Early Childhood Brain Development

Science tells us that stable, consistent experiences and relationships early in life shape the architecture of the developing brain. Since all future development is based on the strength of early foundations, we must ensure that all Maine children aged birth to eight have the opportunities for those positive experiences and relationships that are the building blocks for their future success.

Science also tells us that severe or repeated exposure to traumatic events — such as violence, abuse or neglect — can cause toxic stress responses in those children who lack supportive adults in their lives, with lifelong effects on health, learning and behavior. But timely and appropriate interventions can buffer these effects and change the course of children’s development.

Much of our knowledge about science and the developing brain is due to the efforts of the Center on the Developing Child at Harvard University. The Center works to drive science-based innovation to achieve breakthrough outcomes for children facing adversity. The Center’s projects draw on faculty from across Harvard and its affiliated hospitals, as well as a growing number of collaborators beyond the Harvard community. They work to channel this collective expertise toward securing a brighter future for the world through enlightened investment in its children.

The Center has developed five key scientific concepts as the building blocks of the core story of child development. We urge you to explore these key concepts as they are crucial to the creation of policies that can transform the lives of children.

1) **Brain Architecture**
Children’s early experiences affect the development of brain architecture, which provides the foundation for all future learning, behavior, and health.

2) **Serve and Return**
Serve and return interactions shape children’s brain architecture. When an infant or young child gestures, babbles, or cries, and an adult responds appropriately with eye contact, words, or a hug, neural connections are built and strengthened in the child’s brain that support the development of communication and social skills.

3) **Executive Function & Self-Regulation**
Executive function and self-regulation skills are the mental processes that enable children to plan, focus attention, remember instructions, and juggle multiple tasks successfully.

4) **Toxic Stress**
While some stress responses are positive and tolerable, toxic stress responses can cause lifelong damage to the body and brain and impact health, learning, and behaviors.

5) **Resilience**
Science tells us that some children develop resilience, or the ability to overcome significant adversity, while others do not.