Recent research and technological advances have changed our understanding of the developing brain. With this new information, parents and educators have the opportunity to provide children with interactions and settings that will allow them to reach their greatest potential. We now have a greater appreciation for the fact that the early years are a very fertile period in the child’s life. We need to make conscious choices about how we treat children so that the impact can be a positive one.

Research has demonstrated that there is an interaction between one’s genetic endowment (nature) and the environment (nurture). Structural, hormonal, and chemical influences that are present during pregnancy affect the growth and development of the fetus. As early as three weeks after conception, a baby’s brain cells begin to form. These nerve cells then migrate to sections of the brain that will eventually control the reflexes, voluntary body movements, perception, language and thought. These structural changes—the cellular linkages being made—are unique to each infant. The linkages form as a result of the infant’s experiences, both in the womb and once they are born.

Medical science continues to demonstrate the far-reaching harmful effects of stress. Stress is defined as an emotional reaction that elevates cognitive and physiological activity levels. It places demands upon the system for physical or cognitive productivity. When those demands are activated over a period of time, it progresses to a series of changes leading to exhaustion.

Some researchers posit that a significant degree of stress experienced by a woman while she is pregnant can have a negative impact on the fetus, resulting in a harmful chemical effect on the fetus’ brain development.
The adult “fight or flight” response to stress is not an option for an infant or young child. Exposure to intense anger, loud screaming, or physical violence creates fear within the child that floods the brain with stress hormones. Being left alone and crying when hungry or wet are also conditions that create fear and stress in a young child. Various types of unpredictable, traumatic, chaotic, or neglectful environments physically change the brain by over-activating the neural pathways. As a result, there may be an increase in the child’s muscle tone, profound sleep difficulties, an increased startle response, and significant anxiety. These responses, in turn, can lead to a permanent state of high alert, a tendency to misperceive the intentions and behavior of others, and a tendency to react with aggression.

Conscious memories of the first years of life are lost but the emotional part of the brain, referred to as the limbic system, and the body remembers. An infant’s first sense of what the world is like is recorded in the body. Without intervention, young children who have experienced high levels of stress can be at serious risk for emotional, behavioral and learning difficulties.

Neuroscientist Dr. James LeDoux agrees that events early in life, experienced with strong emotions, can and do remain an influence throughout our lives. He suggests that what we feel is processed before what we think. Feelings experienced pre-cognitively and pre-verbally continue to play out in later life even though the individual may have no conscious memory of the association. A significant trauma that takes place often or intensely enough can rob a child of the ability to learn normally by pulling away brain circuitry meant for other tasks.
An area of the brain, referred to as the amygdala, is central in understanding how stress affects learning. The amygdala governs attention, memory, planning, and behavior—all skills necessary for the child to be able to take in and process information. Difficulties in attention often include distractibility and impulsivity, which impairs problem solving. In social situations, children who are overly active, impulsive, and unable to focus tend to have trouble reading others’ social cues and responding appropriately to others in the environment.

A child’s relationships are the key protective factor in stimulating healthy brain development. Social interactions with an empathic and attuned caregiver plays the major role in the growth and regulation of the child’s nervous system and in helping the child develop the strength needed to become socially competent and able to learn. The consistent experiences of empathy that takes place with an emotionally available caregiver gradually builds the child’s capacity to empathize with others.

Noted child psychiatrist Stanley Greenspan explains that relationships provide the foundation for learning. The capacity to feel a full range of emotions allows a child to organize events and ideas before they have the words to express them. Children learn to think by creating ideas based on their experiences and how it feels to engage in those experiences. For example, young children become more focused and interactive through being able to enjoy the excitement of reciprocal play. The playful and creative give and take with an emotionally present, verbal adult motivates the development of language and encourages the child toward discriminating, generalizing, categorizing, and organizing her experiences. This is the basis for the ability to first think concretely and then abstractly.
There are many things that parents can do to encourage healthy brain development, for example,

- Become educated about the harmful effects of drugs and alcohol on the developing fetus.
- Learn about a child’s need for appropriate stimulation. Focus on reading the child’s cues and avoid undue stress for the child.
- Parents need to be supported in maintaining their own mental health. Untreated depression and anxiety interfere with the parent/child bond and interrupts a parent’s ability to be fully aware of the child’s needs.
- Abuse, neglect, and family violence must be prevented. These have a devastating impact on growing children.

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