

Trauma-Focused Cognitive Behavioral Therapy for Children Affected by Sexual Abuse or Trauma

Trauma-focused cognitive behavioral therapy (TF-CBT) is an evidence-based treatment approach shown to help children, adolescents, and their caregivers overcome trauma-related difficulties. It is designed to reduce negative emotional and behavioral responses following child sexual abuse, domestic violence, traumatic loss, and other traumatic events.¹ The treatment—based on learning and cognitive theories—addresses distorted beliefs and attributions related to the abuse and provides a supportive environment in which children are encouraged to talk about their traumatic experience. TF-CBT also helps parents who were not abusive to cope effectively with their own emotional distress and develop skills that support their children.

¹ While TF-CBT is effective in addressing the effects of traumatic events (e.g., the loss of a loved one, domestic or community violence, accidents, hurricanes, terrorist attacks, etc.), the main focus of this issue brief is the treatment of child sexual abuse and exposure to other trauma.

What's Inside:

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This issue brief is intended to build a better understanding of the characteristics and benefits of TF-CBT. It was written primarily to help child welfare caseworkers and other professionals who work with at-risk families make more informed decisions about when to refer children and their parents and caregivers to TF-CBT therapists. This information also may help biological parents, foster parents, and other caregivers understand what they and their children can gain from TF-CBT and what to expect during treatment. In addition, this issue brief may be useful to others with an interest in implementing or participating in effective strategies for the treatment of children who have suffered from sexual abuse or multiple traumatic events.

Researchers and providers continue to develop and refine trauma treatment approaches and determine how to incorporate them into child welfare services. In September 2011, the Children's Bureau awarded 5-year cooperative agreements to five organizations to focus on integrating trauma-informed and trauma-focused practice in child protective service (CPS) delivery. The grantees will implement TF-CBT and several other therapies demonstrating some evidence of effectiveness with children and families who have experienced trauma.²

² The Children's Bureau does not endorse any specific treatment or therapy. Before implementing a specific type of therapy in your community, consider its appropriateness based on families' needs, resource availability, and fit within the current service delivery system. Read the section Considerations for Child Welfare Agency Administrators to determine if TF-CBT is right for your agency, and consult the section Resources for Further Information to identify and select therapies for the families you serve.

Features of TF-CBT

TF-CBT addresses the negative effects of sexual abuse, exposure to domestic violence and other traumatic events by integrating several therapeutic approaches and treating both child and parent in a comprehensive manner.

TF-CBT Addresses the Effects of Sexual Abuse and Trauma

In the immediate as well as long-term aftermath of exposure to trauma, children are at risk of developing significant emotional and behavioral difficulties (see, for example, Berliner & Elliott, 2002; Briere & Elliott, 2003; Chadwick Center, 2004). For example, victims of sexual abuse often experience:

- **Maladaptive or unhelpful beliefs and attributions** related to the abusive events, including:
 - A sense of guilt for their role in the abuse
 - Anger at parents for not knowing about the abuse
 - Feelings of powerlessness
 - A sense that they are in some way "damaged goods"
 - A fear that people will treat them differently because of the abuse
- **Acting out behaviors**, such as engaging in age-inappropriate sexual behaviors
- **Mental health disorders**, including major depression
- **Posttraumatic stress disorder (PTSD)** symptoms, which are characterized by:

- Intrusive and reoccurring thoughts of the traumatic experience
- Avoidance of reminders of the trauma (often places, people, sounds, smells, and other sensory triggers)
- Emotional numbing
- Irritability
- Trouble sleeping or concentrating
- Physical and emotional hyperarousal (often characterized by emotional swings or rapidly accelerating anger or crying that is out of proportion to the apparent stimulus)

These symptoms can impact the child's daily life and affect behavior, school performance, attention, self-perception, and emotional regulation.

To date, numerous studies have documented the effectiveness of TF-CBT in helping children overcome these and other symptoms following child sexual, domestic violence, and similar traumatic experiences (see Empirical Studies at end of paper). This treatment helps children to process their traumatic memories, overcome problematic thoughts and behaviors, and develop effective coping and interpersonal skills (see Effectiveness of TF-CBT, below).

TF-CBT Treats Nonoffending Parents in Addition to the Child

Recognizing the importance of parental support in the child's recovery process, TF-CBT includes a treatment component for parents (or caregivers) who were not abusive. Treatment sessions are divided into individual meetings for the children and parents, with about equal amounts of time

for both. The parent component teaches stress management, parenting and behavior management skills, and communication skills. As a result, parents are better able to address their own emotional distress associated with the child's trauma, while also supporting their children more effectively.

TF-CBT Integrates Several Established Treatment Approaches

TF-CBT combines elements drawn from:

- **Cognitive therapy**, which aims to change behavior by addressing a person's thoughts or perceptions, particularly those thinking patterns that create distorted or unhelpful views
- **Behavioral therapy**, which focuses on modifying habitual responses (e.g., anger, fear) to identified situations or stimuli
- **Family therapy**, which examines patterns of interactions among family members to identify and alleviate problems

TF-CBT uses well-established cognitive-behavioral therapy and stress management procedures originally developed for the treatment of fear, anxiety, and depression in adults (Wolpe, 1969; Beck, 1976). These procedures have been used with adult rape victims with symptoms of PTSD (Foa, Rothbaum, Riggs, & Murdock, 1991) and have been applied to children with problems with excessive fear and anxiety (Beidel & Turner, 1998). The TF-CBT protocol has adapted and refined these procedures to target the specific difficulties exhibited by children who are experiencing PTSD symptoms in response to sexual abuse, domestic violence, or other childhood traumas. In addition, well-established parenting approaches (e.g.,

Patterson, 2005; Forehand & Kotchick, 2002) also are incorporated into treatment to guide parents in addressing their children's behavioral difficulties.

TF-CBT Shows Results in Various Environments and Cultural Backgrounds

TF-CBT has been implemented in urban, suburban, and rural environments and in clinics, schools, homes, residential treatment facilities, and inpatient settings. TF-CBT has demonstrated effectiveness with children and families of different cultural backgrounds (including Caucasian, African-American, and Hispanic children from all socioeconomic backgrounds) (e.g., Weiner, Schneider, & Lyons, 2009). Therapy has been adapted for Latino, Native American, and hearing-impaired populations. It is a highly collaborative therapy approach in which the therapist, parents, and child all work together to identify common goals and attain them.

TF-CBT Is Appropriate for Multiple Traumas

Recent research findings suggest that TF-CBT is more effective than nondirective or client-centered treatment approaches for children who have a history of multiple traumas (e.g., sexual abuse, exposure to domestic violence, physical abuse, as well as other traumas) and those with high levels of depression prior to treatment (Deblinger, Mannarino, Cohen, & Steer, 2006). The model also has been tested with children who are experiencing traumatic grief after the death of a loved one (Cohen, Mannarino, & Knudsen, 2004; Cohen, Mannarino, & Staron, 2006).

Key Components

TF-CBT is a short-term treatment typically provided in 12 to 18 sessions of 50 to 90 minutes, depending on treatment needs. The intervention is usually provided in outpatient mental health facilities, but it has been used in hospital, group home, school, community, residential, and in-home settings.

