FACTORS PREDICTIVE OF PEDIATRIC POSTTRAUMATIC

STRESS DISORDER ONE YEAR POST TRAUMATIC

INJURY

———————————————

A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF MASTER OF SCIENCE

IN THE GRADUATE SCHOOL OF THE

TEXAS WOMAN'S UNIVERSITY

COLLEGE OF NURSING

BY

ANNE CAFFEE GILL, B.S.N.

———————————————

DENTON, TEXAS

MAY 1999

TEXAS WOMAN'S UNIVERSITY
DENTON, TEXAS

__April 14, 1999____
Date

To the Associate Vice President for Research
and Dean of the Graduate School:

I am submitting herewith a thesis written by Anne Caffee
Gill entitled "Factors Predictive of Pediatric Posttraumatic
Stress Disorder One Year Post Traumatic Injury." I have
examined the final copy of this thesis for form and content
and recommend that it be accepted in partial fulfillment of
the requirements for the degree of Master of Science, with a
major in Nursing.

Jeanette Kernicki, Ph.D.
Jeanette Kernicki, Ph.D.

We have read this thesis and
recommend its acceptance:

Maria L Anderson

Peggy A. Landrum

Accepted

Leslie M Thompson
Associate Vice President for Research
and Dean of the Graduate School

ACKNOWLEDGMENTS

FACTORS PREDICTIVE OF PEDIATRIC POSTTRAUMATIC
STRESS DISORDER ONE YEAR POST TRAUMATIC
INJURY

ABSTRACT

ANNE CAFFEE GILL, B.S.N.

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
MAY 1999

The purpose of this study was to identify risk factors predictive of posttraumatic stress disorder (PTSD) in children following a traumatic injury. This knowledge may assist with early identification and treatment of children at risk for developing PTSD and perhaps prevent the disorder or diminish the intensity of the symptoms. The study was a secondary analysis of data collected from a previous study. Medical records from 337 subjects were abstracted and demographic data were analyzed. Chi-square analysis was used for categorical variables and t-test analysis was used for continuous variables. Results from data analysis revealed gender, ethnicity, age, and injury severity were not risk factors for developing PTSD. However, mechanism of injury, specifically a gun shot wound, was associated with development of PTSD; having a fall was associated with not developing PTSD. Type of injury by body area, specifically a wound to the abdomen, was associated with PTSD.

iv

TABLE OF CONTENTS

Chapter

LIST OF TABLES

CHAPTER 1

INTRODUCTION

Approximately 4 million children in the United States are exposed to traumatic events each year, and approximately one-third of these will require mental health, medical, and educational services (Baker, Ginsburg, & Guohua, 1992). According to the <u>Diagnostic and Statistical Manual of Mental Disorders</u> (DSM-IV) (American Psychiatric Association (APA), 1994), 3% to 58% of individuals at risk will develop posttraumatic stress disorder (PTSD). PTSD is a clinical syndrome characterized by prominent affective and anxiety symptoms and by a "hyperactive" sympathetic nervous system (Schwarz & Perry, 1994). The development of these symptoms are related to the intensity and duration of the acute neurophysiological stress response during the traumatic event (Shannon, Pharm, Lonigan, Finch, & Taylor, 1994). The longer and more intense this "alarm" response, the more intense and chronic the clinical manifestation of PTSD symptoms (Schwarz & Perry, 1994). These symptoms ultimately interfere with the emotional, behavioral, and cognitive functioning in the injured children.

Although the criteria for PTSD is the same for children as adults, several modifications are included in DSM-IV (APA, 1994) that more specifically portray symptoms in children. For example, adults may reexperience the trauma through daydreams, whereas children may reexperience the traumatic event through nightmares or night frights. In addition, children might also relive the trauma through repetitive play, such as staging car crashes with toy cars. A younger child may manifest disorganized or agitated behavior in response to an event. This behavior may represent intense fear, helplessness, or horror experienced by the child (APA, 1994).

Avoidance of stimuli associated with the trauma and a general numbing of responsiveness is evident with both children and adults; however, children may believe that their future is foreshortened and that they will never become an adult. Another criterion of PTSD is persistent symptoms of increased arousal. In children, these symptoms may be evidenced by difficulty falling asleep, difficulty concentrating, hypervigilance, an exaggerated startle response, or outbursts of anger. Children might also exhibit physical symptoms such as stomachaches or headaches. To meet DSM-IV criteria, these symptoms must be present for more than one month and the disturbance must cause clinically

significant distress or impairment in social or other areas of functioning.

According to Schwarz and Perry (1994), PTSD represents the abnormal persistence of what in an acute situation is a normal adaptive response. The perception of intense danger activates the neurosensory apparatus and alters the pattern of neurotransmitter release throughout neuronal systems responsible for sensation, perception, and processing of survival information (Pitman, 1993). When the child experiences a significant trauma, the normal physiological and mental response is to activate a fight or flight response, including the total neurophysiological and neuroendocrine response associated with it. If this condition persists for hours or even days, the child will internalize and carry forward a persisting state of fear.

Problem of Study

In the vast majority of PTSD research, PTSD has been centered on the etiology, prevalence, and treatment of the disorder in adults, particularly combat veterans (Foy, Sipprelle, Rueger & Carroll, 1984; Keane, Fairbank, Caddell & Zimering, 1989). Previous studies of children with PTSD have been focused on natural disasters such as the Buffalo Creek Dam collapse (Newman, 1976) and Hurricane Andrew (Vernberg, Silverman, La Greca, & Prinstein, 1996). Little

research has been reported in children who have sustained traumatic injury from more common occurrences, such as motor vehicle collisions and falls.

The focus of this study is to identify what risk factors may predict the occurrence of PTSD in children who have sustained a traumatic injury. The knowledge derived from this study may assist with the early identification and treatment of children at risk for developing PTSD and thus decrease the intensity and duration of the disorder.

Justification of Problem

There are several reasons why it is important to identify risk factors in children vulnerable to the development of PTSD. Among these reasons is the paucity of similar studies in the literature that examine the development of PTSD and the relationship between psychosocial factors (i.e., demographics, injury events). Similar studies are lacking because earlier definitions of PTSD were less inclusive of what was considered a "traumatic event." Prior to 1994, DSM-III-R (APA, 1987) Criterion A for PTSD required that the person experience an event that was considered outside the range of usual human experience and would be markedly distressing to almost anyone. Criterion A was changed as DSM-IV (APA, 1994) was redefined to include events that the persons experienced or witnessed that

threatened death or serious injury or a threat to the physical integrity of self or others. Studies of PTSD in children following a motor vehicle collision or a fall simply did not exist because those events did not meet the diagnostic definition.

Another reason a study such as this is important is to support previous studies with adults and preliminary studies with children which have shown that early identification of individuals who are vulnerable to the development of PTSD and early implementation of interventions can decrease the intensity and duration of the "alarm" reaction (Blanchard et al., 1996; Vernberg et al., 1996). Reducing the alarm reaction may help prevent the development of PTSD and related neuropsychiatric problems.

The rational for the proposed study is further supported by recommendations from other researchers. Martini, Ryan, Nakayama, and Ramenofsky (1990) interviewed children who were injured while attending the Pittsburgh Regatta in 1988. During a featured race, a speed boat veered into the crowd and injured 23 people, 12 of whom were children. The authors evaluated the children for the presence of PTSD and other factors such as the severity of the injury, previous psychiatric illness and the family environment. Results of the study revealed that the severity

of the PTSD symptoms expressed by these children did not parallel the nature of their experience nor did it reflect the severity of the injuries. Consequently, the authors recommended evaluating children for the presence of PTSD in multiple settings and in other stressful situations.

This study was designed to analyze data from a previous study to determine if risk factors for the development of PTSD in children can be identified. If factors are shown to be statistically significant, nurses can then identify patients at risk for the development of PTSD. In these times of increasing cost consciousness in health care, such information may save money by enabling nurses to begin early treatment and management of pediatric patients at risk.

Conceptual Framework

Roy's adaptation model (1984; Roy, 1980) is an ideal conceptual framework for this study. As stated earlier, PTSD is the abnormal persistence of a normal adaptive response. The congruence of concepts and definitions associated with posttraumatic stress disorder and Roy's adaptation model support a logical association between theory and research.

According to Roy (1984), a person is conceptualized as an adaptive system that includes input, control processes, effectors, and output. Persons that exhibit ineffective responses are not adapting positively and are in need of

nursing attention. Persons may use both innate and acquired mechanisms to adapt (Andrews & Roy, 1986).

Roy (1984) indicated that a person has two subsystems for adapting, the regulator and cognator mechanisms. The regulator mechanism works through the autonomic nervous system to organize a reflex action that prepares individuals to respond and adapt to their environment. Stimuli are received from internal and external environments, causing the body to react with autonomic, endocrine, and perception responses.

The cognator subsystem identifies, stores, and relates stimuli and attaches meaning to behavior. The control processes as identified by Roy (1984) are: perceptual, information processing, learning, judgement, and emotion. These processes will influence a person's response. If there is a failure in the regulator or the cognator mechanism, a person will not adapt positively.

According to the adaptation model there are four effector modes: physiological needs, self concept, role function, and interdependence. The regular and the cognator mechanisms relate to each effector mode differently. The regulator mode is related predominantly to the physiological mode that allows a person to respond physically to the

environment. It receives input from the external environment and from changes in the person's internal state.

The cognator subsystem is related to the adaptive modes by receiving input from external and internal stimuli. It involves psychosocial, physical, and physiological factors. Self-concept is concerned with a person's conceptions of their physical and personal selves. Role function as used in Roy's model is concerned with people's performance of roles as the basis of their positions within society. The interdependence mode focuses on the development and maintenance of satisfying, affectional relationships with significant others (Andrews & Roy, 1991).

Assumptions

The following assumptions were derived from Roy's (1984) adaptation model.

1. The person is a bio-psycho-social being.

2. The person is in constant interaction with a changing environment.

3. To cope with a changing world, the person uses both innate and acquired mechanisms, which are biologic, psychologic, and social in origin.

4. The person's adaptation level is determined by three classes of stimuli: focal, contextual, and residual stimuli.

5. The person is conceptualized as having four modes of adaption: physiologic need, self-concept, role function, and interdependence relations.

The Roy model allows for the holistic nature of individuals. Fitzpatrick, Whall, Johnston, and Floyd (1982) recognized that the theory utilizes both strengthening adaptive behaviors and decreasing the strength of maladaptive behaviors.

Research Question

Using Roy's (1984) adaptation model as a theoretical framework, the following research question was formulated: What regulator and cognator mechanisms predict the occurrence of PTSD over 12 months in children who have sustained a traumatic injury?

The dependent variable is PTSD. The independent variables are regulator and cognator mechanisms.

