- If you are viewing this course as a recorded course after the live webinar, you can use the scroll bar at the bottom of the player window to pause and navigate the course.

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Typical Development

By Emily Roper Prentice (INPP)

Course Objectives

- 1) You will be able to explain the two basic principles of brain development.
- 2) You will be able to discuss the importance of pregnancy, birth, and early infancy on normal brain development.
- 3) You will be able to describe several aspects of the brain body connection.

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CONTINUED

My Background

Bachelor's Degree in Psychology from the University of Central Oklahoma

Certified Midwife's Assistant with the Oklahoma Midwives Alliance

Post-Graduate Degree in Neuro-Developmental Delay from the Institute of Neuro-Physiological Psychology

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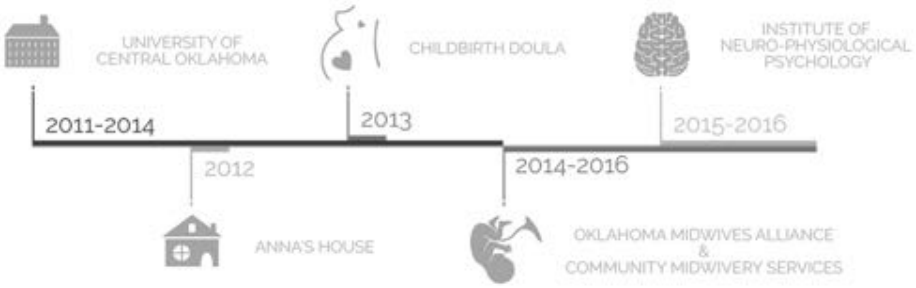
CONTINUED

My Background



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Early Brain Development

The early brain development that occurs during pregnancy, birth, and early infancy sets the foundation for all other brain development and function.

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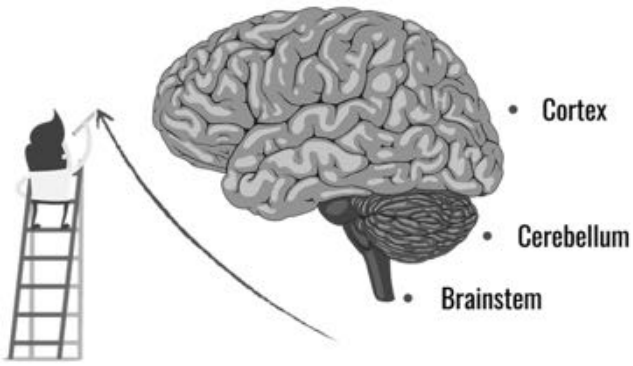
1st General Concept

The brain develops both physically and functionally from the bottom up.



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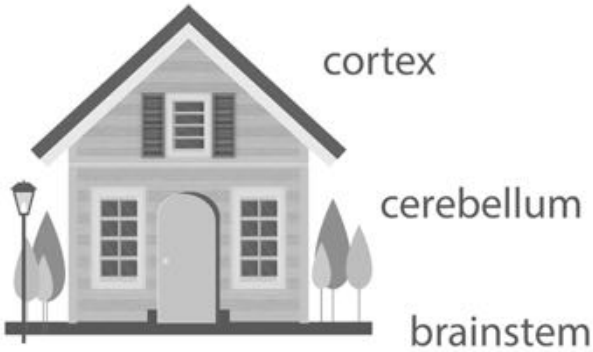
1st General Concept

The brain is like a house. The higher sections are dependent on the support of the lower sections.



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2nd General Concept

Brain development occurs through movement, use, and interaction with the environment.

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2nd General Concept

The brain and body are completely connected and interdependent.

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CONTINUED

The Developed Brain

Upper level (cortex)

Lower level (brain stem and cerebellum)

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CONTINUED

Conception

Natural conception is actually a complex process that requires the cooperation of several healthy systems.

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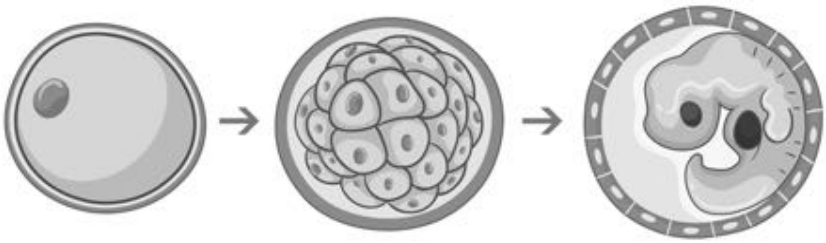
Embryonic Period (First 8 weeks)

The embryonic period is first 8 weeks after fertilization when all of the baby's parts are forming.



