

# Posttraumatic Stress Symptoms in Parents of Children with Acute Burns

Erin Hall,<sup>1</sup> MA, Glenn Saxe,<sup>1</sup> MD, Frederick Stoddard,<sup>2</sup> MD, Julie Kaplow,<sup>3</sup> PhD, Karestan Koenen,<sup>4</sup> PhD, Neharika Chawla,<sup>5</sup> MA, Carlos Lopez,<sup>5</sup> MD, Lynda King,<sup>6</sup> PhD, and Daniel King,<sup>6</sup> PhD

<sup>1</sup>*Boston Medical Center, Boston University, <sup>2</sup>Shriner's Burns Hospital, Harvard Medical School,*

<sup>3</sup>*University of Medicine and Dentistry of New Jersey, <sup>4</sup>Harvard School of Public Health,*

<sup>5</sup>*Boston Medical Center, and <sup>6</sup>VA Boston Healthcare System, Boston University*

**Objective** To develop a model of risk factors for posttraumatic stress disorder (PTSD) symptoms in parents of children with burns. **Methods** Immediately following the burn and 3 months later, parents reported on their children's and their own psychological functioning and traumatic stress responses. **Results** Approximately 47% of the parents reported experiencing significant posttraumatic stress symptoms 3 months after the burn. Our model indicates three independent pathways to PTSD symptoms (i.e., parent-child conflict, parents' dissociation, and children's PTSD symptoms). Additionally, parents' anxiety predicted increased parent-child conflict, conflict with extended family and size of the burn predicted parents' dissociation, and size of the burn and children's dissociation predicted children's PTSD symptoms. **Conclusions** This study suggests that many parents of children with burns suffer from posttraumatic stress symptoms. Interventions that target factors such as family conflict, children's symptoms, and parents' acute anxiety and dissociation may diminish the risk for PTSD.

**Key words** burns, Parents, PTSD.

Traumatic stress symptomatology has been identified in children surviving burns (Saxe et al., 2004; Stoddard, Norman, Murphy, & Beardslee, 1989), recovering from injuries (Stoddard & Saxe, 2001; Winston et al., 2002), diagnosed with cancer (e.g., Barakat, Kazak, Gallagher, Meeske, & Stuber, 2000; Kazak et al., 1997; Stuber et al., 1997), and undergoing transplant surgery (e.g., Young et al., 2003). There are few studies, however, addressing the impact of illnesses and injuries on the parents of these children. A severe injury or a life-threatening medical diagnosis in a child can be extremely stressful for a parent (e.g., Kazak, 1997; Stuber, Christakis, Houskamp, & Kazak, 1996; Stuber, Kazak, Meeske, & Barakat, 1998; Winston et al., 2002). The parents of an injured or ill child must contend with the possibility of their child's death as well as with the serious impact of the medical

event on the child's future. Further, parents must help their child cope with the stress of hospitalization, which often includes painful medical procedures. These experiences can overwhelm even the most resilient of parents.

Existing studies examining parents of children with burns have consistently demonstrated that burns in children may be among the most stressful events for a parent (e.g., Byrne et al., 1986; Cella, Perry, Kulchysky, & Goodwin, 1988; Mason & Hillier, 1993a; Mason & Hillier, 1993b; Mason, 1993; Rizzone, Stoddard, Murphy, & Kruger, 1994). Parental stressors that may be associated with the burn itself are multiple and include a parent's own burn injuries, witnessing their child's painful surgeries and medical procedures, being away from home, other family members and social support, and contending with the serious impact of the burn on the child's future.

