

# PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

## **Understanding the Behavioral and Emotional Consequences of Child Abuse**

John Stirling, Jr, Lisa Amaya-Jackson and Lisa Amaya-Jackson

*Pediatrics* 2008;122;667

DOI: 10.1542/peds.2008-1885

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/122/3/667.full.html>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2008 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™





## CLINICAL REPORT

# Understanding the Behavioral and Emotional Consequences of Child Abuse

Guidance for the Clinician in Rendering  
Pediatric Care

## AMERICAN ACADEMY OF PEDIATRICS

John Stirling, Jr, MD, and the Committee on Child Abuse and Neglect and Section on Adoption and Foster Care

## AMERICAN ACADEMY OF CHILD AND ADOLESCENT PSYCHIATRY

Lisa Amaya-Jackson, MD, MPH

## NATIONAL CENTER FOR CHILD TRAUMATIC STRESS

Lisa Amaya-Jackson, MD, MPH

**ABSTRACT**

Children who have suffered early abuse or neglect may later present with significant behavior problems including emotional instability, depression, and a tendency to be aggressive or violent with others. Troublesome behaviors may persist long after the abusive or neglectful environment has changed or the child has been in foster care placement. Neurobiological research has shown that early abuse results in an altered physiological response to stressful stimuli, a response that deleteriously affects the child's subsequent socialization. Pediatricians can assist caregivers by helping them recognize the abused or neglected child's altered responses, formulate more effective coping strategies, and mobilize available community resources. *Pediatrics* 2008;122:667–673

**INTRODUCTION**

Early maltreatment can significantly alter a child's normal developmental arc and leave the victim with significant long-term impairments. Health care professionals who provide care for maltreated children must consider the consequences of previous abuse for the child's ongoing development and adaptation when faced with a variety of long-term behavior problems regardless of whether children reside with their birth families, foster families, or adoptive families.

An increasing body of evidence documents the robust relationship between adverse experiences in early childhood and a host of complications, both medical and psychological, that manifest throughout childhood and later in adult life. The Adverse Childhood Events Studies have demonstrated that child abuse, neglect, and other circumstances that disrupt the parent-child relationship are significantly associated with many leading causes of adult death, such as stroke, cancer, and heart disease, and with heavy health service utilization. These disparate consequences, including depression and suicide, hypertension and diabetes, cigarette smoking, alcohol and other substance abuse, and fractured bones, bear compelling testimony to the vulnerability of children to stressful experience.<sup>1</sup>

Pediatricians see children before, during, and after adverse events. In the office, clinicians deal daily with children who are suffering the effects of trauma, including separation and loss, physical and sexual abuse, parental neglect, and witnessing violence. Many of these children, especially those for whom the stress is particularly severe, chronic, or pervasive, will have difficulty overcoming their persistent physiological and psychological responses to their earlier stress. Lingering symptoms of posttraumatic stress disorder (PTSD) or disrupted attachment can present as difficulties with sleep, anxiety, oppositional behavior, violent behaviors, and school failure.<sup>2,3</sup>

The child's problematic behavior may continue long after abuse or neglect have ceased, despite consistent and attentive parenting by foster or adoptive parents or birth parents who have successfully changed their own behaviors. Desperate caregivers may seek the pediatrician's help in diagnosing and treating a suspected "medical condition" or "chemical imbalance." Unless health care professionals recognize the relationships of these common behavior problems to their remote antecedents, their interventions will be at best inefficient and at worst ineffective or even counterproductive. The primary health care professional holds the first, perhaps most critical link for caregivers and

[www.pediatrics.org/cgi/doi/10.1542/peds.2008-1885](http://www.pediatrics.org/cgi/doi/10.1542/peds.2008-1885)

doi:10.1542/peds.2008-1885

All clinical reports from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

The guidance in this report does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

**Key Words**

child abuse, posttraumatic stress disorder, foster care

**Abbreviations**

PTSD—posttraumatic stress disorder  
HPA—hypothalamic-pituitary axis

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275). Copyright © 2008 by the American Academy of Pediatrics

children: to help them understand that the child's unsatisfactory response to stress may have originated as a biologically based adaptation to the child's abnormal world and that persisting problem behaviors are the consequence. Pediatricians can help caregivers understand that there are healthy strategies and interventions that can help children reduce these excessive responses to environmental stress and assist children in resuming a normal developmental trajectory.