Definition of Terms

The following terms are conceptually and operationally defined:

1. Regulator mechanism is conceptually defined by Roy (1984) as a coping mechanism which responds automatically through neural-chemical-endocrine processes. In this study, the operational definition includes age, race, gender, and

injury severity as determined by the Abbreviated Injury Scale (AIS).

2. Cognator mechanism is conceptually defined by Roy (1984) as a coping mechanism which responds through complex process of perception and information processing, learning, judgement, and emotion. In this study, the operational definition encompasses mechanism of injury, including motor vehicle collision, fall, gunshot wound, and assault. It also includes the area of the body injured, such as the head, chest, abdomen, arm, or leg. Parental composition is another definition of cognator mechanism.

3. PTSD is conceptually defined as stated in DSM-IV (APA, 1994). In this study, children identified with PTSD met all basic criteria for PTSD which include persistent reexperiencing of trauma, persistent avoidance of stimuli associated with the trauma or a general numbing of responsiveness, and persistent symptoms of increased arousal. The following characteristics unique to children with the disorder were recognized: (a) reexperiencing the trauma through repetitive play; (b) loss of developmental milestones; (c) sense of a foreshortened future, (d) disorganized agitated behavior; (e) difficulty falling asleep; (f) difficulty concentrating; (g) hypervigilance; (h) nightmares or night frights; (i) an exaggerated startle

response; or (j) outbursts of anger. The client must have
had at least one reexperience symptom, three or more
symptoms of avoidance, and two or more symptoms of increased
arousal to meet DSM-IV criteria. In addition, the symptoms
must have been present for more than one month and the
disturbance must have caused clinically significant distress
or impairment in social or other areas of functioning.
Patients with PTSD symptomatology but not meeting full
criteria were not considered as having PTSD.

   4. A <u>child</u> is defined both conceptually and
operationally as an individual between the ages of 12 months
and 16 years of age.

   5. <u>Traumatic</u> is defined by <u>Merriam-Webster's</u> (1993) as
"bodily injury or shock, an emotional shock often having
lasting psychic effect." Injury is defined by <u>Merriam-
Webster's</u> as "harm or damage." For the purpose of this
study, a traumatic injury is a physical injury resulting
from a motor vehicle collision, gun shot wound, fall, or
assault that is significant enough to require a hospital
admission.

<center>Limitations</center>

   This study relied on an existing data source to explore
cognator and regulator coping mechanisms predictive of PTSD
in children. In a study that limits itself to hospitalized

injured children, findings do not provide insight about factors of less severe injuries treated in community hospitals, emergency departments, or outpatient medical facilities. This sample was a convenience sample composed of the subjects readily available (Polit & Hungler, 1995). Thus, this sample may not be representative, therefore the findings cannot be generalized beyond the sample.

Summary

This study was designed to identify cognator and regulator factors predictive of PTSD in pediatric trauma patients treated in an outpatient clinic located in a large urban area. Identifying factors predictive of PTSD is important to initiate early treatment that will decrease the intensity and duration of the "alarm reaction" and possibly prevent the development of the disorder.

The conceptual framework was based on the adaptation model developed by Roy (1984; Roy, 1980). A retrospective review was used to collect data for this study. The use of a convenience sample limits the findings to a specific group of children, therefore the findings may not be generalizable to the whole population of pediatric patients. However, it is hoped that the findings from this research will add to the body of knowledge in this field of study.

CHAPTER 2

REVIEW OF LITERATURE

This literature review of articles from 1940 to the
present includes historical information and data from
previous research done on posttraumatic stress disorder
(PTSD) in adults and children. Current prevalence of PTSD in
the general population ranges from 1% to 14% (American
Psychiatric Association (APA), 1994). In children, Giaconia
et al. (1995) found that by 18 years of age more than two-
fifths of the youths studied in a community sample met
criteria for at least one DSM-III-R trauma and more than 6%
met criteria for a lifetime diagnosis of PTSD.

The review of the literature is divided into eight
sections. The first section contains the historical
perspectives of PTSD. The second section reviews PTSD in
children. The third section examines gender differences in
PTSD. The fourth section explores the influence of the
child's age and development level. The fifth and sixth
sections review previous exposure to traumatic events and
the impact of family influences. The seventh section is
concerned with socioeconomic and cultural factors, and the
eighth section is a summary of the literature review.

Historical Perspectives

For the professional and layperson alike, PTSD often conjures images of the Vietnam veteran returning home from the war. Popular movies over the last few years have illustrated the crippling effects of PTSD. These depictions helped educate the public and medical community about the emotional and psychological effects resulting from traumatic events. However, it was not until 1980 that the APA added PTSD to the third edition of its Diagnostic and Statistical Manual of Mental Disorders (DSM-III) nosologic classification scheme.

In the first edition of the Diagnostic and Statistical Manual of Mental Disorders, published by APA in 1952, stress response syndrome was listed under the heading of "gross stress reactions." In the APA's second edition in 1968, trauma-related disorders were conceptualized as just one example of situational disorders. Finally, at the persistence of forensic psychiatrists, DSM-III listed PTSD as a subcategory of anxiety disorders. For this classification in DSM-III, intense controversy existed over whether PTSD was an anxiety or a dissociative disorder. In the most current edition of DSM-IV, published by APA in 1994, the Advisory Subcommittee on PTSD was unanimous in

classifying PTSD as a new stress response category
(Turnbull, 1998).

Inclusion of PTSD in DSM-III gave legitimacy to this
psychological disorder, although many argued that it was
merely a re-labeling of what had already been described as
"shell shock," "war neurosis," "traumatic neurosis," "combat
trauma," or "combat fatigue." Others argued that its origins
can be found in the hysteria research conducted by Sigmund
Freud (1894) in the late 1800s. In 1981, Trimble authored a
book entitled Post-Traumatic Neurosis: From Railway Spine to
the Whiplash. Looking back to studies carried out on
railroad accident survivors of the 1700s, Trimble examined
the biological components which produce PTSD symptoms. He
also addressed the issue of malingering versus authentic
disorders. Malingering became recognized with the advent of
railroad accidents that could be compensated for with legal
action.

Kardiner's works The Traumatic Neuroses of War (1941)
and War Stress and Neurotic Illness (1947) are considered
the seminal early psychological works on PTSD. In these
works, Kardiner condensed much psychiatric thought on the
traumatic syndrome resulting from World War II with what he
had termed "neurosis of war." The symptoms of this syndrome
included features such as fixation on the trauma,

constriction of personality functioning, and atypical dream life. Kardiner provided insights on the phenomenology, nosology, and treatment of war-related stress, anticipating virtually every aspect of contemporary PTSD.

From an historical perspective, the significant change ushered in by the PTSD concept was the stipulation that the etiological agent was outside the individual rather than an inherent individual weakness (i.e., a traumatic neurosis). The key to understanding the scientific basis and clinical expression of PTSD is the concept of "trauma."

In its initial DSM-III (APA, 1980) formulation, a traumatic event was conceptualized as a catastrophic stressor that was outside the range of usual human experience. The framers of the original PTSD diagnosis had in mind events such as war, torture, rape, natural disasters (i.e., earthquakes, hurricanes, and volcano eruptions), and human-made disasters (i.e., factory explosions, airplane crashes, and automobile accidents). They considered traumatic events as clearly different from the very painful stressors that constitute events of daily life such as divorce, illness, or financial failure. This distinction between traumatic and other stressors was based on the assumption that although most individuals have the ability to cope with ordinary stress, their adaptive capacities are

likely to be overwhelmed when confronted by a traumatic stressor.

PTSD is unique among other psychiatric diagnoses because of the great importance placed upon the etiological agent, the traumatic stressor. In fact, one cannot make a PTSD diagnosis unless the patient has actually met the "stressor criterion" which means that the patient has been exposed to an historical event that is considered traumatic. Clinical experience with the PTSD diagnosis has shown, however, that there are individual differences regarding the capacity to cope with catastrophic stress so that while some people exposed to traumatic events do not develop PTSD, others go on to develop the full-blown syndrome (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1996). Such observations have prompted a recognition that trauma, like pain, is not an external phenomenon that is objective. Like pain, the traumatic experience is filtered through cognitive and emotional processes before it can be perceived as an extreme threat. Because of individual differences in perception, different people appear to have different trauma thresholds, some more protected and some more vulnerable to developing clinical symptoms after exposure to extremely stressful situations. Although there is a renewed interest in subjective aspects of traumatic events, the underlying

assumption is that rape, torture, combat, and genocide are experienced as traumatic events by nearly everyone.

The DSM-III (APA, 1980) diagnostic criteria for PTSD were revised in DSM-III-R (APA, 1987) and DSM-IV (APA, 1994). Diagnostic criteria for PTSD include a history of exposure to a "traumatic event" and symptoms from each of three symptom clusters: intrusive recollections, avoidant/ numbing symptoms, and hyperarousal symptoms. A fifth criterion concerns duration of symptoms. One important finding, which was not apparent when PTSD was first proposed as a diagnosis in 1980, is that it is relatively common. Recent data from the national comorbidity survey indicated PTSD prevalence rates are 5% and 10%, respectively, among American men and women (Kessler et al., 1996).

As stated in DSM-III-R (APA, 1987), the stressor criterion specifies that a person has been exposed to a catastrophic event involving actual or threatened death or injury or a threat to the physical integrity of self or others. During this traumatic exposure, the survivor's subjective response is marked by intense fear, helplessness, or horror.

The intrusive recollection criterion includes symptoms that are perhaps the most distinctive and readily identifiable symptoms of PTSD. For individuals with PTSD,

the traumatic event remains, sometimes for decades or a lifetime, a dominating psychological experience that retains its power to evoke panic, terror, dread, grief, or despair as manifested in daytime fantasies, traumatic nightmares, and psychotic reenactment known as PTSD flashbacks. Furthermore, traumatic stimuli that trigger recollections of the original event have the power to evoke mental images, emotional responses, and psychological reactions associated with the trauma. Keane, Wolfe, and Taylor (1987) were able to reproduce PTSD symptoms in the laboratory by exposing affected individuals to auditory or visual traumatic stimuli.

The avoidant/numbing criterion consists of symptoms reflecting behavioral, cognitive, or emotional strategies by which PTSD patients attempt to reduce the likelihood that they will either expose themselves to traumatic stimuli or, if exposed, will minimize the intensity of their psychological response. Behavioral strategies include avoiding any situation in which they perceive a risk of confronting such stimuli. In its most extreme manifestation, avoidant behavior may superficially resemble agoraphobia because the PTSD individual is afraid to leave the house for fear of confronting reminders of the traumatic event. Dissociation and psychogenic amnesia are included among

avoidant/numbing symptoms by which individuals cut off the conscious experience of trauma-based memories and feelings. Finally, since individuals with PTSD cannot tolerate strong emotions, especially those associated with the traumatic experience, they separate the cognitive from the emotional aspects of psychological experience and perceive only the former. Such "psychic numbing" is an emotional anesthesia that makes it extremely difficult for people with PTSD to participate in meaningful interpersonal relationships.