*All correspondence concerning this article should be addressed to Erin Hall, Child and Adolescent Psychiatry, Boston Medical Center, Dowling 1 North, 1 Boston Medical Center Place, Boston, Massachusetts 02118. E-mail: erin.hall@bmc.org.*

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Several or all of these stressors combine to initiate and sustain the complex stress response and grieving experienced by parents of children with burns. Recently, Kent, King, and Cochrane (2000) reported that mothers of preschool children with burns demonstrated higher anxiety scores compared to mothers of children with fractures or with illnesses. Even as the anxiety of the mothers of children with burns diminished over time, it remained consistently higher than the anxiety of mothers of children with other illnesses or injuries. Kent et al.'s (2000) results also suggest that compared to their children, mothers may be at greater risk of developing psychological distress following their child's burn.

Although some studies suggest that parents of children with burns may develop psychological symptoms including guilt, depression, anxiety, and hostility following their child's burns (Byrne et al., 1986; Cella et al., 1988; Kent et al., 2000; Mason & Hillier, 1993a,b; Mason, 1993), fewer studies have examined posttraumatic stress responses in parents of children with burns. In a study of severely burned children (mean burn size = 37.9%), 52.0% of these mothers met criteria for posttraumatic stress disorder (PTSD) at some point since their child's burn (Rizzone et al., 1994), whereas only 25% of children met criteria for PTSD. In addition, 31% of mothers met criteria for PTSD approximately 7 years following their child's hospitalization for an acute burn. The strongest predictor of parents' PTSD symptoms was the size of the child's burn, above and beyond the contributions of proximity to the event, perceived social support, or perceived stress. Other predictors included having more than one child burned and parents having been burned themselves. Fukunishi (1998) examined posttraumatic symptoms and depression in parents of children who had been scalded in bath water both acutely and 4 years later. Acutely, 18.8% met criteria for PTSD. Although, none of the parents met criteria for PTSD at the time of follow-up approximately 13% reported symptoms of increased irritability and difficulty sleeping.

Overall, these findings indicate that parents of children with burns are likely to develop significant psychological distress. There is preliminary evidence to suggest that responses of parents of children with burns may be more severe than those of parents whose children have endured different types of injuries or illnesses (Kent et al., 2000). As there is a high prevalence of posttraumatic stress symptoms in parents of burned children, there is a great need to understand variables that contribute to the progression of these symptoms. The goal of this study was to determine a model of risk factors for the development of posttraumatic stress in parents of children with burns.

Given that this study is one of the few to assess parents of children with burns prospectively, from the immediate aftermath of the trauma, it seeks to clarify the nature of risk factors for PTSD in parents through the application of a stress-diathesis framework (Yehuda, 1999). This framework posits that individual vulnerabilities interact with environmental stressors to create stress responses. Of these environmental stressors, one of the most salient that leads to poor outcomes in children and parents is family conflict (e.g., Duncan, Strycker, Duncan, & Okut, 2002; Moos & Moos, 1994; Thompson et al., 1994). Therefore, we chose measures of family conflict as independent variables. Within this structure, we also considered the temporal sequence of trauma (i.e., pretrauma variables, trauma characteristics, peritraumatic variables, and posttraumatic variables) in developing our hypotheses. Thus, we hypothesized that pretrauma environmental stressors (familial conflict), as well as the severity of the trauma would be positively associated with parents' peritraumatic anxiety and dissociation (intrinsic vulnerability).

## Method

### Participants

Sixty-two parents (54 mothers and 8 fathers) of children who were hospitalized at Shriners Burns Hospital in Boston for an acute burn participated in the study. None of the parents were burned in the incident that led to the hospitalization of their children. Sixty-six percent of participants were Caucasian, 11% were African American, 5% were Hispanic, 5% were either Asian, Native American, or West Indian (i.e., one family from each of the aforementioned ethnic groups), and the ethnicity of 13% of the families is unknown. The mean age of the children was 11.45, with a range of 6–17. Sixty-nine percent were male, the mean length of stay was 24 days and the mean Total Body Surface Area Burned (TBSA) was 16.9% with a range of 1–85%. This cohort of children has been described in other studies (i.e., Saxe et al., 2003, in press).

