The Post-Traumatic Response in Children and Adolescents

Eitan D. Schwarz, MD, FAPA, FAACAP
Bruce D. Perry, MD, PhD

Official citation: Schwarz, E and Perry,BD *The post-traumatic response in children and adolescents.* Psychiatric Clinics of North America, 17 (2): 311-326, 1994

SYNOPSIS

Each year in the United States over 3 million children and adolescents experience some form of traumatic event. The adaptive and maladaptive responses to trauma in children and adolescents is compared with adults. Post-traumatic disorders are viewed as the maladaptive persistence of a previously adaptive set of mental and physiological responses to the trauma organized as 'malignant memories'. This view allows integration of neurodevelopmental and psychosocial conceptualizations that underlie rational clinical assessment and treatment.

TRAUMATIZED CHILDREN: A PUBLIC HEALTH CRISIS

Worldwide, terrified helpless youngsters are too often silent witnesses or survivors of violence in the home, school, street, and war zones. In the U.S. alone, based on conservative estimates of the incidence of sexual and physical abuse and exposure to community and domestic violence, over three million children were exposed to traumatic events last year. If the percentage of American youngsters scarred by the battles of childhood approximates that of Vietnam veterans, each year approximately one million are joining the swelling ranks requiring special mental health, medical, and educational services, exceeding the total number of adult combat veterans who developed PTSD over ten years of war in Vietnam (38). Yet, despite increasing awareness in the medical community of this public health crisis (25), research in childhood trauma lags far behind that of adults, and few studies have looked at adolescents as a distinct group.

Trauma during childhood and adolescence can lead to future disorders by etching its often indelible signature on the individual's maturation and development. Depending on the number, nature, and pattern of traumatic events, 27% to 100% of youngsters, especially those exposed to sudden, unexpected, man-made violence, will develop Post-traumatic Stress Disorder (PTSD)(47). Others will have a range of PTSD symptoms, behavior disorders, anxiety, phobias, and depressive disorders. For example, children who were kidnapped (87), young Cambodian genocide survivors (67), and Holocaust survivors and their offspring continue to have serious symptoms years later. Abused children (50, 55, 65) and those exposed to war (31) develop PTSD and other psychopathology. In addition to PTSD, young children traumatized chronically can also develop symptoms that meet the criteria for other Axis I disorders (e.g. Attention Deficit Hyperactivity Disorder, Major Depression) and Axis II disorders, including Borderline Personality Disorder (15, 22). Furthermore, trauma-induced influences on development

can extend beyond childhood. Not only is there less improvement with the passage of time than survivors, families, and others often wish to believe, but trauma in childhood increases risk rather than inoculates against later psychopathology (95).

THE NEUROBIOLOGY OF SURVIVAL AND MALIGNANT MEMORIES

The tenacious effects of trauma are rooted in the well-characterized total initial body freeze, fight-or-flight, alarm or stress response to life threat (6, 55, 54, 97, 7). This complex set of interactive processes includes activation of the centrally-controlled peripheral autonomic nervous system tone, the immune system (42), the hypothalamic-pituitary axis with a concomitant peripheral release of adrenocorticotrophic and cortisol, and of other neurochemical systems in the central nervous system (CNS)(81). The locus coeruleus (LC) is a central mediator of the stress response (36). This bilateral grouping of norepinephrine-containing neurons originates in the pons, a more primitive, regulatory part of the brain, and sends diverse axonal projections to virtually all major brain regions, enabling its function as a general regulator of noradrenergic tone and activity. The ventral tegmental nucleus (VTN) also plays a part in regulating the sympathetic nuclei in the pons/medulla. Acute stress results in an increase in LC and VTN activity and release of norepinephrine that influences the brain and the rest of the body. This system plays a critical role in regulating arousal, vigilance, affect, behavioral irritability, locomotion, attention, the response to stress, sleep and the startle response (42, 53, 55, 81, 36).