Symptoms included in the hyper arousal criterion most closely resemble those seen in panic and generalized anxiety disorder. Whereas symptoms such as insomnia and irritability are generic anxiety symptoms, hyper vigilance and startle are more unique. The hyper vigilance in PTSD may sometimes become so intense as to appear like frank paranoia. According to Friedman, Charney, and Deutch (1995), the startle response has a unique neurobiological substrate and may actually be the most pathognomonic PTSD symptom.

The duration criterion specifies how long symptoms must persist in order to qualify for the (chronic or delayed) PTSD diagnosis. In DSM-III (APA, 1980), the mandatory duration was 6 months. In DSM-III-R (APA, 1987), the duration was shortened to one month, where it has remained in DSM-IV (APA, 1994). An additional significance criterion

was added in DSM-IV that specifies that the survivor must experience significant social, occupational, or other distress as a result of these symptoms.

Since 1980, there has been a great deal of attention devoted to the development of instruments for assessing PTSD. Keane et al. (1987) have developed both psychometric and psychophysiologic assessment techniques that have proven to be both reliable and valid. Research using these techniques has been used in the epidemiological studies mentioned above and with natural disaster victims, rape/incest survivors, and other traumatized cohorts.

Neurobiological research indicates that PTSD may be associated with stable neurobiological alterations in both the central and autonomic nervous systems (Friedman et al. 1995). Psychophysiological alterations associated with PTSD include hyper arousal of the sympathetic nervous system, increased sensitivity and augmentation of the acoustic-startle eye blink reflex, a reducer pattern of auditory evoked cortical potentials, and sleep abnormalities. Neuropharmacologic and neuroendocrine abnormalities have been detected in the noradrenergic, hypothalamic-pituitary-adrenocortical, and endogenous opioid systems.

Longitudinal research has shown that PTSD can become a chronic psychiatric disorder that can persist for decades

and sometimes for a lifetime. Patients with chronic PTSD often exhibit a longitudinal course marked by remissions and relapses. There is a delayed variant of PTSD in which individuals exposed to a traumatic event sometimes do not exhibit the PTSD syndrome until months or years afterwards. Usually, the immediate precipitant is a situation that resembles the original trauma in a significant way; for example, a war veteran whose child is deployed to a war zone or a rape survivor who is sexually harassed or assaulted years later.

If an individual meets diagnostic criteria for PTSD, it is likely that the individual also will meet DSM-IV criteria for one or more additional diagnoses (Davidson & Foa, 1993; Kulka et al., 1990). Most often these co-morbid diagnoses include major affective disorders, dysthymia, alcohol or substance abuse disorders, anxiety disorders, or personality disorders.

Although PTSD continues to be classified as an anxiety disorder, areas of disagreement about its nosology and phenomenology remain. Questions about the syndrome itself include: what is the clinical course of untreated PTSD; are there different subtypes of PTSD; what is the distinction between traumatic simple phobia and PTSD; and what is the clinical phenomenology of prolonged and repeated trauma.

With regard to the latter, Herman (1992) has argued that the current PTSD formulation fails to characterize the major symptoms of PTSD commonly seen in victims of prolonged, repeated interpersonal violence such as domestic or sexual abuse and political torture.

PTSD in Children

The mention of PTSD may cause one to envision the Vietnam veteran suffering from "shell shock" or "battlefield stress." Initially, research dealing with PTSD encompassed primarily the Vietnam veteran population. As the disorder became more recognized and diagnostic criteria became better described, there was a shift of focus toward large-scale catastrophes. Current research on PTSD is centered on individual experiences that are suspected to contribute to the development of posttraumatic stress disorder. In children, these events may include child abuse and rape (Hillary & Schare, 1993).

Shannon, Pharm, Lonigan, Finch, and Taylor (1994) reported that stress and trauma can have a severe impact on children and adolescents. They suggested that childhood trauma may account for some of the variability in the presence and degree of psychiatric disorders in adulthood. However, it has only been in the past decade that clinicians

and researchers have recognized that, as an immediate effect of severe trauma, children may also develop PTSD.

An early reference to PTSD in children was discussed by Newman (1976) after an evaluation of children who survived a disaster in Buffalo Creek. In that cohort, 224 children were found to be significantly or severely emotionally impaired. Although the author did not identify PTSD per se, examples of the symptoms were consistent of PTSD criteria. Peterson, Prout, and Schwarz (1991) argued that not only does PTSD occur in children, but the purported that children may be the foremost victims with on incidence range from 30% to 100%.

For a child, trauma can take on many forms which can potentially contribute to and exacerbate the likelihood of a PTSD diagnosis. Terr (1991) has delineated two classes of trauma that may lead to the development of PTSD in children: Type I trauma involves single traumatic events that are sudden and unexpected. Examples of such trauma are being the victim of a violent crime or witnessing a homicide. Type II trauma is caused by the repeated occurrence of a traumatic event, and the traumatic event may often be expected and predictable. Examples of Type II trauma include many cases of sexual abuse, ritualistic abuse, chronic exposure, or the repeated physical abuse of a child.

A difficulty with the research on childhood PTSD has been encountered through the lack of consensus in assessing the problem in children. Hyman, Zelikoff, and Clarke (1988) used instruments of a psychoeducational nature to measure the PTSD descriptors. Hillary and Schare (1993) attempted to investigate the phenomenon of PTSD in adolescents through the use of standard objective measures (e.g., the Minnesota Multiphasic Personality Inventory, the Beck Depression Inventory, the Spielberger State Trait Anxiety Inventory). The use of these standardized objective personality measures did not support PTSD diagnoses in a study utilizing a sample of 19 adolescent males (Hillary & Schare, 1993). It has been suggested that another distinct DSM diagnosis that would include reactions to prolonged stress such as on-going abuse be specified as "Disorders of Extreme Stress Not Otherwise Specified" (DESNOS). This category might be appropriate for describing psychological disturbances following prolonged trauma that do not currently meet PTSD standings (Motta, 1994).

Adult survivors of childhood sexual abuse may reveal some insights into PTSD in children. It is not uncommon for clinicians who are unfamiliar with survivor-victim syndromes to misdiagnose PTSD. This unfamiliarity often has resulted in an inappropriate use of institutionalization or counter

therapeutic use of psychopharmacological intervention. McNew and Abell (1995) indicated that misdiagnosis often occurs as a result of failure to make connections between events that happened years ago (in the case of an adult survivor of childhood sexual abuse) with present symptoms. This may result in blaming the victim and focusing on present symptomatology as representing character defects.

It is not yet fully understood how to diagnose and treat children who suffer from PTSD-like symptoms. Wolfe, Gentile, and Wolfe (1983) and Schwarz and Perry (1994) pointed out that children and adolescents do not manifest the same symptom cluster that seems to be evidenced in the adult population.

Posttraumatic stress disorder in adults has a fairly long history in the literature. However, it seems that childhood PTSD has only just begun to receive increased attention. While clinical interventions have been described, there is virtually no information about the comparative effectiveness of treatment modalities. It would be evident that continual investigation is needed to better understand and treat PTSD as it occurs among children and adolescents. Controversy exists regarding the nature of the stressors that precipitate PTSD in childhood and whether behaviors such as flashbacks are an integral part of the PTSD

diagnosis. It is far less certain whether physical and sexual abuse, which can take place over an extended period, can be causal (Motta, 1994).

The role of cognitive-behavioral treatments may be helpful in the treatment of PTSD symptoms. It is essential that the symptoms be clearly defined and that the target for the behavioral change be clearly delineated. According to Rothbaum and Foa (1992), the locus of cognitive-behavioral treatment is contingent on the premise that being a victim of a traumatic event does not in itself constitute psychopathology (e.g., rape victim, witness to a murder, etc.), but rather the impairment that is caused by the trauma should be the target of treatment.

According to many authors (Green et al., 1991; Pfefferbaum, 1997; Vernberg, Silverman, La Greca, & Prinstein, 1996) factors that influence a child's response to trauma are identified as gender, age and developmental level, previous exposure, family influences, and socioeconomic and cultural factors. Each of these factors are discussed below with supporting or nonsupporting research from the literature.

<u>Gender</u>

Children's gender may influence their ability to cope, the use of social support, and societies expectations for

response. In several studies with large sample sizes, researchers have found girls to have more PTSD symptoms than boys (Giaconia et al., 1995; Green et al., 1991; Shannon et al., 1994). In addition, Green et al. noted that girls were somewhat more likely to receive a probable PTSD diagnosis. However, Shaw et al. (1995) found boys to have more qualitative gender differences in symptoms and recovery.

Age and Developmental Level

Age has a significant impact on children's perceptions and understanding of trauma. Numerous researchers have found age to be an important predictor for PTSD (Frederick, 1985; Schwarz & Kowalski, 1991; Terr, 1988). More importantly, trauma and the child's response to it may have the potential to disrupt normal development (Schwarz & Perry, 1994). As a result, the child's cognition, attention, social skills, and impulse control may all be affected (Nader, Pynoos, Fairbanks, & Frederick, 1990).

Age may also effect children's specific symptoms. Schwarz and Kowalski (1991) found that avoidance was more common in younger children, but that reexperiencing and hyperarousal was more common in older children.

A study conducted by Frederick (1985) revealed a high incidence of PTSD among victims of physical and sexual abuse. Of the 300 children studied, 77% were diagnosed with

PTSD using DSM-III criteria. Of special interest was the finding that if a child was about the age of six, PTSD was always in evidence. In this study, age may be a predictor of PTSD only for traumas resulting from physical and sexual abuse.

Previous Exposure

Symptomatology and recovery may be related to the severity of distress or emotional response at the time of the event. In a prospective study of posttraumatic stress in children after Hurricane Andrew, La Greca, Vernberg, Silverman, and Prinstein (1996) examined symptoms of PTSD in 3rd-5th grade school children. Interviews were conducted at 3, 7, and 10 months after the hurricane. The investigators evaluated the children to determine (a) the exposure to traumatic events during and after the disaster, (b) the preexisting demographic characteristic, (c) the occurrence of major life stressors, (d) the availability of social support, and (e) the type of coping strategies used to cope with disaster-related distress.