### Procedure

Prior to participant recruitment, the Institutional Review Board at Shriners Burns Hospital and Massachusetts General Hospital approved the study protocol including the informed consent and assent forms. When the child was medically stable, a master's level trained research assistant approached the child and parent(s) to explain the study and to obtain informed consent and assent. Participants were excluded if they did not speak fluent English. Fifty-eight percent of 106 eligible families participated ( $N = 62$ ).

Of the 44 children that did not participate, 26 of the families declined the offer to participate and 18 were discharged before we were able to obtain consent. The benefits of the study, including contributing to a project that aims to help other children suffering from burns in the future, were emphasized by the research assistant in order to obtain maximum enrollment. In addition, hospital staff, including doctors and nurses, were invested in the study goals and offered support and encouragement whenever necessary. Common reasons participants declined to participate included not wanting to make a time commitment and lack of interest in the study goals.

After giving their assent and consent, parents completed a battery of questionnaires assessing their acute stress symptoms, psycho-social functioning and family strains. While in the hospital, the children's primary nurses also completed a questionnaire about the children's dissociative symptoms. In a study specifically examining risk factors for PTSD in these children (Saxe et al., in press) the nurses' report of the children's dissociation was a stronger predictor of children's later PTSS than the children's own report of their dissociative symptoms. Furthermore, given that children hospitalized with burns have longer hospital stays, the nurses spend a lot of time with these children, which creates a strong vantage point from which to evaluate the children's dissociative symptoms. Three months following the initial assessment parents completed a questionnaire about their posttraumatic stress symptoms and family strains and children answered questions via a semistructured interview about their posttraumatic stress symptoms.

## Measures

### Parent Measures

**Parents' PTSD.** The civilian version of the PTSD Checklist (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1993) is a 17-item self-report questionnaire designed to assess the 17 PTSD symptoms described in the DSM-IV. The total score on the PCL-C was our index of PTSD symptoms in parents (i.e., our main dependent variable). It has been cross-validated with the Clinician Administered PTSD Scale (CAPS; Blake et al., 1995) and is considered to be a valid and reliable screening measure for PTSD (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). The diagnostic efficiency of the PCL-C versus the CAPS is .90 and the internal consistency coefficient of the total score (Cronbach's alpha) is .94. Sample items include "Avoiding activities or situations because they reminded you of your stressful experience?" and "Having difficulty concentrating?"

**Parents' Dissociation.** The Stanford Acute Stress Reaction Questionnaire (SASRQ; Cardena, Koopman, Classen,

Waelde & Spiegel, 2000) is a 30-item questionnaire designed to evaluate acute stress in accordance with the DSM-IV criteria for Acute Stress Disorder (ASD). The 10-item dissociation subscale was our index of dissociation for parents. This subscale has demonstrated excellent internal consistency across various populations and yielded a Cronbach's alpha of .94 with a sample of emergency rescue workers (Dr Cardena, personal communication, March 10, 2004). The dissociation subscale also has strong predictive validity as subscale items are significantly correlated with PTSD symptomatology measured by the Civilian Mississippi scale ( $r = .31-.47$ ,  $p < 0.01$ ). Sample items include "I experienced myself as though I were a stranger" and "I felt estranged/detached from other people."

**Parents' Anxiety.** Parents' anxiety was measured by the anxiety subscale of the Brief Symptom Inventory (BSI; Derogatis, 1993), a 53-item self-report instrument that assesses psychological symptom patterns of both adult psychiatric outpatients and adult non psychiatric outpatients. Overall, the BSI yields nine symptom dimension scores as well as three scores of global indices. The anxiety symptom dimension consists of 6 items (e.g., "nervousness or shakiness inside") with an alpha of .81, indicating acceptable internal consistency.