#### **WHEN TRAUMATIC STRESS WILL NOT GO AWAY**

Children who have survived acute events such as house fires, automobile accidents, major medical illness, or natural disasters frequently complain of disordered sleep, intrusive "flashback" memories, and altered emotional responses to everyday situations. These are classic symptoms that arise from experiencing a single traumatic life event. Such severe stress reactions are particularly common after incidents of interpersonal violence (such as domestic violence, child abuse, and terrorism). In cases of child abuse or neglect or other exposure to violence, in which the stresses are often prolonged and unavoidable, long-term stress reactions are common and can be especially devastating. In patients suffering from the aftereffects of significant early stress, the offending stimulus, sometimes minor, seems to echo the previous abuse and to produce an equivalent, dramatic emotional reaction that is often inappropriate to the provocation. Stimuli that produce such reactions are known as traumatic reminders and may take many forms. Reaction to an old trauma may be brought forth by a smell, sound, or other sensory input or may be triggered by an action, place, or date. In this reaction, the brain is engaging in what seems to be an exaggerated form of pattern recognition, a common form of learning in which similar patterns of stimuli call forth a similar neuroendocrine (and, thus, behavioral) response.<sup>4,5</sup>

Symptoms can be grouped into 3 main behavioral clusters: (1) reexperiencing through intrusive thoughts, dreams, and "flashback" recollections; (2) avoidance of reminders and numbing of responsiveness, including social withdrawal, restricted range of affect, and constriction of play; and (3) physiological hyperarousal in the form of hypervigilance and exaggerated startle response, attention and concentration problems, and sleep disturbance. When disordered stress responses persist long after the trauma, the condition is termed PTSD.<sup>6,7</sup> It is uncertain why some children develop PTSD after trauma but others do not, although severity and chronicity of the initiating stress seem to play a part, as do such host factors as social support and genetic variation.<sup>2</sup>

Diagnostic criteria for PTSD are the same in children as in adults. These may be summarized as: (A) exposure to a traumatic event that involved serious threat of death accompanied by intense fear and horror; (B) a tendency to persistently reexperience the traumatic event (through intrusive thoughts, dreams, and "flashback" recollections); (C) numbing of general responsiveness; and avoidance of stimuli that trigger this reexperience (seen as social withdrawal, restricted range of affect, and constriction of play); and (D) persistent symptoms of

arousal (hypervigilance, exaggerated startle, and other physiological measures), (E) duration of above symptoms for more than 1 month and causing clinically significant distress or impaired functioning.<sup>6</sup> In children, these characteristics may manifest in developmentally different ways, such as traumatic play or extreme emotional lability, with "hair-trigger" explosive responses to minor provocations.<sup>8-11</sup>

Research has shown anatomical changes correlated with a history of PTSD symptoms, including smaller brain volumes and size differences in limbic structures.<sup>12-14</sup> Similarly, end-organ responses along the hypothalamic-pituitary axis (HPA) are altered by prolonged exposure to cortisol, a glucocorticoid critical to the body's stress response. Abuse victims have demonstrated abnormalities of the HPA response.<sup>14-18</sup> These observations underscore the premise that the exaggerated behavioral responses seen in complex PTSD have strong—and durable—anatomical and physiological underpinnings. Indeed, complex traumatic stress suffered early in life may be thought of as having both behavioral and developmental consequences.

Caregivers of a child with very difficult behaviors need to hear that the fault is neither entirely theirs nor entirely the child's. They need to learn that their child is dealing with a physiological response unfamiliar to them and to learn new and more effective ways of responding themselves. Although love and consistency are essential, they are not always enough.

#### **THE SIGNIFICANCE OF EARLY STRESS: PSYCHOLOGY OR PHYSIOLOGY?**

It is hardly remarkable that the seeds of adult dysfunction are sown in early childhood stress. We have long known, for example, of the lifelong effects of early malnutrition or of exposures to toxins such as lead or alcohol. What is remarkable, however, is the realization that many of the dysfunctional behaviors have their origins not in some random organic dysfunction but, rather, in the otherwise healthy brain's physiological adaptations to the abnormal world in which the developing child finds himself or herself. These adaptations, although initially useful, have not prepared the child for existence in the larger, more normal world outside the home. Behaviors that may have been useful, even life-saving, in a violent or neglectful home (such as hypervigilance or extreme passivity) become the problem behaviors identified at school or in child care (often interpreted as "attention deficit" or "daydreaming"). Once clearly established and internalized, however, the child's typical response to a stimulus (his or her definition of "normal") can be very hard to change.

The past 2 decades have seen remarkable progress in the understanding of neurodevelopment.<sup>19,20</sup> Once thought of as an enigmatic "black box," the brain is now seen as a complex of specialized, interactive organs, constantly developing through interaction with the environment and each other. Nowhere is this development more dramatic than in the first 3 years of life as the young brain undergoes sweeping structural change as it senses and adapts to the environment in which it finds

itself. Neurons develop myelin sheaths and proliferate, developing myriad connections with others throughout the cranium. With experience, some are strengthened, developing more connections with other neurons. Others are cut back through a process known as apoptosis, the “pruning” of unused connections. Significant apoptosis is seen as early as 4 years of age, continuing until the typical adult brain has lost nearly half of the neuronal connections it possessed at age 3.