Evidence is accumulating that the alarm reaction initiates a cascade of cellular and molecular processes that alter brain structure and function to create an adaptive record of survival-related information. Intense danger activates the neurosensory apparatus and alters the pattern and quantity of neurotransmitter release throughout neuronal systems responsible for sensation, perception and processing of survival information. Neurotransmitter receptor/effector activation then alters intracellular chemical constituents, including second (e.g. cAMP, phosphatidyl inositol) and third messengers.

Changes in these messengers alter the micro-environmental milieu of the nucleus. Since the portion of the genome expressed in a given neuron is dependent upon the local micro-environment in its nucleus, changes in gene transcription and expression of proteins can result, including sensitization of receptors to similar future neurotransmitter stimulation in all synaptically connected neurons.

Further evidence suggests that newly arrayed patterns of sensitized interconnected neurons then organize the brain of a survivor into functional neural networks (48). For example, the widely distributed but tightly connected limbic network is critical in making new experiences storable and old experiences retrievable. Enabling association between multimodal sensory information and affective states related to fear and reward, the amygdala elicits the recall of emotionally charged memories. Such networks integrate the sensation, perception, processing, and memory storage and retrieval of threat-related information to enable adaptive responses to future threats.

Yet, while the alarm reaction enables survival, it seems to go awry in certain individuals

when the initial stressor is of sufficient duration, intensity, or frequency. Instead of reversibility of the initial response or appropriate evaluation and response to future situations that resemble the original threat, the individual becomes either hyper- or hypo-reactive and suffers a variety of PTSD symptoms. Evidence is accumulating that sensitization of catecholamine receptors in the LC/VTN system leads to hypervigilance, increased startle, affective lability, anxiety, dysphoria, increased autonomic nervous system hyper-reactivity (37, 53). Facilitory or inhibitory alterations in other systems may underlie memory and learning mechanisms related to hypo-reactivity, avoidant and other PTSD symptoms. Therefore, PTSD appears to represent a maladaptive generalized activation of the alarm response, with symptoms representing exaggerations of appropriate functions: hypervigilance instead of appropriate prediction and early detection of future danger; avoidance and re-enactment rather than adaptation and survival.

Malignant memories (74, 77, 54) can be conceptualized as the patterned maladaptive functional contents of network activities integrating survival-related perception, memory, arousal, cognition, affect, somatic and psychological state, and behavior. Triggered by external sensory or internal cognitive, affective, or somatic cues, a malignant memory invades experience with high levels of noxious arousal and can include cognitive distortions, dissociative and somatic states, affective intensities, and behavioral and affective over-activity or opposite tendencies to hypo-reactivity, numbness, amnesia, or avoidance.

DEVELOPMENTAL CONSIDERATIONS
NEURODEVELOPMENT AND MALIGNANT MEMORIES:

A growing body of evidence suggests that the developing brain organizes in response to the pattern, intensity , and nature of sensory perceptual and affective experience of events during childhood and adolescence to produce a unique person. Mediated by neurotransmitters and hormones, a stressor can affect the differentiation of the brain undergoing neurogenesis, migration, synaptogenesis, and neurochemical differentiation, (52, 53, 54). Indeed, the developing CNS is exquisitely sensitive to stress. For example, rats exposed to perinatal handling stress show major alterations in their stress response later in life (96). Such studies suggest that early exposure to consistent, daily stress can result in more adaptive later behavior and resiliency, while exposure to unpredictable stress can result in deficits. Predictability and control can make events much less destructive or traumatic.

We may speculate that its plasticity makes the developing brain more susceptible to formation of malignant memories that affect not only the stress response system but also the emerging organizations of neural networks regulating other basic states and characteristics of the individual. Thus, an infant, who has reasonable frustration, gratification, and control during rapprochement in regulating tension anxiety by returning to a welcoming mother for comfort, may be establishing an appropriate neurochemical milieu for the development of a flexible, maximally-adaptive physiological apparatus for responding to future stressors, as well as other neuropsychological structures that mediate object relations, affect regulation, and adaptive personality characteristics. For traumatized children, however, the template for

organization of their developing systems includes powerful experiences of fear, threat, unpredictability, frustration, anger, helplessness, hunger, and pain. Perry (54, 55) found altered cardiovascular regulation, affective lability, behavioral impulsivity, increased anxiety and startle response, and sleep abnormalities in such children. Such youngsters are at risk to develop 'traumatized' brains characterized by dysregulated systems that would serve them poorly when exposed to psychosocial stressors later in life (52, 55, 53).