The treatment involves individual sessions with the child and parent (or caregiver) separately and joint sessions with the child and parent together. Each individual session is designed to build the therapeutic relationship while providing education, skills, and a safe environment in which to address and process traumatic memories. Joint parent-child sessions are designed to help parents and children practice and use the skills they learned and for the child to share his/her trauma narrative while also fostering more effective parent-child communication about the abuse and related issues.

Goals

Generally, the goals of TF-CBT are to:

- Reduce children's negative emotional and behavioral responses to the trauma
- Correct maladaptive or unhelpful beliefs and attributions related to the traumatic experience (e.g., a belief that the child is responsible for the abuse)
- Provide support and skills to help nonoffending parents cope effectively with their own emotional distress
- Provide nonoffending parents with skills to respond optimally to and support their children

Protocol Components

Components of the TF-CBT protocol can be summarized by the word “PRACTICE”:

- **P - Psychoeducation and parenting skills**—Discussion and education about child abuse in general and the typical emotional and behavioral reactions to sexual abuse; training for parents in child behavior management strategies and effective communication
- **R - Relaxation techniques**—Teaching relaxation methods, such as focused breathing, progressive muscle relaxation, and visual imagery
- **A - Affective expression and regulation**—Helping the child and parent manage their emotional reactions to reminders of the abuse, improve their ability to identify and express emotions, and participate in self-soothing activities
- **C - Cognitive coping and processing**—Helping the child and parent understand the connection between thoughts, feelings, and behaviors; exploring and correcting of inaccurate attributions related to everyday events
- **T - Trauma narrative and processing**—Gradual exposure exercises, including verbal, written, or symbolic recounting of abusive events, and processing of inaccurate and/or unhelpful thoughts about the abuse
- **I - In vivo exposure**—Gradual exposure to trauma reminders in the child’s environment (for example, basement, darkness, school), so the child learns to control his or her own emotional reactions

- **C - Conjoint parent/child sessions**—Family work to enhance communication and create opportunities for therapeutic discussion regarding the abuse and for the child to share his/her trauma narrative
- **E - Enhancing personal safety and future growth**—Education and training on personal safety skills, interpersonal relationships, and healthy sexuality and encouragement in the use of new skills in managing future stressors and trauma reminders

Target Population

TF-CBT is appropriate for use with sexually abused children or children exposed to trauma ages 3 to 18 and parents or caregivers who did not participate in the abuse.

Appropriate Populations for Use of TF-CBT

Appropriate candidates for this program include:

- Children and adolescents with a history of sexual abuse and/or exposure to trauma who:
 - Experience PTSD
 - Show elevated levels of depression, anxiety, shame, or other dysfunctional abuse-related feelings, thoughts, or developing beliefs
 - Demonstrate behavioral problems, including age-inappropriate sexual behaviors

- Children and adolescents who have been exposed to other childhood traumas (e.g., exposure to community violence, traumatic loss of a loved one) and show symptoms of depression, anxiety, or PTSD
- Nonoffending parents (or caregivers)

Meaningful assessment is important in selecting which children may benefit from TF-CBT and to inform the focus of the intervention. The assessment should specifically address PTSD, depressive and anxiety symptoms, and sexually inappropriate behaviors and other behavior problems, as these have been found to be most responsive to TF-CBT in multiple studies.

Limitations for Use of TF-CBT

TF-CBT may not be appropriate or may need to be modified for:

- Children and adolescents whose primary problems include serious conduct problems or other significant behavioral problems that existed prior to the trauma and who may respond better to an approach that focuses on overcoming these problems first.
- Children who are acutely suicidal or who actively abuse substances. The gradual exposure component of TF-CBT may temporarily worsen symptoms. However, other components of TF-CBT have been used successfully to address these problems. It may be that, for these children, the pace or order of TF-CBT interventions needs to be modified (as has been done in the Seeking Safety model; Najavits, 2002), rather than that TF-CBT is contraindicated for these populations.

- Adolescents who have a history of running away, serious cutting behaviors, or engaging in other parasuicidal behavior. For these teens, a stabilizing therapy approach such as dialectical behavior therapy (Miller, Rathus, & Linehan, 2007) may be useful prior to integrating TF-CBT into treatment.

Effectiveness of TF-CBT

The effectiveness of TF-CBT is supported by outcome studies and recognized on inventories of model and promising treatment programs.

Demonstrated Effectiveness in Outcome Studies

To date, at least 11 empirical investigations have been conducted evaluating the impact of TF-CBT on children who have been victims of sexual abuse or other traumas (see Empirical Studies at end of paper). In addition, there have been studies specifically showing the effectiveness of TF-CBT with children exposed to domestic violence (Cohen, Mannarino, & Iyengar, 2011; Weiner, Schneider, & Lyons, 2009). The findings consistently demonstrate TF-CBT to be useful in reducing symptoms of PTSD as well as symptoms of depression and behavioral difficulties in children who have experienced sexual abuse and other traumas. In randomized clinical trials comparing TF-CBT to other tested models and services as usual (such as supportive therapy, nondirective play therapy, child-centered therapy), TF-CBT resulted in significantly greater gains in fewer clinical sessions. Follow-up studies (up to 2 years following the conclusion of therapy) have shown that these gains are sustained over time.

Children showing improvement typically:

- Experience significantly fewer intrusive thoughts and avoidance behaviors
- Are able to cope with reminders and associated emotions
- Show reductions in depression, anxiety, disassociation, behavior problems, sexualized behavior, and trauma-related shame
- Demonstrate improved interpersonal trust and social competence
- Develop improved personal safety skills
- Become better prepared to cope with future trauma reminders (Cohen, Deblinger, Mannarino, & Steer, 2004)

Research also demonstrates a positive treatment response for parents (Cohen, Berliner, & Mannarino, 2000; Deblinger, Lippmann, & Steer, 1996). In TF-CBT studies, parents often report reductions in depression, emotional distress associated with the child's trauma, and PTSD symptoms. They also report an enhanced ability to support their children (Deblinger, Stauffer, & Steer, 2001; Cohen, Deblinger, et al., 2004; Mannarino, Cohen, Deblinger, Runyon, & Steer, in press).

Recognition as an Evidence-Based Practice

Based on systematic reviews of available research and evaluation studies, several groups of experts and Federal agencies have highlighted TF-CBT as a model program or promising treatment practice. This program is featured in the following sources:

- *Closing the Quality Chasm in Child Abuse Treatment: Identifying and Disseminating Best Practices* (Chadwick Center, 2004) at <http://www.chadwickcenter.org/kauffman/kauffman.htm>

- The National Child Traumatic Stress Network's (2005) *Empirically Supported Treatments and Promising Practices*, supported by the Substance Abuse and Mental Health Services Administration (SAMHSA), at <http://www.nctsn.org/resources/topics/treatments-that-work/promising-practices>
- *Child Physical and Sexual Abuse: Guidelines for Treatment* (Saunders et al., 2004) at http://academicdepartments.musc.edu/ncvc/resources_prof/OVC_guidelines04-26-04.pdf
- The California Evidence-Based Clearinghouse for Child Welfare (2011) at <http://www.cebc4cw.org>
- *SAMHSA Model Programs: National Registry of Evidence-Based Programs and Practices* at <http://nrepp.samhsa.gov>
- *Journal of Clinical Child and Adolescent Psychology* (Silverman et al., 2008).