Several important findings were revealed in this study (La Greca et al., 1996). Although PTSD symptoms declined over time, a large portion of the children had high symptom levels at the end of the school year. This finding supported work by Green et al., (1991) which predicted identifying

factors for PTSD in children following a disaster. However, even with diminished reactions, 12% of the children were reporting severe to very severe levels of PTSD at 10 months. Almost all of the children that had moderate to very severe PTSD symptoms at 10 months had shown problems such as nightmares, distress at exposure reminders, and difficulty concentrating early in the evaluation.

La Greca et al. (1996) were able to determine that each of the factors studied were predictive of children's PTSD symptomatology over an extended time period. Exposure to disaster-related trauma perceived as threat to life and the disruption after the disaster were major factors contributing to the predication of PTSD. This finding confirms the importance of intensity and duration of exposure not only initially, but also over extended periods of time.

Family Influences

McFarlane (1987) and Breton, Valla, and Lamber (1993) have demonstrated an association between the children's and their parents' symptomatology. Because parents serve as role models, children tend to copy the parents' response. Pynoos and Nader (1993) found that (a) children separated from their parents immediately after a natural disaster, (b) ongoing maternal preoccupation with the event, and

(c) altered family functioning were predictive of PTSD in children after a disaster.

Socioeconomic and Cultural Factors

There are few studies that have investigated racial, ethnic, or cultural differences in PTSD per se. However, refugee populations commonly suffer stress associated with war and displacement. Kinzie et al. (1986) studied children of Cambodian refugees following massive trauma. Of the 40 children evaluated, half were diagnosed with PTSD. In this sample, intrusive imagery was not reported and there was a marked tendency to deny distress and avoidance of memories. Even talking about the experience was uncommon. These findings may be the result of a small sample size or a cultural variant.

Summary

The process by which PTSD was identified and described was discussed. Historical information about the understanding and diagnosis of PTSD in adults was provided. Although PTSD was been recognized as a syndrome in adults for many years (although labeled by different names, i.e., "shell shock"), the existence of PTSD in children was argued until the 1980s.

The process by which the DSM-VI criteria was developed was discussed. Each criteria was explored and expanded beyond the introduction in chapter one. Current PTSD diagnosis criteria was provided.

Findings from some studies of PTSD in children were discussed. Cognator and regulator factors that are "generally agreed upon" as predictors for PTSD in children were presented with the supporting and nonsupporting research that was available in the literature.

The literature review has revealed that PTSD has evolved from a loose association of symptoms to being recognized as a definitive anxiety disorder. Although the recognition of PTSD in children has lagged behind its recognition in adults, the expanse of knowledge has been dramatic. However, no clear treatment for this disorder in children has been proven to be effective.

As a result of the information--or rather paucity of information--in the literature, the present study was designed to identify cognator and regulator factors predictive of PTSD in children. This information will add to the body of knowledge by identifying children at risk for PTSD.

CHAPTER 3

PROCEDURE FOR COLLECTION OF DATA

The present study is a retrospective review and
secondary analysis of data collected from a previous study.
The study was designed to determine cognator and regulator
factors that may be predictive of posttraumatic stress
disorder (PTSD) in children one year posttraumatic injury.
The design of this study was nonexperimental ex post facto
research. Polit and Hungler (1995) defined ex post facto
research as that which is conducted after the variations in
the independent variables have occurred. This chapter
addresses the setting, population and sample, protection of
human subjects, instruments, data collection, and the
treatment of data.

Setting

The original study was conducted at a multidisciplinary
pediatric trauma outpatient clinic of a Level I trauma
hospital. This clinic is situated in a medical center
located in a metropolitan area of 3.6 million people. The
clinic is affiliated with a major medical school located in
the Southwestern United States. The clinic provides services
for minority patients with an income of $20,000 or less a

33

year. The clinic was held once a week on Wednesday afternoon from 2:30 pm until 7:00 pm. Approximately 10 patients were treated at each clinic visit. Most patients did not pay anything for the clinic visit. Medicaid was billed for those patients with that resource. The medical and physical evaluation of the patient was done in the patient exam rooms. Spanish-speaking interpreters were present and available at all clinics to assist with medical and psychiatric evaluations.

Population and Sample

The population was comprised of patients who met the following inclusion/exclusion criterion: subject was less than 17 years of age who sustained an injury significant enough to require hospital admission. The exclusion criterion included patients who had an isolated fracture, e.g., a single metacarpal or humerus fracture. After discharge from the hospital and obtaining informed consent, the patient was evaluated in the multidisciplinary pediatric trauma clinic. The multidisciplinary team consisted of a pediatrician, pediatric physiatrist, psychiatrist, and nurse case manager. Intervention patients were evaluated at 2 weeks, 4 weeks, 3 months, 6 months and 12 months post injury. A cohort of 149 intervention patients completed the original study. Physical and psychosocial outcomes of this

cohort were then compared against the same outcomes of 233 patients followed in other clinics within the institution. The purpose of the original study was to evaluate the efficacy of a multidisciplinary trauma clinic compared to "traditional" clinics by determining if the patient had a physical or psychosocial poor outcome. A poor outcome was defined as an injury-related medical or psychological condition that was either untreated or undiagnosed one year after the injury.

The present study comprised a sample size of 382 patient records. These records contained the medical documentation for subjects seen in the original study. A convenience sampling technique was used to obtain the sample. Demographic and injury information for all 382 patients had previously been collected and entered into a relational database.

Protection of Human Subjects

Approval for the original study was granted by the IRB of the institution when the initial study was carried out (Appendix A). Additionally, as a nonexperimental, ex post facto study of secondary analysis of data, an exempt review approval was granted by the Human Subjects Review Board of Texas Woman's University. Data were reported in aggregate.

Informed consent from the original participants was obtained in the original study.

Instruments

The original study used several forms to collect data (Appendix B), one which was a self-reported questionnaire for age, gender, ethnicity, and parental composition. The questionnaire was printed in both English and Spanish and completed by the patient's caretaker. People who filled out the questionnaire were told they did not have to complete a question if they chose not to. Volunteers assisted families in English and Spanish who were unable to read the form. After the form was completed, it was reviewed by both the primary physician and nurse case manager for completeness.

Factors such as mechanism of injury and injured body area were obtained from the inpatient medical record. These factors were confirmed by a physician during physical exam.

The Abbreviated Injury Scale (AIS) (American Association for Automotive Medicine, 1990) was calculated from the inpatient medical record by a certified injury coder. The AIS was first developed in 1971 and has since become the most widely used anatomic scale for rating severity of injuries. It has been adopted as the official injury data collection tool by all federally funded crash

investigation teams in the United States and is used world wide (Petrucelli, States, & Hames, 1981).

The AIS is a numerical scale ranging from 1 (minor injury) to 6 (maximum injury). Scores are grouped in the AIS manual by body area. The AIS score is not a ranking of expected mortality from injury. However, empirical data (Petrucelli et al., 1981) showed that the AIS correlates well with the probability of death at the serious and life-threatening levels (AIS $\geq$ 3). The AIS has a validity coefficient of .92 and an interrater reliability coefficient of .89 (MacKenzie, Shapiro, & Eastham, 1985). In the present study, the highest single AIS code was used if a patient had more than one injury.

Data Collection

After approval to conduct the study was obtained from Texas Woman's University Human Subjects Review Board and the principal investigator of the original study, records from 382 subjects were abstracted. For the original intervention cohort, clinic notes from each visit were reviewed to determine if a board certified psychiatrist had diagnosed PTSD at any time during the study. A patient from this cohort was considered as having PTSD even if the disorder had resolved by the end of the 12-month period.

Patient clinic records from the original comparison group were reviewed to determine if a board certified psychiatrist had diagnosed PTSD at the 12-month follow-up visit (Appendix C). In addition, a patient from this cohort was considered as having had PTSD if records provided documentation that the patient had been treated for the disorder by a psychiatrist prior to the 12-month visit.

Treatment of Data

Data were entered into a relational data base. After data entry was complete, data were converted and analyzed using SAS version 6.12. Chi-square analysis was used for categorical variables and $\underline{t}$-test analysis was used for continuous variables. Groups were considered different at an alpha of .05. Frequency and percentage distributions were used to analyze the data. Because the study was a nonexperimental design, percentages and means obtained from the frequency distributions were used to answer the research question determining what cognator and regulator factors may be predictive of the development of PTSD in pediatric patients 12 months posttraumatic injury.

CHAPTER 4

ANALYSIS OF DATA

This chapter includes a description of the sample and the findings of the study. The purpose of this study was to determine what cognator and regulator factors might be predictive of posttraumatic stress disorder (PTSD) in pediatric patients one year post traumatic injury. The findings related to the research question are described. Analysis of data was accomplished using secondary analysis of existing data from a large study entitled, "Comparison of Medical and Psychosocial Outcomes of Injured Children with Multidisciplinary vs Conventional Medical Follow-up." The chapter is divided into three sections: (a) a description of the sample, (b) findings, and (c) a summary of the findings.

Description of Sample

Using a convenience sampling method, data were collected from clinic records to identify patients who had a diagnosis of PTSD one year following a traumatic injury. The sample was comprised of 382 pediatric patients. The independent variables were cognator and regulator factors and the dependent variable was PTSD. Of the original cohort of 382 patients, 45 subjects had to be excluded from the

39

analysis. Subjects who did not have a psychiatric evaluation at the one year visit ($\underline{n}$ = 16) were excluded. Likewise, subjects under the age of 12 months at the time of the injury ($\underline{n}$ = 29) were excluded. Data from the remaining 337 subjects were analyzed. Data analysis included examining the demographic characteristics of the group.

Cognator factors generated from the study were: (a) parental composition, (b) type of injury by body area, and (c) mechanism of injury. The regulator factors generated from the study included: (a) age, (b) gender, (c) ethnicity, and (d) injury severity as measured by the Abbreviated Injury Scale (AIS). Data analysis included determining the presence or absence of PTSD and examining the factors associated with the disorder.

Age

The sample was limited to pediatric patients. Ages ranged from 12 months to 16 years and 11 months at the time of the injury (Table 1). The mean age for the sample was 8.55 years. The standard deviation for age was 5.02.

Gender

Male gender was predominant in the study. Of the 337 subjects, 216 (64%) were males and 121 (36%) were females (Table 1)

Table 1

Frequency Distribution and Percentages According to Age,
Gender, and Ethnicity (N = 337)

Variable	n	%
Age		
1-3 years	87	26
4-7 years	84	25
8-11 years	59	17
12-15 years	85	25
16 years	22	7
Total	337	100

Mean 8.55 years; Standard Deviation 5.02

Gender		
Male	216	64
Female	121	36
Total	337	100
Ethnicity		
African American	98	29
Caucasian	28	8
Hispanic	199	59
Other	12	4
Total	337	100

Ethnicity

The majority of children in this study were Hispanic
(199; 59%) (Table 1). There were 98 (29%) African Americans,
28 (8%) Caucasian, while 12 (4%) were grouped as "other"
category (Asian, Native American, Polynesian). It is

important to note that the ethnicity of the sample is not reflective of national normative distributions.