It is now understood that this pruning is experience dependent—use strengthens neural pathways, and idleness marks others for demolition. As neurophysiologists remark, “neurons that fire together wire together.” Although the 3-year-old’s brain is optimized for learning, an adult’s brain becomes optimized for performance. Use and disuse of specific pathways alter the neuronal structure through a variety of mechanisms, including changes in sensitivity and the number of synaptic connections.

These changes act to adapt the brain structurally to its environment. By allowing experience to alter its structure, the brain can grow to become the best brain for a child’s given surroundings. It is, in other words, learning. A more visually complex environment, for example, may favor a larger visual cortex, whereas a child born blind might devote more cortical area to hearing. Similarly, a brain grown in a more threatening world may benefit from a highly developed fight-or-flight response, with appropriate modifications to the limbic system and HPA.<sup>16,21</sup> For instance, the amygdala, a vital part of the limbic system and necessary in emotional regulation, demonstrates a biphasic response to circulating stress hormones.<sup>22</sup> It becomes more sensitive to stress initially but shrinks when chronically exposed to high circulating concentrations of the stress hormone cortisol, adapting by becoming less sensitive. The hippocampus, a cortical region essential to the proper encoding and retrieval of memory, is similarly affected.<sup>23</sup> These structural changes, by affecting the brain’s (and, thus, the individual’s) response to stimuli, result in an altered behavioral response to stress.<sup>10,16</sup> The more chronic the stress, the more likely and longer lived the physiological changes.

### WAR OF THE WORLDS

Unfortunately for the child, a brain specifically adapted for one type of extreme environment is seldom optimized to perform in another. This, in itself, would not be an insurmountable problem. However, children raised in abusive, violent, or neglectful homes are often denied the very tools that would help them adapt to new and different surroundings. Abused or neglected children often suffer impairments in their language abilities and cognitive skills.<sup>24</sup> One recent study found 36% of preschoolers in foster care to be developmentally delayed and found no difference between the developmental effects associated with reported physical abuse, sexual abuse, or neglect.<sup>25</sup> These deficiencies may reflect prenatal insults or postnatal contributors, such as malnutrition or toxic exposures, but almost certainly correlate with inadequate parental care during sensitive periods in early brain development, providing children with less

exposure to language and fewer opportunities for cognitive development.

One of the most important tasks of early childhood is learning to discriminate states of affect.<sup>26</sup> Lacking good models, abused and neglected children may grow up unable to explain (or, indeed, to understand) the difference between such feelings as sadness and anger. In extreme cases, this is termed alexithymia (an inability to “read” emotion). Without this important perception, the ability to perceive the intentions of others, or to monitor one’s own response, is lost and social learning is severely impaired.

The brain is most easily altered, or adapted, early in its life. Although there are thought to be few true “critical periods” after which alterations become impossible, early childhood may be thought of as a “sensitive period” for many forms of cognitive—and most emotional—learning, after which it becomes difficult to establish new patterns of thinking or reacting.<sup>19,20</sup> Thus, the abused or neglected child is asked to adapt to a new and different world but is given inadequate neural and behavioral tools with which to do so.

### POSITIVE FEEDBACK (OF THE NEGATIVE KIND)

A child’s hypervigilance and inability to regulate emotional states after maltreatment can result in challenging behaviors in interactions with others. Victims of previous abuse or neglect are far more often identified as “problem children” than are their peers and show higher rates of diagnosis with attention problems and violent and oppositional behaviors.<sup>27</sup> Caregivers and teachers often respond to these behaviors in the traditional fashion: warnings become more brusque (and often louder) and discipline more strict (and often more punitive).

Although such responses from adults usually gain the desired result in normal children, they become problematic when the listener is hypervigilant for threats and has difficulty controlling his or her own emotions. To a child who is physiologically adapted to a high-threat environment, a minor slight or stern admonition can sound like the prelude to real danger. When the child’s exaggerated emotional response calls forth an even stronger response, the child may mistakenly assume that his or her initial reaction was warranted. Such responses inadvertently confirm the child’s mistaken impression that the world in general is a high-threat environment. This is, in effect, positive feedback in that it reinforces the preceding behavior—behavior that has negative consequences for the child and for all those around him or her. With reinforcement, neural adaptation (learning) continues. Thus, although maltreated children’s threat-adapted neuroanatomy can be said to determine their behavior, that behavior (via the responses of those around them) would be expected, in turn, to determine the further growth of their anatomy.

