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How to Build a Better Brain from Birth

Babies are born ready to learn. Each and every year, research about how the brain grows and develops becomes clearer and more informative. With the help of technology, researchers can track and monitor the brain activity of infants, toddlers, children and adults to see what experiences and interactions impact certain areas of the brain. The research shows how early experiences frame the foundation for early learning, health, and behavior factors.

Let's start at the beginning, the brain begins growing in utero, about 16 days from conception and by approximately 27 days post conception, the brain and spinal cord of an infant can be detected. From here forward, a baby's brain continues to grow into adulthood with a significant amount of the brain growth occurring by age 3. For example, when a baby is born her brain weighs less than one pound, averaging 12 to 14 ounces, and in just three short months, the brain grows to more than half of its adult size. By age 6, the brain has grown to approximately 95% of its adult size which is about 3 to 3 ½ pounds.

What happens during these early crucial years of growth is simply fascinating. In the beginning, neural connections are formed at the rate of one million per second. Every interaction a baby experiences causes neurons to connect and form pathways. The number of times a similar experience occurs, the stronger that specific pathway develops. As infants, sensory pathways will typically have the most experiences so vision and hearing skills develop initially. Think about what you do when you see a baby. Most people will talk and coo at the baby while trying to get his attention so he looks at you or an object you are holding. The more often a baby sees the same face or hears the same voice, the more familiar that person becomes to him and thus begins the bonding and attachment process. In many cases,

an infant recognizes his mother's voice at birth so these sensory experiences are already forming attachment with his mother. As the infant grows into a toddler and preschooler, the pathways most frequently used have been paved by those earlier consistent neural connections and become stronger and more complex. Over time, these strong, consistent connections will remain while those pathways least used are pruned off or eliminated.

The brain is open wide to new experiences in the early years however, as the child grows and develops, the brain becomes less adaptable over time. While the ability to learn new things remains open like "windows" in the early years, the neural connections create more established pathways and are more difficult to change as a child grows and changes into an adult. An example of this is when a young child begins to learn language. Before she even understands language, a baby will begin to inventory certain sounds heard repeatedly and begin to understand the consistency of those sounds depending on the language being spoken. As a young baby begins to categorize those consistent sounds with a familiar language very quickly, she will also recognize the sounds of other languages if heard consistently, thereby becoming a dual language learner very easily compared to an adult learning a new language.

On the outside, how a baby learns at first may seem very primitive but it is really quite amazing. A baby eats, sleeps, cries and can fill a diaper, however she is taking in the world around her, processing every experience in her brain. Ensuring a healthy start for a baby includes providing for her basic needs of nutrition, sleep, warmth and physical safety. Balanced nutrition ensures a baby will stay healthy and strong along with adequate sleep and routines that help develop a sense of what to expect. With that being said, there is considerable research showing relationships to be one of the strongest indicators of healthy brain development.

During infancy, the bonding and attachment process can be positive or negative based on what the child experiences most frequently.

When a child is met with smiles, eye contact and a pleasant voice when she coos or cries, connections in the brain are strengthened for human connection and language. If a baby experiences turmoil and uncertainty when she cries, then the connections in her brain that process fear will be strengthened. Over time, babies who experience secure attachments to sensitive responsive caregivers build a strong foundation for all other learning. Insecure attachments with caregivers who are distant, disengaged or inconsistent result in babies who are unsure if their needs will be met.

The quality of a baby's first relationships impacts all other relationships and also impacts how he will learn to deal with stress. At birth, the sympathetic nervous system or the part of the brain that controls reaction to stress is fully developed. Every baby will experience stress of some sort while growing and learning. The parent or primary caregiver can moderate that stress depending on how the caregiver reacts to a baby's needs. Small amounts of stress are unavoidable and the stress response is particularly useful during times that are threatening, such as the fight, flight or freeze responses. When the brain interprets an event as stressful, a hormone called cortisol is released and helps slow down the systems in the body that are not needed for survival. When the stressful situation is remedied, the brain returns the bodily systems back to normal functioning. Sensitive caregivers help their child develop a healthy response to stress and buffer those difficult times allowing the child to develop trust and the opportunity to learn how to deal with stress.

Chronic stress brought on by extreme poverty, maternal depression, or abuse/neglect, can have lifelong effects on a child's learning. Sometimes referred to as "toxic stress", this sustained state of chronic stress results in higher level of cortisol in a young child, which leaves the brain and body functioning on "survival" mode when a caring adult is not present or available to alleviate this stress. Over time and without relief, this can actually change the way a child's brain develops. The good news is long-term studies show that a child who has one caring adult in her life, can

acquire protective factors that can buffer the effects of stress on her brain and body.

