Posttraumatic Stress in Children Following Acute Physical Injury

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Objective: To prospectively assess the presence of posttraumatic stress disorder (PTSD) in children hospitalized following acute physical injury. The focus was identification of the incidence of PTSD, PTSD symptoms, and exploration of factors associated with development of PTSD symptoms and disorder.

Method: Forty children ages 8–17 were interviewed approximately 1 month following a serious injury and assessed for PTSD, pretrauma behavior problems, levels of peritraumatic fear, and posttraumatic thought suppression.

Results: Twenty-two and a half percent of participants met DSM-IV diagnostic criteria for PTSD; 47.5% met criteria for at least two of the three PTSD symptom clusters. Greater thought suppression was associated with increased symptoms of PTSD, as were the child’s peritraumatic fear response and pretrauma internalizing behaviors.

Conclusions: Results suggest that many children who have been hospitalized for physical trauma may be experiencing clinically significant PTSD symptomatology and may benefit from psychological as well as medical intervention.

Key words: PTSD; physical injury; child; pediatric psychology.

Each year, thousands of children are admitted to hospitals for medical treatment of a range of injuries and acute medical conditions. Many injuries and conditions involve the threat of serious injury or death and evoke feelings of intense fear, helplessness, or horror, thus fulfilling the definition of a traumatic stressor according to Diagnostic and Statistical Manual Disorders-Fourth Edition (DSM-IV; APA, 1994). Despite this apparent link, the presence of PTSD in children who have experienced severe acute physical trauma has not been widely examined (Jaworowski, 1992), and psychological intervention is not generally considered, except in extraordinary circumstances.

A growing body of studies has noted psychiatric symptoms including PTSD in adults who are physically injured in motor vehicle accidents (MVAs; e.g., Blanchard et al., 1995; Mayou, Bryant, & Duthie, 1993). However, the adverse effects of acute and short-term medical traumas on children have received little attention.

A scant literature does suggest that children who experience ongoing painful and stressful medical procedures to combat the effects of injury or illness may develop PTSD. For example, some children who have been moderately to severely burned (Stoddard, Norman, Murphy, & Beardslee, 1989),
who have undergone bone marrow transplantation (Stuber, Nader, Yasuda, Pynoos, & Cohen, 1991), and who have had cancer (Stuber, Meeske, Gonzalez, Houskamp, & Pynoos, 1994) have been shown to exhibit PTSD even years after the experience. Likewise, children who experience severe acute psychological traumas also may develop PTSD (e.g., McFarlane, 1987; Pynoos et al., 1987, 1993; Terr, 1983). Even when full-blown PTSD does not emerge, many children experience numerous symptoms of PTSD. For some, these symptoms are transient and remit following a period of distress immediately posttrauma. However, for a substantial number of children, symptoms persist and reflect the ongoing negative effects of the trauma (McFarlane, 1987; Terr, 1983).

Given that many of the emergency hospitalizations of children involved in MVAs and those injured in other ways likely directly result from experiences that meet the DSM-IV traumatic stressor criterion of PTSD, the extent to which PTSD and PTSD symptoms develop in these children is an important but unanswered question. If such adverse stress responses are present, there are a number of ramifications. First, PTSD in children has been shown to have an insidious course and persist for months to years without intervention (Nader, Pynoos, Fairbanks, & Frederick, 1990; McFarlane, 1987; Terr, 1983). Therefore, if PTSD and clinically significant PTSD symptoms are potential consequences of severe physical injury, screening for such sequelae becomes imperative. Identification and treatment of such symptoms may help to alleviate psychological distress, increase subsequent medical treatment compliance, and promote continued healthy psychosocial development.

Previous research has identified a number of factors related to the development of PTSD symptoms. For example, Helzer, Robins, and McEvoy (1981) demonstrated that premorbid behavior problems predict PTSD in adults. Children have also been shown to exhibit a dose-response effect based on the level of exposure to traumatic stressors (Pynoos et al., 1987). Laboratory research has demonstrated that thought suppression can produce the paradoxical effect of increasing the intrusion of unwanted thoughts or images (e.g., Wegner, Schneider, Carter, & White, 1987).