Parental Composition

Parents and children were asked to list the family members living in their home. Families were categorized as having both natural parents in the home, single parent-mother, single parent-father, no parent, other caretaker, or unknown. It is important to note that families were given the option to not answer all of the questions on the form. As a result, 134 responses were missing for the category of parental composition (Table 2).

Table 2

Frequency Distribution and Percentages According to Parental Composition (N = 337)

Variable	n	%
Parental Composition		
Both parents	98	29
Mother only	58	17
Father only	11	3
No parent	12	3
Other caretaker	24	7
Missing Data	134	41
Total	337	100

Types of Injury

The types of injury were evaluated by the actual area of the body that sustained the physical injury and by the causative agent, or mechanism, of injury. Table 3 shows the frequency and distribution for the eight body areas and the eight mechanisms of injury.

Table 3

Frequency Distribution and Percentages of Type of Injury by Body Area and Mechanism of Injury (N - 337)

Variable	n	%
Body Area Injured		
Head	154	46
Face	216	64
Neck	9	3
Chest	23	7
Abdomen	45	13
Pelvic	18	5
Upper extremity	54	16
Lower extremity	94	28
Total Number of Injuries	613	
Mechanism of Injury		
Motor Vehicle Collision	149	44
Fall	83	25
Gun Shot Wounds	40	12
Burns	7	2
Sport Injury	13	4
Assault	21	6
Drowning	1	>1
Unknown	24	7
Total	337	100

Type of Injury by Body Area

The body area that sustained an injury was determined. Body areas included head, face, neck, chest, abdomen, pelvic, upper extremity, and lower extremity. Some children had injuries in more than one body area, and each individual injury was considered. The most frequently injured body area in the sample was the head with 154 (46%) cases. The second most injured body area was the lower extremity (94; 28%).

Mechanism of Injury

Parents and children were asked what caused their injury. By far the most frequent mechanism of injury in this sample was motor vehicle collision (119; 44%). Falls (83; 25%) were the second most frequently reported causes of injury.

Abbreviated Injury Scale (AIS)

For almost three decades, the AIS has been used by researchers in all fields of trauma. It has been shown to correlate with the probability of survival in numerous articles of peer reviewed literature and is considered the "gold standard" of injury scoring (Petrucelli, States, & Hames, 1981). The scores range from 1 to 6 and describe injury severity. AIS definitions for severity are as follows: 1-Minor, 2-Moderate, 3-Serious, 4-Severe,

5-Critical, and 6-Maximum. A severity of 6 is usually
considered to be unsurvivable. Table 4 shows the AIS
distribution frequency and percentage for the sample.

Table 4

Frequency Distribution and Percentages of Injury Severity as
Measured by AIS (N - 317)

Variable	n	%
Injury Severity		
AIS 1	37	12
AIS 2	75	24
AIS 3	115	36
AIS 4	47	15
AIS 5	43	13
AIS 6	0	0
Total	317	100

In this study, AIS scores were as follows: 37 children
(12%) had a minor injury. Seventy-five children (24%) had a
moderate injury. Serious injuries accounted for 115 (36%) of
the sample, and there were 47 (15%) severe injuries (Table
4). Of the children, 43 (13%) had critical injuries. Scores
for 20 subjects were missing for the category of AIS
severity.

PTSD Diagnosis

In the overall sample, 69 (21%) met the DSM-IV criteria for PTSD: being exposed to a traumatic event, reexperiencing the event, avoidance of the stimuli associated with the event and numbing of responsiveness, symptoms of increased arousal, and symptoms lasting more than one month causing clinically significant distress. The majority of the sample (268 subjects; 79%) did not demonstrate symptoms of PTSD (Table 5).

Table 5

Frequency Distribution and Percentage of PTSD (N = 337)

Variable	n	%
PTSD		
No	268	79
Yes	69	21
Total	337	100

Findings

Results of the secondary analysis of 337 subjects treated in a previous study provided current data regarding statistically significant cognator and regulator factors associated with PTSD one year after a traumatic injury. One research question was posed for this study: What regulator

and cognator mechanisms predict the occurrence of PTSD over 12 months in children who have sustained a traumatic injury? The analysis did support the research question by identifying two cognator factors that were associated with the development of PTSD in children at risk. No regulator factors were found to be associated with the disorder. There were more boys than girls in the study. However, there were no significant differences between the genders for the incidence of PTSD (Table 6).

No significant differences were found for the following cognator and regulator factors: age, ethnicity, parental composition, or AIS. However, gun shot wounds (p = .001) were associated with the development of PTSD (Table 7). Another finding was that falls are not associated with PTSD; 9.64% of those with falls had PTSD compared to 23.7% of those who did not have falls (inversely significant at $p <$ .05)

Type of injury by body area was also predictive of the development of PTSD (Table 8). Patients who had sustained an abdominal injury had a statistically significant association or correlation with the development of PTSD (p = .019).

The relationship between type of injury by body area and mechanism of injury were further analyzed. Data revealed that gun shot wounds were associated with abdominal injuries

Table 6

<u>Frequency Distribution and Percentages of Age, Gender,
Ethnicity and Parental Composition in Children with and
without PTSD (N = 337)</u>

Variable	<u>PTSD (n = 69)</u>		<u>No PTSD (n = 268)</u>		p value
	<u>n</u>	%	<u>n</u>	%	
Age (mean)	10.69	--	7.9	--	
<u>Gender</u>					.95
Male	44	20	172	80	
Female	25	20	96	80	
Total	69		268		
<u>Ethnicity</u>					.44
African American	24	25	74	75	
Caucasian	4	14	24	86	
Hispanic	40	20	159	80	
Other	1	8	11	92	
Total	69		268		
<u>Parental Composition</u>					.47
Both parents	21	39	77	52	
Mother only	17	31	41	28	
Father only	4	7	7	5	
No Parent	5	10	7	5	
Other caretaker	5	9	7	5	
Unknown	7	13	17	11	
Total	69		268		

Table 7

Frequency Distribution and Percentages of Mechanism of Injury in Children with and without PTSD (N = 337)

Variable	PTSD (n = 69)		No PTSD (n = 268)		p value
	n	%	n	%	
Motor Vehicle	33	49	116	43	.437
Gun Shot Wound	18	26	22	8	.001*
Fall	8	12	75	28	.006**
Burns	0	0	7	3	.249
Assault	7	10	12	4	.069
Other	1	1	15	22	.177
Total	69		268		

*p < .001   **p < .001, but it is an inverse relationship.

Table 8

Frequency Distribution and Percentages of Type of Injury by Body Area in Children with and without PTSD (N = 337)

Variable	PTSD (n = 69)		No PTSD (n = 268)		p value
	n	%	n	%	
Head	31	46	123	46	.956
Face	5	7	31	11	.316
Neck	4	6	5	2	.067
Chest	8	12	15	6	.072
Abdomen	15	22	30	11	.019*
Pelvic	6	9	12	4	.155
Upper extremity	10	15	44	16	.731
Lower extremity	20	29	74	28	.768
Total	69		268		

*p < .05

($\underline{p}$ = .001) and that gun shot victims were older. Children who are older appear to be more likely to get shot, and the gun shot wound is generally in the abdomen. This group of subjects are more likely to experience PTSD.

Summary of Findings

This study was conducted to identify cognator and regulator factors that may be predictive of PTSD in pediatric patients one year following a traumatic injury. Findings of the secondary analysis study revealed that there was a greater number of boys involved in the cohort than girls. However, males were neither more or less likely to develop PTSD than girls. Data revealed no significance related to gender and the development of PTSD.

Cognator and regulator factors that were not predictive of PTSD in this cohort were: age, ethnicity, parental composition, or AIS severity. Cognator factors and regulator factors that were associated with the development of PTSD were mechanism of injury, specifically gun shot wounds and not having a fall, and type of injury by body area, specifically an abdominal wound.

CHAPTER 5.

SUMMARY OF THE STUDY

This study examined posttraumatic stress disorder
(PTSD) as a consequence of injury. The study was a
nonexperimental secondary analysis of data from a previous
study that evaluated poor medical and psychosocial outcomes
in children one year after a traumatic injury. The medical
records of 337 subjects from that study were abstracted. The
data were collected and entered into a database for
statistical analysis. This chapter addresses the following
aspects of the study: (a) a summary of the study,
(b) discussion of the findings and literature comparison,
(c) conclusions and implications, and (d) recommendations
for further study.

Summary

Using Roy's adaptation model (Roy, 1984) as a
conceptual framework, this study was designed to identify
cognator and regulator factors predictive of posttraumatic
stress disorder in pediatric trauma patients treated in an
outpatient clinic located in a large urban area. Identifying
cognator and regulator factors in pediatric patients at risk
for the development of PTSD can lead to early treatment

which may decrease the intensity and duration of the "alarm reaction" and possibly prevent the development of the disorder. The data were collected from 382 study records from a previous study. The sample consisted of 337 records that included children whose ages ranged from 12 months to 16 years and 11 months at the time they were injured. All subjects in the sample were interviewed by a board certified psychiatrist one year after the injury and were specifically evaluated for the presence of PTSD.

Patient records were collected and abstracted to determine if a psychiatrist had made a diagnosis of PTSD. These data were collected over a period of 3 weeks and entered into a database which included demographic information obtained during the original study. Analysis of the data using SAS version 6.12 was completed. Frequencies, percentages, and means were utilized to summarize the findings.

The present study differed from the parent study in several ways. The original study only analyzed medical and psychosocial outcomes in children one year after an injury if the clinical outcome was found to be either untreated or undiagnosed. In the same way that a child with an amputated foot was not considered a poor outcome if he or she had received the appropriate medical treatment, likewise a child

with unresolved PTSD was not considered a poor outcome if they were under the care and treatment of a psychiatrist. In addition, the original study was a comparison of two cohorts receiving follow-up treatment in different clinics. The present study combined all pediatric patients into a single cohort to determine what, if any, cognator and regulator factors were statistically significant in the presence of PTSD regardless of the follow-up care they had received.

Discussion of Findings

The findings revealed that a greater number of boys had sustained a traumatic injury in comparison to girls. This finding is consistent with national injury demographics (Singh & Yu, 1996). Of the 337 subjects, 69 (20%) met the DSM-IV criteria for the diagnosis of PTSD. This finding is also consistent with the 3% to 58% prevalence rate of PTSD for patients at risk (American Psychiatric Association (APA), 1994).