A number of studies provide correlative data suggesting that severe early trauma can be a major expresser of underlying constitutional or genetic vulnerability and may be a primary etiological factor in the development of a broad range of later disorders (5, 41, 66). Davidson and Smith (10) showed that 22% of adult psychiatric outpatients received a diagnosis of PTSD, with vulnerability to trauma greatest during early childhood and adolescence. Moreover, veterans with combat-related PTSD were more likely to have a history of childhood physical abuse than those without PTSD (4). Breier and co-workers (3) concluded that early parental loss accompanied by absence of a supportive relationship is associated with adult psychopathology. Other studies have documented associations between developmental trauma and the creative output of adult artists and writers (90), and borderline personality (51, 27), depressive (32), dissociative (59, 56), and a variety of other medical and psychiatric disorders (8, 9, 21, 1, 2, 24, 10). Indeed, alterations in a variety of neuroendocrine and blood element markers observed in borderline personality disorder are similar to those seen in PTSD (81, 97).

SYMPTOM FORMATION:

With advancing development, an individual becomes more complexly organized as more differentiated and specific response capacities accumulate in a layered fashion from interactions among aspects of a potential traumatic event and the emerging composite of distinctive individual biopsychological vulnerabilities and resilience, coping strategies, and familial and communal environments (49, 20). Although it may not yet be possible in any individual case to pinpoint the contribution of any single factor in this composite, extent of development can be one factor in determining whether an event will become a traumatic stressor that provokes malignant memories. Thus, what would be experienced as a stressor for an adolescent might not be traumatic for a younger child. For example, unlike an adolescent who may react to the communal destructiveness of a devastating hurricane, a very young infant may respond only to the mother's behavior or emotional states during and after the storm.

The presentation and course of post-traumatic symptoms depend on how far a person has progressed along his developmental trajectory. Because malignant memories, reflecting altered neurodevelopmental and neural network processes, are organized according to developmentally-dependent perceptions, cognitions, arousal states, and memory mechanisms, they differentiate youngsters of varying ages and adults. For example, while adult PTSD symptoms appear to be more stimulus-specific, children, most notably those younger or chronically traumatized, seem to respond to a variety of stimuli that may not be directly associated with the original trauma. Youngsters manifest a more pervasive and persistent increase in basal autonomic nervous system

tone and a generalization of hyper-reactivity (55), more global confusion and effect on behavior (46), and report reactivity to more generalized stimuli (74). Furthermore, developmentally sensitive depression, behavior problems (78), and grief reactions (61, 78) may coexist with PTSD symptoms when the trauma is associated with loss. Malignant memory configuration in children may therefore reflect development-specific neuropsychological processes that underlie grief and depression.

Other observations suggest that response to trauma depends on age. For example, while not always obvious in adults, regression can be striking in individuals whose developmental gains are still consolidating. Also, cognitive development determines how a survivor places the stressor in time and attributes causality, influencing prediction of future trauma as well as framing the present stressor. Time sense distortions such as omen formation and future foreshortening, described initially for children, have also been reported in adults (88, 74). Youngsters' notions of cause of events and their impact evolve from the magical, through the egocentric and the concrete, to more abstract concepts of multiple interacting factors and morality. Moreover, Terr (89) found absence of flashbacks in children, but the definition of flashback as distinct from other manifestations of reexperiencing is not clear (47). Additionally, some symptoms seen in adult PTSD presentations may not be useful or would be difficult to assess in infants or preschoolers (e.g. difficulty concentrating). Avoidant symptomatology may decrease and anger increase with age (74).