**Familial Conflict.** The Family Strains Index (FSI; McCubbin & Patterson, 1982) is a 10-item self-report measure designed to assess changes and life events that can leave a family susceptible to the effect of a subsequent stressor or change. Two individual items *increased conflict with extended family* and *increased in conflict with children* were used in our model. Respondents reply to each item on a dichotomous scale (i.e., *yes* or *no*). Psychometric properties include a Cronbach's alpha of .69 and a convergent validity coefficient, derived from a correlation with the Family Inventory of Life Events and Changes (FILE; McCubbin, Patterson, & Wilson, 1983), of .87 (McCubbin, Thompson, & McCubbin, 1996).

### Child Measures

**Children's PTSD.** The Child Posttraumatic Stress Disorder Reaction Index (CPTSD-RI; Nader, 1996) is a 20-item semistructured interview that assesses posttraumatic symptoms in children. The total score was our index of child's PTSD symptoms. Inter-rater reliability is high (Cohen's Kappa = 0.88). Validity is supported by the finding that children who are known to have PTSD have much higher scores on this instrument. Sample items include "Do thoughts about the burn come back to you even when you don't want them to?" and "Do you feel more detached or distant from other people since the burn?"

### Nurse Measures

**Children's Dissociation.** The Numbing and Dissociation Scale of the Child Stress Disorders Checklist (CSDC; Saxe et al., 2003), which the child's primary nurse completed during the child's hospitalization, was our index of child's acute dissociative symptoms. This eight-item scale assesses the dissociative dimension of the child's acute and posttraumatic stress response. Test-retest reliability, calculated by correlating scores reported by parents, two days apart, is .70. Validity of the subscale is supported by a significant decrease in the subscale score 3 months later as traumatic stress symptoms are expected to decrease with time. Sample items include *child seems "spaced out" or in a daze* and *child seems numb or distant from his or her emotions*.

### Data Analysis

Data analysis consisted of a strategy similar to that used by Shalev, Peri, Cenetti and Schrieber (1996) in another prospective study of acutely traumatized individuals. The rule of thumb for sample size in path analyses is 5–10 subjects per parameter in the model (indicated by a straight arrow) in order to have confidence in the results (Bentler & Chou, 1988). A conservative approach of at least seven subjects per parameter indicates that eight parameters ( $8 \times 7 = 56$ ) can be used comfortably in the model, given our sample size of 62. As this strategy follows a prospective longitudinal design, the directionality of many of the paths is constrained by the time at which the variables were assessed. Accordingly, we divided variables into (a) parents' PTSD symptoms (our main dependent variable; derived from the PCL-C at follow-up), (b) posttraumatic variables (variables assessed at the 3 month follow-up), (c) peritraumatic variables (variables assessed shortly after the trauma), (d) trauma exposure variable (percentage of body surface area burned), and (e) pretrauma variables (variables about the child or family from before the trauma). Owing to the non-normality of the PCL variable, it was subjected to a square root transformation before inclusion in the analyses; the skewness and kurtosis were reduced from 1.82 and 3.06 to 1.42 and 1.67, respectively (Curran, West, & Finch, 1996).

A series of hierarchically nested multiple regression analyses were used to estimate direct and indirect effects among variables. The first step was to predict the dependent variable (parents' PTSD symptoms). Of the remaining variables, we chose combinations of variables that accounted for a high percentage of the variance of PTSD symptoms (high  $R^2$ ) guided by the research literature on risk factors for PTSD (e.g., Yehuda, 1999) and constrained by the strength of the bivariate relationships

(i.e., all bivariate relationships:  $r > .30$ ). Accordingly, we chose three primary variables (i.e., parents' acute dissociation, children's PTSD symptoms, and increased parent-child conflict, all measured 3 months following the trauma) that together accounted for 57% of the variance of PTSD ( $R^2 = .57$ ). Once these three variables were chosen we began building a model including more "upstream" or antecedent variables that would place parents' dissociation, child's PTSD symptoms, and increased parent-child conflict in the roles of mediators. We specified a fully saturated model and then removed paths that were not significant. We were also guided by the strength of bivariate relationships, and we were further constrained by temporal relationships (e.g., peritraumatic dissociation could not lead to the size of the burn). In this way, a network of associations among variables was generated, as illustrated in Figure 1, which, as discussed below, adds important understanding to the unfolding of PTSD in parents of burned children over time.

