



Supporting Brain Development in Traumatized Children and Youth

Healthy brain development is essential for realizing one's full potential and for overall well-being. For children and youth who experience child abuse or neglect and associated trauma, brain development may be interrupted, leading to functional impairments. Ongoing maltreatment can alter a child's brain development and affect mental, emotional, and behavioral health into adulthood. Frontline child welfare professionals are in a unique position to recognize developmental delays in children and youth and provide appropriate support services. This bulletin summarizes what you can do to promote healthy brain development for this vulnerable group of children and youth and put families and service providers in touch with the most effective, evidence-based interventions.

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This bulletin is a companion piece to Child Welfare Information Gateway's issue brief *Understanding the Effects of Maltreatment on Brain Development* (<https://www.childwelfare.gov/pubs/issue-briefs/brain-development/>), which helps professionals understand the behavioral, emotional, and mental impacts of early abuse and neglect in children who come to the attention of the child welfare system.

Understanding Trauma and Brain Development

Early life experiences shape the development of brain circuitry and help to determine the makeup of a person's intelligence, emotions, and personality. Positive experiences with caregivers, family members, and the broader community strongly influence whether an infant or child develops a strong or weak foundation for future social-emotional health and help the child's developing brain offset the potentially negative consequences of abuse or neglect (Chen, Miller, Kobor, & Cole, 2011).

When infants and young children are exposed to chronic or acute maltreatment within the caregiving context, brain development may be compromised and emotional, behavioral, or learning challenges may persist, especially in the absence of targeted and trauma-informed interventions.

When primary caregivers make infants and children feel safe and nurtured, their developing brains are able to spend more time learning and building essential connections. When children feel unsafe or threatened, however, their brains shift into survival mode, making learning particularly difficult.

Brain imaging studies of children with documented cases of maltreatment reveal distinct changes in both the brain's structure and functioning (Delima & Vimpani, 2011). Such studies show that abuse, neglect, and other exposure to trauma can result in long-lasting negative changes to the brain. Victims of child maltreatment frequently suffer from

delayed speech, reading ability, and school readiness (Chamberlain, 2016). Although these results could be related to other variables as well, the correlation between childhood abuse and neglect and altered brain functioning appears significant in brain imaging studies (Nemeroff, 2016):

- The area of the brain associated with executive functioning and planning, the prefrontal cortex, shows correspondingly smaller amounts of gray and white matter in youth who were studied for their reported experiences with childhood trauma compared with those who did not report such experiences.
- The region of the brain associated with learning, the hippocampus region, is smaller in individuals reporting early exposure to trauma.
- The brain's emotional reaction center associated with behavioral functioning and survival instincts, the amygdala, shows correspondingly increased reactivity with higher reported exposure to trauma during infancy and early childhood.

Trauma-induced changes to the brain can result in varying degrees of cognitive impairment and emotional dysregulation that can lead to a host of problems, including difficulty with attention and focus, learning disabilities, low self-esteem, impaired social skills, and sleep disturbances (Nemeroff, 2016). Since trauma exposure has been linked to a significantly increased risk of developing several mental and behavioral health issues—including posttraumatic stress disorder, depression, anxiety, bipolar disorder, and substance use disorders—it is important for practitioners to be aware of steps they can take to help minimize the neurological effects of child abuse and neglect and promote healthy brain development (Shonkoff, 2011).

Abusive Head Trauma

Abusive head trauma (AHT)—forceful blows to the head or the shaking of an infant’s head (“shaken baby syndrome”)—creates a distinct set of problems for the developing brain. AHT is a leading cause of severe brain injury and death in infants and children in child abuse cases. Annually, it affects 30 in 100,000 children under age 1 (American Academy of Pediatrics, 2015). The Centers for Disease Control and Prevention (CDC) within the U.S. Department of Health and Human Services (HHS) identified AHT as a serious public health issue that can result in potential brain damage and related hearing loss, developmental delays, and physical disabilities (HHS, 2016).

Children who sustain serious AHT at a young age may suffer greater deficits in cognitive and behavioral development than those experiencing head trauma later in childhood (McKinlay & Anderson, 2013). AHT can harm the brain’s frontal lobes and future capacity for executive functioning skills, such as goal setting, planning, problem-solving, mental flexibility, and abstract thought. The extent of AHT damage may not be fully understood until a child matures, as potential deficits may present during development (Savage, 2012).