What to Look for in a Therapist

Caseworkers should become knowledgeable about commonly used treatments before recommending a treatment provider to families. Parents or caregivers should receive as much information as possible about the treatment options available to them. If TF-CBT appears to be an appropriate treatment model for a family, the caseworker should look for a provider who has received adequate training, supervision, and consultation in the TF-CBT model. If feasible, both the caseworker and the family should have an opportunity to interview potential TF-CBT therapists prior to beginning treatment.

Questions to Ask Treatment Providers

In addition to appropriate training and thorough knowledge of the TF-CBT model, it is important to select a treatment provider who is sensitive to the particular needs of the child, caregiver, and family. Caseworkers recommending a TF-CBT therapist should ask the treatment provider to explain the course of treatment, the role of each family member in treatment, and how the family's specific cultural considerations will be addressed. The child, caregiver, and family should feel comfortable with and have confidence in the therapist with whom they will work.

Some specific questions to ask regarding TF-CBT include:

- What is the nature of the therapist's TF-CBT training (when trained, by whom, length of training, access to follow-up consultation, etc.)? Is this person clinically supervised by (or did he or she participate in a peer supervision group for private practice therapists with) others who are TF-CBT trained?
- Is there a standard assessment process used to gather baseline information on the functioning of the child and family and to monitor their progress in treatment over time?
- What techniques will the therapist use to help the child manage his or her emotions and related behaviors?
- How and when will the therapist ask the child to describe the trauma?
- Will the therapist use a combination of individual and joint child-parent sessions?

- Is the practitioner sensitive to the cultural background of the child and family?
- Is there any potential for harm associated with treatment?

TF-CBT Training

TF-CBT training sessions are appropriate for therapists and clinical supervisors with a master's degree or higher in a mental health discipline, experience working with children and families, and knowledge of child sexual abuse dynamics and child protection. Therapists may benefit from sequential exposure to different types of training:

- Completing the 10-hour web-based training on TF-CBT on the Medical University of South Carolina website (<http://tfcbt.musc.edu>)
- Reading the program developer's treatment book(s) and related materials
- Participating in intensive skills-based training (2 days)
- Receiving ongoing expert consultation from trainers for 6 to 12 months
- Participating in advanced TF-CBT training for 1 to 2 days

See Training and Consultation Resources, below, for contact information.

Considerations for Child Welfare Agency Administrators

Agency administrators considering promoting the use of TF-CBT with children who have suffered trauma and their families will want to research several variables:

- Agency-level adjustments to support successful TF-CBT with families, such as modifications in policy, practice, and data collection
- Identification of therapists or mental health agencies with experience offering TF-CBT and who can work with children from child welfare populations (see above)
- Projected costs

When introducing TF-CBT as a referral option that child welfare workers may consider for children and families in their caseload, administrators will want to ensure that workers have a clear understanding of how TF-CBT works, the values that drive it, and its efficacy. Training for child welfare staff on the basics of TF-CBT, how to screen for trauma, and how to make appropriate referrals can expedite parent and child's access to effective treatment options (see the National Child Traumatic Stress Network's Child Welfare Trauma Training toolkit at <http://www.nctsn.org/products/child-welfare-trauma-training-toolkit-2008>).

Research has shown that TF-CBT works best under the following organizational conditions:

- Organizational leadership that supports the use of evidence-based interventions, which, in turn, promote acceptance by workers and supervisors
- Provision of ongoing supervision to help child welfare workers make informed referrals to trauma-informed services and supervision for trained clinicians providing treatment

Conclusion

TF-CBT is an evidence-based treatment approach for children who have experienced sexual abuse, exposure to domestic violence, or similar traumas. Despite the impressive level of empirical support for TF-CBT and an established publication track record, many professionals remain unaware of its advantages, and many children and parents who could benefit do not receive such treatment. Further, in many communities around the nation, there may not yet be any TF-CBT trained therapists. The current demand for such evidence-based treatments, however, will encourage other professionals to acquire the needed training and to implement the TF-CBT model. Increased availability of TF-CBT, along with increased awareness among those making treatment referrals, can offer significant results in helping children to process their trauma and overcome emotional and behavioral problems following sexual abuse and other childhood traumas.

Resources for Further Information

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Online Resources

Center for Traumatic Stress in Children & Adolescents

<http://www.pittsburghchildtrauma.net>

Medical University of South Carolina

Guidelines for Treatment of Physical and Sexual Abuse of Children

http://academicdepartments.musc.edu/ncvc/resources_prof/OVC_guidelines04-26-04.pdf

Chadwick Center for Children and Families

Closing the Quality Chasm in Child Abuse Treatment: Identifying and Disseminating Best Practices

<http://www.chadwickcenter.org/Kauffman/kauffman.htm>

National Child Traumatic Stress Network

Empirically Supported Treatments and Promising Practices

<http://www.nctsn.org/resources/topics/treatments-that-work/promising-practices>

University of Medicine & Dentistry of New Jersey, School of Osteopathic Medicine

CARES Institute

<http://www.caresinstitute.org>

SAMHSA Model Programs

National Registry of Evidence-Based Programs and Practices

<http://nrepp.samhsa.gov>

The California Evidence-Based Clearinghouse for Child Welfare

<http://www.cebc4cw.org/program/trauma-focused-cognitive-behavioral-therapy>

Interventions Addressing Child Exposure to Trauma: Part 1 – Child Maltreatment and Family
Violence Agency for Healthcare Research and Quality, U.S. Department of Health and Human
Services

<http://effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?mode=&pageaction=displayproduct&productid=846>

Blueprints for Violence Prevention

University of Colorado Boulder's Center for the Study and Prevention of Violence

<http://www.colorado.edu/cspv/blueprints>

Training and Consultation Resources

Web-Based Training

Medical University of South Carolina (MUSC). Distance learning course on TF-CBT

<http://tfcbt.musc.edu>

Web-based training in TF-CBT is available as an adjunct or precursor to attending training workshops. The website training may be accessed free of charge. Therapists typically benefit from a 2-day intensive initial training course, as well as advanced training seminars after some experience implementing the model. Access to written resources such as books and treatment manuals (listed below), ongoing consultation or clinical mentoring, and regular clinical supervision are important complements to any web-based training.

Medical University of South Carolina (MUSC). Distance Learning course on Child Traumatic Grief

<http://ctg.musc.edu>

Web-based training is available on the application of TF-CBT principles and interventions to child traumatic grief along with presentation of grief-related interventions.

National Child Traumatic Stress Network. Child Welfare Trauma Training Toolkit

<http://www.nctsn.org/products/child-welfare-trauma-training-toolkit-2008>

This course is designed to teach basic knowledge, skills, and values about working with children in the child welfare system who have experienced traumatic stress. It also teaches how to use this knowledge to support children's safety, permanency, and well-being through case analysis and corresponding interventions tailored for them and their biological and resource families.

Web-Based Consultation

Medical University of South Carolina (MUSC). Distance Learning Consultation on TF-CBT

<http://etl2.library.musc.edu/tf-cbt-consult/index.php>

This web-based consultation tool provides information about frequently asked questions by providers implementing TF-CBT.