Helping parents and caregivers understand the impact they have on their child's development is crucial and can help impact a child's lifelong trajectory. There are many parenting resources available online via science-based websites, social media, and parenting blogs. Interestingly enough, a recent survey conducted by Zero To Three, an online resource for parents, professionals and policy makers, asked millennial parents where they turn to find the most trusted source of parenting information. The results showed the majority of young parents turn to grandparents or family members, followed by health care providers, then teachers and other professionals. The connection of family and community in raising children seemed strong throughout the survey.

In a nutshell, if we want to impact a child's life, the first step is reaching out to parents and caregivers because babies don't raise themselves. Building better brains begins with supporting the adults in children's lives.

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State and Federal Opportunities to Improve the Lives of Infants and Toddlers and their Families

State and Federal Opportunities to Improve the Lives of Infants and Toddlers and their Families calls on federal and state policymakers to embrace a bold policy agenda—one that invests in proven programs and seizes new opportunities to make policies work better for families with infants and toddlers. The six policy recommendations, while not comprehensive, represent key policy opportunities that are timely and already have groundwork laid at the local, state, or federal level. Additional resources are listed to support implementation of the policy solutions.

The download is available at: <https://www.zerotothree.org/resources/2569-state-and-federal-opportunities-to-improve-the-lives-of-infants-and-toddlers-and-their-families?fbclid=IwAR3UmQZb5SPFQaEaMM2my01oRzOBISPKhoXIUDqUM4CKI DaU0swRADbk0>

Submitted by Kim Page (620-421-6550) or email kpage@ku.edu for more information.

Just for Families

The winter holidays can present problems for families with children suffering from food allergies. Keeping children safe during all the celebrations can be a challenge. Here are some great tips from kidswithfoodallergies.org:

- Host your own party with allergy free foods and decorations.
- Work with the host to provide safe foods or offer to provide some for kids with allergies.
- Always wash hands before and after handling food.
- Prevent cross-contamination in preparation and serving.
- Read the labels of all food ingredients.
- Prepare and cook safe meals first. Seal them, and set aside. Then make unsafe foods.
- Keep unsafe foods away from safe foods when preparing, serving, and storing.
- Use separate serving utensils for each dish. Be careful not to mix them up.

<https://kidswithfoodallergies.org>

Submitted by Kim Page (620-421-6550) or email kpage@ku.edu for more information.



Childhood Trauma: Understanding, Supporting, and Prevention

The [Illinois Early Intervention Training Program](#) (EITP) at the University of Illinois has spent the past 18 months developing a free, interactive, self-paced, online training module on the topic of childhood trauma. “Childhood Trauma: Understanding, Supporting, and Preventing” is finished, live, and available to participants, free of charge! In the past, programs have been willing to not only share offerings with those in their organizations, but also recognize the CE credits the University of Illinois supplies. It is the hope that programs will consider doing the same with this module.

This module carries 7 total EI credential hours from EITP and participants must complete all

parts of the module and pass a post-test in order to receive a certificate with their credits. A brief summary of the content of the module is below. The author and developer of the content is Dr. Deserai Miller.

Unit One: Prevalence and Impact of Trauma

This unit covers basic terms commonly associated with trauma. It also provides a broad overview of the Adverse Childhood Experiences Study conducted by the CDC and Kaiser Permanente. Finally, the general impact of trauma is discussed across the lifespan.

Unit Two: Manifestations of Trauma in Young Children

This unit provides examples of some of the ways the impacts of trauma may manifest in young children as well as addressing the connection between trauma and disability. Scenarios are presented throughout which ask learners evaluate behaviors as manifestations of trauma or disability.

Unit Three: Providing Trauma-Informed Supports

This unit introduces learners to trauma-informed care, and how its practices can be used to better support young children and their families. Four broad areas of trauma-informed care are reviewed:

1. Promoting Safety
2. Promoting Emotional Regulation
3. Promoting Positive Relationships
4. Promoting an Understanding of Trauma.

Varying policies related to trauma, abuse, and neglect which were established by professional organizations (NEA, NAEYC, DEC, etc.) are also discussed.

Unit Four: Preventing Future Trauma

This unit addresses not only mandated reporting as a prevention model, but also the importance of self-care and strategies for implementing effective self-care strategies.