In general, malignant memories rooted in trauma occurring during early development are likely to manifest later as disorders of self, personality or ego functions, including cognitive development and regulation of object relations, attention, affect, and arousal, and are not usually recalled as deriving from discreet events (26). Development beyond early childhood adds differentiated reactions that increasingly resemble those of adults and enable use of adult PTSD criteria (74). Whatever the age, sufficiently severe stressors can interact with individual characteristics to create malignant memories that reflect reorganized activities of established neural networks initially arrayed during earliest development. The more severe a stress or vulnerable an individual, the more likely will symptoms involve functions consolidated earlier in development and greater the regression seen clinically.

FAMILY FACTORS:

Envirosocial factors provide an essential context for the development of malignant memories. Further differentiating them from adults, dependency on others for security and safety provides a crucial envirosocial context for defining what might become a traumatic stressor for youngsters. For example, children's PTSD and behavior symptoms were associated with parent PTSD symptoms (77) and with parent and family factors (44, 23). Moreover, youngsters are physically more vulnerable to family violence or betrayal by family members who neglect or abuse them. A traumatic event affecting the child can also induce traumatic responses in family members, which in turn may alter the family environment (33). Moreover, genetic factors (94) that mediate arousal states and learning mechanisms may predispose some children and parents to form malignant memories. Thus, a symptomatic child-parent system may function as an oscillator that maintains malignant memory activity through reinforcing feedback loops. Components

of such a system may synergistically trigger each other and escalate arousal, reexperiencing, and avoidance symptoms in vicious cycles. Characteristics such as intensity or stability of any particular system would depend on individual, pre-event, or post-event factors.

SYMPTOM ACCUMULATION WITH DEVELOPMENT:

Beginning in infancy and early childhood, trauma to either the child or principal caretaker that severely disrupts good-enough-mothering may interfere with essential early developmental processes that modify the genetic endowment and organize the core of the personality. These processes are variously conceptualized as psychological birth, attachment, formation of basic trust and self structures, state and affect regulation, and symbiosis. Exquisitely sensitive to caretakers' emotional states and behavior more than to cognitively-mediated assessment of danger, infants may respond with symptomatic disturbances of global such as helpfulness.

In addition, school-age children may be anxious, depressed, or inhibited, and may report guilt, hypervigilance, change in play, loss or change in interests, return of old or onset of new fears, sleep disorder, and impaired concentration, functioning and initiative. School age children are increasingly reactive to extra-familial traumatic events and their effects on caretakers and the community (76). They may also manifest disorders in school performance and learning (73).

Adolescents may add identity, eating, and personality (including multiple personality) disorders, and pseudo-seizures. They may act out with suicidality, hypersexuality, substance abuse, delinquency and truancy. In an effort to relieve intensely uncomfortable stress-induced states of subjective affective emptiness and numbing that can include hypo-responsivity to physical pain, some adolescents report urges to self-mutilate. Yet, school age youngsters and adolescents may also actively and creatively cope through more effective feeling, thinking and acting and can exhibit surprising resilience and drive for mastery (49). functioning, excessive crying, eating, sleeping, psychophysiological lability, overstimulated states, or apathy and failure to thrive.

Toddlers add to their repertoire of responses disruptions of rapprochement and separation-individuation and changes in autonomy, motor activity, and aggressivity. Preschoolers add somatization, repetitive play, avoidance, fears, sadness, dissociative states, clinginess, regressive behaviors, and feelings of shame regarding their vulnerability. They may show delays in cognition, including language development (39), or present as withdrawn and mute (12). Their aggressiveness and vengefulness may be erroneously labeled as a behavior disorder. Yet these youngsters may also exhibit increasingly effective coping with their developing language, cognitive, and social skills.