Implementation Guide

Child Sexual Abuse Task Force and Research & Practice Core, National Child Traumatic Stress Network. (2008). *How to implement trauma-focused cognitive behavioral therapy.*

http://www.nctsn.org/nctsn_assets/pdfs/TF-CBT_Implementation_Manual.pdf

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Practitioner's Guides

Cohen, J. A., Mannarino A. P. & Deblinger, E. (2006). *Treating trauma and traumatic grief in children & adolescents*. New York: Guilford Press.

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The following children's books by Stauffer & Deblinger also may be useful in teaching personal safety and other coping skills:

Stauffer, L. B., & Deblinger, E. (2003). *Let's talk about taking care of you: An educational book about body safety*. Hatfield, PA: Hope for Families, Inc.

Stauffer, L., & Deblinger, E. (2005). *Let's talk about coping and safety skills: A workbook about taking care of you*. Hatfield, PA: Hope for Families, Inc.

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U.S. Department of Health and Human Services
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Administration on Children, Youth and Families
Children's Bureau





Understanding the Effects of Maltreatment on Brain Development

This issue brief provides basic information on brain development and the effects of abuse and neglect on that development. The information is designed to help professionals understand the emotional, mental, and behavioral impact of early abuse and neglect in children who come to the attention of the child welfare system.

What's Inside:

- How the Brain Develops
- Effects of Maltreatment on Brain Development
- Implications for Practice and Policy
- Summary



In recent years, there has been a surge of research into early brain development. New technologies, such as neuroimaging (e.g., magnetic resonance imaging or MRI), provide increased insight into how the brain develops and how early experiences affect that development.

One area that has been receiving increasing research attention involves the effects of abuse and neglect on the developing brain, especially during infancy and early childhood. Much of this research is providing biological explanations for what practitioners have long been describing in psychological, emotional, and behavioral terms. There is now scientific evidence of altered brain functioning as a result of early abuse and neglect. This emerging body of knowledge has many implications for the prevention and treatment of child abuse and neglect.

How the Brain Develops

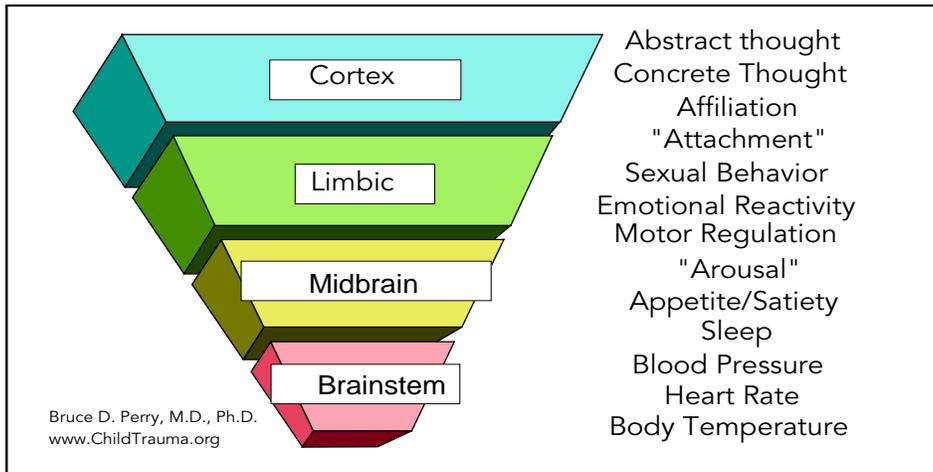
What we have learned about the process of brain development has helped us understand more about the roles both genetics and the environment play in our development. It appears that genetics predisposes us to develop in certain ways. But our experiences, including our interactions with other people, have a significant impact on how our predispositions are expressed. In fact, research now shows that many capacities thought to be fixed at birth are actually dependent on a sequence of experiences combined with heredity. Both factors are essential for optimum development of the human brain (Shonkoff and Phillips, 2000).

The Newborn Brain

The raw material of the brain is the nerve cell, called the *neuron*. When babies are born, they have almost all of the neurons they will ever have, more than 100 billion of them. Although research indicates some neurons are developed after birth and well into adulthood, the neurons babies have at birth are primarily what they have to work with as they develop into children, adolescents, and adults.

During fetal development, neurons are created and migrate to form the various parts of the brain. As neurons migrate, they also differentiate, so they begin to “specialize” in response to chemical signals (Perry, 2002). This process of development occurs sequentially from the “bottom up,” that is, from the more primitive sections of the brain to the more sophisticated sections (Perry, 2000a). The first areas of the brain to fully develop are the brainstem and midbrain; they govern the bodily functions necessary for life, called the autonomic functions. At birth, these lower portions of the nervous system are very well developed, whereas the higher regions (the limbic system and cerebral cortex) are still rather primitive (ZERO TO THREE, 2009).

Newborns’ brains allow babies to do many things, including breathe, eat, sleep, see, hear, smell, make noise, feel sensations, and recognize the people close to them. But the majority of brain growth and development takes place after birth, especially in the higher brain regions involved in regulating emotions, language, and abstract thought. Each region manages its assigned functions through complex processes, often using chemical messengers (such as neurotransmitters and hormones) to help transmit information to other parts of the brain and body (Perry, 2000a).



gradually discarded. This process of synapse elimination—or pruning—is a normal part of development (Shonkoff & Phillips, 2000). By the time children reach adolescence, about half of their synapses have been discarded, leaving the number they will have for most of the rest of their lives.

The Growing Baby's Brain

Brain development, or learning, is actually the process of creating, strengthening, and discarding connections among the neurons; these connections are called *synapses*. Synapses organize the brain by forming pathways that connect the parts of the brain governing everything we do—from breathing and sleeping to thinking and feeling. This is the essence of postnatal brain development, because at birth, very few synapses have been formed. The synapses present at birth are primarily those that govern our bodily functions such as heart rate, breathing, eating, and sleeping.

The development of synapses occurs at an astounding rate during children's early years, in response to the young child's experiences. At its peak, the cerebral cortex of a healthy toddler may create 2 million synapses per second (ZERO TO THREE, 2009). By the time children are 3, their brains have approximately 1,000 trillion synapses, many more than they will ever need. Some of these synapses are strengthened and remain intact, but many are

Brain development continues throughout the lifespan. This allows us to continue to learn, remember, and adapt to new circumstances (Ackerman, 2007).

Another important process that takes place in the developing brain is *myelination*. Myelin is the white fatty tissue that insulates mature brain cells by forming a sheath, thus ensuring clear transmission across synapses. Young children process information slowly because their brain cells lack the myelin necessary for fast, clear nerve impulse transmission (ZERO TO THREE, 2009). Like other neuronal growth processes, myelination begins in the primary motor and sensory areas (the brain stem and cortex) and gradually progresses to the higher-order regions that control thought, memories, and feelings. Also, like other neuronal growth processes, a child's experiences affect the rate and growth of myelination, which continues into young adulthood (Shonkoff & Phillips, 2000).

By the age of 3, a baby's brain has reached almost 90 percent of its adult size. The growth in each region of the brain largely depends on receiving stimulation, which spurs activity

in that region. This stimulation provides the foundation for learning.