For more information contact: Robyn DiPietro-Wells rrwells@illinois.edu 217-300-2915.

For registration go to:

<https://blogs.illinois.edu/view/6039/175193>

New to the ECRC

- Bigelow, K., Carta, J., Irvin, D. & Hemmeter, M. (2018). *Teaching Pyramid Infant-Toddler Observation Scale (TPITOS) for Infant-Toddler Classrooms Manual*. Baltimore, MD. Brookes.
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Pathways Growth and Development Charts

Pathways.org is a 501(c)(3) not-for-profit organization providing FREE child development information to empower parents and health professionals. Their milestones are supported by American Academy of Pediatrics (AAP) findings. Pathways' child milestone checklists help ensure childhood development is on the right track, from birth through 3 years old. Milestones are sorted by **age** and **category (motor, sensory, communication, feeding)**. Checklists can also to take to well-baby visits! Some checklists are available in English and Spanish.

Short videos are available to help parents with tips on development and are available in several

languages. Videos cover tummy time, sensory integration and typical vs atypical development with side by side comparison to help parents see the difference. Find all the checklists and videos at <https://pathways.org>.

Submitted by Kim Page (620-421-6550) or email kpage@ku.edu for more information.



ECRC Spotlight on: Teaching Pyramid Infant-Toddler Observation Scale for Infant-Toddler Classrooms

TPITOS is used to ensure that infant-toddler teachers are using the Pyramid Model practices with fidelity with children 0-3

Modeled after the (TPOT for Preschool Classrooms, TPITOS is for early childhood center-based programs caring for infants and toddlers. Focusing on teacher practices and classroom environment variables, TPITOS measures how well your program's staff is fostering responsive, nurturing relationships with children and promoting strong social-emotional development in their earliest years.

- Ensures effective implementation of the proven PBIS-based [Pyramid Model](#)
- Supports professional development efforts in center-based infant-toddler settings
- Strengthens the practices of individual teachers or caregivers, classroom teams, and entire programs
- Monitors the success of quality improvement initiatives
- Builds a foundation for social-emotional competence in the critical first years of life

Resources about outdoor play are available and may be borrowed from the KITS Early Childhood Resource Center. Contact Kim Page at resourcecenter@ku.edu or (620 421-6550).

Contact the KITS

Early Childhood Resource Center

(620) 421-6550 ext. 1651

Toll free in Kansas: (800) 362-0390 ext. 1651

Email: resourcecenter@ku.edu.

Our entire catalog is searchable online at [KITS ECRC](http://kskits.org/ecrc/) or <http://kskits.org/ecrc/>

Collaborative Calendar of Events

Check the KTIS Collaborative Training Calendar for information
on a variety of training event for Kansas early childhood professionals!

DATE	EVENT / LOCATION	SPONSOR / CONTACT / REGISTRATION
1-09-2019	New Coordinator Training	KITS – https://kskits.org
1-14-2019	Master Coach Call	KITS – https://kskits.org
1-15-2019	Expanding Your Early Childhood Toolkit	KCCTO-KITS Infant Toddler Specialist Network http://kccto.inc@gmail.com
1-16-2019	Master Coach Call	KITS – https://kskits.org
1-17-2019	Supporting Infant and Toddler Temperaments	KCCTO-KITS Infant Toddler Specialist Network http://kccto.inc@gmail.com
1-22-2019	Expanding Your Early Childhood Toolkit	KCCTO-KITS Infant Toddler Specialist Network http://kccto.inc@gmail.com
2-06-2019	Cohort 4, Local Leadership Team Meetings: Kansas Part C State Systemic Improvement Plan (SSIP) Implementation	KITS – https://kskits.org
2-07-2019	Cohort 4, Local Leadership Team Meetings: Kansas Part C State Systemic Improvement Plan (SSIP) Implementation	KITS – https://kskits.org
2-13-2019	New Coordinator Training	KITS – https://kskits.org
2-18-2019	Master Coach Call	KITS – https://kskits.org
2-20-2019	Master Coach Call	KITS – https://kskits.org
2-28-2019	36th Annual KDEC Conference	KDEC – www.kdec.org
	Coordinator Meeting/Data Managers/FSC/Financial	KITS – https://kskits.org
3-13-2019	New Coordinator Training	KITS – https://kskits.org
3-21-2019	Expanding Your Early Childhood Toolkit	KCCTO-KITS Infant Toddler Specialist Network http://kccto.inc@gmail.com