The goals of this study were to determine the incidence of PTSD and PTSD symptoms in a sample of children hospitalized following an acute physical trauma and to explore factors related to PTSD symptom development. We predicted that pretrauma behavior problems, peritraumatic fear, and posttraumatic thought suppression would all contribute to the prediction of PTSD symptoms, with increased levels of each associated with greater PTSD symptomatology.

Method

Participants

Participants consisted of 40 children admitted to the pediatric intensive care units or general pediatric units at two large teaching hospitals. Children were evenly divided across gender lines (n = 21 girls; n = 19 boys). They ranged in age from 8 to 17 years (mean age = 13.6 years; SD = 2.95). Fourteen children were age 12 or younger; 11 children were between 13 and 15; 15 were 16 or 17. Eighty-five percent of children were Caucasian, while 15% were African American. They spent an average of 7.03 days in the hospital (SD = 6.59) and were interviewed approximately 4 weeks after their injury (mean = 27.87 days; SD = 5.84; range 18–47 days).

Because some children admitted to these units (particularly to the general pediatric unit) have more routine problems, children were included only if they experienced a physical injury that, by their own or their parents’ report, also involved a perceived threat of death or serious harm and a fear response in the child. Children for whom brain injury was suspected were not included in order to avoid confounding psychological symptoms due to brain injury with the psychological impact of the trauma. Likewise, children whose injuries caused long-lasting physical impairments, required extensive rehabilitation, or involved a very painful recovery were not included in order to avoid confounding the effects of continuing physical trauma with the immediate posttraumatic consequences.

Potential participants were identified prospectively at admission based on their injuries and admitting diagnoses obtained from hospital records and chart review. A total of 92 patients were identified as potentially meeting inclusion criteria. Of these, 14.1% (n = 13) were excluded because they could not be contacted following discharge from the hospital (e.g., disconnected telephone). An additional 8.7% (n = 8) were excluded because the children did not experience a sense of fear during the event leading to hospitalization. Of the remaining 71 potential participants (those eligible and contacted), 43.7% (n = 31) refused to partici-
pate. Of these 31 families, 61.3% (n = 19) were excluded because the parents indicated that they were not interested or they did not wish their children to participate, and 38.7% (n = 12) were excluded because the children did not wish to participate. The remaining 40 children (56.3% of those eligible and contacted) composed the final sample. Participants and nonparticipants did not differ in age (t[90] = .37, ns) or gender (chi-square[1] = 2.96, ns). As part of the inclusion criteria, all participants were determined to have met the stressor criterion for the DSM-IV PTSD diagnosis. Events leading to the children’s injuries were varied, with the greatest number of children hospitalized after being a passenger in an MVA or being hit by an automobile (n = 30; 75%). The remaining injury events included vehicular accidents other than automobile (e.g., bicycle, all-terrain vehicle; n = 4; 10%), being hit by a falling object (n = 2), event leading to respiratory distress (n = 2), physical assault other than child abuse (n = 1), and horse kick (n = 1). Specific injuries were diverse and included both life-threatening and relatively benign conditions (e.g., bone fractures, skin and organ lacerations).

**Measures**

**Narrative Account.** A detailed narrative account of the experience was solicited from each child. The child was asked to provide information about the event itself and his or her thoughts and feelings both during and after the experience. Areas addressed included the actual event, the child’s perception of the event and likely outcomes, the child’s feelings during and after the experience, memory lapses and fears of death, with Likert scale questions addressing the level of fear and perceived life threat during and immediately after the experience. Parents were asked to provide narrative information and respond to Likert scale questions about their own experience of the injury and their appraisal of the child’s response to the event.