Plasticity—The Influence of Environment

Researchers use the term *plasticity* to describe the brain's ability to change in response to repeated stimulation. The extent of a brain's plasticity is dependent on the stage of development and the particular brain system or region affected (Perry, 2006). For instance, the lower parts of the brain, which control basic functions such as breathing and heart rate, are less flexible than the higher functioning cortex, which controls thoughts and feelings. While cortex plasticity may lessen as a child gets older, some degree of plasticity remains. In fact, this brain plasticity is what allows us to keep learning into adulthood and throughout our lives.

The developing brain's ongoing adaptations are the result of both genetics and experience. Our brains prepare us to expect certain experiences by forming the pathways needed to respond to those experiences. For example, our brains are "wired" to respond to the sound of speech; when babies hear people speaking, the neural systems in their brains responsible for speech and language receive the necessary stimulation to organize and function (Perry, 2006). The more babies are exposed to people speaking, the stronger their related synapses become. If the appropriate exposure does not happen, the pathways developed in anticipation may be discarded. This is sometimes referred to as the concept of "use it or lose it." It is through these processes of creating, strengthening, and discarding synapses that our brains adapt to our unique environment.

The ability to adapt to our environment is a part of normal development. Children growing up in cold climates, on rural farms, or in large sibling groups learn how to function in those environments. But regardless of the general environment, all children need stimulation and nurturance for healthy development. If these are lacking—if a child's caretakers are indifferent or hostile—the child's brain development may be impaired. Because the brain adapts to its environment, it will adapt to a negative environment just as readily as it will adapt to a positive one.

Sensitive Periods

Researchers believe that there are sensitive periods for development of certain capabilities. These refer to windows of time in the developmental process when certain parts of the brain may be most susceptible to particular experiences. Animal studies have shed light on sensitive periods, showing, for example, that animals that are artificially blinded during the sensitive period for developing vision may never develop the capability to see, even if the blinding mechanism is later removed.

It is more difficult to study human sensitive periods. But we know that, if certain synapses and neuronal pathways are not repeatedly activated, they may be discarded, and the capabilities they promised may be diminished. For example, infants have the genetic predisposition to form strong attachments to their primary caregivers. But if a child's caregivers are unresponsive or threatening, and the attachment process is disrupted, the child's ability to form any healthy relationships during his or her life may be impaired (Perry, 2001a).

While sensitive periods exist for development and learning, we also know that the plasticity of the brain often allows children to recover from missing certain experiences. Both children and adults may be able to make up for missed experiences later in life, but it may be more difficult. This is especially true if a young child was deprived of certain stimulation, which resulted in the pruning of synapses (neuronal connections) relevant to that stimulation and the loss of neuronal pathways. As children progress through each developmental stage, they will learn and master each step more easily if their brains have built an efficient network of pathways.

Memories

The organizing framework for children's development is based on the creation of memories. When repeated experiences strengthen a neuronal pathway, the pathway becomes encoded, and it eventually becomes a memory. Children learn to put one foot in front of the other to walk. They learn words to express themselves. And they learn that a smile usually brings a smile in return. At some point, they no longer have to think much about these processes—their brains manage these experiences with little effort because the memories that have been created allow for a smooth, efficient flow of information.

The creation of memories is part of our adaptation to our environment. Our brains attempt to understand the world around us and fashion our interactions with that world in a way that promotes our survival and, hopefully, our growth. But if the early environment is abusive or neglectful, our brains will create memories of these experiences that may adversely color our view of the world throughout our life.

Babies are born with the capacity for *implicit memory*, which means that they can perceive their environment and recall it in certain unconscious ways (Applegate & Shapiro, 2005). For instance, they recognize their mother's voice from an unconscious memory. These early implicit memories may have a significant impact on a child's subsequent attachment relationships.

In contrast, *explicit memory*, which develops around age 2, refers to conscious memories and is tied to language development. Explicit memory allows children to talk about themselves in the past and future or in different places or circumstances through the process of conscious recollection (Applegate & Shapiro, 2005).

Sometimes, children who have been abused or suffered other trauma may not retain or be able to access explicit memories for their experiences. However, they may retain implicit memories of the physical or emotional sensations, and these implicit memories may produce flashbacks, nightmares, or other uncontrollable reactions (Applegate & Shapiro, 2005). This may be the case with very young children or infants who suffer abuse or neglect.

Brain Development in Adolescence

Studies using magnetic resonance imaging (MRI) techniques, involving brain scans at regular intervals, show that the brain continues to grow and develop into young adulthood (at least to the mid-twenties). Right before puberty, adolescent brains experience a growth spurt that occurs mainly in the frontal lobe, which is the area that governs planning, impulse control, and reasoning. During the teenage years, the brain again goes through a process of pruning synapses—somewhat

like the infant and toddler brain (National Institute of Mental Health, 2001). As the teenager grows into young adulthood, the brain develops more myelin to insulate the nerve fibers and speed neural processing, and this myelination occurs last in the frontal lobe. MRI comparisons between the brains of teenagers and the brains of young adults have shown that most of the brain areas were the same—that is, the teenage brain had reached maturity in the areas that govern such abilities as speech and sensory capabilities. The major difference was the immaturity of the teenage brain in the frontal lobe and in the myelination of that area (National Institute of Mental Health, 2001).

Another change that happens during adolescence is the growth and transformation of the limbic system, which is responsible for our emotions. Teenagers may rely on their more primitive limbic system in interpreting emotions and reacting, since they lack the more mature cortex that can override the limbic response (Chamberlain, 2009).

Effects of Maltreatment On Brain Development

Babies' brains grow and develop as they interact with their environment and learn how to function within it. When babies' cries bring food or comfort, they are strengthening the neuronal pathways that help them learn how to get their needs met, both physically and emotionally. But babies who do not get responses to their cries, and babies whose cries are met with abuse, learn different lessons. The neuronal pathways that are developed and strengthened under negative

conditions prepare children to cope in that negative environment, and their ability to respond to nurturing and kindness may be impaired (Shonkoff & Phillips, 2000).

Brief periods of moderate, predictable stress are not problematic; in fact, they prepare a child to cope with the general world. The body's survival actually depends upon the ability to mount a response to stress (Shonkoff & Phillips, 2000). Children learn to deal with moderate stress in the context of positive relationships with reliable adult caregivers. Greater amounts of stress may also be tolerable if a child has a reliable adult who can help to buffer the child. But prolonged, severe, or unpredictable stress—including abuse and neglect—during a child's early years is problematic. In fact, the brain's development can literally be altered by this type of toxic stress, resulting in negative impacts on the child's physical, cognitive, emotional, and social growth.

The specific effects of maltreatment may depend on such factors as the age of the baby or child at the time of the abuse or neglect, whether the maltreatment was a one-time incident or chronic, the identity of the abuser (e.g., parent or other adult), whether the child had a dependable nurturing individual in his or her life, the type and severity of the abuse, the intervention, and how long the maltreatment lasted.

The sections below give a brief description of abuse and neglect and are followed by descriptions of some of the consequences of maltreatment.