Problems related to missing data can reduce the number of subjects for a particular analysis to a less than optimal level. We employed the statistical package Mplus 2.1 (Muthen & Muthen, 1998) with full information maximum likelihood estimation to retain complete sample size for each analysis. Mplus is the statistical application preferred because it is able to use the full information maximum likelihood procedure in concert with the Satorra-Bentler correction for non-normal data [see the work of McArdle and Cattell (1994) and Graham, Hofer, Donaldson, MacKinnon, and Schafer (1997) for discussion of the advantages of maximum likelihood-based incomplete data methods over more traditional listwise and pairwise deletion procedures].

## Results

### Parents' Posttraumatic Stress Symptomatology

The mean score on the PCL-C was 27.38 ( $SD = 12.51$ ), with a range of 17–67. The PCL-C scores were analyzed through a symptom cluster approach, which identifies individuals who have clinically significant PTSD symptoms, if they report being at least "moderately bothered" by at least one cluster B (Reexperiencing) symptom, three cluster C (Avoidance) symptoms, and two cluster D (Arousal) symptoms (e.g., Manne, Du Hamel, Gallelli, Sorgen, & Redd, 1998). Using this approach, 38% of parents endorsed clinically significant cluster B symptoms, 16% endorsed clinically significant cluster C symptoms, and 32% endorsed clinically significant cluster D symptoms. Although the PCL-C is a screening and not a diagnostic instrument, 47% of parents reported experiencing

clinically significant symptoms from at least one of the PTSD symptom clusters, 28% from at least two symptom clusters, and 9% from all three symptom clusters, suggesting that this sample of parents were highly symptomatic.

With regard to individual items, the symptoms most commonly endorsed as clinically significant (i.e., at least “moderately bothered” on PCL-C) were watchfulness (34%), becoming upset at reminders of the trauma (28%), trouble sleeping (22%), and intrusive thoughts (22%).

### Path Analyses

The results indicate three direct pathways to PTSD symptoms. These pathways are from (a) acute parental dissociation ( $\beta = 0.24$ ), (b) children’s PTSD symptoms ( $\beta = 0.21$ ), and (c) increased parent-child conflict ( $\beta = 0.63$ ). In addition, parents’ acute dissociation and children’s PTSD symptoms mediated the relationship between total body surface area burned and parents’ PTSD symptoms, whereas children’s PTSD symptoms also mediated the relationship between children’s dissociation and parents’ PTSD symptoms. Moreover, increased conflict between parents and children mediated the relationship between parents’ acute anxiety and their PTSD symptoms. The relationship between pretraumatic conflict with extended family and parents’ PTSD symptoms was mediated by parents’ dissociation. Together these pathways account for 57% of the variance of PTSD symptoms, as aforementioned. The descriptive data for each variable in the model are provided in Table I. Figure 1 displays the results of the model with standardized regression coefficients (betas) given for each path. As expected, variables that were directly related to each other in the model were also highly correlated (Table II). The overall model yielded the following strong fit indices: Chi Square,  $\chi^2(14, N = 62) = 14.84, p = .39$ , comparative

fit index (CFI = 0.99), and root mean square error of approximation (RMSEA = 0.03).