### ATTACHMENT ISSUES

The child’s sense of the parents’ availability and responsiveness to protect him or her and see to his or her needs—a building block of secure attachment<sup>28</sup>—is a

critical mediator of developmental success, especially under conditions of traumatic stress.<sup>29</sup> An attentive caregiver may help the child learn the give-and-take nature of social communication and teaches the child to recognize and regulate his or her own emotions in a continuous “dance” of interaction.<sup>30,31</sup> With such a benefactor, the infant is secure to learn and explore. When the parent is frankly abusive, the resultant attachment can be confused and disorganized, but even less-severe mistreatment can affect attachment. When the caregiver is absent, preoccupied, or inconsistent, it also becomes difficult for the infant to feel safe. Observers describe neglected infants as more demanding, anxious, or more difficult to console, and they can present special challenges to their already compromised parents. Unless the cycle is broken, the challenged parents are likely to respond with anger or by further distancing themselves from the demanding child, and another positive feedback cycle begins to reinforce maladaptive behaviors.

### INTERVENTIONS

Across this continuum of outcome possibilities, current caregivers—be they birth parents, foster parents, or adoptive parents—are almost certain to face major challenges in appropriately responding to the child’s mental and physical health needs. A previously neglectful birth parent who has stopped using drugs or left a violent domestic situation may now be able to be consistent and attentive but may find the child unresponsive to his or her best efforts. When a previously maltreated child presents with behavior problems, especially when those problems are resistant to intervention, maladaptive physiological responses may contribute to a child’s presentation. In fostering or newly adoptive parenting situations, it is not enough to merely provide a loving and consistent environment; the new parents must be helped to see that the child who has suffered abuse or neglect might indeed see, and respond to, that environment differently than might another child who has not suffered abuse.<sup>32</sup> Too often, maladaptive physiological responses are misinterpreted by teachers and parents and the child is dismissed as willfully “mean” or “disrespectful” and punished accordingly, which reinforces the response.

As abused children grow and develop, earlier trauma is revisited and reconsidered. Often, a child who has learned to live with these abnormal responses will experience added challenges in addressing them as an adolescent. Physiological changes and the onset of formal operational thought can complicate adjustment issues, and problematic behavior can resurface in new and often more dangerous forms. Here again, caregivers need preparation to help children respond constructively.

Therapy must be directed to reshaping the child’s perceptions and emotional responses while helping the caregivers address their own behaviors. Failure to do so can result in serious long-term consequences that range from violent behavior to dangerous risk taking to impaired domestic relationships.<sup>33,34</sup>

A child’s primary health care professional plays a critical role in identifying for caregivers and children the psychological and biological signs and symptoms of child traumatic stress. A careful psychosocial history should be

taken whenever a child presents with behavioral symptoms, with attention paid to early abuse, neglect, or abandonment, especially during the first 3 years of life. Domestic violence, drug abuse, or parental mental health diagnoses are “red flags” that should raise concerns. If an accentuated stress response is suspected, the physician can help caregivers understand that the child’s problems are more than simple “defiance” or willful misbehavior. Guidance can include discouraging aggressive responses to aggressive behaviors, including corporal punishment, and explaining how noise and anger can further aggravate the child’s runaway stress reaction. Furthermore, physicians can clearly state that there are evidence-based treatments that mental health professionals use to help children and adolescents with traumatic stress reactions and assist them in resuming a more normal developmental path. This information can be shared with the caregivers, starting them on the road to better understanding and ability to obtain trauma-specific services. It is important for parents to know that treatment research has demonstrated that one of the most important factors influencing children’s psychological adjustment is the degree of support they receive from their parents and other guardians.<sup>35,36</sup>

The best available evidence from controlled trials supports treating child abuse trauma reactions and related symptoms with trauma-specific psychotherapy that emphasizes cognitive-behavioral approaches. Cognitive-behavioral approaches used in treating abused children include education about child abuse and common reactions of children; teaching safety skills, stress-management techniques, and emotion-regulation skills; facilitating a coherent narrative of the traumatic event; and assisting appropriate emotional and cognitive processing (correcting untrue or distorted ideas about how and why the trauma occurred). Dyadic or conjoint parent work is emphasized as well, recognizing that the child’s caregivers bear responsibility for continuing the work of therapy on a day-to-day basis.<sup>37–40</sup> This is especially important with younger and preverbal children.