**PTSD Measures.** The Reaction Index (RI; Frederick, Pynoos, & Nader, 1992) is a 20-item child-report measure that was originally patterned after the DSM-III PTSD criteria and has been updated for DSM-III-R and DSM-IV. The RI is the most widely used instrument to assess childhood trauma following acute stressors (McNally, 1991) and has been used to assess PTSD and PTSD symptoms following numerous traumatic events (e.g., Frederick, 1987; Lonigan, Shannon, Taylor, Finch, & Sallee, 1994; Pynoos et al., 1993; Shaw et al., 1995; Stuber et al., 1994; Stuber et al., 1991). Each item is scored on a 5-point scale (0 = none of the time, 1 = a little of the time, 2 = some of the time, 3 = much of the time, 4 = most of the time), and a total index is obtained by summing the scores for each item. Although the RI has often been used as a self-report scale, Frederick (personal communication, Nov. 18, 1995) recommends its use as a semistructured interview, and it was used in this manner for this study. Interrater reliability for the RI has been reported from .77 (Frederick, 1987) to .94 (Pynoos et al., 1987). Frederick (1985) reported correlations with confirmed cases of PTSD as .91 for children and .95 for adults. Reaction Index scores were assigned by the first author based on children’s responses and were subsequently scored blindly by a second rater, based on audiotapes of the interviews. Reliability for coding was good, with a kappa of .76. Cronbach’s alpha for this sample was .92.

The Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979) is a 15-item self-report scale that assesses intrusive imagery and avoidance experienced in the past week. Items are scored on a 4-point scale (0 = not at all, 1 = rarely, 2 = sometimes, 3 = often) and summed for total subscale and scale scores. Split-half reliability was reported to be .86, and internal consistency of the scales was also high (Cronbach’s alpha = .78 for Intrusion, .82 for Avoidance) (Horowitz et al., 1979). Test-retest reliability over one week was .87 for the total scale, .89 for the Intrusion subscale, and .79 for the Avoidance subscale (Horowitz et al., 1979). Although primarily an adult measure, the IES is also suitable for use with children (McNally, 1991). Cronbach’s alpha for this sample was .89 for the total IES score.

**Additional Measures.** The Child Behavior Checklist (CBCL; Achenbach and Edelbrock, 1986) is a widely used and well-standardized measure that solicits adults’ report of children’s behavior problems and competencies. The CBCL consists of 113 items, which are scored on a 3-point scale (0 = not true, 1 = somewhat or sometimes true, 2 = very true or often true). The measure is intended for children 4–18 years of age and standardized by age group. Scores were computed for the total scale and two broad subscales (Internalizing and Externalizing). Because the CBCL was used as a measure of premorbid functioning, respondents were asked to complete items describing their children’s behavior in the 6 months preceding the injury.

The White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) is a 15-item self-report measure of chronic general thought suppression,
with items that assess effortful suppression and intrusive thoughts. The scale has been repeatedly factor-analyzed and is reported to reliably assess one dimension (Wegner & Zanakos, 1994). The WBSI is a self-report measure, and items are scored on a 5-point scale (A = strongly disagree, B = disagree, C = neutral or don’t know, D = agree, E = strongly agree). The scale has good reported internal consistency, with Cronbach’s alpha .87–.89 for the different samples assessed (Wegner & Zanakos, 1994). Stability over time is good, with 1-week test-retest reliability of .92, and a 3-week to 3-month test-retest reliability of .69 (Wegner & Zanakos, 1994). Cronbach’s alpha for this sample was .89.

**Procedure**

Participants were first contacted during their hospital stay or by telephone shortly after. During this initial contact, screening questions were asked to determine whether inclusion criteria were met, the study was described, and parents and children were asked if they might be interested in participating. Families were informed that the purpose of the study was to better understand children’s emotional responses to injuries such as those they had experienced. If the families expressed interest, they were subsequently contacted for an appointment date.

Approximately 4 weeks following hospitalization, the child was interviewed by the principal investigator. This time period provided for an initial assessment within a short time following the injury, but for the more seriously injured children, adequate time to move past the acute phase of the physical threat. Children were interviewed in their homes in all but one instance. The child interview consisted of a brief rapport-building period, followed by a request to draw a picture. A detailed narrative account of the injury experience was then solicited, followed by administration of the RI and the remaining child-report instruments (IES, WBSI), which were administered orally and in interview format to ensure adequate comprehension and provide clarification when needed.