Neuroscience is rapidly developing potential new therapeutic opportunities for traumatic brain injuries, including gene expression, immune system treatment, stem-cell use, and drug protocols (Su, Veeravagu, & Grant, 2016). A range of interventions can be pursued after a child’s brain injuries have been medically stabilized, depending on the child’s age and the type and extent of damage. Interventions may assist children to varying degrees—from achieving very basic skills (e.g., feeding, chewing, and swallowing) to more advanced capabilities (e.g., speech and higher cognitive functions) (Castelli, 2012). For more information, consult the International Brain Injury Association website at www.internationalbrain.org.

Encouraging Healthy Brain Development

As a child welfare professional, you can help support healthy brain development by promoting safe and nurturing environments for children and families and by encouraging both the prevention and treatment of trauma.

Preventing Trauma

Efforts to support healthy brain development ideally should start before and continue through pregnancy, when maternal health can influence the developing brain and the mother-child attachment begins. Maternal stress can affect the developing brain and create long-term issues for the unborn child (Brohl, 2016). You can help parents and caregivers focus on optimal fetal, newborn, and child development by linking families to services designed for at-risk expectant families, such as home visiting programs. Home visiting programs teach caregivers specific parenting skills—techniques for coping with a baby’s crying or other behavioral challenges, for example—and have been linked with reduced stress in the family environment (Garner, 2013). For more information, visit Information Gateway’s webpage on child maltreatment prevention and home visiting programs at <https://www.childwelfare.gov/topics/preventing/prevention-programs/homevisit/homevisitprog/>.

Healthy brain development can be encouraged after birth through supportive services such as continued home visits and other parent education programs. Information Gateway’s website features extensive resources on protective factors that professionals can use to strengthen families and help prevent trauma, including the following:

- Nurturing and attachment
- Parental education regarding child and youth development
- Parental resilience
- Social connections
- Concrete supports for parents
- Social and emotional competence for children

The webpage on protective factors, which also includes the most current Children's Bureau resource guide, can be accessed at <https://www.childwelfare.gov/topics/preventing/promoting/protectfactors/>.

For more information about protective factors, refer to Child Welfare Information Gateway's issue brief *Protective Factors Approaches in Child Welfare* at <https://www.childwelfare.gov/pubs/issue-briefs/protective-factors/> and the National Child Abuse and Neglect Technical Assistance and Strategic Dissemination Center (CANTASD) website at <http://www.cantasd.org/>. CANTASD is a service of the Children's Bureau's Office on Child Abuse and Neglect.

Enhancing Caregiver Interactions and Building Relationships

You can help parents and caregivers by talking with them about child development, including important developmental milestones, how each child has a different timetable for reaching those milestones, and how quality interaction with the child can enhance his or her development. Helping parents and caregivers increase their sensitivity and responsiveness to their child's needs can make a tremendous difference in that child's future mental health and well-being. Child welfare professionals can help ensure that a child has a positive, enduring relationship with at least one important person in his or her life. For instance, training relative caregivers or foster parents to meet the child's emotional and behavioral needs can help promote healthy bonds that support the child's development. If the child has been placed in out-of-home care, you can facilitate quality visits between the birth parent and the child. You can also ensure that the birth family, resource family, and any other caregivers are all receiving the same advice regarding parenting and attachment techniques.

The predictability of a routine gives a child the sense that the world is a safe place for exploring, learning,

and growing. This is important to the developing brain because it lowers stress and reinforces a sense of well-being. You can help parents and caregivers understand the importance of consistency for children and suggest an age-appropriate plan. A routine also allows caregivers to establish limits for challenging behavior and disciplinary strategies, which should be applied consistently and fairly. Consistency is very important to the developing infant and child, and caregivers should be very clear with children if, and when, there will be changes to routines.