Some children may not be ready immediately to construct a narrative about their trauma. When coping skills have been put into place, however, conversation between the child and a skilled therapist about the trauma has been a critical ingredient in studies that have provided the strongest research evidence. In fact, studies of adult rape victims have suggested not only that telling the story of the trauma is critical to treatment but also that organization of the trauma narrative and a client’s emotional engagement in talking about his or her story can predict symptom reduction.<sup>41,42</sup> Art therapy may be a venue for some children to express their experiences nonverbally.<sup>43</sup>

Given the biological nature of the stress response, medications are often considered to assist children in regulating symptoms of physiological hyperarousal (such as nightmares, sleep difficulties, and high anxiety) and can be prescribed by child psychiatrists, pediatric primary health care professionals, or other pediatric medical subspecialists such as developmental/behavioral pediatricians. Pharmacologic approaches should be considered whenever the behaviors symptomatic of the uncontrolled stress response

interfere with the child's ongoing socialization. The evidence base for psychopharmacologic approaches to treating children and adolescents who suffer from PTSD symptoms is emerging, and although medication can often help ameliorate the stress response in youth, it is important to note that the research on these psychopharmacologic approaches lags behind the research in adults.<sup>44</sup> The same can be said about the promising efforts to prevent PTSD pharmacologically by using medications to blunt the acute stress response.<sup>45-47</sup> Such prevention, of course, would be more feasible after a single trauma, such as a criminal act, than for chronic stress. However effective in reducing symptoms, psychopharmacologic intervention should be considered an adjunct to, rather than a substitute for, psychotherapy.

Effective intervention may involve a variety of professionals working together. A skilled therapist can help the child learn to recognize and regulate his or her emotions and can help the family to respond in a way that makes the situation better instead of worse. Neuropsychological testing can aid in identifying the child's cognitive strengths and weaknesses, helping to anticipate future difficulties and indicating possible solutions, particularly in the area of school performance. Psychiatric or pediatric physicians may prescribe medications to help control extreme behaviors, and educators can tailor educational interventions that respect the child victim's special challenges. Social service workers can help the family obtain needed respite care or other support. By providing a "medical home" for the child, the pediatrician can serve as the facilitator for the intervention team.

## CONCLUSIONS

In pediatric office practice, physicians and nurses are often asked to treat common behavioral problems. Children with a history of abuse, neglect, or abandonment may present to the pediatrician with symptoms including anger, aggressive behaviors, depression, or difficulties sustaining attention. In many cases, the children are no longer exposed to direct threat but present with residual behaviors that can be linked to neurophysiological responses to previous maltreatment. When the children are in foster or adoptive care or when a birth parent's circumstances have improved, caregivers may be attentive and consistent in their attempts to address a child's maladaptive behaviors but still find typical behavior-modification strategies unsuccessful. In many cases, the child's exaggerated reactions to stressful stimuli can cause the caregivers to act in ways that reinforce the child's misbehavior.

When attentive and consistent parenting seems ineffective, the physician would do well to remember that early maltreatment (physical or sexual abuse, neglect, or exposure to violence and fear) can deprive the child of the tools needed to adapt to a larger social environment. In addition to denying the developing child necessary social interactions, early maltreatment can alter the normal child's neural physiology, significantly changing the expected responses to stress and affecting the child's ability to learn from experience.

The pediatrician can assist directly and in cooperation

with other professionals. Pediatricians should continue to advocate for timely evaluation of children entering the foster care system, as recommended by the American Academy of Pediatrics.<sup>48</sup> Given the risks posed by early neglect and abuse, these examinations should include developmental and cognitive screening in addition to the usual medical assessment,<sup>49</sup> although many foster children do not receive these comprehensive evaluations.<sup>50</sup> Ongoing education for the caregivers of previously maltreated children, especially for foster parents, is essential and can be better guided by the results of a comprehensive evaluation.

Using their therapeutic relationship with the child and family, physicians can work to educate the caregivers, helping them understand that their child's behavioral responses may well be different from those of other children in the same situation and that the differences may reflect a physiological difference rather than willful misbehavior or an egregious failure on the part of the caregivers. If such timely educational interventions can change caregivers' perceptions, they can relieve stress and begin to stabilize the family, with the ultimate goal of decreasing turnover in foster care. A change in perception might also open the door to ongoing counseling on referral from the primary health care professional.

Although many patients with a significant history of trauma will need to be followed by mental health professionals, the pediatrician still plays an important role in management. By providing a medical home, the pediatrician can work longitudinally with caregivers and continue to treat symptoms that are obstructing therapy. Pediatricians can facilitate access to community resources, work closely with the child's school to address behavioral challenges to learning, and help coordinate care among specialists in other disciplines.