### Discussion

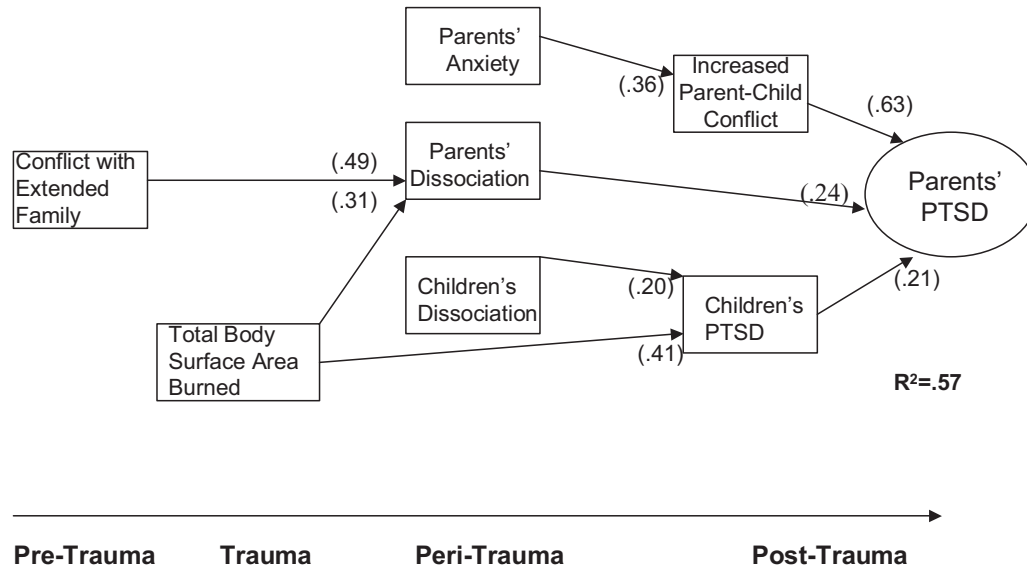
Posttraumatic stress symptoms were highly prevalent in this sample of parents of burned children. As previously described, 3 months following their children’s hospitalization for a burn 47% of parents had clinically significant symptoms from one symptoms cluster, 28% from two symptom clusters, and 9% from all three symptom clusters of PTSD. Parents’ dissociation at the time of the burn, conflict with their children, and their child’s PTSD symptoms were all directly related to their PTSD symptoms. Other risk factors that were related to PTSD indirectly via the three aforementioned paths included parents’ anxiety at the time of the burn, children’s dissociation, the severity of the children’s burns, and pretrauma conflict with the extended family. We will now discuss each of these pathways in turn.

#### Conflict with Extended Family, Size of Burn, and Acute Dissociation

Parents’ dissociation, which was assessed in the immediate aftermath of the trauma (i.e., during children’s hospitalization), was a direct predictor of later PTSD symptoms. Although this finding is consistent with results obtained with other traumatized adult populations, this is the first study, to our knowledge, that has demonstrated this relationship in parents of injured or ill children. The size of the child’s burn was directly related to the parents’ dissociation, which is consistent with studies that demonstrate that greater trauma severity is associated with dissociative responses. It is possible that adults respond to their child’s burn similarly to how other adults respond to a traumatic event that they have

**Table I.** Descriptives: Pretrauma, Trauma, Peritraumatic, and PTSD Variables

Variable	<i>M</i>	<i>SD</i>	Range
Pretrauma variables			
1. Conflict with extended family	10.23	17.66	0.00–40.00
Trauma variables			
2. Total body surface area burned	16.93	17.93	1.00–85.00
Peritraumatic variables			
3. Parents’ anxiety	58.89	8.97	38.00–73.00
4. Parents’ dissociation	12.11	9.81	0.00–44.00
5. Children’s dissociation	3.15	2.90	0.00–10.00
Posttraumatic variables			
6. Increased conflict between parents and children	9.84	18.90	0.00–45.00
7. Child’s PTSD	15.77	11.40	2.00–67.00
8. Parent’s PTSD	27.38	12.51	17.00–67.00