CLINICAL INTERVENTIONS GENERAL PRINCIPLES:

Interventions in the aftermath of trauma, including assessment and treatment, can be conceptualized as preventing and attenuating malignant memories, restructuring their configurations, or uncoupling links among reexperiencing, arousal, and avoidance. Clinicians intervening with traumatized youngsters must consider not only the

presenting symptoms and the individual child's ability to cope, but also the biopsychosocial development and the impact of trauma on the youngster's maturational and developmental trajectories. Additionally, it is crucial to intervene with the child's community and network of caretakers, including parents, other family members, and teachers to enlist their assistance and provide them with support (20, 76).

Clinicians who undertake work with traumatized youngsters and families should be adept at such interventions and familiar with changing developments in this rapidly evolving field. They must maintain a compassionate, empathic, professional attitude and remain alert to the common pitfalls of subtle biases, inclinations to identify with or condemn young survivors and parents, or tendencies to gratify voyeuristic wishes or rescue fantasies. Such work can be so demanding that even experienced clinicians should consider obtaining ongoing consultation from colleagues who specialize in working with traumatized children. In disaster, episodes of community violence, or complex clinical situations, interventions are often best coordinated among mutually supportive members of a specialized multidisciplinary team. Intervention modalities may include critical incident debriefing; individual, pharmaco-, family, and group assessments and therapies; and pragmatic consultative, administrative, political, or economic support and advocacy. Specialized techniques include art, storytelling, role playing, and free or directed play. Intervention sites may include the home, clinic, or school.

Because PTSD may be preventable, professional activities should include public education aimed at preventing violence and children's exposure to it and identifying its effects on them, as well as advocacy for provision of services to traumatized youngsters. Especially for events such as war or natural disasters, but also for ongoing trauma such as abuse or neglect, the media can be used to educate caretakers about the special needs of children. The media should be encouraged and assisted to furnish children themselves with carefully crafted comprehensible information to assist in their avoidance, active cognitive and behavioral coping, and interpretation and appraisal of traumatic events. Additionally, if exposure to violent events is inevitable but predictable, systematic training may prepare youngsters and attenuate the impact of the stressor.

Following disasters, large public health education and screening efforts can be undertaken. Case finding often includes educating caretakers and advocating for children's right to evaluation and treatment. However, caretakers' own response to the traumatic event and psychological mindedness determine access to and the nature of care they would allow. For example, family members, teachers, and even therapists, often deny youngsters' symptoms, enclosing them in a 'trauma membrane' (40) to shield the children -- and themselves -- from retraumatization. Intending to "put the event behind" them and fearing reexperiencing, caretakers can be quite hostile to interventions they perceive as reminders of the trauma. Because such resistance often results from displaced anger, hypervigilance, or avoidance symptomatology (75), educational efforts may have limited success.

Youngsters can develop post-traumatic reactions to a wide variety of events, and individual children exposed to the same event may react differently. Stressors are generally categorized as either single or repeated (93, 28). Single event traumas can

include rape, dog bites, automobile or other accidents, violent crimes, disasters, and medical procedures such as bone marrow transplants (84). Chronic exposure can include sexual abuse (45, 98), burn injury (82), or witnessing domestic violence (30). However, the distinction between single event and chronic trauma is often more theoretical than real because a single event may produce a chronic course when retraumatization with each episode of reexperiencing and remembering repeatedly reactivates malignant memories. For example, symptoms may recur during anniversaries, medical procedures, other reminders, or legal proceedings. Often, as in the case of chronic abuse forgotten or kept secret, remembering or disclosing the abuse to others can become a significant acute stressor for the youngster and family.

Moreover, symptoms are usually related to degree of exposure (61), but dose of exposure may not necessarily be limited by physical proximity (74). Exposure can be through direct experience, direct observation or witnessing (60, 63), or merely hearing about an event (70). Therefore, children exposed to traumatized family members or schoolmates may suffer post-traumatic reactions themselves by contagion (85).