Following the completion of the child portion of the interview, the parents were seen without the children present when possible and asked to complete the CBCL. In addition, parents were asked to complete ratings of and respond to open-ended narrative questions about their own and their children’s response to the traumatic event.

Informed consent was obtained from all participants/guardians verbally on initial contact during or shortly after hospitalization and by both children and parents/guardians formally on the day of evaluation.

**Statistical Analyses**

Because questions about the incidence of PTSD and PTSD symptoms were not amenable to power analyses, confidence intervals (CIs) were constructed around obtained incidence percentages for PTSD diagnosis and symptom clusters. Power analyses were conducted for the remaining inferential statistical procedures used to address the relationship between PTSD symptoms and other variables. Assuming moderate effect sizes, power in this study was .48 for correlational analyses, .33 for tests of mean differences (t tests and main effects in 2 × 2 analyses of variance [ANOVA]), .18 for the interaction in 2 × 2 ANOVAs, and .46 in the multiple regression analyses with three predictor variables.

**Results**

**Presence of PTSD and PTSD Symptoms**

Because of the selection criteria, all participants met the DSM-IV stressor criterion. The presence or absence of PTSD was determined by the use of the RI with additional items added to assess symptoms not directly addressed in the original RI. (To preserve the psychometric properties of the RI, scores from additional items were not used in other statistical procedures reported here.) Symptoms were considered to be present if the RI score for the corresponding item was a 2 (“some of the time”), 3 (“much of the time”), or 4 (“most of the time”), and absent if the score was a 0 (“none of the time”) or 1 (“a little of the time”).

Twenty-two and a half percent of the participants (n = 9) met full diagnostic criteria for PTSD (95% CI = 9.6%–35.4%). Almost half of the children interviewed (47.5%; 95% CI = 32.0%–63.0%) met diagnostic criteria for at least two of the three symptom clusters that comprise the PTSD diagnosis, and almost three out of four (72.5%; 95% CI = 58.7%–86.3%) met criteria for at least one symptom cluster. Sixty-seven and a half percent (95% CI = 53.0%–82.0%) of participants met DSM-IV criteria for the reexperiencing symptom cluster. Twenty-five percent of participants (95% CI = 11.6%–
38.4%) met the criteria for the avoidance symptom cluster. Half of the participants (95% CI = 34.5%–65.5%) met the criteria for the increased arousal symptom cluster. Almost all children (95%) who were positive for at least one symptom cluster met the criteria for the reexperiencing cluster. All but one child who met the criteria for avoidance were positive for a diagnosis of PTSD. Increased arousal, when it occurred, coexisted with reexperiencing symptoms in all but two cases.

The PTSD symptoms of intrusion and avoidance were also measured with the IES. Descriptive statistics for the IES and other main variables are presented in Table I. The IES scores do not permit assigning of PTSD diagnosis or symptom cluster; however, RI and IES scores were highly correlated ($r = .84, p < .001$).

**Factors Associated with PTSD**

Subject characteristics were not associated with PTSD symptomatology or other variables. More specifically, there was no relationship between PTSD symptomatology as measured by the RI or IES total scores and children's age, gender, race, socioeconomic status, or treating hospital. In addition, there was no relationship between PTSD symptomatology as measured by the RI or IES total scores and the number of days between the dates of hospitalization and dates of interview.

Children stayed in the hospital for a mean of 7.03 days ($SD = 6.59$; range: 1–27 days). Only four children had hospital stays longer than 2 weeks. There was a moderate degree of association between the number of days a child spent in the hospital and his or her RI total score ($r = .32, p < .05$), and between number of hospital days and parents’ combined ratings of the children's fear and perceived life threat ($r = .38, p < .05$).

**Relation between PTSD and Peritraumatic Fear.** Children's ratings of their fear at the time of injury was associated with RI total score ($r = .56, p < .001$) and IES total score ($r = .48, p < .01$), but not thought suppression ($r = .05$, ns). An index of children’s overall self-reported fear response was created by summing scores from the child self-reported fear and life threat items. This index was associated with RI total score ($r = .56, p < .001$) and IES total score ($r = .52, p < .01$), but not thought suppression ($r = .26$, ns). See Table II for correlations of main variables.