Abuse—Physical, Sexual, and Emotional

Abuse can refer to physical abuse, such as hitting, shaking, burning, or other forms of maltreatment that a parent or other caregiver might inflict. Sexual abuse is a subset of abuse that refers to any type of sexual behavior with a minor, while emotional abuse generally refers to any injury to a child's psychological or emotional stability (Child Welfare Information Gateway, 2008). Chronic stress may also qualify as emotional abuse. In some States, alcohol or substance abuse or domestic violence that affects the unborn child is considered child abuse.

Physical abuse can cause direct damage to a baby's or child's developing brain. For instance, we now have extensive evidence of the damage that shaking a baby can cause. According to the National Center on Shaken Baby Syndrome (2009), shaking can destroy brain tissue and tear blood vessels. In the short-term, shaking can lead to seizures, loss of consciousness, or even death. In the long-term, shaking can damage the fragile brain so that a child develops a range of sensory impairments, as well as cognitive, learning, and behavioral disabilities.

Babies and children who suffer abuse may also experience trauma that is unrelated to direct physical damage. Exposure to domestic violence, disaster, or other traumatic events can have long-lasting effects. An enormous body of research now exists that provides evidence for the long-term damage of physical, sexual, and emotional abuse on babies and children. We know that children who experience the stress of abuse will focus their brains' resources on survival and responding to threats in their environment.

This chronic stimulation of the brain's fear response means that the regions of the brain involved in this response are frequently activated (Perry, 2001a). Other regions of the brain, such as those involved in complex thought and abstract cognition, are less frequently activated, and the child becomes less competent at processing this type of information.

One way that early maltreatment experiences may alter a child's ability to interact positively with others is by altering brain neurochemical balance. Research on children who suffered early emotional abuse or severe deprivation indicates that such maltreatment may permanently alter the brain's ability to use serotonin, which helps produce feelings of well-being and emotional stability (Healy, 2004).

Altered brain development in children who have been maltreated may be the result of their brains adapting to their negative environment. If a child lives in a threatening, chaotic world, the child's brain may be hyperalert for danger because survival may depend on it. But if this environment persists, and the child's brain is focused on developing and strengthening its strategies for survival, other strategies may not develop as fully. The result may be a child who has difficulty functioning when presented with a world of kindness, nurturing, and stimulation.

Neglect—Lack of Stimulation

While chronic abuse and neglect can result in sensitized fear response patterns, neglect alone also can result in other problems. Malnutrition is a classic example of neglect. Malnutrition, both before and during the first few years after birth, can result in stunted

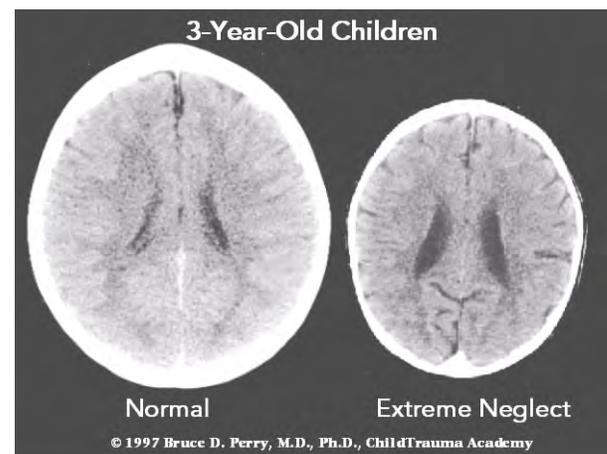
brain growth and slower passage of electrical signals in the brain (Shonkoff & Phillips, 2000). This is due, in part, to the negative effect of malnutrition on the myelination process in the developing brain (ZERO TO THREE, 2009). The most common form of malnutrition in the United States, iron deficiency, can affect the growing brain and result in cognitive and motor delays, anxiety, depression, social problems, and attention problems (Shonkoff & Phillips, 2000).

Although neglect often is thought of as a failure to meet a child's physical needs for food, shelter, and safety, neglect also can be a failure to meet a child's cognitive, emotional, or social needs. For children to master developmental tasks in these areas, they need opportunities, encouragement, and acknowledgment from their caregivers. If this stimulation is lacking during children's early years, the weak neuronal pathways that had been developed in expectation of these experiences may wither and die, and the children may not achieve the usual developmental milestones.

For example, babies need to experience face-to-face baby talk and hear countless repetitions of sounds in order to build the brain circuitry that will enable them to start making sounds and eventually say words. If babies' sounds are ignored repeatedly when they begin to babble at around 6 months, their language may be delayed. In fact, neglected children often do not show the rapid growth that normally occurs in language development at 18-24 months (Scannapieco, 2008). These types of delays may extend to all types of normal development for neglected children, including their cognitive-behavioral, socio-emotional, and physical development (Scannapieco, 2008).

Global Neglect

Researchers use the term "global neglect" to refer to deprivations in more than one domain, i.e., language, touch, and interaction with others. Children who were adopted from Romanian orphanages in the early 1990s were often considered to be globally neglected; they had little contact with caregivers and little to no stimulation from their environment—little of anything required for healthy development. One study found that these children had significantly smaller brains than the norm, suggesting decreased brain growth (Perry, 2002).



"These images illustrate the negative impact of neglect on the developing brain. In the CT scan on the left is an image from a healthy 3-year-old with an average head size. The image on the right is from a 3-year-old suffering from severe sensory-deprivation neglect. This child's brain is significantly smaller than average and has abnormal development of cortex." These images are from studies conducted by a team of researchers from the Child Trauma Academy (www.ChildTrauma.org) led by Bruce D. Perry, M.D., Ph.D. (Reprinted with permission.)

This type of severe, global neglect can have devastating consequences. The extreme lack of stimulation may result in fewer neuronal

pathways available for learning. The lack of opportunity to form an attachment with a nurturing caregiver during infancy may mean that some of these children will always have difficulties forming meaningful relationships with others (Perry, 2001a). But these studies also found that time played a factor—children who were adopted as young infants have shown more recovery than children who were adopted as toddlers (Rutter, et al., 2000).

Emotional and Behavioral Impact

New brain imaging technologies, research with animals, and studies of human growth in optimal and deprived conditions (such as institutions) continue to shed light on the impact of abuse and neglect on brain development. The sections below describe some of the major effects.

Persistent Fear Response. Chronic stress or repeated traumas can result in a number of biological reactions, including a persistent fear state (Perry, 2006). Neurochemical systems are affected, which can cause a cascade of changes in attention, impulse control, sleep, and fine motor control (Perry, 2000a; 2000b). Chronic activation of certain parts of the brain involved in the fear response (such as the hypothalamic-pituitary-adrenal [HPA] axis) can “wear out” other parts of the brain such as the hippocampus, which is involved in cognition and memory (Perry, 2000b). The HPA axis may react to chronic fear or stress by producing excess cortisol—a hormone that may damage or destroy neurons in critical brain areas (Putnam, 2006). Chronic activation of the neuronal pathways involved in the fear response can create permanent memories that shape the child’s perception of and response to the environment. While this adaptation may be necessary for survival in a hostile world,

it can become a way of life that is difficult to change, even if the environment improves.