To help strengthen the bond between caregiver and child and create safe environments for the families in your care, see Gateway's *Parent Education to Strengthen Families and Reduce the Risk of Maltreatment* at <https://www.childwelfare.gov/pubs/issue-briefs/parented/> and the CDC guide, *Essentials for Childhood Framework: Steps to Create Safe, Stable, Nurturing Relationships and Environments for All Children*, at <http://www.cdc.gov/ViolencePrevention/childmaltreatment/essentials/index.html>. You can also consult the Triple P Positive Parenting Program, an evidence-based program shown to improve parent-child interactions, at <http://www.ct.gov/triplep/lib/triplep/pdfs/triplepoverview.pdf>.

Supporting Brain Development in Older Children

Another critical phase of human brain development occurs during adolescence, offering youth the potential to recover from earlier trauma and set a new foundation for the years ahead (Jim Casey Youth Opportunities Initiative, 2011). Positive experiences during this pivotal phase can strengthen healthy neural connections and promote learning. Child welfare staff, and others working with young people, can create opportunities to engage in trauma-informed practice and provide supports that may help reverse the harmful impacts of prior trauma. According to the Jim Casey Youth Opportunities Initiative (2011), they can do this in the following ways:

- Develop an understanding of trauma and its impact on child and youth development
- Recognize that youth can be traumatized by systems and services designed to help them

- Create safe and welcome spaces for young people
- Share information about trauma, complex trauma, ambiguous loss, neuroplasticity, and resilience to increase their understanding of the developmental needs of older youth

Trusted adults can provide a needed safety net at this vulnerable time and offer youth advice and support regarding their growing independence.

You can help the important adults in a preteen's life understand how the brain develops and educate them about strategies that will help youth with the following:

- Organizational and goal-setting skills
- Decision-making skills
- Stress management techniques
- Wellness practices (e.g., balanced diet, ample sleep, avoidance of risky behaviors)

The Jim Casey Youth Opportunities Initiative features comprehensive information on strategies for promoting adolescent brain development at <http://www.jimcaseyyouth.org/areas-of-expertise/160/adolescent-brain-development>.

Screening Children for Services and Working With Other Providers

It is important for children who have experienced trauma to receive screening as soon as possible to check for potential developmental delays. Determining whether the children and youth in your care require services can make a substantial difference in their future health and well-being, as early treatment may prevent additional developmental delays or deficits and increase the likelihood of favorable outcomes (Brohl, 2016; Levitt, 2014).

The CDC lists the following as risk factors for developmental delays (HHS, 2015):

- Medical factors such as low birthweight, premature or multiples birth, or brain damage experienced in utero or later
- Genetic factors or maternal or paternal mental health issues

- Unhealthy parental behaviors during pregnancy, such as drinking or smoking
- Exposure of mother or child to high levels of environmental toxins

For a comprehensive list of screening instruments to assess a child's potential developmental delays, see *Early Childhood Developmental Screening: A Compendium of Measures for Children Ages Birth to Five* at http://www.acf.hhs.gov/sites/default/files/opre/compendium_2013_508_compliant_final_2_5_2014.pdf. Information Gateway features extensive resources on developmental stages on its website at <https://www.childwelfare.gov/topics/preventing/promoting/parenting/understanding/>.

Collaborating with multiple providers across varied service sectors may help improve outcomes for children and youth since no single system can address all the issues a child and family may experience. The following sections provide a summary of key services for children and families affected by trauma.

Early Intervention

Each State has an early intervention program (EIP) that provides specialized health, education, and therapeutic services to infants and toddlers who have an identified developmental delay or disability. EIPs can support families in addressing children's developmental delays through parenting training, home visitations, respite care, or other supports. When a family is referred to an EIP, the EIP service coordinator will work with the family to develop an individual family service plan and coordinate with the child welfare system to make sure the child's needs are being met. According to the Early Childhood Technical Assistance Center (ECTAC), early intervention services result in greater developmental progress for between 67 and 75 percent of participating children across three outcomes—social relationships, the use of knowledge and skills, and taking action to meet needs—and most children receiving such services leave the program functioning within age-level expectations (ECTAC, 2016).

For more information on early intervention services for young children in child welfare, see *Addressing the Needs of Young Children in Child Welfare: Part C—Early Intervention Services* at <https://www.childwelfare.gov/pubs/partc/>.