**Relation between PTSD and Thought Suppression.** Effects of thought suppression on PTSD were evaluated by examining correlations between measures of suppression and PTSD indices and by putting children into groups of high and low suppressors on the basis of suppression scores and examining mean differences on PTSD indices. The WBSI total scores were correlated with RI total scores ($r = .55, p < .001$), RI reexperiencing scores ($r = .59, p < .001$), RI avoidance scores ($r = .50, p < .001$), and IES total scores ($r = .66, p < .001$). Children were divided into high and low suppressors by splitting groups at 1 SD above the mean. Reaction Index PTSD scores were significantly higher for high than low suppressors ($t(38) = 5.81, p < .001$). The difference in mean scores was substantial as well as sig-

| Table I. Descriptive Statistics for Main Variables |
| **Variable** | **Mean** | **SD** |
|Reaction Index | 20.75 | 14.64 |
|Impact of Event Scale-Intrusion | 6.32 | 5.26 |
|Impact of Event Scale-Avoidance | 7.55 | 6.40 |
|Impact of Event Scale-Total | 13.88 | 10.55 |
|Child Behavior Checklist-Internalizing T-score | 49.68 | 13.26 |
|Child Behavior Checklist-Externalizing T-score | 51.60 | 13.02 |
|Child Behavior Checklist-Total T-score | 51.20 | 13.26 |
|White Bear Suppression Inventory | 46.22 | 11.18 |

<p>| Table II. Correlations of Main Variables |</p>
<table>
<thead>
<tr>
<th><strong>Fear Index</strong></th>
<th><strong>RI</strong></th>
<th><strong>IES</strong></th>
<th><strong>Internalizing</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>RI</td>
<td>.56***</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>IES</td>
<td>.52**</td>
<td>.82***</td>
<td>—</td>
</tr>
<tr>
<td>Internalizing</td>
<td>.48**</td>
<td>.39*</td>
<td>.28</td>
</tr>
<tr>
<td>Suppression</td>
<td>.26</td>
<td>.55***</td>
<td>.66***</td>
</tr>
</tbody>
</table>

RI = Reaction Index; IES = Impact of Event Scale; Internalizing = CBCL Internalizing T-score; Suppression = WBSI Total Score.

*p < .05, **p < .01, ***p < .001.
significant (mean[high] = 42.29; n = 7; mean[low] = 16.18; n = 33). The IES PTSD scores were also significantly higher for high than low suppressors (t(38) = 4.93, p < .001). The difference in mean scores was substantial as well as significant (mean[high] = 28.00; mean[low] = 10.88). High suppressors had a mean of 10.71 symptoms, while low suppressors had a mean of 4.09 symptoms.

Relation between PTSD and Pre-, Peri-, and Post-trauma Variables. Parent-reported pretrauma internalizing behavior, child-reported peritraumatic fear and life threat, and child-reported thought suppression all correlated with PTSD symptoms. These indicators of PTSD response were entered into a simultaneous regression onto the PTSD measure. For each major indicator of overall PTSD response, only the child’s fear and suppression emerged as significant predictors of PTSD symptomatology. In each case, these two predictors accounted for a substantial portion of the total variance in PTSD response. For RI total score, they accounted for 50% of the variance; for IES total score, they accounted for 56% of the variance (see Table III). As noted in Table II, parent-reported pretrauma internalizing was not associated with thought suppression.

Finally, a possible interaction between thought suppression and the child’s fear during the event on symptoms of PTSD was examined by ANOVA. Children were classified as high or low suppressors by splitting WBSI scores at the median and as having high or low perceived fear by splitting the total child fear measure at the median. Total scores on the RI were evaluated based on group membership. There were significant main effects for suppression (F[36, 1] = 12.06, p < .01), and for fear, (F[36, 1] = 9.13, p < .01), but the interaction was not significant, (F[36,1] = 1.16, ns). Group means are listed in Table IV.