No regulator factors were found to be statistically significant for the development of PTSD in pediatric patients. Therefore, age, race, gender, and injury severity did not predispose a patient at risk for PTSD. Cognator factors that were associated with the development of PTSD in this cohort were: (a) mechanism of injury, specifically gun shot wounds, and (b) type of injury by body area,

specifically an abdominal wound. Having a fall was not found to be associated with developing PTSD. Parental composition was the cognator factor that was not statistically significant for the development of PTSD. These findings are of interest in that they tend to support work of other researchers (Green et al.,1991; La Greca, Vernberg, Silverman, & Prinstein, 1996; McFarlane, 1987; Motta, 1994) and provide new information about factors not yet studied. Findings from the data analysis are discussed in reference to each of the individual cognator and regulator factors.

<div align="center">Gender</div>

As stated previously, males were neither more nor less likely to develop PTSD than girls. Although findings from some studies have shown girls to have a higher incidence of PTSD (Giaconia et al., 1995), others have shown boys to be more likely to develop the disorder (Shaw et al., 1995). Gender is a recognized risk factor for the propensity of some mental health disorders such as depression, which is more common in women (United States Public Health Service, 1995). Evidence supporting a gender bias for the development of PTSD is not conclusive in the literature nor is it supported in the analysis of data obtained from this study.

Age

Age was not a predictor for PTSD in this sample of records. This finding neither supports or disputes other findings in the literature. According to Terr (1988), older children are more likely to experience PTSD. Terr noted that a younger child is more likely to be protected by caregivers and therefore is spared the full emotional impact of the trauma.

Ethnicity

Ethnicity was not identified as a predictor for the development of PTSD. This finding is consistent with those of other studies (Pfefferbaum, 1997) which reported no association of ethnicity and the risk of developing PTSD. Kinzie's (1986) work with Cambodian youth and Weine et al.'s (1998) work with Bosnian adolescents have demonstrated that PTSD is not a disorder associated exclusively with Western youth and culture.

Parental Composition

Parental composition was not a predictor for the development of PTSD. Researchers (Breton, Valla, & Lamber, 1993; McFarlane, 1987) did suggest a correlation between the development of PTSD in children and the parental response to the trauma. In the present study, the parental reaction was

not measured and no associations can be made about the development of PTSD and the coping ability of the parent. However, Kinzie (1986) did suggest that the family does provide a protective environment for the child. Therefore, one could postulate that if a parent or parents were missing from the home environment, the child would not experience as much protection at home as would occur with a parent or parents in the home. This association was not supported by the results of this study which showed no statistical difference for the development of PTSD regardless of the parental composition.

Abbreviated Injury Scale Severity

Of interest is the finding that the Abbreviated Injury Scale (AIS) score was not associated with the development of PTSD. An anticipated finding of this study was that there would be an increased incidence of PTSD with an AIS score of 3 or more. Analysis of the data did not support this finding. No other researchers have reported a relationship between AIS severity and the development of PTSD. Hubbard, Realmuto, Northwood, and Masten (1995) found that the chronicity of a trauma was associated with psychological consequences. Thus, one would assume that an isolated traumatic event, although severe, is not as significant for

the development of PTSD as continued or prolonged exposure to a life threat.

Type of Injury by Body Area and Mechanism of Injury

No studies were found which reported the relationship between the development of PTSD and mechanism of injury or type of injury sustained by the child. Findings from this study reveal that a child who sustained a wound to the abdomen is more likely to develop PTSD than the child would with only an injury to the arms, legs, head, chest or face. In addition, an injury resulting from a gun shot wound is also more likely to result in a diagnosis of PTSD. These findings represent important new information and contribute to the scientific body of injury knowledge.

Gun shot wounds were associated predominantly with abdominal injuries, and both were statistically significant for the development of PTSD. Several questions are raised by this association. Why would a child be more likely to suffer from PTSD if shot in the abdomen as opposed to being shot in the head or an extremity? It might be postulated that a child shot in the abdomen will rarely lose consciousness unless the child suffers a significant loss of blood from the wound. Moreover, a gun shot wound to the head may result in amnesia of the event, thus diminishing the impact of the trauma. Many adolescents would recognize a gun shot wound to

the abdomen as a serious life threat, whereas a gun shot wound to the thigh or arm may not be perceived as such. It may be that children with a gun shot wound to the abdomen, who have full control of their mental capacities, would have a heightened alarm reaction resulting from the increased awareness of a life-threatening event.

Falls were not shown to be associated with the development of PTSD. This finding is not surprising and is congruent with the mechanism of injury. Most falls are not life threatening unless they are associated with a fall from greater than 4 feet (Chadwick, Chin, Salerno, Landsverk, & Kitchen, 1991). A child would not generally associate a fall on the playground as a threat to life. Moreover, children who are the most likely to experience a fall from a great height, such as off a balcony or out a window, are of a younger age. Although very young children are known to be affected by trauma and experience PTSD, it is difficult to make the diagnosis based only on described symptoms.

Conclusions and Implications

Based on data analysis of this study, the following conclusions were made about the sample:

1. Gender does not protect one from the development of PTSD.

2. Ethnicity does not appear to be a risk factor for the development of PTSD.

3. Age alone does not increase the risk of developing PTSD. However, age and mechanism of injury might be correlated with each other.

4. Trauma is subjective and the severity of an injury may not be as important to the development of PTSD as is the intensity of the alarm reaction.

5. Children with gun shot wounds, especially to the abdomen, are at risk for the development of PTSD. All pediatric patients with a gun shot wound presenting to a health care facility should be evaluated for the presence of PTSD by a psychiatric nurse practitioner or other qualified mental health provider.

6. Pediatric patients who are injured due to a fall should not be routinely screened for the presence of PTSD.

Recommendations for Further Study

Based on the conclusions and implications of this study, the following recommendations are made:

1. A replication of this study is recommended to determine if mechanism of injury and type of injury by body area continue to be predictive for the development of PTSD.

2. Further studies should be conducted to determine what defines a prolonged exposure to a trauma and if

prolonged exposure is a significant predictor for the development of PTSD. A study that determines length of exposure could have implications for events not generally recognized as a traumatic stressor. Examples could include prolonged hunger, neglect, or chronic exposure to the elements.

3. Age continues to be debated as a risk factor for the development of PTSD. A study that identifies the DSM-IV symptomatology criteria that is age-correlated may help redefine PTSD to be age specific.

REFERENCES

American Association for Automotive Medicine. (1990). The abbreviated injury scale. Des Plaines, IL: Author.

American Psychiatric Association. (1952). Diagnostic and statistical manual of mental disorders. Washington, DC: Author.

American Psychiatric Association. (1968). Diagnostic and statistical manual of mental disorders (2nd ed.). Washington, DC: Author.

American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.

American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., revised). Washington, DC: Author.

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.

Andrews, H., & Roy, C. (1986). Essentials of the Roy adaptation model. Norwalk, CT: Appleton-Century-Crofts.

Andrews, H., & Roy, C. (1991). The Roy adaption model: The definitive statement. Norwalk, CT: Appleton-Century Crofts.

Baker, S., Ginsburg, M., & Guohua, L. (1992). The injury fact book. New York: Oxford.

Blanchard, E. B., Hickling, E. J., Taylor, A. E., Loos, W. R., Fornis, C., & Jaccard, J. (1996). Who develops PTSD from motor vehicle accidents? Behavior Research & Therapy. 34(1), 1-10.

Breton, J., Valla, J., & Lamber, J. (1993). Industrial disaster and mental health of children and their parents. Journal of the American Academy of Child and Adolescent Psychiatry, 32, 438-445.

Chadwick, D., Chin, S., Salerno, C., Landsverk, J., & Kitchen, L. (1991). Deaths from falls in children: How far is fatal? Journal of Trauma, 31, 1353-1355.

Davidson, J. R. T., & Foa, E. B. (Eds.) (1993). Posttraumatic stress disorder: DSM-IV and beyond. Washington, DC: American Psychiatric Press.

Fitzpatrick, J., Whall, A., Johnston, R., & Floyd, J. (1982). Nursing models and their psychiatric mental health applications. Bowie, MD: Prentice-Hall.

Foy, D., Sipprelle, R., Rueger, D., & Carroll, E. (1984). Etiology of posttraumatic stress disorder in Vietnam veterans: Analysis of premilitary, military, and combat exposure influences. Journal of Consulting and Clinical Psychology, 52, 79-87.

Frederick, C. J. (1985). Selected foci in the spectrum of posttraumatic stress disorders. In J. Laube & S. Murphey (Eds.), Perspectives on disaster recovery (pp. 110-131). Norwalk, CT: Appleton-Century-Crofts.

Freud, S. (1894). On the grounds for detaching a particular syndrome from neurasthenia under the description anxiety neurosis. The standard edition of the complete psychological works of Sigmund Freud, vol 3. London: Hogarth.

Friedman, M. J., Charney, D. S., & Deutch, A. Y. (1995). Neurobiological and clinical consequences of stress: From normal adaptation to PTSD. Philadelphia: Lippincott-Raven.

Giaconia, R. M., Reinherz, H. Z., Silverman, A. B., Pakiz, B., Frost, A. K., & Cohen, E. (1995). Traumas and posttraumatic stress disorder in a community population of older adolescents. Journal of the American Academy of Child and Adolescent Psychiatry, 34, 1369-1380.

Green, B., Koral, M., Grace, M., Vary, M., Leonard, A., Gleser, G., & Smitson-Cohen, S. (1991). Children and disaster: Age, gender, and parental effects on PTSD symptoms. Journal of the American Academy of Child and Adolescent Psychiatry, 30, 945-951.

Herman, J. L. (1992). Trauma and recovery. New York: Basic Books.

Hillary, B. E., & Schare, M. L. (1993). Sexually and physically abused adolescents: An empirical search for PTSD. Journal of Clinical Psychology, 49, 161-165.

Hubbard, J., Realmuto, G., Northwood, A., & Masten, A. (1995). Comorbidity of psychiatric diagnoses with posttraumatic stress disorder in survivors of childhood trauma. Journal of the American Academy of Child Adolescent Psychiatry, 34, 1167-1173.

Hyman, I. A., Zelikoff, W., & Clarke, J. (1988). Psychological and physical abuse in the schools: A paradigm for understanding post traumatic stress disorder in youth and children. Journal of Traumatic Stress, 1, 243-267.

La Greca, A., Vernberg, E., Silverman, W., & Prinstein, M. (1996). Symptoms of posttraumatic stress in children after Hurricane Andrew: A prospective study. Journal of Consulting and Clinical Psychology, 4, 712-723.

Kardiner, A. (1941). The traumatic neuroses of war. New York: Hoeber.

Kardiner, A. (1947). War stress and neurotic illness. New York: Hobner.

Keane, T. M., Wolfe, J., & Taylor, K. I. (1987). Post-traumatic stress disorder: Evidence for diagnostic validity and methods of psychological assessment. Journal of Clinical Psychology, 43, 32-43.

