investigators to overemphasize medically related variables as predictors in recovery. As a consequence, variables such as the size and location of the burn injury are often emphasized to the exclusion of factors that may better predict psychological recovery.

The research on psychological recovery from burns would be better served by models that take into account preinjury patient characteristics, as well as the wealth of potential moderating variables that can influence adjustment. To that end, the model that Vitaliano and his colleagues proposed for disaster research, which views distress as a function of survivor vulnerability and psychological and social resources, could serve as a useful strategy (Vitaliano, Maiuro, Bolton, & Armsden, 1987). Finally, we recommend that investigations into psychological burn adjustment include more moderating variables that have been found to be useful in other areas of health psychology. Concepts such as negative affectivity (Watson & Clark, 1984; Watson & Pennebaker, 1989), hardiness (Kobasa, 1979), commitment and control (Hull, Van Treuren, & Virnelli, 1987), and coping ability (L. Peterson, 1989) could all be useful in predicting how people will recovery from burn injuries.

Clinical Implications

Although the clinical applications of the studies we reviewed are worthy of a separate article, we would be remiss not to list briefly the implications for the psychological care of people who have sustained burn injuries.

A Burn Injury Can Often Be a Sign That Something in a Patient's Life Is Dysfunctional and Potentially Treatable

The majority of people who sustain burns have essentially unremarkable preinjury histories and experience this form of trauma as the result of an understandable accident. However, for a sizable minority of patients, this is unfortunately not the case. For these persons, it is often more important to address preexisting conditions, such as Axis I psychiatric disorders, alcohol or substance abuse, homelessness, or assaultive relationships rather than merely attending to the adjustment issues associated with the burn itself. Obviously, the degree to which a burn injury can serve as such a signal for dysfunction can run the gamut from blatant to subtle. Burns sustained through suicide attempts are examples in which a burn injury serves as a dramatic sign that a patient is suffering from significant premorbid problems. Less obvious, and largely hypothetical, are pathological factors in burn injuries sustained on the job. Although many, if not most, job-related burns are purely accidental, we were struck by the statistics indicating that a significant proportion of people sustaining burns subsequently change their vocation. We will not delve into the arguments that some injuries of this nature represent an unconscious wish to escape an unpleasant job or are a function of stress levels associated with vocational dissatisfaction. Our point is that in many cases a burn injury serves as a useful sign that something has gone

wrong in a patient's life. Useful clinical work should focus on remedies for the factors that led to the trauma rather than solely on the burn itself.

In most instances, there are no easy remedies for the dysfunction in a burn patient's life. In fact, such issues as adjustment to disfigurement or the existential meaning of the burn may be far down the list of needs for a hospitalized patient. As an example, burn centers in large urban settings located in colder climates are bound to have a high rate of admissions of homeless patients with severe alcoholism who burn themselves on hot water pipes or street grates in an attempt to keep warm during the winter months. To assume that psychological issues can be addressed in relation to the magnitude of such social problems is naive and illustrates the necessity for prioritizing the needs of the patient. For this reason, the role of the social worker on the burn unit staff cannot be overemphasized.

The Psychological Goal in the Treatment of Hospitalized Patients Should Be to Minimize Suffering Because Most Symptoms of Distress Usually Dissipate on Their Own

In looking at types of psychological symptoms that occur during hospitalization, we found frequent reports of delirium, anxiety, pain, and dysphoria. Although some level of distress and suffering appears to be common in patients on a burn unit, seldom do psychological reactions of this nature reach levels at which they can be regarded as psychiatric disorders worthy of diagnosis. Furthermore such symptoms tend to dissipate by the time of hospital discharge. This is consistent with a recently completed review of the disaster research indicating that psychopathology decreases as time since trauma increases (Rubonis & Bickman, 1991). Thus, a primary goal of psychological intervention with patients who are hospitalized for burns should be the immediate reduction of suffering, particularly where pain is concerned.

The particular psychological needs of such patients should also be carefully considered. It is common to hear hospital staffs or family members complain that a patient in a burn unit is "being too cheerful" or "taking it too well." The burn unit staff may be tempted to encourage a patient to face grief (for example, the death of a family member in a fire) prematurely. Our point is that the psychological interests of patients are usually going to be best served by maximizing whatever coping mechanisms they bring to the situation. Burn patients receiving treatment in an ICU should be encouraged to muster their resources and successfully complete this phase of care rather than come to terms with the cosmetic impact of their injury or other potential long-term emotional complications. Fordyce (1982) proposed that the sudden onset of disability could be perceived by patients as a form of punishment. The early behavioral response of traumatized patients constitutes a crisis phase during which clinicians should present calm, stable role models and encourage mastery in day-to-day events. Although conventional psychotherapy allows for the possibility of generating a certain amount of stress as a means of facilitating behavior change, this approach is seldom appropriate for patients who are being hospitalized for burn care. With this in mind, a number of psychologically based techniques have been reported that are geared toward reducing pain, anxiety, and behavioral problems in hospitalized burned patients (Everett, Patterson, & Chen, 1990; Patterson, Everett, Burns, & Marvin, 1992).

