Early Brain Development and Caregiving: Promoting and Protecting

*The brain and nervous system underlie all behavior—thought, action, emotion, communication.*  
*(Early Development and the Brain 2008)*

Because the brain is developing so rapidly in the first years of life, and its development is so powerfully influenced by experience, it is essential that caregivers have some basic knowledge about the importance of their role in promoting healthy brain development. This material hopes to link science and caregiving strategies for providers.

The brain develops in two stages:

1. **Setting up the structure**—the neurons/brain cells—occurs prenatally; and

2. **Setting up the function**—the synapses/connections between the brain cells—begins prenatally and continues throughout our lifetimes. In order for the brain to function efficiently, HOW the synapses/connections develop is dependent on the interaction between genetic influences and experience. The brain develops from the “bottom up” and the healthy development of one area is necessary for the healthy development of the next area. The brain learns in a serve and return manner—the child reaches out for interaction and is dependent on predictable, consistent responses from caregivers for optimal brain development (which is why, for young children, we limit TV watching which is passive and provides no ‘return’).

There are sensitive periods of brain development during which the brain is developing especially rapidly in certain areas. This slide from the Center for the Developing Child at Harvard shows how the brain’s neural connections developing particularly rapidly in the first year of life in the areas of language, sensory pathways, and cognitive functioning.

Self-regulation is a key developmental task:
The early years are also a sensitive period for the development of the brain’s capacity for **self-regulation, a key developmental task which is dependent on caregiving experiences**, and is influenced by temperament and maturation.

- **Self-regulation is the ability to manage physiology, arousal, emotion, attention, and behavior appropriately for a task or situation** *(Early Development and the Brain)*
- **The growth of self-regulation is a cornerstone of early childhood development that cuts across all domains of behavior.* *(Neurons to Neighborhoods)*

The growth of self-regulation depends on the ongoing presence of a human, interactive environment as the newborn infant is completely dependent on caregivers for regulation.
Defining appropriate stimulation for young children is individual and depends on:

- **Intensity**—Too loud or quiet? Too bright or dim? Too fast or slow? Too animated or sedate? Just right?

- **Complexity**—Not complex enough to be interesting? So complex that it is too challenging or overwhelming? Just right?

- **Timing**—when the child is already overwhelmed or exhausted? Already engaged in something else? Ready and eager to take it in?

To promote healthy development, it is essential that there be a ‘match’ between the developing child’s emerging physiological capacity to manage the response to stimuli and the intensity, complexity and timing of the stimuli. The very young child is dependent on the caregiver to buffer him from experiences which are beyond the capacity of the child’s developing regulatory systems.

The caregiver needs to observe the child’s cues in response to stimulation and adapt the stimulation to appropriate levels; flexible response to the individual child’s cues supports the development of his/her individual adaptation/coping strategies and protects the child from toxic stress. Developmentally appropriate levels of stress can be growth-producing, such as the productive stress which accompanies challenge to support children’s goals, e.g. the infant who becomes more irritable before achieving a major milestone.

### Stress and brain development

- **Stress is defined as:** A psychological and physiological response to actual or perceived threats to psychological or physical well-being in the context of a lack of certainty about one’s capacity to cope with or effectively manage the stress. (Gunner)

- **What is stressful for one individual** may be experienced as an exciting challenge for another depending on individual temperament, experience and the context.

- **A healthy stress system** turns on when we need it and turns off when we don’t.

- **Chronic stress affects the brain**—including memory, selective attention, self-control and the ability to turn off the stress response. Being chronically ‘wired’ in this state of ‘high alert’ interferes with children’s ability to explore and learn from their environment and socialize with others. *States become traits* over time as the brain is developing.
The physiology of stress

- **Our bodies have a response to perceived threat** which involves mobilizing energy resources and focusing our attention to deal with the immediate needs of the threat. This physiological response to stress prepares us for “flight or fight.”

- **In response to stress:**
  - Stress sets off a chain reaction in our brain which results in the production of cortisol, the “stress hormone” that triggers a change in our entire nervous system.
  - Respiration, heart rate, attention, memory for threat and energy availability increase;
  - Our bodies defer ‘future needs’ such as digestion, sleep, immune system functioning and tissue repair, physical growth and exploration/play.

**Managing stress**—The “Big Three” help determine how each of us as individuals experience an event as more or less stressful: *(Gunner in Early Development and the Brain)*

- **Controllability**—We experience situations as more or less stressful depending on whether we feel we have control of the situation. *(I feel like I have some choices within the situation.)*

- **Predictability**—This allows us to prepare for the stressor and know when we are safe. *(I knew this situation was coming—In two more minutes, it will be time to put toys away and get ready for lunch)*

- **Social support** helps us regulate our stress response. We support children by listening and empathizing; helping them understand and deal with the stressor; and offering physical contact and comfort.

The early care and education challenge--some sources of children’s stress:

- **Separation from parents**/primary caregiver, their primary source of security;

- **Novelty of the situation**—e.g. changes in familiar routines, expectations, and stimuli;

- **The stress of negotiating peer relationships**—especially for toddlers; increasing social competence in the preschool years correlates with lowering cortisol levels in childcare.

- **Quality matters**: research shows that younger children in high quality care where they receive a lot of focused attention and stimulation from the care provider are less likely to exhibit significant rises in cortisol.

Alleviating/managing children’s stress in early care and education:

- **Relationships/social support**—play a powerful role in managing stressors and regulating emotion in early childhood (and throughout life!) We support children by listening and offering empathy, offering them physical contact and comfort, and helping them understand and deal with the stressor. Promoting important relationships/social supports include:
  - Building secure relationships between children and their caregivers
  - Promoting parent-child relationships
  - Foster and support the development of peer relationships
• **Responsive interaction**—comes from attending to and responding to the cues of young children, including body language, facial expressions, sounds and words. Positive interactions, such as smiling and talking back and forth, engage brain activity in ways that promotes the trust and security that builds healthy brains.

• **Respect and support children’s individual coping strategies**—Coping is successful when we feel safe or relieved and are able to turn off our stress response. Respecting children’s individual coping strategies, e.g. a fearful child’s need to observe before participating, helps them be more willing to explore and try new things.

• **Respecting children as individuals, their parents and their culture** promotes children’s sense of self-worth, trust and security which reduces stress and promotes optimal development.

• **Routines and repetition**—providing predictability with routines and predictable environments, explaining to a baby what we are going to do (*I’m going to pick you up and change your diaper*), giving children opportunities to repeat and practice activities, following the child’s lead in play, all contribute to children’s sense of trust and a sense of competence and controllability over their world.

• **Pay special attention to**—
  o Children who are experiencing stress at home
  o Children with difficulty managing their own behavior and navigating social relationships  
  (Gunner & Davis, “Stress, coping and caregiving” in *Early Development and the Brain*)

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**References**