Once a survivor or witness is identified and becomes accessible to the clinician, responsible and ethical professionalism dictates protection of the youngster followed by initiation of rational treatment rooted in an adequate diagnostic assessment. If at all possible, intervention should begin during the course of the event itself (e.g. ongoing domestic violence, war or natural disaster), through preventive measures that include reduction of helplessness and arousal, promotion of a sense of safety, provision of emotional support, and encouragement of active coping, mastery and adaptation (99).
Because the course and clinical presentation of ensuing symptoms depend on exposure to a specific pattern, nature, and number of stressors, as well as distinct demographic, temperamental, developmental, and envirosocial factors, any generalizations about intervention must be interpreted cautiously. For example, while younger children have been reported to be less symptomatic after disasters (23), they reacted more to domestic violence (29, 30). Traumatized girls may become more passive, while boys turn to activity and aggression (18). Furthermore, single event traumas differ from chronic patterns of exposure, with children exposed to ongoing stress presenting as more disturbed (35). Man-made or repeated traumas are likely to cause more profound and long-lasting damage and require ongoing intervention.

Intervention with a youngster should include family and school functioning. Caretakers need ongoing support and interpretation of the youngster's experience. Pre-schoolers and toddlers can be assessed and treated through cooperative parents and teachers, with less individual contact with the child himself. Intervention with the family should include not only attention to family factors that may mediate the youngster's response to the traumatic event, such as capacity for nurturance and protection, but also to the impact of the event on the family itself. Trauma can dramatically change family members' roles, level of family conflict, and family process, functioning, and structure. For example, parents may become secondarily traumatized themselves, feel guilt about their failure to protect the youngster, and blame each other with resultant increase in marital discord. Parents of survivors of low probability, high impact traumas may require help to avoid regressive over-protection of the child that can interfere with age-appropriate autonomy and development of a sense of competence. A family may face

disintegration because it lacks resiliency sufficient to survive the distress, or the trauma may precipitate or exacerbate family violence. Such impact on the family can indirectly distort a child's development and become the principal determinant of a youngster's post-traumatic course. Family members and survivors are helped by focussing on their demonstrated competence to survive and heal. Family therapy is indicated if the trauma has affected family functioning or if the trauma has occurred in the family. Additionally, a parent may require individual attention for malignant memories or other psychopathology that may be triggered by the passage of a child through a particular developmental period, leading to complicated family problems and difficulties in accessing the parent or youngster.

Because the line between assessment and treatment is indistinct, the therapeutic value of the assessment should be maximized, while ongoing evaluation should continue throughout the therapeutic phase. Periodic intervention with of the youngster and family through adolescence is often indicated because development can add new capacities for coping, as well as a new experience of the trauma. The maturing youngster may need to reassess and work through grief and trauma repeatedly. Additionally, symptoms may become submerged or altered during development, only to reappear later. For example, a child traumatized when young may appear to make good progress until the onset of hypersexual behavior, school problems, aggression, depression, and anxiety in early adolescence. Furthermore, because childhood trauma may be hidden until adulthood when malignant memories again emerge in the form of PTSD or other psychiatric disorders, a presentation of sudden decompensation in an adolescent or adult should raise suspicion that malignant memories have been triggered. Dissociation, guilt, depression, disorganization, and suicidal behavior often accompany such presentations (78).

Other general principles that may apply to work with survivors of all ages include: establishing an ethical, non-exploitative, non-intrusive, and empathic professional psychotherapeutic relationship; giving the survivor as much control as possible over the format of the therapy and pace of remembering, revealing, and reexperiencing while providing sufficient structure and protection from overstimulation and retraumatization; enabling reappraisal of affective and cognitive aspects of malignant memories and authenticating the experience; and encouragement of coping and restoration of individual, family, spiritual, group, and community competence.

ASSESSMENT:

While evaluation may begin with gathering information from family members and other informed adults, children should be evaluated directly and separately from parents. In addition to frequency and intensity of nightmares and levels of motor activity and distractibility, physical examinations to monitor pulse and blood pressure can yield valuable information about the youngster's fluctuating levels of arousal. Techniques of assessment depend on the child's age. Play and art are essential means for interacting with preadolescent children (20). Assessment can include psychological and educational testing, and the use of PTSD scales (46, 69) and semi-structured interviews (12).