Physical Rehabilitation and Medical Interventions With a Cosmetic or Functional Impact May Optimize Psychological Adjustment

With burn injuries, the relationship between moderating and outcome variables is often complex and cyclical. In reviewing the literature, we were impressed by how often people with disfigurement from burn injuries appeared to adjust well. However, a minority of those people who initially appear to be adjusting well may develop long-term adverse emotional effects. Because the psychological impact of physical disability or disfigurement may not become manifest for a period of time, the best preventive measures for maladjustment may be to minimize the effect of these variables. It follows that treating a burn injury as effectively as possible from a medical standpoint may be the best means of facilitating psychological well-being. Approaches that reduce physical disability or disfigurement are particularly useful. In addition, psychological or psychiatric consultation may often be best directed at the staff or family. There is often a tendency for both families and staff to overpathologize when estimating the emotional sequelae of a burn. In this vein, individuals in the patient's support system should be encouraged to alleviate patient suffering and provide emotional support, and the emphasis on helping them deal with an underlying problem should be reduced.

Predicting Who Will Show Long-Term Suffering From Burns Involves Appreciating Cyclical Interplay Among Social, Economic, Psychological, and Physical Variables

One clear finding from our review is that the majority of people who are hospitalized for burns do not suffer from major psychopathology as a result of their injury and do not need mental health services after discharge. However, a minority of burn injury survivors report significant emotional problems. Furthermore, we are unsure about the long-term effects of massive burns (e.g., greater than 70% TBSA burned), as this patient population has largely escaped empirical scrutiny. In patients reporting problems, financial or social disincentives (i.e., rewards for remaining ill), such as litigation over the burn or workers' compensation for a disgruntled employee, are often substantial and should therefore be a focus of treatment. Furthermore, the literature on adjusting to stress and medical disorders in general suggests that those patients who are premorbidly vulnerable (Vitaliano, Maiuro, Bolton, & Armsden, 1987), show poor coping strategies (L. Peterson, 1989; Revenson & Felton, 1989), or lack social support (Cohen & Wills, 1985) are more likely to need treatment. We feel that most patients who require long-term psychotherapy after a burn injury usually require a limited number of sessions to discuss the actual burn itself. We found no evidence that patients with burns go through any predictable sequence of stages in recovery from this trauma. Thus, stage theories of burn recovery are as inadequate in describing recovery in this population as they are in describing other types of disability (e.g., Trieschmann, 1988).

A special area of concern is the burn injury that results in

notable and permanent cosmetic disfigurement. As stated above, we were impressed in our review by the emotional strength with which many patients have been able to face their change in appearance. The presence of social support and other psychological resources may account for this resilience. However, some studies suggest that patients with disfigurement tend to withdraw socially. There is likely a subset of the burn population who have shied away from studies as a result of their disfigurement; treatment with this group presents a challenge. Such individuals with disfigurement may be essentially "normal" people in the sense that they lack any premorbid psychiatric symptoms. Thus, they may tend to avoid psychotherapy as a means of addressing the issues created by their disfigurement. Presuming that some of these individuals will enter the treatment setting, there are a variety of theoretical approaches to addressing cosmetic concerns (see Pruzinsky & Cash, 1990).

Conclusions

Although burn injuries are unusual in their capacity to produce pain, anxiety, and even disfigurement, they are still in essence a basic form of trauma. Although we have limited our discussion almost exclusively to burn injuries, we nevertheless maintain that improving the outcome literature in this field will require researchers to draw on state-of-the-art psychological studies of stress, coping, and adjustment to other types of medical disorders. Unfortunately, the literature on the psychological impact of burn injuries has lagged behind the medical research on such injuries. Almost all of the studies we reviewed displayed a number of weaknesses. Such problems typically were observed in design (particularly a lack of control groups), adequate sampling, and measurement (Eyles et al., 1984). The lack of studies on burn patients with extremely large burn injuries was also disappointing. We also found that much of the literature concerning adjustment in burn patients has been driven by a medical model that falls short of describing the complexities of the psychological impact of burn injuries. Neither the medical model nor stage theories are adequate to describe the dynamic fluctuations and range of emotional reactions that must be considered when studying the psychological effects of burn injuries.

Despite weaknesses in the burn literature, a number of clinically useful findings are apparent. One trend supported by several studies is that, although the data are admittedly retrospective, it is important to evaluate what psychopathology might have existed in patients *before* they were burned. It is also clear that a substantial number of patients suffer from a variety of symptoms including pain, anxiety, PTSD, dysphoria, and delirium during their hospitalization for the treatment of a burn. Although such symptoms may arise during hospitalization, they are most often transient and seldom reach a level indicating a specific psychiatric disorder. A similar lack of clinically significant adjustment problems was noted in the long-term follow-up literature. Burn outcome is better characterized in terms of a series of functional outcome variables (e.g., return to work, social relationships, and sexual functioning) than by global variables such as self-esteem.

The findings in this review challenge the notion that a burn, or any single event, can have an overarching impact on personality. Certainly, a severe burn combined with the right combination of circumstances can significantly alter the course of one's life, as can any particular chance encounter (e.g., Bandura, 1982). However, rather than finding repeated evidence of psychopathology after severe burn injuries, we are impressed with the emotional resilience that many people seem to show after suffering this form of trauma. The psychological-burn literature is in need of additional studies and models that are sophisticated enough to address the complexity of the psychological effects of a burn. One element of such future studies, it is hoped, will be the avoidance of conceptualizing change exclusively in deficit terms.

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