## COMMITTEE ON CHILD ABUSE AND NEGLECT, 2007-2008

Carole Jenny, MD, MBA, Chairperson  
Cindy W. Christian, MD  
Roberta A. Hibbard, MD  
Nancy D. Kellogg, MD  
Betty S. Spivack, MD  
John Stirling, Jr, MD

## LIAISONS

David L. Corwin, MD  
American Academy of Child and Adolescent  
Psychiatry  
Janet Saul, PhD  
Centers for Disease Control and Prevention

## STAFF

Tammy Piazza Hurley

## SECTION ON ADOPTION AND FOSTER CARE EXECUTIVE COMMITTEE, 2007-2008

\*Lisa M. H. Albers, MD, MPH  
David A. Harmon, MD  
Patrick W. Mason, MD

\*Contributor.

Lisa Nalven, MD, MA  
Elaine E. Schulte, MD  
Moira A. Szilagyi, MD, PhD

#### STAFF

Mary Crane, PhD, LSW

#### REFERENCES

1. Felitti VJ, Anda RF, Nordenberg P, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med.* 1998;14(4):245–258
2. Holbrook TL, Hoyt DB, Coimbra R, Potenza B, Sise M, Anderson JP. Long term trauma persists after major trauma in adolescents: new data on risk factors and functional outcome. *J Trauma.* 2005;58(4):764–771
3. Lansford JE, Dodge KA, Pettit GS, Bates JE, Crozier J, Kaplow J. A 12-year prospective study of the long-term effects of early child physical maltreatment on psychological, behavioral, and academic problems in adolescence. *Arch Pediatr Adolesc Med.* 2002;156(8):824–830
4. Bremner JD, Vythilingham M, Vermetten E, et al. Cortisol response to a cognitive stress challenge in posttraumatic stress disorder (PTSD) related to childhood abuse. *Psychoneuroendocrinology.* 2003;28(6):733–750
5. Elzinga BM, Schmal CG, Vermetten E, van Dyck R, Bremner JD. Higher cortisol levels following exposure to traumatic reminders in abuse-related PTSD. *Neuropsychopharmacology.* 2003;28(9):1656–1665
6. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders.* 4th ed, Text Revision. Washington, DC: American Psychiatric Association Press; 2000:xxxvii, 943
7. Cook A. *Complex Trauma in Children and Adolescents.* Los Angeles, CA: National Child Traumatic Stress Network; 2003. Available at: [www.nctsn.org/nctsn\\_assets/pdfs/edu\\_materials/ComplexTrauma\\_All.pdf](http://www.nctsn.org/nctsn_assets/pdfs/edu_materials/ComplexTrauma_All.pdf). Accessed January 16, 2008
8. Yehuda R. Post-traumatic stress disorder. *N Engl J Med.* 2002;346(2):108–114
9. Eth S, ed. PTSD in children and adolescents. In: Oldham JM, Riba MB, series eds. *Review of Psychiatry.* Series Vol 20. Washington, DC: American Psychiatric Association Press; 2001:1–200
10. Pfefferbaum B. Posttraumatic stress disorder in children: a review of the past ten years. *J Am Acad Child Adolesc Psychiatry.* 1997;36(11):1503–1511
11. Pynoos R. Traumatic stress and developmental psychopathology in children and adolescents. In: Oldham JM, Riba MB, Tasman A, eds. *Review of Psychiatry.* DC: American Psychiatric Association Press; 1993:205–238 Vol 12. Washington
12. Teicher MH, Andersen SL, Polcari A, Anderson CM, Navalta CP. Developmental neurobiology of childhood stress and trauma. *Psychiatr Clin North Am.* 2002;25(2):397–426
13. Teicher MH, Dumont NL, Ito Y, Vaituzis C, Giedd JN, Andersen SL. Childhood neglect is associated with reduced corpus callosum area. *Biol Psychiatry.* 2004;56(2):80–85
14. De Bellis MD, Keshavan MS, Clark DB, et al. Developmental traumatology, part II: brain development. *Biol Psychiatry.* 1999;45(10):1271–1284
15. Anderson CM, Teicher MH, Polcari A, Renshaw PF. Abnormal T2 relaxation time in the cerebellar vermis of adults sexually abused in childhood: potential role of the vermis in stress-enhanced risk for drug abuse. *Psychoneuroendocrinology.* 2002;27(1–2):231–244
16. Gunnar MR, Donzella B. Social regulation of the cortisol levels in early human development. *Psychoneuroendocrinology.* 2002;27(1–2):199–220
17. Tarullo AR, Gunnar MR. Child maltreatment and the developing HPA axis. *Horm Behav.* 2006;50(4):632–639
18. Bugental DB, Martorell GA, Barraza V. The hormonal costs of subtle forms of infant maltreatment. *Horm Behav.* 2003;43(1):237–244
19. Institute of Medicine, Committee on Integrating the Science of Early Childhood Development. *From Neurons to Neighborhoods: The Science of Early Child Development.* Shonkoff J, Phillips D, eds. Washington, DC: National Academies Press; 2000
20. Siegel DJ. *The Developing Mind: Toward a Neurobiology of Intrapersonal Experience.* New York, NY: Guilford Press; 1999
21. De Bellis MD, Chrousos GP, Dorn LD, et al. Hypothalamic-pituitary-adrenal axis dysregulation in sexually abused girls. *J Clin Endocrinol Metab.* 1994;78(2):249–255
22. McEwen BS. Glucocorticoids, depression, and mood disorders: structural remodeling in the brain. *Metabolism.* 2005;54(5 suppl 1):20–23
23. Landfield PW, McEwen BS, Sapolsky RM, Meany MJ. Hippocampal cell death. *Science.* 1996;272(5266):1249–1251
24. Rossman BBR. Longer term effects of children's exposure to domestic violence. In: Graham-Bermann SA, Edelson JL, eds. *Domestic Violence in the Lives of Children: The Future of Research, Intervention, and Social Policy.* Washington, DC: American Psychological Association; 2001:35–65
25. Zimmer MH, Panko LM. Developmental status and service use among children in the child welfare system: a national survey. *Arch Pediatr Adolesc Med.* 2006;160(2):183–188
26. Beeghly ME, Cicchetti DA. Child maltreatment, attachment, and the self system: emergence of an internal state lexicon in toddlers at high social risk. In: Hertzog M, Farber E, eds. *Annual Progress in Child Psychiatry and Child Development.* Philadelphia, PA: Brunner/Mazel; 1996:127–166
27. Wodarski JS, Kurtz PD, Gaudin JM Jr, Howling PT. Maltreatment and the school-aged child: major academic, socioemotional, and adaptive outcomes. *Social Work.* 1990;35(6):506–513
28. Bowlby J. *Attachment and Loss.* 2nd ed. New York, NY: Basic Books; 1982
29. Lieberman AF, Amaya-Jackson L. Reciprocal influences of attachment and trauma: using a dual lens in the assessment and treatment of infants, toddlers, and preschoolers. In: Berlin LJ, Ziv Y, Amaya-Jackson L, Greenberg MT, eds. *Enhancing Early Attachments: Theory, Research, Intervention, and Policy.* New York, NY: Guilford Press; 2005:100–124
30. Greenspan SI. Comprehensive clinical approaches to infants and their families: psychodynamic and developmental perspectives. In: Meisels SJ, Shonkoff JP, eds. *Handbook of Early Childhood Intervention.* New York, NY: Cambridge University Press; 1990:150–172
31. Carlson EA, Sroufe LA. Contribution of attachment theory to developmental psychopathology. In: Cicchetti D, Cohen DJ, eds. *Developmental Psychopathology. Volume 1: Theory and Methods.* New York, NY: John Wiley & Sons; 1995:581–617
32. James B. *Handbook for the Treatment of Attachment Trauma Problems in Children.* New York, NY: Free Press; 1994
33. Styron T, Janoff-Bulman R. Childhood attachment and abuse: long-term effects on adult attachment, depression, and conflict resolution. *Child Abuse Negl.* 1997;21(10):1015–1023
34. Alexander P. The differential effects of abuse characteristics and attachment in the prediction of long-term effects of sexual abuse. *J Interpers Violence.* 1993;8:346–362
35. Deblinger E, Stauffer LB, Steer RA. Comparative efficacies of supportive and cognitive behavioral group therapies for young children who have been sexually abused and their nonoffending mothers. *Child Maltreat.* 2001;6(4):332–343
36. Cohen JA, Deblinger E, Mannarino AP, Steer RA. A multisite randomized controlled clinical trial for multiply traumatized