**MVA versus Non-MVA Injuries**

To evaluate the hypothesis that the shared features of the injury experience (e.g., threat of death or serious injury, feelings of intense fear or helplessness) would define a group that was not overly heterogeneous, we conducted secondary analyses of all main statistical procedures reported in this study excluding all participants who were not involved in an MVA (N = 30 for the secondary analysis). Analyses

### Table III. Prediction of PTSD from Pre-, Peri-, and Posttraumatic Variables

<table>
<thead>
<tr>
<th>Model</th>
<th>Beta Internalizing</th>
<th>Fear</th>
<th>Suppression</th>
<th>F</th>
<th>p</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.39*</td>
<td>—</td>
<td>—</td>
<td>6.89</td>
<td>&lt;.05</td>
<td>.15</td>
</tr>
<tr>
<td>Model 2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.48**</td>
<td>—</td>
<td>—</td>
<td>11.21</td>
<td>&lt;.01</td>
<td>.23</td>
</tr>
<tr>
<td>Model 3&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.12</td>
<td>.39**</td>
<td>.42**</td>
<td>11.93</td>
<td>&lt;.001</td>
<td>.50</td>
</tr>
<tr>
<td>Model 1&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.28</td>
<td>—</td>
<td>—</td>
<td>3.30</td>
<td>&lt;.08</td>
<td>.08</td>
</tr>
<tr>
<td>Model 3&lt;sup&gt;c&lt;/sup&gt;</td>
<td>—.01</td>
<td>.37**</td>
<td>.56***</td>
<td>15.01</td>
<td>&lt;.001</td>
<td>.56</td>
</tr>
</tbody>
</table>

<sup>a</sup>Dependent variable is Reaction Index.
<sup>b</sup>Dependent variable is Peritraumatic Fear.
<sup>c</sup>Dependent variable is Impact of Event Scale.

*<i>p</i> < .05.
**<i>p</i> < .01.
***<i>p</i> < .001.

### Table IV. Group RI Means for High/Low Suppression and High/ Low Fear

<table>
<thead>
<tr>
<th>Group membership</th>
<th>No. in group</th>
<th>Mean RI score</th>
<th>RI category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low fear</td>
<td>18</td>
<td>12.83</td>
<td>Mild</td>
</tr>
<tr>
<td>High fear</td>
<td>22</td>
<td>27.23</td>
<td>Moderate</td>
</tr>
<tr>
<td>Low suppression</td>
<td>19</td>
<td>13.84</td>
<td>Mild</td>
</tr>
<tr>
<td>High suppression</td>
<td>21</td>
<td>27.00</td>
<td>Moderate</td>
</tr>
<tr>
<td>Low fear/low suppression</td>
<td>11</td>
<td>10.64</td>
<td>Doubtful</td>
</tr>
<tr>
<td>Low fear/high suppression</td>
<td>7</td>
<td>16.29</td>
<td>Mild</td>
</tr>
<tr>
<td>High fear/low suppression</td>
<td>8</td>
<td>18.25</td>
<td>Mild</td>
</tr>
<tr>
<td>High fear/high suppression</td>
<td>14</td>
<td>32.36</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Interaction is not significant. RI = Reaction Index.

with the remaining sample were consistent with those utilizing the full sample.

**Discussion**

One month after a potentially serious or life-threatening physical injury that resulted in an emergency hospitalization, many of the children interviewed were suffering from clinically significant levels of PTSD symptomatology. The percentage of participants meeting full diagnostic criteria for PTSD was substantial (22.5%), and almost half of the children could be considered to be suffering considerable distress, as they met at least two of the three symptom clusters necessary for a PTSD diagnosis. Although the sample size was relatively small, even at the lower limits of CIs, a substantial number of children would be identified.

As predicted, participants who were more fearful and those who perceived that they were at a greater risk for serious injury or death had increased symp-
Pretraumatic internalizing, peritraumatic fear, and posttraumatic thought suppression all are correlated with severity of PTSD, only peritraumatic fear and thought suppression directly predict PTSD response. The association between pretrauma internalizing and PTSD is mediated through the child’s fear response at the time of the injury (Baron & Kenny, 1986).