In general, since youngsters rarely attribute symptoms to trauma, may be reluctant

patients or poor historians, and because post-traumatic symptomatology can be non-specific, superimposed on, or mimic other childhood disorders, it is important to maintain a high level of suspicion regarding the post-traumatic etiology of any presenting symptoms and include the possibility of trauma in differential diagnoses of most childhood symptoms. Thus, even when youngsters present without a history of trauma, it is nevertheless useful to inquire routinely, "Have you ever been hurt by anyone?... touched in a way you didn't like?... treated in a way you didn't like?... seen something that really scared you?... had nightmares?... got real jumpy?" Clinicians should be alert to unexplained regressions, sudden symptoms, or recurrence of direct or disguised traumatic themes or references in play, drawings, stories, dreams, or fantasies. However, suggestible and eager to please young children may be easily led to believe and to convincingly describe a version of an event implied by biased adults because they may not yet grasp notions of a consistent 'truth' independent of their feelings, fantasies or wishes to please examiners or parents. therefore, clinicians should exercise extreme care to avoid inducing "false memories" by structuring any inquiry in a scrupulously open-ended and non-biased manner. Even with such precautions, both adults (78, 16) and children (89, 64) may unintentionally offer distorted recollections of traumatic events. Often, it is impossible to determine the validity of a young child's description. While a detailed accurate description of an event may be essential in forensic situations, it is not as necessary for effective clinical intervention and should not be sought with excessive zeal. Forensic assessments should be rigorously documented and may require specialized techniques and electronic recording. Because the goals and procedures of forensic and therapeutic activities differ, it is advisable that be conceptualized as separate processes conducted by different clinicians.

As with adults, symptoms deriving from childhood trauma constitute a spectrum. While many children may not meet more stringent PTSD diagnostic criteria, they may nevertheless have significant post-traumatic symptoms, as well as internalizing and externalizing behavior disorders. While DSM-III and DSM-III-R criteria, usually based on self-reports, have been utilized to assess school-age children and adolescents, assessment of younger children usually relies on direct observation and on caretaker reports. Saigh (69) noted PTSD children to be distinct from phobic or normal children. Schwarz & Kowalski (74) showed DSM-III-R to be more stringent than DSM-III or proposed DSM-IV criteria and children to show a range of symptoms similar to adults.

TREATMENT:

Once a trauma has occurred, early detection, immediate assessment, and aggressive treatment may prevent or attenuate the development of malignant memories. A clear treatment plan, based on careful assessment of developmental factors, differential diagnosis, and benefits and risks, should be developed. Following a one blow trauma, the post-traumatic period may be divided into the first hours and days, the first month, and the long-term.

During the immediate post-trauma phase, the youngster may be unresponsive, avoidant, mute, or withdrawn, and day dream or stare off in a glazed look, or appear robot-like. Such states, often mistaken for oppositional defiant behavior because the

child may not respond to directives and instructions, may lead to escalating threats and power struggles. Aggressive behavior and tantrums may be other manifestation of the child's attempt at fight or flight or regain a sense of control. Transient regressive behaviors may appear, including clinging, sleeping in the parental bed, and loss of recent developmental gains. While alarming, such symptoms usually represent transient normal emergency attempts to cope, restore organization and control, or reestablish the stimulus barrier. Such efforts to adapt by attenuating arousal and over-stimulation through control over the environment and modification of inner experience and should be allowed and power struggles avoided.

Additionally, animal studies, showing that there may be a critical period before which a fear memory is transferred from temporary storage in the hippocampus to permanent storage (34), suggest that aggressive intervention during the early hours and days may be especially effective. Such treatment would consist of restoring a sense of control and reassurance of safety, affection, and protection. Restoration of family, group, and community nurturance and protection is vital and lays the groundwork for necessary treatment alliance with parents. Psychopharmacological treatment, such as a course of benzodiazepines, propranolol or clonidine (14, 17, 55), could attenuate autonomic hyper-arousal manifested by tachycardia, elevated blood pressure, hyperactivity, distractibility, and nightmares. These immediate and aggressive attempts to modify the entire experience of the trauma may partially neutralize the effect of the event and prevent formation of malignant memories.