- children with sexual abuse-related PTSD symptoms. *J Am Acad Child Adolesc Psychiatry*. 2004;43(4):393–402
37. Chaffin M, Hanson R, Saunders BE, et al. Report of the APSAC Task Force on Attachment Therapy, Reactive Attachment Disorder, and Attachment Problems. *Child Maltreat*. 2006;11(1):76–89
  38. Lieberman AF. Child-parent psychotherapy: a relationship-based approach to the treatment of mental health disorders in infancy and early childhood. In: Sameroff AJ, McDonough SC, Rosenblum KL, eds. *Treating Parent-Infant Relationship Problems*. New York, NY: Guilford Press; 2004
  39. Hembree-Kigin TL, Bodiford McNeil C. *Parent-Child Interaction Therapy*. New York, NY: Plenum Press; 1995
  40. Kolko DJ, Swenson CC. *Assessing and Treating Physically Abused Children and Their Families: A Cognitive-Behavioral Approach*. Thousand Oaks, CA: Sage Publications; 2002
  41. Amir N, Stafford J, Freshman MS, Foa EB. Relationship between trauma narratives and trauma pathology. *J Trauma Stress*. 1998;11(2):385–392
  42. Jaycox LH, Foa EB, Morral AR. The influence of emotional engagement and habituation on outcome of exposure therapy for PTSD. *J Consult Clin Psychol*. 1998;66(1):185–192
  43. Murphy J, ed. *Art Therapy With Young Survivors of Sexual Abuse: Lost for Words*. Philadelphia, PA: Taylor & Francis Inc; 2001
  44. Donnelly CL, Amaya-Jackson L, March JS. Psychopharmacology of pediatric posttraumatic stress disorder. *J Child Adolesc Psychopharmacol*. 1999;9(3):203–220
  45. Stahl SM. Is psychopharmacologic “inoculation” effective in preventing posttraumatic stress disorder? *J Clin Psychiatry*. 2005;66(1):5–6
  46. Vaiva G, Ducrocq F, Jezequel K, et al. Immediate treatment with propranolol decreases posttraumatic stress disorder two months after trauma. *Biol Psychiatry*. 2003;54(9):947–949
  47. Pitman RK, Sanders KM, Zusman RM, et al. Pilot study of secondary prevention of posttraumatic stress disorder with propranolol. *Biol Psychiatry*. 2002;51(2):189–192
  48. American Academy of Pediatrics, Committee on Early Childhood, Adoption, and Dependent Care. Health care of children in foster care. *Pediatrics*. 1994;93(2):335–338
  49. American Academy of Pediatrics, Committee on Early Childhood, Adoption, and Dependent Care. Developmental issues for young children in foster care. *Pediatrics*. 2000;106(5):1145–1150
  50. Leslie LK, Hurlburt MS, Landsverk J, Rolls JA, Wood PA, Kelleher KJ. Comprehensive assessments for children entering foster care: a national perspective. *Pediatrics*. 2003;112(1 pt 1):134–142