Quality Early Care and Education

Early care and education (ECE) professionals can be critical partners in supporting healthy brain development and in helping to overcome the effects of an unhealthy home environment. Young children often spend a substantial amount of time in ECE settings, and ECE professionals may be among the first to observe signs of developmental delays. ECE programs that encourage regular communication with families can help professionals to flag developmental concerns, connect families to needed services, reduce stress, and improve outcomes (National Scientific Council on the Developing Child, 2013). Children's stress responses have been shown to return to normal through relationships with supportive and responsive caregivers and high-quality early education services (Levitt, 2014).

Many States have instituted a quality rating system for ECE. The National Association for the Education of Young Children has set 10 standards for early childhood programs. To earn accreditation, programs must meet all 10 standards. For more information, see <https://families.naeyc.org/accredited-article/10-naeyc-program-standards>.

For information about Head Start, the HHS program that promotes school readiness for young children from low-income families, visit <http://www.acf.hhs.gov/programs/ohs>.

To learn more about developing responsive relationships with ECE providers, visit the ZERO TO THREE website at <https://www.zerotothree.org/early-learning/child-care>.

Schools and Communities

Children whose brain development has been compromised by trauma may face significant problems in their schools and communities, including absenteeism, poor academic performance, and behavioral issues. These problems are often compounded when children fall behind their peers in school and have difficulty making and maintaining social connections. You can reach out to school staff regarding the children you serve to inform them of each child's individual needs and to seek accommodations to ensure their educational success. School officials may benefit in particular from special training on the impact of trauma and from guidance on how to work with traumatized children and youth.

The National Child Traumatic Stress Network has developed tools and materials to help educators understand and respond to the specific needs of traumatized children. For more information on the role of educators in helping children overcome the effects of trauma at different developmental stages, refer to the National Child Traumatic Stress Network's *Child Trauma Toolkit for Educators* at http://www.nctsn.org/sites/default/files/assets/pdfs/Child_Trauma_Toolkit_Final.pdf.

Child Welfare and Education Collaboration

The Connecticut Department of Children and Families was 1 of 10 Children's Bureau grantees chosen to promote collaboration between child welfare and education systems in order to increase educational stability for children. Connecticut's Waterbury Educational Stability Initiative provided training on child traumatic stress to education and child welfare stakeholders, including child welfare professionals, school counselors, parent liaisons, and foster parents. The project also sought to bridge the gap between the schools and law enforcement by training municipal police officers assigned to the schools. The site visit report is available at <https://www.childwelfare.gov/pubpdfs/waterbury.pdf>.

Mental Health

Children and youth affected neurologically by trauma may experience a variety of emotional regulation and/or behavioral challenges that require attention by a mental health professional. An assessment by a trained professional can help determine if the child or youth would be best served by individual or group therapy and which type of therapy would be most appropriate. When parental or primary caregiver stress and unresolved trauma from the parent's childhood are a factor in parent (or caregiver) and child well-being, treatment may be necessary for both children and guardians.

For more information, see the Information Gateway web section on working with children, youth, parents, and caregivers affected by mental health concerns at <https://www.childwelfare.gov/topics/systemwide/bhw/casework/families-mh/> and Information Gateway's *Intergenerational Patterns of Child Maltreatment: What the Evidence Shows* at <https://www.childwelfare.gov/pubs/issue-briefs/intergenerational/>.

Treatment for Trauma-Affected Children and Youth

There are several promising evidence-based intervention models for helping to restore social, emotional, and cognitive health in infants, children, and youth who have experienced developmental deficits from traumatic stress. These treatments aim to reduce the harmful effects of toxic stress by restoring the balance between the emotional and cognitive systems of the brain. Treatment may include teaching children how to self-calm and regulate emotions; how to process their experience through images, thoughts, emotions, and movement to engage all parts of the brain and encourage positive emotions and initiative; and a family component to address communication patterns, conflict, and hierarchy (Stien & Kendall, 2004). The type and length of intervention will depend on the degree of impairment and the services that are available in your area. The following are examples of interventions that can help support brain health.