Hyperarousal. When children are exposed to chronic, traumatic stress, their brains sensitize the pathways for the fear response and create memories that automatically trigger that response without conscious thought. This is called *hyperarousal*. These children have an altered baseline for arousal, and they tend to overreact to triggers that other children find nonthreatening (Child Trauma Academy, n.d.). These children may be highly sensitive to nonverbal cues, such as eye contact or a touch on the arm, and they may read these actions as threats. Consumed with a need to monitor nonverbal cues for threats, their brains are less able to interpret and respond to verbal cues, even when they are in a supposedly nonthreatening environment, like a classroom. While these children are often labeled as learning disabled, the reality is that their brains have developed so that they are constantly alert and are unable to achieve the relative calm necessary for learning (Child Trauma Academy, n.d.).

Dissociation. Infants or children who are the victims of repeated abuse may respond to that abuse—and later in life to other unpleasantness—by mentally and emotionally removing themselves from the situation. This coping mechanism of *dissociation* allows the child to pretend that what is happening is not real. Children who “zone out” or often seem overly detached may be experiencing dissociation. In some cases, it may be a form of self-hypnosis (Stien & Kendall, 2004). Dissociation is characterized by first attempting to bring caretakers to help, and if this is unsuccessful, becoming motionless (freezing) and compliant and, eventually, dissociating. Dissociation may be a reaction to

childhood sexual abuse, as well as other kinds of active, physical abuse or trauma. Children who suffer from dissociation may retreat to the dissociative state when they encounter other stresses later in life.

This type of response may have implications for the child's memory creation and retention. The brain may use dissociation to smother the memories of a parent's abuse in order to preserve an attachment to the parent, resulting in amnesia for the abuse (Stien & Kendall, 2004). However, the implicit memories of the abuse remain, and the child may experience them in response to triggers or as flashbacks or nightmares. In its most extreme form, the child may develop multiple personalities, known as dissociative identity disorder.

Disrupted Attachment Process. At the foundation of much of our development is the concept of attachment, which refers to the emotional relationships we have with other people. An infant's early attachment to his or her primary caregiver provides the foundation for future emotional relationships. It also provides the base for other learning, because babies and children learn best when they feel safe, calm, protected, and nurtured by their caregivers. If the attachment process is disrupted or never allowed to develop in a healthy manner, as can occur with abusive and neglectful caretakers, the child's brain will be more focused on meeting the child's day-to-day needs for survival rather than building the foundation for future growth (Applegate & Shapiro, 2005).

Disrupted attachment may lead to impairments in three major areas for the developing child (Cook et al., 2005):

- Increased susceptibility to stress

- Excessive help-seeking and dependency or excessive social isolation
- Inability to regulate emotions

Young infants depend on positive interactions with caregivers to begin to develop appropriate emotional control and response (affect regulation) (Applegate & Shapiro, 2005). For instance, lots of appropriate face-to-face and other contact helps infants recognize and respond to emotional cues. Infants whose caregivers are neglectful or abusive may experience affect dysregulation—meaning that these children are not able to identify and respond appropriately to emotional cues (Applegate & Shapiro, 2005). Ongoing maltreatment may result in insecure or anxious attachment because the child is not able to derive a feeling of security and consistency from the caregiver. Children who have experienced insecure or anxious attachments may have more difficulties regulating their emotions and showing empathy for others' feelings (Applegate & Shapiro, 2005). These children may have difficulties forming attachments later in life as well.

Impact of Abuse and Neglect on Adolescents

Adolescents who are abused or neglected were often maltreated at younger ages, as well. It can be difficult to isolate the effects of abuse and neglect during the adolescent years, because these youth often suffer from the cumulative effects of a lifetime of abuse and neglect.

Most teenagers who have not been victims of abuse or neglect find their teenage years to be exciting and challenging. Normal puberty and adolescence lead to the maturation of

a physical body, but the brain lags behind in development, especially in the areas that allow teenagers to reason and think logically. Most teenagers act impulsively at times, using a lower area of their brain—their “gut reaction”—because their frontal lobe is not yet mature. Impulsive behavior, poor decisions, and increased risk-taking are all part of the normal teenage experience.

For teens who have been abused, neglected, or traumatized, this impulsive behavior may be even more apparent. Often, these youth have developed brains that focus on survival, at the expense of the more advanced thinking that happens in the brain’s cortex (Chamberlain, 2009). An underdeveloped cortex can lead to increased impulsive behavior, as well as difficulties with tasks that require higher-level thinking and feeling. These teens may show delays in school and in social skills as well (Chamberlain, 2009). They may be more drawn to taking risks, and they may have more opportunity to experiment with drugs and crime if they live in environments that put them at increased risk for these behaviors. Teenagers who lack stable relationships with caring adults who can provide guidance and model appropriate behavior may never have the opportunity to develop the relationship skills necessary for healthy adult relationships or for becoming good parents.

Long-Term Effects of Abuse and Neglect

Maltreatment during infancy and early childhood can have enduring repercussions into adolescence and adulthood. As mentioned earlier, the experiences of infancy and early childhood provide the organizing framework for the expression of children’s intelligence, emotions, and personalities.

When those experiences are primarily negative, children may develop emotional, behavioral, and learning problems that persist throughout their lifetime, especially in the absence of targeted interventions. The Adverse Childhood Experiences (ACE) study is a large-scale, long-term study that has documented the link between childhood abuse and neglect and later adverse experiences, such as physical and mental illness and high-risk behaviors (Centers for Disease Control and Prevention, n.d.).

Some of the specific long-term effects of abuse and neglect on the developing brain can include (Teicher, 2000):

- Diminished growth in the left hemisphere, which may increase the risk for depression
- Irritability in the limbic system, setting the stage for the emergence of panic disorder and posttraumatic stress disorder
- Smaller growth in the hippocampus and limbic abnormalities, which can increase the risk for dissociative disorders and memory impairments
- Impairment in the connection between the two brain hemispheres, which has been linked to symptoms of attention-deficit/hyperactivity disorder

Implications for Practice and Policy

The knowledge we have gained from research examining the effects of maltreatment on brain development can be helpful in many ways. With this information, we are better able to understand what is happening within

the brains of children who have been abused and neglected. In fact, much of this research is providing concrete/scientific evidence for what professionals and caregivers have long been describing in behavioral, emotional, and psychological terms. We can use this information to improve our systems of care and to strengthen our prevention efforts.

The Role of the Child Welfare System

While the goal of the child welfare system is to protect children, many child welfare interventions—such as investigation, appearance in court, removal from home, placement in a foster home, etc.—may actually reinforce the child’s view that the world is unknown, uncontrollable, and frightening. A number of trends in child welfare may help provide a more caring view of the world to an abused or neglected child. These trends include:

- Family-centered practice and case planning
- Individualized services for children and families
- The growth of child advocacy centers, where children can be interviewed and assessed and receive services in a child-friendly environment
- The use of differential response to ensure children’s safety while providing nonadversarial support to families in low-risk cases

Prevention. Child welfare systems that devote significant efforts to prevention may be the most successful in helping children and families and promoting healthy brain development. Prevention efforts should focus on supporting and strengthening children’s families so that children have the best chance of remaining safely in their homes

and communities while receiving proper nurturing and care. The Centers for Disease Control and Prevention (CDC) has developed several publications that promote Safe, Stable, and Nurturing Relationships (SSNRs) between children and caregivers and prevent maltreatment.