### RECOMMENDED READING

- American Academy of Child and Adolescent Psychiatry. Practice parameter for the assessment and treatment of children and adolescents with reactive attachment disorder of infancy and early childhood. *J Am Acad Child Adolesc Psychiatry*. 2005;44(11):1206–1219
- Cohen JA. Posttraumatic stress disorder in children and adolescents. In: Sadock BJ, Sadock VA, eds. *Kaplan & Sadock's Comprehensive Textbook of Psychiatry*. Vol 2. 8th ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2005:3286–3291



## Understanding the Behavioral and Emotional Consequences of Child Abuse

John Stirling, Jr, Lisa Amaya-Jackson and Lisa Amaya-Jackson

*Pediatrics* 2008;122;667

DOI: 10.1542/peds.2008-1885

<b>Updated Information &amp; Services</b>	including high resolution figures, can be found at: <a href="http://pediatrics.aappublications.org/content/122/3/667.full.html">http://pediatrics.aappublications.org/content/122/3/667.full.html</a>
<b>References</b>	This article cites 34 articles, 8 of which can be accessed free at: <a href="http://pediatrics.aappublications.org/content/122/3/667.full.html#ref-list-1">http://pediatrics.aappublications.org/content/122/3/667.full.html#ref-list-1</a>
<b>Citations</b>	This article has been cited by 8 HighWire-hosted articles: <a href="http://pediatrics.aappublications.org/content/122/3/667.full.html#related-urls">http://pediatrics.aappublications.org/content/122/3/667.full.html#related-urls</a>
<b>Subspecialty Collections</b>	This article, along with others on similar topics, appears in the following collection(s): <b>Committee on Child Abuse and Neglect</b> <a href="http://pediatrics.aappublications.org/cgi/collection/committee_on_child_abuse_and_neglect">http://pediatrics.aappublications.org/cgi/collection/committee_on_child_abuse_and_neglect</a> <b>Office Practice</b> <a href="http://pediatrics.aappublications.org/cgi/collection/office_practice">http://pediatrics.aappublications.org/cgi/collection/office_practice</a> <b>Section on Adoption and Foster Care</b> <a href="http://pediatrics.aappublications.org/cgi/collection/section_on_adoption_and_foster_care">http://pediatrics.aappublications.org/cgi/collection/section_on_adoption_and_foster_care</a>
<b>Permissions &amp; Licensing</b>	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: <a href="http://pediatrics.aappublications.org/site/misc/Permissions.xhtml">http://pediatrics.aappublications.org/site/misc/Permissions.xhtml</a>
<b>Reprints</b>	Information about ordering reprints can be found online: <a href="http://pediatrics.aappublications.org/site/misc/reprints.xhtml">http://pediatrics.aappublications.org/site/misc/reprints.xhtml</a>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2008 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