Attachment and Biobehavioral Catchup

Attachment and biobehavioral catchup (ABC) interventions are designed for caregivers of infants and very young children up to age 2 who have suffered from neglect. ABC takes place in the caregiver's home and includes both the caregiver and affected child over a 10-session treatment sequence. The sessions are designed to instruct the caregiver on how to best nurture the child and how routine interactions can optimize the child's healthy development. Studies of ABC interventions have shown them to be successful in reducing a child's stress hormones (Dozier & Fisher, 2014), which improves a child's overall well-being.

For more information on ABC therapeutic interventions, see the Infant Caregiver Project's webpage at <http://www.infantcaregiverproject.com/>.

Child-Parent Psychotherapy

Child-parent psychotherapy (CPP) is a flexible two-way model targeted to young children from infancy through age 6 with attachment, behavioral, or mental health problems from exposure to maltreatment, domestic violence, or other trauma. CPP can be used with birth parents, foster parents, or kinship parents and can also be adjusted for transitions among caregivers.

Therapy is designed to repair trust in the relationship between the child and primary caregiver through restoring the child's sense of safety and building the primary caregiver's sense of competence in parenting skills. CPP also considers current socioeconomic stressors and cultural values, such as those experienced in immigrant families, and it creates an opportunity for caregivers to understand their own emotions surrounding unresolved losses or traumas from earlier experiences (Zindler, Hogan, & Graham, 2010). CPP is conducted in weekly sessions with the parent or primary caregiver and child over the course of a year.

For more information on CPP, see the National Child Traumatic Stress Network factsheet at http://www.nctsn.org/sites/default/files/assets/pdfs/cpp_general.pdf.

New York City Child Welfare Program Addresses Trauma

In New York City, the Administration for Children's Services (ACS) launched a program in 2013 that offers 11 evidence-based treatment models for working with at-risk families, several of which are directly aimed at improving the neurological outcomes of trauma exposure. The ACS program has had substantial success in reducing the number of children in care, including a 14 percent reduction in teenage foster care placements between fiscal years 2013 and 2014 (Metz & Collins, 2016).

ACS has also launched a new initiative, Strong Families NYC, which includes comprehensive trauma screening for children and youth entering foster care. Since July 2014, provider agencies have completed more than 14,000 screenings using the *Child and Adolescent Needs and Strength – NY* tool (https://www.omh.ny.gov/omhweb/resources/publications/cans/cans_manual.pdf). This measures a child and his or her caregiver in multiple areas, such as trauma exposure, school performance, medical concerns, and cultural identity, to allow caseworkers to identify appropriate interventions.

Parent-Child Interaction Therapy

Parent-child interaction therapy (PCIT) is designed for children ages 2–12 and is used to address interpersonal trauma and repair the caregiver-child relationship by building responsive parenting skills. PCIT takes place through the active coaching of primary caregivers during caregiver-child play sessions. Coaching takes place in real time behind a one-way mirror during a caregiver-child play session—with a hearing device in the caregiver's ear—so that coaching is concealed from the child. The goal of PCIT is to build responsive parenting skills and a secure parent-child relationship based on nurturing care,

firm control, and effective communication where clear limit setting results in consistent discipline and positive behavior.

For more information, visit PCIT International at www.pcit.org. Also see the Information Gateway issue brief *Parent-Child Interaction Therapy With At-Risk Families* at <https://www.childwelfare.gov/pubs/f-interactbulletin/>.

Eye Movement Desensitization and Reprocessing

Eye movement desensitization and reprocessing (EMDR) is a clinical psychotherapy technique used with all age groups—from very young children to adults—where the emotional or behavioral problems associated with past trauma exposure are alleviated by the active “reprocessing” of traumatic memories. This reprocessing allows the individual to establish a healthier frame of mind. The length of treatment will depend on many factors, including whether single-episode or chronic and complex trauma exposure is involved. In general, the treatment must progress through eight distinct phases that incorporate past memories, current triggers, and positive responses for the future (Wessellmann & Shapiro, 2013).

For more information, visit the EMDR Institute website at www.emdr.com.