**Figure 1.** Path analytic model of parents' posttraumatic stress.

**Table II.** Correlation Matrix: Pretrauma, Trauma, Peritrauma, Posttrauma Variables

	2	3	4	5	6	7	8
Pretrauma variables							
1. Conflict with extended family	0.13	0.36*	0.56**	0.00	0.31	0.35*	0.47*
Trauma							
2. Total body surface area burned	—	0.42**	0.35*	0.43*	0.34	0.52**	0.42*
Peritrauma							
3. Parents' anxiety	—	—	0.39**	0.44**	0.41*	0.36*	0.48*
4. Parents' dissociation	—	—	—	0.12	0.30	0.30	0.41*
5. Children's dissociation	—	—	—	—	0.17	0.46**	0.33
Posttrauma							
6. Arguments between parents & children	—	—	—	—	—	0.24	0.71**
7. Children's PTSD	—	—	—	—	—	—	0.44*
8. Parents' PTSD	—	—	—	—	—	—	—

Values in bold indicate direct relationships in path analytic model (Figure 1).  
 \* $P < 0.05$ . \*\* $P < 0.01$ .

experienced directly, such as a surviving a firestorm (Koopman, Classen, & Spiegel, 1996). Interestingly, in our current model, children's dissociation also directly predicted their own PTSD symptoms 3 months later, which is consistent with the findings from a path analytic model specifically examining the development of PTSD in this sample of children (Saxe et al., in press). Thus, these parallel pathways between dissociation and PTSD symptoms in parents and in children in our model strongly support the role of dissociation in the development of PTSD symptoms, and highlight the need to further investigate the nature of this relationship.

Parents' conflict with their extended family in the year before the burn and, as aforementioned, the size of

the child's burn were strongly related to their dissociative response immediately following the burn. The experience of one's own child on a burn unit is extremely stressful and requires the support of one's social network to help manage physical necessities (e.g., care of other children, transportation, and financial help) and emotional needs during this extremely difficult time. This support is especially critical when children's burns are larger and more severe. Rizzone et al. (1994) found a correlation between parental PTSD symptoms and the size of their child's burn. Pretrauma conflict with extended family may be indicative of a lack of physical and emotional support. A study examining parents of children with cancer also demonstrated that social support was inversely related to

mothers' PTSD (Kazak et al., 1998). This pathway indicates that parents who have conflict with their extended family and have children with larger burns are likely to develop acute dissociative responses, which then lead to greater levels of PTSD symptoms.

### ***Parents' Acute Anxiety and Increased Conflict with Children***

Interestingly, parents who developed acute anxiety responses (rather than acute dissociative responses) were more likely to develop conflict with their children during the period following discharge from the hospital. This increased conflict with their children was directly related to the development of PTSD symptoms. Anxious parents (as opposed to parents with dissociative responses) may develop active avoidant strategies by restricting their burned children's activities in order to minimize the possibility of their children becoming injured again. This active avoidant strategy may then produce conflict with children. Further, ongoing conflict in the home may prevent trauma processing and may maintain PTSD symptoms. Obviously such an interpretation is speculative as coping strategies were not directly measured in this study; nevertheless, it corresponds to our clinical observation that anxious parents place increasing restrictions on their children. In fact, Ellis, Stores, and Mayou's (1998) results indicate that parents of children who had survived road traffic accidents reported becoming more protective of their children, and subsequently placing more restriction on their travel. This led to increased parent-child conflict. Best, Streisand, Catania and Kazak (2001) reported that parents' anxiety during their children's cancer treatment was significantly related to the development of their PTSD.

Both this pathway and the previous route to PTSD symptoms demonstrate the role of different forms of family conflict in the development of PTSD symptoms. The previous pathway identified conflict with extended family before the burn as predictive of acute dissociative responses in parents, whereas this pathway identifies acute anxiety responses as predictive of conflict between parents and children, which then lead to PTSD symptoms. Together, both pathways strongly support the importance of the family conflict in the development of PTSD or, possibly, family cohesion in the prevention of PTSD.