Given the power of peritraumatic fear and thought suppression to predict PTSD and PTSD symptoms, a pathway to a PTSD response is suggested. The child’s sense of fear and perception of life threat during the injury or in the aftermath of the injury puts the child at risk for the development of a PTSD response. Some children cope with this frightening experience by trying to suppress thoughts of the event; others allow themselves to think about the event. Those children who suppress and avoid thoughts and feelings about the event appear to be at increased risk for subsequent PTSD. That is, the strong sense of fear and life threat serves as a potential activating event, but those children who cope by avoiding are more likely to go on to a negative outcome.

Thus, PTSD symptomatology in children who have been hospitalized following serious acute physical injury appears to be substantially influenced by the children’s experience at the time of injury and subsequent willingness to think and talk about their experience. Those children who reported that they were most afraid, and most afraid that they would be seriously injured or killed, displayed increased symptoms of PTSD 1 month following their injury. Children whose style of coping with unpleasant or painful thoughts is to avoid or suppress them also displayed increased symptoms of PTSD. Conversely, children who had a less severe fear response and those more willing to think about their experience had fewer and less intense symptoms of PTSD. Children who were both very afraid and who were high suppressors showed an additive effect and exhibited the greatest amount of PTSD symptomatology.

A number of methodological issues may limit the generalizability of these findings. First, the study did not employ a comparison group. Studies of PTSD frequently omit comparison groups because of the nature of the disorder. In fact, PTSD, or at least the risk for PTSD, begins with a specific event, and the symptoms are inextricably linked to that event, making it difficult to inquire about many symptoms in the absence of a specified stres-
sor. However, data were not gathered about previous exposure to traumatic events that could have influenced the child’s fear response and thought suppression. Second, the children were evaluated only once, a fairly short time after the trauma. Additional follow-up will be necessary to determine whether the symptoms observed 1 month post-trauma remit spontaneously or persist. Third, although parent-report measures were included, broader family functioning variables, including the family responses to the children’s injuries and to the children’s responses to those injuries were not evaluated. Such family variables may account for a substantial portion of the variance not explained by the variables in this study. Fourth, it is possible that the parents’ retrospective reports of their children’s behavior may have underestimated the degree of behavior problems. While this type of distortion would not be surprising in the aftermath of a life threat to the child, the equivalence of the group CBCL mean scores to those of the normative sample suggests that this is not the case.

A final issue potentially limiting generalizability is the participation rate. Approximately 44% of those approached declined to participate in the study. Refusing to participate may represent a reluctance to address issues that continue to be distressing (a form of thought suppression) and could suggest ongoing negative effects of the injury experience. It is also possible that those who declined may have been initially unaffected or have successfully resolved any traumatic aspects of the injury experience.

Despite these limitations, the finding that a substantial number of children hospitalized following injuries may be experiencing unrecognized psychological distress is important. Appropriate identification and treatment may help reduce patients’ distress, increase their compliance with medical follow-up, and improve their chances of healthy psychological and psychosocial development. The findings reported here demand consideration of the possible benefits of psychological intervention for children who have had an acute physical injury in which they believed they were at risk of serious injury or death.

Psychological intervention might be particularly effective with at-risk children based on the findings regarding thought suppression. Suppression and psychological intervention can be conceptualized as opposite approaches to dealing with a traumatic experience. The finding that thought suppression is an ineffective, even maladaptive, method of coping with the emotional sequelae of serious injury suggests that some open discussion of the events, with or without direct psychological intervention, may help to prevent the subsequent development of PTSD symptoms (Foa, Rothbaum, Riggs, & Murdock, 1991).

Intervention at the family level may have particular benefit for a number of reasons. First, parents can help their children use active coping strategies that would lessen their tendency to use thought suppression. Second, a tendency to avoid distressing thoughts and feelings might represent a family as well as individual coping style. Third, many children will not receive psychological intervention after discharge from the hospital, because either they do not have severe symptoms or their symptoms are not identified. In-hospital intervention with parents might therefore be targeted to both educate parents about signs and symptoms of psychological maladjustment in the wake of the injury and to help promote more open family communication about the possible reactions to the event. Further research on the role of family communication and coping styles may help elucidate the most effective avenues for intervention.

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