Integrative Treatment of Complex Trauma

Integrative treatment of complex trauma (ITCT) is designed for children and youth who have experienced complex psychological trauma. These children frequently present with parental attachment issues (e.g., parental abandonment, multiple foster placements). ITCT employs multiple treatment modalities, including relational treatment in individual and group therapy and cognitive, exposure, and play therapies. There are separate programs for children (ITCT-C for ages 8–12) and adolescents (ICTC-A for ages 13–21). For more information on the children's version of ICTC, see http://www.nctsn.org/nctsn_assets/pdfs/Slides_Lanktree.pdf. More information on the adolescent version of ITCT is available through the University of Southern California Adolescent Trauma Training Center at <http://keck.usc.edu/adolescent-trauma-training-center/about-itct-a>.

Trauma-Focused Cognitive Behavioral Therapy

Trauma-focused cognitive behavioral therapy (TF-CBT) is targeted to children ages 3–18 and their families to address significant trauma-induced emotional or behavioral difficulties. At its core, CBT is based on the premise that individuals' thoughts, perceptions, and attitudes about themselves and others affect their interpretation of external events and related emotions and behaviors. CBT seeks to inform individuals' awareness of their cognitive distortions and the behavior patterns that reinforce such thinking (Chard & Buckley, 2010). TF-CBT is a structured child and parent model that combines elements of cognitive therapy, behavioral therapy, and family therapy to eliminate a child's negative emotional and behavioral responses to trauma and provides primary caregivers with the tools to address the child's emotional distress. When possible, TF-CBT is conducted with children and primary caregivers in separate, parallel sessions.

For more information, refer to the TF-CBT National Therapist Certification Program at <https://tfcbt.org/> and Information Gateway's *Trauma-Focused Cognitive Behavioral Therapy for Children Affected by Sexual Abuse or Trauma* at <https://www.childwelfare.gov/pubs/trauma/>.

Trauma Systems Therapy

Trauma systems therapy (TST) is both a clinical and an organizational model designed for children and youth ages 6 through 19 affected by trauma to coordinate a broad-based approach to trauma care. TST enlists the family, neighborhood, school, and community in meeting a child's needs and recognizing his or her strengths and weaknesses. It relies on a two-pronged approach that builds the child's capacity to self-regulate powerful emotions and equips the child's social environment to help the child manage these emotions and protect against threats.

For more information, refer to the National Child Traumatic Stress Network's factsheet on the topic at http://www.nctsn.org/sites/default/files/assets/pdfs/tst_general.pdf.

Mindfulness Meditation

Mindfulness meditation has shown promise for improving mental, behavioral, and physical outcomes in youth who have experienced trauma (Ortiz & Sibinga, 2017). Mindfulness therapy is similar to CBT and involves retraining an individual's attention on the present moment. Brain imaging studies with combat veterans demonstrate that mindfulness-based exposure therapy can alleviate posttraumatic stress disorder symptoms by redirecting attention from disturbing flashbacks to a focus on the present (King et al., 2016). Mindfulness-based meditation practice has also been shown to increase attention and working memory in patients with mild traumatic brain injury or postconcussion syndrome (Jackson, 2014) and to strengthen the brain's ability to control emotions and reduce mood swings and anxiety (Wolkin, 2016).

Coping With Trauma

There are several resources for addressing the needs of children and youth who have experienced trauma, including the following:

- ChildTrauma Academy (<http://childtrauma.org/>), a not-for-profit organization dedicated to helping high-risk children in therapeutic, child protection, and educational settings through direct service, research, and education
- National Child Traumatic Stress Network (<http://www.nctsn.org>), a database of empirically supported treatments and promising practices for responding to trauma and tools for assessing children's exposure to trauma and related mental health issues

See also Information Gateway's *Developing a Trauma-Informed Child Welfare System* at <https://www.childwelfare.gov/pubs/issue-briefs/trauma-informed/>.

Conclusion

Research demonstrating the brain's remarkable ability to overcome adversity offers promise for neurological recovery from child maltreatment with the appropriate interventions. Positive attachment relationships are essential in helping to heal trauma and buffer its negative effects. Building the capacity of birth, foster, kin, and adoptive parents to provide responsive caregiving to the children in their care (National Scientific Council on the Developing Child, 2016)—as well as ensuring access to early intervention and trauma-informed practices—can help promote healthier brain development and improve outcomes for children, youth, and families involved in the child welfare system.

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