Keane, T. M., Fairbank, J. A., Caddell, J. A., & Zimering, R. T. (1989). Implosive therapy reduces symptoms of PTSD in Vietnam combat veterans. Behavior Therapy, 20, 245-260.

Kessler, R. C., Sonnega, A. L., Bromet, E., Hughes, M., & Nelson, C. B. (1996). Posttraumatic stress disorder in the national comorbidity survey. Archives of General Psychiatry, 52, 1048-1060.

Kinzie, J. D. (1986). Severe posttraumatic stress disorder among Cambodian refugees: Symptoms, clinical course, and treatment approaches. In J. H. Shore (Ed.), Disaster stress studies: New methods and findings (pp. 123-1140). Washington, DC: American Psychiatric Press.

Kulka, R. A., Schlenger, W. E., Fairbank, J. A., Hough, R. L., Jordan, B. K., Marmar, C. R., & Weiss, D. S. (1990). Trauma and the Vietnam War generation. New York: Brunner Mazel.

MacKenzie, E., Shapiro, S., & Eastham, J. (1985). The Abbreviated Injury Scale and Injury Severity Score: Levels of inter- and intrarater reliability. Medical Care, 23, 823-835.

Martini, D., Ryan, C., Nakayama, D., & Ramenofsky, M. (1990). Psychiatric sequelae after traumatic injury: The Pittsburgh regatta accident. Journal of the American Academy of Child Adolescent Psychiatry, 29(1), 71-75.

McFarlane, A. (1987). Posttraumatic phenomena in a longitudinal study of children following a natural disaster. Journal of the American Academy of Child and Adolescent Psychiatry, 26, 764-769.

McNew, J. A., & Abell, N. (1995). Post traumatic stress symptomatology: Similarities and differences between Vietnam veterans and adult survivors of childhood sexual abuse. Social Work, 40(1), 115-126.

Merriam-Webster's collegiate dictionary (10th ed.). (1993). Springfield, MA: Merriam-Webster.

Motta, R. W. (1994). Identification of characteristics and causes of childhood posttraumatic stress disorder. Psychology in the Schools, 31, 49-56.

Nader, K., Pynoos, R., Fairbanks, L., & Frederick, C. (1990). Children's PTSD reactions one year after a sniper attack at their school. American Journal of Psychiatry, 147, 1526-1530.

Newman, C. J. (1976). Children of disaster: Clinical observations at Buffalo Creek. American Journal of Psychoanalysis, 133, 306-312.

Peterson, K., Prout, M., & Schwarz, R. (1991). Post-traumatic stress disorder, a clinician's guide. New York: Plenum.

Petrucelli, E., States, J., & Hames, L. (1981). The abbreviated injury scale: Evolution, usage and future adaptability. Accident Annual and Prevention, 13, 29-35.

Pfefferbaum, B. (1997). Posttraumatic stress disorder in children: A review of the past 10 years. Journal of the American Academy of Child and Adolescent Psychiatry, 36, 1503-1511.

Pitman, R. (1993). Biological findings in posttraumatic stress disorder: Implications for DSM-IV classification. In J. Davidson & E. Foa (Eds.), Posttraumatic stress disorder: DSM-IV and beyond (pp. 173-189). Washington, DC: American Psychiatric Press.

Polit, D. F., & Hungler, B. P. (1995). Nursing research: Principles and methods (5th ed.). Philadelphia: Lippincott.

Pynoos, R., & Nader, K. (1993). Issues in the treatment of posttraumatic stress in children and adolescents. In J. P. Wilson & B. Raphael (Eds.), International handbook of traumatic stress syndromes (pp. 535-549). New York: Plenum.

Rothbaum, B. O., & Foa, E. B. (1992). Cognitive-behavioral treatment of posttraumatic stress disorder. In P. A. Saigh (Ed.), Post traumatic stress disorder: A behavioral approach to assessment and treatment (pp. 85-110). Boston: Allyn & Bacon.

Roy, C. (1980). The Roy adaptation model. In J. P. Riehl & C. Roy (Eds.), Conceptual models for nursing practice (2nd ed.; pp. 179-192). New York: Appleton-Century-Crofts.

Roy, C. (1984). Introduction to nursing: An adaptation model (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Singh, G., & Yu, S. (1996). U.S. childhood mortality, 1950 through 1993: Trends and socioeconomic differentials. American Journal of Public Health, 86, 505-512.

Schwarz, E. D., & Kowalski, J. (1991). Malignant memories: PTSD in children and adults after a school shooting. Journal of the American Academy of Child and Adolescent Psychiatry, 30, 936-944.

Schwarz, E. D., & Perry, B. D. (1994). The post-traumatic response in children and adolescents. Psychiatric Clinics of North America, 17, 311-326.

Shannon, M., Pharm, D., Lonigan, C., Finch, A., & Taylor, C. (1994). Children exposed to disaster: I. Epidemiology of posttraumatic symptoms and symptom profiles. Journal of the American Academy of Child and Adolescent Psychiatry, 33, 80-92.

Shaw, J., Applegate, B., Tanner, S., Perez, D., Rothe, E., Campo-Bowen, A., & Lahey, B. (1995). Psychological effect of Hurricane Andrew on an elementary school population. Journal of the American Academy of Child and Adolescent Psychiatry, 34, 1185-1192.

Terr, L. C. (1988). What happens to early memories of trauma? A study of twenty children under age five at the time of a documented traumatic events. Journal of the American Academy of Child and Adolescent Psychiatry, 27, 96-104.

Terr, L. C. (1991). Childhood trauma: An outline and overview. American Journal of Psychiatry, 148, 10-20.

Trimble, M. R. (1981). Post traumatic neuroses: From railway spine to whiplash. Chichester: Wiley.

Turnbull, G. J. (1998). A review of post-traumatic stress disorder. Part II: Historical development and classification. Injury, 3, 169-175.

United States Public Health Service. (1995). Depression in adults. American Family Physician, 51, 1701-1704.

Vernberg, E., Silverman, W., La Greca, A., & Prinstein, M. (1996). Prediction of posttraumatic stress symptoms in children after Hurricane Andrew. Journal of Abnormal Psychology, 105, 237-248.

Weine, S., Vojvoda, D., Becker, D., McGlashan, T., Hodzic, E., Laub, D., Hyman, L., Sawyer, M., & Lazrove, S. (1998). PTSD symptoms in Bosinian refugees one year after resettlement in the United States. American Journal of Psychiatry, 155, 562-564.

Wolfe, V. V., Gentile, C., & Wolfe, D. A. (1989). The impact of sexual abuse on children: A PTSD formulation. Behavior Therapy, 20, 215-228.

APPENDIX A

AGENCY APPROVALS

Texas Children's Hospital

Located in the Texas Medical Center

Academic General Pediatrics
Clinical Care Center, Ste 500
1102 Bates, MC 3-2305
P.O. Box 300630
Houston, Texas 77230-0630
Tel: 713/770-3441
Fax: 713/770-3435

BEN TAUB GENERAL HOSPITAL

Pediatric Emergency & Ambulatory Center

1504 Taub Loop
Houston, Texas 77034

Tel: 713/793-2595
Fax: 713/793-2569

BAYLOR COLLEGE OF MEDICINE

One Baylor Plaza • Houston, Texas 77030-3498 ·

Department of Academic General Pediatrics

Rebecca T. Kirkland, M.D., M.P.H., Chief	770-3441
Jamil T. Azzam, M.D.	793-2593
Mariam R. Chacko, M.D.	770-3440
David Childers, M.D.	770-3441
Jan E. Druz, M.D.	798-6585
Hildegard C. Emslander, M.D.	793-2596
Erin E. Endom, M.D.	770-5497
Yong Han, M.D.	770-5497
Marcus J. Hanfling, M.D.	793-2592
Sue Jong, M.D.	770-3441
Claudia A. Kozinetz, Ph.D., M.P.H.	770-3730
Andrew E. MacMahon, M.D.	770-3441
Susan R. Mihm, M.D	770-3441
Clifford O. Mishaw, M.D.	770-3440
Milton H. Nirken, M.D.	770-5497
Robin S. Pearson, M.D.	770-3441
James L. Phillips, M.D.	798-8646
Teresa D. Rice, M.D.	770-3441
Boyd F. Richards, Ph.D.	798-7291
Joan S. Steinkuller, M.D.	793-2596
Terri Lee Turner, M.D., M.P.H.	770-3441

December 11, 1998

Leslie M. Thompson
Associate Vice President for Research
Dean of the Graduate School
P.O. Box 425649
Denton, Texas   76204-5649

Dear Ms. Thompson,

As the Principal Investigator of the research protocol entitled "# H-5356 Comparison of Medical and Psychosocial Outcomes of Injured Children with Multidisciplinary vs Conventional Medical Follow-up" I give my permission for Anne Gill, RN, B.S.N. to conduct a secondary review and analysis of the data obtained from that study. I understand that the secondary review is being conducted as part of Ms. Gill's thesis research project.

You may call me at (713) 793-2595 if you have any questions about this study.

Sincerely Yours,

Marcus J. Hanfling, M.D.
Assistant Professor, Pediatrics
Baylor College of Medicine
Director, Pediatric Emergency Center &
Ambulatory Clinics, Ben Taub General Hospital

Marcus J Hanfling M.D.
Department of Pediatrics-Academic General
Mail Station: BTGH/42004
Baylor College of Medicine
Houston, Texas 77030

**BAYLOR
COLLEGE OF
MEDICINE**

One Baylor Plaza
Houston, Texas 77030-3498
Office of Research
Tel.: (713) 798-6970
FAX: (713) 798-6990

RE: #H-5356 - COMPARISON OF MEDICAL AND PSYCHOSOCIAL OUTCOMES OF
INJURED CHILDREN WITH MULTIDISCIPLINARY VS CONVENTIONAL MEDICAL
FOLLOW-UP

Approval valid from 10/7/97 to 10/7/98

Dear Dr. Hanfling:

The Institutional Review Board for Human Subject Research for Baylor College of Medicine and Affiliated
Hospitals (BCM IRB) is pleased to inform you that your above referenced research protocol and consent
form were approved according to institutional guidelines and provided they receive the unaltered approval
of any other institutional committees in which your research is involved.

    1.   Continued review will be required
- ( )   a. After each subject's exposure
- ( )   b. Quarterly
- ( )   c. Semi-annually
- (X)   d. Annually
- (X)   e. Change in protocol
- (X)   f. Development of unexpected problems or unusual complications
- ( )   g. Other

    2.   Method of Review
- (X)   a. IRB renewal form (IRB2)
- ( )   b. New protocol
- ( )   c. Interview with principal investigator
- ( )   d. Other

If a consent form is being used for this protocol, only the IRB approved (and stamped) version should be
used for obtaining consent from potential study subjects.