Following the early post-trauma hours and days, most youngsters and families usually require and seek continuing assistance for the next two weeks. During this period, symptoms usually begin to subside except for episodes of reexperiencing triggered by external or internal cues. After the first few days, a predictable and normal daily pattern should be restored, and children made aware of what to expect each day. Youngsters should be allowed to continue their attempts at active mastery and interact with caregivers by talking, playing out, role playing, and art. However, they should be redirected when these activities become overstimulating, appear to trigger unmanageable reexperiencing, are endless and do not seem to promote resolution, or are transmitted to non-traumatized youngsters by "contagion" (85). Throughout, cognitive reframing by patient and nurturing caretakers should continue, allowing for the youngster's proneness to misconceptions based on concreteness, egocentricity, and magical causality.

Assistance beyond the acute period is often sought less actively or even resisted by some parents. However, clinical access to youngsters may improve through educational efforts directed at caretakers that alerts them to the natural history of the trauma response (13). Aside from citing statistics and weighing risk factors, it is ultimately impossible to predict long term outcome accurately. Although youngsters may need reassurance that a rare traumatic event will definitely not recur and that they will feel better soon, reassurance that they are safe and protected and recognition of their own competence to survive and heal should be underscored.

Individual treatment of acute and chronic trauma often includes multimodal approaches dictated by clinical needs and age (57, 91, 13). Once a treatment alliance has been

established, therapists must remain alert for how malignant memories are reexperienced in the therapeutic relationship (i.e. distrust, need for control, fears of dependency and passivity). Individual and group treatments may be offered at the school (62). Individual treatment modalities include psychoanalytic, art (83) play (43, 86, 80, 92) cognitive behavioral (11) and flooding and desensitization (68, 72). Psychoeducational groups have been described using drawings and role playing (19). The whole gamut of psychotropic medications used with children and adolescents can be considered symptomatically.

Adolescents are generally more likely to be exposed to rape, automobile accidents and other high risk behaviors, school and street violence, and peer suicide. Additionally, trauma during adolescence may unmask earlier childhood trauma. Survivors may require specialized treatment for substance abuse, eating, behavior, personality, or affective disorders. Adolescent developmental tasks of identity formation, sexuality, and differentiating from the family are special areas of concern. Angry and striving for autonomy and individuation, adolescents may utilize family support or holding environments poorly and resist therapeutic alliances. They may respond to milieu and group therapies with other survivors better than younger children, although some may require more privacy initially. However, resiliency deriving from more developed psychosocial and cognitive skills may enable considerable therapeutic gains with adolescents.

Treatment of survivors of all ages suffering severe disorders that accompany the emergence of hidden trauma can be quite demanding. It includes establishment of a safe holding environment in a patient long-term therapeutic relationship, medications to subdue depression, arousal, aggression and rage, and careful attempts to weave the traumatic experiences and walled off memories into the personal narrative. Because psychic trauma, especially in younger children, might be rooted in enduring neurodevelopmental changes, this process may remain incomplete and care may require a lifetime. Even when given control over the pace at which these efforts are made, the haunted survivor may remain mistrustful, frightened, and difficult to engage as malignant memories are resurrected in the transference. Sometimes, a survivor's adaptation is best served by understanding the need for strengthening fragile defenses until ego development or the treatment alliance buttress capacities to tolerate the anxiety that accompanies remembering and reexperiencing. Ultimately, one hopes for the acceptance of vulnerability and mortality tempered by love and healing as a beginning of wisdom. This attainment is beyond the developmental capacity of youth.
Mental health professionals are beginning to recognize how violence -- be it in the home, media, street, school, genocide, or war -- can leave indelible signature on the human psyche, on brain function and structure. Mental health professionals have important roles to play in preventing malignant memories and subduing their pernicious effects, as well as studying the dramatic cascade of interactions among environment, brain, and behavior initiated by trauma.