By the time a child who has been abused or neglected comes to the attention of professionals, it is likely that some damage already has been done. Prevention efforts must reach out to families before this point. These efforts may target the general population (“primary” or “universal” prevention), educating the public and changing policies to promote healthy brain development. Prevention efforts also may target children and families considered to be at-risk of developing problems (“secondary” or “selected” prevention). Brain research underscores the importance of prevention efforts that target the youngest children—efforts such as early childhood home visiting programs for expectant and new mothers who might be at-risk because of their age, income, or other circumstances, and parent education programs that promote protective factors and lead to positive outcomes for both parents and children.

Prevention efforts for at-risk families should focus on strengthening the family and building on the family’s positive attributes. Recent prevention resource guides from the U.S. Department of Health and Human Services Children’s Bureau (2009) encourage professionals to promote five “protective factors” that can strengthen families, help prevent abuse and neglect, and promote healthy brain development:

- Nurturing and attachment

- Knowledge of parenting and of child and youth development
- Parental resilience
- Social connections
- Concrete supports for parents

Early Intervention. Intensive, early interventions are key to minimizing the long-term effects of early trauma on children's brain development (Committee on Early Childhood, Adoption and Dependent Care, 2000). In recognition of this fact, Federal legislation requires States to develop referral procedures for children ages 0-36 months who are involved in a substantiated case of child abuse or neglect. Once a child is identified, States must provide intervention services through Early Intervention Plans funded under Part C of the Individuals with Disabilities Education Improvement Act (IDEA). A number of States have developed innovative programs to meet these requirements and to identify and help the youngest victims of abuse and neglect (Child Welfare Information Gateway, 2007).

In order to heal a damaged or altered brain, interventions must target those portions of the brain that have been altered (Perry, 2000b). Because brain functioning is altered by repeated experiences that strengthen and sensitize neuronal pathways, interventions cannot be limited to weekly therapy appointments. Interventions must address the totality of the child's life, providing frequent, consistent replacement experiences so that the child's brain can begin to incorporate a new environment—one that is safe, predictable and nurturing.

Child welfare professionals can play a crucial role in helping children who have experienced abuse or trauma receive appropriate mental

health services. Even when the maltreatment occurred in the distant past, there are interventions that can help a child or youth heal. In fact, many types of interventions and therapies have emerged in recent years to help children and adults deal with past abuse and trauma. The Child Trauma Academy (www.childtrauma.org) provides some online trainings to help professionals become more familiar with the effects of abuse on brain development and the need for early interventions. The National Child Traumatic Stress Network, funded by the U.S. Department of Health and Human Services, offers resources for parents, caregivers, and professionals on helping children survive and recover from many kinds of trauma, including factsheets on trauma-focused interventions. Other resources are listed at the end of this paper.

The Role of Caregivers

Many children who have suffered abuse and neglect are removed from their homes by the child welfare system for their safety. These children may be temporarily cared for by extended family, foster parents, or group home staff, and some will be adopted. In these cases, educating caregivers about the possible effects of maltreatment on brain development may help them better understand and support the children in their care. Child welfare workers may also want to explore any past abuse or trauma experienced by parents that may influence their parenting skills and behaviors.

It is important for caregivers to have realistic expectations for their children. Children who have been abused or neglected may not be functioning at their chronological age in terms of their physical, social, emotional, and cognitive skills. They may also be displaying

unusual and/or difficult coping behaviors. For example, abused or neglected children may:

- Be unable to control their emotions and have frequent outbursts
- Be quiet and submissive
- Have difficulties learning in school
- Have difficulties getting along with siblings or classmates
- Have unusual eating or sleeping behaviors
- Attempt to provoke fights or solicit sexual experiences
- Be socially or emotionally inappropriate for their age
- Be unresponsive to affection

Understanding some basic information about the neurobiology underlying many challenging behaviors may help caregivers shape their responses more effectively. They also need to know as much as possible about the particular circumstances and background of the individual children in their care.

In general, children who have been abused or neglected need nurturance, stability, predictability, understanding, and support (Committee on Early Childhood, Adoption and Dependent Care, 2000). They may need frequent, repeated experiences of these kinds to begin altering their view of the world from one that is uncaring or hostile to one that is caring and supportive. Until that view begins to take hold in a child's mind, the child may not be able to truly engage in a positive relationship. And the longer a child lived in an abusive or neglectful environment, the harder it will be to convince the child's brain that the world can change. Consistent nurturing from caregivers who receive training and support

may offer the best hope for the children who need it most.

Summary

In 2007, approximately 794,000 children were determined to be victims of abuse and/or neglect (U.S. Department of Health and Human Services, 2009), but it is likely that many more children are actually suffering under adverse conditions. These children already may have suffered damage to their growing brains, and this damage may affect their ability to learn, form healthy relationships, and lead healthy, positive lives.

One lesson we have learned from the research on brain development is that environment has a powerful influence on development. Stable, nurturing caregivers and knowledgeable, supportive professionals can have a significant impact on these children's development. Focusing on preventing child abuse and neglect, helping to strengthen families, and ensuring that children receive needed services are some of the most important tasks we can undertake.

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Highlighted Resources

Child welfare professionals may find these resources particularly helpful:

Center on the Developing Child—Founded and directed by Jack Shonkoff, M.D., the Center publishes and links to research on early brain development, learning, and behavior and applying that knowledge to policies and practices.

www.developingchild.harvard.edu

Centers for Disease Control and Prevention—The CDC website offers several publications that promote Safe, Stable, and Nurturing Relationships to prevent child maltreatment. CDC also sponsors the Adverse Childhood Experiences (ACE) study.

www.cdc.gov/ViolencePrevention/childmaltreatment/index.html

www.cdc.gov/nccdphp/ACE/index.htm

Child Trauma Academy—This website offers free online courses and other trainings on early brain development and the impact of maltreatment. A wide variety of other resources also are available through the website, including books and articles by Bruce Perry, M.D., and other experts in the field.

www.childtrauma.org/

From Neurons to Neighborhoods: The Science of Early Childhood Development—This book was written in 2000 by a committee of experts (Committee on Integrating the Science of Early Childhood Development, J. P. Shonkoff and D. A. Phillips, eds). Not only does it pull together the findings of neurobiology, but the authors explore what the findings suggest for society in terms of how we can nurture and protect our young children.

Healing Trauma: Attachment, Mind, Body, and Brain (M. F. Solomon and D. J. Siegel, Editors)—This book covers both the development and treatment of trauma, including attachment trauma.

The National Child Traumatic Stress Network—This federally funded initiative is a collaboration of academic and community-based service centers whose mission is to “raise the standard of care and improve access to services for traumatized children.” The website includes an extensive list of factsheets of promising practices for treating child trauma.

www.nctsnet.org/ncts/nav.do?pid=ctr_top_trmnt_prom

ZERO TO THREE—This national nonprofit organization offers resources, training, and support for professionals and parents of young children. The online Baby Brain Map is a useful tool for showing how brain development parallels baby behavior.

www.zerotothree.org/site/PageServer?pagename=ter_util_babybrainflash