Sincerely yours,

[signature] Seth P. Lerner, MD

Seth P. Lerner, M.D., Vice-Chair
Institutional Review Board for Human Subject Research
for Baylor College of Medicine & Affiliated Hospitals
Office of Research

OCT 1997
RELEASED

SPL:lmf

Application to Human Subjects Review Committee
Exempt Review Only

Approved by HSRC Chair _[signature]_____ Date _3-31-99_

If it is the decision of the research committee (for student research) or the department coordinator (for faculty research) that the proposed research is exempt from expedited or full review by the Human Subjects Review Committee (HSRC), please complete the following form. Three copies of this property signed form must be submitted to the chair of the HSRC. In addition, one copy of all research instruments (i.e. questionnaires, interview schedules, etc.) must also be included. If this application is exempt because it has received approval from another IRB, include a copy of the final approval letter.

Principal Investigator(s): ___Anne Susan Gill_____ SS# ___463-78-1988_____

Faculty Advisor: _Jeanette Kernicki, RN., Ph.D._Department: ___Nursing_____

Title of Study: ___Factors Predictive of Pediatric Post-traumatic Stress Disorder____

___12 Months Post Traumatic Injury_____

___X___ Is Exempt from Human Subjects Review Committee review because (see p. 11 of Policies and Procedures manual):

The study consists of secondary analysis of existing data. Record review

The number of records to be retrieved will be approximately 380-390.

Estimated beginning date of the study: ___March 1, 1999_____

Estimated duration of the study: ___Three months - March - May_____

Research being conducted for:
Professional Paper____ Thesis _X_ Dissertation____ Class Project____ Pilot Study____ Faculty____

Is this research being conducted for a non-university sponsor? Yes____ No _X_

Name of Sponsor:_____

APPENDIX B

DATA COLLECTION FORMS

BEN TAUB PEDIATRIC INJURY CLINIC
INJURY HISTORY

Date of Injury:_____/_____/_____

Time of Injury: _____(military)

For the following three items, please enter a 99 if the information is missing or an 88 if not applicable

Glasgow Coma Score on Admission _____
Glasgow Coma Score per EMS _____ if available
Pediatric Truama Score _____

Location of Injury:
 1-Home 2-school 3-Park 4-other(specify)_____

Mechanism of Injury:
MVA: 1-pedestrian 2-occupant 3-bike 4-other_____
Drowning: 1-pool 2-bathtub 3-bayou 4-other_____
Fall: 1-stair 2-window 3-balcony 4-other_____ 5-bed 6-sofa
Gunshot Wound: 1-handgun 2-rifle 3-shot gun 4-other_____
Sport: 1-football 2-basketball 3-running 4-other_____
Burn: 1-scald 2-flame 3-electric 4-other_____
Physical abuse   0-No 1-Yes
Sexual assault   0-No 1-Yes
Sexual abuse   0-No 1-Yes
Assault   0-No 1-Yes
Other   0-No 1-Yes   Specify_____
Unknown   0-No 1-Yes

Protection Devices used(if applicable):
0-no 1-yes type_____8 N/A
          (ie helmet, seat belt, car seat)

ETOH involved: 0-No 1-Yes 8 N/A
Drugs involved: 0-No 1-Yes 8 N/A

Was CPS called?   0-No 1-Yes
Was a CPS report filed?   0-No 1-Yes
Did CPS take custody?   0-No 1-Yes
Did CPS do an investigation?   0-No 1-Yes

Any complications as a result of the injury?   0-No 1-Yes
If yes, describe_____

BEN TAUB PEDIATRIC INJURY CLINIC
SELF-REPORTED HISTORY

This form is to help your doctor give your child better care. It is confidential and will be a part of the medical record. Please fill in the blanks or check the correct answers.
Esta forma le ayudara al medico a darle mejor cuidado a su hijo(a). la informacion es confidencia y sera parte del archivo medico. Por favor llene los espacios abajo o marque la respuesta correcta.

Name of child/*Nombre de nino(a)*: _____

Date/*Fecha*:_____

Informant (relationship):
Su parentesco con el nino:_____

Child's age:
Edad del nino: _____ yrs/mos

Birthdate:
Fecha de Nacimiento:_____

How long has child lived in Houston?
*Por cuanto tiempo ha vivido el nino en Houston?*_____yrs/mos

Family history
Historia medical de la familia

How many children does the child's mother have?
Cuantos hijos tiene la madre del nino?
1 2 3 4 5 5 7 8 9 OR MORE (Circle one).
o mas (indique el numero)

This child was the (Circle one) 1st 2nd 3rd 4th or more
Este nino es el (indique el numero) 1° 2° 3° 4° mas

Is this child adopted?
Este nino es adoptado(a)? Yes/*Si*____ No____

How many people (adults and children) live at home with this child?
Cuantos personas viven en la casa con el nino?
1 2 3 4 5 6 7 8 9 OR MORE (circle one).
o mas (indique el numero)

This child is now living with whom?
Con quien vive el nino ahora?
1. Mother ——   2. Father____   3. Both____
   Madre   Padre   Los dos
                                    padre

4. Other____   If other, who?_____
   Otro   *Si marco otro, quien es?*

At the present time, who usually cares for this child during the day or after school? (Check one).
Por ahora, quien cuida al nino durante el dia o despues de escuela? (Seleccione la respuesta).

1. Child's mother____   2. Other family member____
Madre de nino   *Otro miembre de la familia*
3. Child's father____   4. Babysitter____
Padre de nino   *Ninera (babysitter)*
5. Stays alone___   6. Friend____
Se queda solo(a)   Amigo

What language is usually spoken in the child's home?
Que idioma se habble generalmente en la casa de nino?
1. ___English   2.___Spanish   3.___Other   If other, what_____
Ingles   Espanol   Otro

Name of child's school:
Nombre de la escuela del nino:

_____

School District:
1.___HISD   2.___Spring   3.___Alief
4.___Pasadena   5.___Other   If Other, what_____
                                         Otro

How many days did the child miss from this school year?
Cuantos dias falto el nino este ano de escuela? _____

Present grade level or grade last completed (circle one):
Grado en que esta el nino (indique el numero):
Kindergarten 1 2 3 4 5 6 7 8 9 10 11 12

Where does this child usually go for medical care?
A donde va el nino generalmente para cuidado medico?

_____
_____

Please give a Houston phone number that will sure to reach someone responsible for this child in case of an emergency.
De un numero de telefono en Houston donde siempre sera posible alcanzar a alguien responsable por el nino en caso de emergencia.

_____

Whose phone is this?
*De quien es este numero?*_____

Child's natural father's present age:
*Edad actuad del padre del nino:*_____ **years/anos**

What is the natural father's race?
Cual es la raza del padre?

1. Hispanic____   **2. Black/African American**____   **3. Asian**____
Hispano   *Negro/Africano*   *Asiatico*

4. White-Caucasian____   **5. Other**____
Caucasiano   *Otro*

What is the usual occupation of the natural father?
*Cual es la ocupacion usual del padre?*_____

What is the father's highest grade of school completed?
*Grado en que el padre completo?*_____

Child's natural mother's present age:
*Edad actual de la madre del nino:*_____ years/anos

What is the natural mother's race?
Cual es la raza de la madre?

1. **Hispanic**____   **2. Black/African American**____   **3. Asian**____
Hispano   *Negro/Africano*   *Asiatico*

4. White-Caucasian____   **5. Other**____
Caucasiano   *Otro*

What is the usual occupation of the natural mother?
*Cual es la ocupacion usual del madre?*_____

What is the mother's highest grade of school completed?
*Grado en que el madre completo?*_____

Please check the <u>one</u> blank which best describes the mother's present status:
Por favor indique el estado civil actual de la madre:

1. Married____   **2. Divorced____**   **3. Widow____**   **4. Never married____**
Casada   *Divorciada*   Viuda   Soltera

5. Separated____   **6. Remarried____**
Separada   *Casada por segunda o mas ves*

In what country was the child born?
En que pais nacio el nino?

1. U.S.A____   **2. Mexico____**   **3. Other/***Otro*____

Where was the child born?
Donde Nacio el nino?

*1. At home /En la casa*____   2. Hospital/*En el hospital*____
                                        Name/*Nombre*_____

How much did this child weigh at birth?
Que tanto peso el nino cuando nacio?

Pounds/*Libras*____   **Ounces/***onzas*____

Before this injury, has the child ever had:
Ha tenido este nino alguna vez:

A broken bone?
Un Hueso partido (roto)
Yes/*Si*____   **No**____

Been knocked out or unconscious?
Perdida de conocimiento debido a un golpe
Yes/*Si*____   **No**____

Had stitches/been hurt or injured in anyway?
Ha tenido puntas/estado lastimado/herido en alguna manera?
Yes/*Si*____   **No**____

If yes, how?
*Si respondo si, como?*_____

Does this child have any health problems now?
Tiene este nino algun problema de salud ahora?
Yes/*Si*____   **No**____

If yes, what?
*Si Respondosi, cual?*_____

Exercise _____
Case # _____

BODY REGION	INJURY	AIS CODE	Highest AIS	AIS²
Head/Neck:	_____	_____	_____	____
	_____	_____		
	_____	_____		
	_____	_____		
	_____	_____		
Face:	_____	_____	_____	____
	_____	_____		
	_____	_____		
	_____	_____		
Chest:	_____	_____	_____	____
	_____	_____		
	_____	_____		
	_____	_____		
	_____	_____		
	_____	_____		
Abdomen:	_____	_____	_____	____
	_____	_____		
	_____	_____		
	_____	_____		
	_____	_____		
Extremities:	_____	_____	_____	____
	_____	_____		
	_____	_____		
	_____	_____		
	_____	_____		
External:	_____	_____	_____	____
	_____	_____		
	_____	_____		
	_____	_____		
	_____	_____		
		ISS =		____

APPENDIX C

PTSD DATA COLLECTION FORM

DATA FORM

Factors Predictive of Posttraumatic Stress Disorder One Year Post Traumatic Injury

Key
0 = No PTSD   8= Not Applicable
1= DSM-IV PTSD Diagnosis   9= Missing Data

* Diagnosis of PTSD cannot be made for symptoms lasting less than one month.

CASE NUMBER	2 Wk* Visit	4 Wk* Visit	3 Month Visit	6 Month Visit	12 Month Visit
	8	8			
	8	8			
	8	8			
	8	8			
	8	8			
	8	8			
	8	8			
	8	8			
	8	8			
	8	8			
	8	8			
	8	8			
	8	8			
	8	8			
	8	8			
	8	8			