### ***Child's Acute Dissociation and Child's PTSD Symptoms***

Children's PTSD symptoms were directly associated with parents' PTSD symptoms. The association between

parents' and their children's PTSD symptoms has not been widely studied, despite evidence that child and parent adjustment are interrelated (Kazak, 1997). Within the burn literature, the family support unit is considered to have the greatest influence of children with burns' overall psychosocial adjustment (LeDoux, Meyer, Blakeney, & Herndon, 1998). In addition, there is compelling preliminary support for the connection between PTSD symptoms in children with chronic illness and their parents (Barakat et al., 2000), as well as in injured children and their parents (de Vries et al., 1999). It is of interest that parents' peritraumatic anxiety or dissociation were not predictive of children's PTSD symptoms. Furthermore, parents' dissociation and children's dissociation were not related, which is consistent with findings from the pediatric injury literature (e.g., Winston et al., 2002). Thus, although parents' and children's posttraumatic stress symptoms are related, their acute stress reactions are not. It is possible that parents' and children's reactions follow different trajectories that do not initially overlap. Overall, the association between parents' and children's traumatic stress responses in this sample of burn victims highlights the need to further elucidate the nature of this relationship in order to develop efficacious interventions for children and families in pediatric psychology.

### ***Limitations***

A strength of this study is the longitudinal prospective design, which enabled us to examine the interaction of several variables over time. Because all the acute variables were measured concurrently in the hospital and all of the posttraumatic variables were assessed concurrently 3 months later, it was not possible to determine the directionality of relationships within each assessment point. A possible methodological limitation included the use of dichotomous variables for our two family conflict variables. Dichotomous variables are used less often than continuous variables in path analyses because they can attenuate correlations.

Our results clearly indicate that parents develop posttraumatic stress in response to their children's burns. However, it should be noted that some aspects of the parental reactions endorsed as ASD or PTSD symptoms could be appropriate or adaptive responses to the situation. For example, parents' increased watchfulness after their child's burn may be helpful in promoting the child's recovery.

Although our sample size was adequate for the analyses we conducted the generalizability of the results is limited because it is a relatively small sample and because of the under representation of fathers and ethnic minorities. Kazak et al. (1998) developed two separate

models for the development of PTSD for mothers and fathers of children diagnosed with cancer. Although the models were similar, these results demonstrate that there are possible differences in parents' responses that, to our knowledge, have not been explored in parents of burn victims.

There is evidence to suggest that ethnicity can be a risk factor for PTSD, with belonging to a minority ethnic group being associated with higher PTSD (Kessler et al., 1999). Winston et al. (2002) reported that fewer White participants than Black, Hispanic, Asian, and other minority populations reported broad distress in the acute aftermath of a trauma. The population at Shriners's Burns Hospital is primarily White, of European-American descent, therein limiting diversity of the study sample. Future research should aim to include ethnicity as an independent variable for these types of studies.

## Conclusions

Despite these limitations, the results indicate a high prevalence of posttraumatic stress symptoms in parents of children who have been burned, 3 months following the trauma. Our model indicates three independent pathways to PTSD symptoms in parents of burned children: (1) from conflict with extended family and size of burn to acute dissociation and to PTSD symptoms, (2) from acute anxiety to conflict with children after hospital discharge, to PTSD symptoms, and (3) from the size of the burn to the children's acute dissociation to the children's PTSD symptoms and to the parents' PTSD symptoms. Overall, these data underscore the importance of addressing the aforementioned risk factors during acute trauma care, which can be facilitated by brief screening measures such as the The Screening Tool for Early Predictors of PTSD (STEPP; Winston, Kassam-Adams, Garcia-Espana, Ittenbach, & Cnaan, 2003). Furthermore, our findings support the utility of a posttraumatic stress framework for conceptualizing pediatric medical trauma and highlight the importance of considering family members and family variables in developing treatments and interventions.

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