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Intrauterine Reflexes

Reflexes develop and inhibit at key stages during a person's neurological development. They assist with survival, function and the development of certain brain and body systems. They also provide reliable indicators of the developmental maturity of a person's nervous system.

- Emerge during the embryonic period (between weeks 5-7.5)
- They are mediated by the spinal cord
- Whole body withdrawal or freeze response
- They withdraw prior to birth

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CONTINUED

Fetal Period

The fetal period occurs at the end of the embryonic period and continues until birth. During this phase all of the baby's systems are growing, developing and refining their function.

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CONTINUED

Primitive Reflexes

Reflexes develop and inhibit at key stages during a person's neurological development. They assist with survival, function and the development of certain brain and body systems. They also provide reliable indicators of the developmental maturity of a person's nervous system.

- Emerge during the fetal period (between weeks 9 -24)
- They are mediated by the brain stem
- They are involuntary stereotyped responses whose characteristics vary (e.g. grasping, clasping, vestibular)
- They withdraw during the first year after birth

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CONTINUED

Environment of the Womb

Remember the 2nd general concept of brain development: movement, use, and interaction with the environment.

- Confined inside a uterus
- Surrounded by and suspended in fluid
- Sensory input is being dampened by their environment

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CONTINUED

Labor and Birth

After birth, babies are thrown into a world of intense sensory stimulation. They now have to adapt to a world with gravity, bright lights, loud noises, and more. Labor and birth help prime their nervous system for this transition.

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CONTINUED

Reflexes and Birth

These are three of the many reflexes that aid in the birth process. Not only do these reflexes help birth go smoothly, but the process of normal birth helps to stimulate and strengthen them.

Tonic Labyrinthine Reflex (TLR)

Spinal Galant Reflex

Asymmetric Tonic Neck Reflex (ATNR)

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CONTINUED

The Brain at Birth

At birth a baby's brain is very immature. The brain stem is the most mature part of the brain and it regulates most of baby's function. The primitive reflexes are what gives the brain stem so much power and control at this stage.

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Postural Reflexes

Reflexes develop and inhibit at key stages during a person's neurological development. They assist with survival, function and the development of certain brain and body systems. They also provide reliable indicators of the developmental maturity of a person's nervous system.

- Emerge after birth during the first 3 ½ years
- They are mediated by the midbrain and cerebellum
- They are responsible for preconscious control of posture and they also assist with control of voluntary movements
- They stay with a person through adulthood

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CONTINUED

Don't Forget!

Upper level (cortex)

Lower level (brain stem and cerebellum)

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CONTINUED

The Early Years

The first few years after birth mark a period of intense brain and body development. Early "learning" or brain development is primarily focused on developing control of ones body.

Stages of Movement:

1. Piscean
2. Reptilian
3. Mammalian
4. Primate
5. Bipedal

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CONTINUED

Example: Importance of Crawling

- Promotes brain development
- Stimulates the proprioceptive and vestibular systems
- Develops visual skills

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CONTINUED

Think Holistically

"Children's difficulties do not exist in specialist departments; they exist within the context of the whole child."

- Sally Goddard Blythe

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CONTINUED

The Brain and Body Connection

"The brain is the most complex organ of intelligence; stored inside this blob of matter is the entire evolutionary history of the individual waiting to unfold its potential. But, the brain cannot exist without the body. It is the body which supports, protects, sustains and nourishes the brain through interaction with the environment. For optimum mental as well as physical health, performance and well being there needs to be congruence in the relationship between the brain and the body – the human mind with all its possibilities is the product of this continuously adapting relationship." – Sally Goddard Blythe

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CONTINUED

The Vestibular System

Your vestibular system is like your 6th sense. It is responsible for helping with balance and spatial orientation.

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The Vestibular Nuclei

The vestibular nuclei has connections to and from the vestibular system, the eyes, the cerebellum, and the body.

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Remember!

1. The brain develops from the bottom-up.
2. The brain develops through use, movement, and interaction with the environment.
3. Always think holistically. The brain does not develop or function in isolation.

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Resources

Buck, A. (2014). *A journey of hope: For parents of struggling children.* Northglenn, CO: Anna's House LLC.

Fix, J. D., & Harvey, D. M. (2008). *Neuroanatomy.* (4th ed.). C. Taylor, K. Horvath, & B. Martz. (Eds.). Philadelphia, PA: Lippincott Williams & Wilkins.

Frye, A. (2013). *Holistic midwifery: A comprehensive textbook for midwives in homebirth practice.* (Vol. 2). (2nd ed.). Portland, OR: Labry's Press.

Goddard, S. (2002). *Reflexes, learning, and behavior: A window into the child's mind.* Eugene, OR: Fern Ridge Press.

Goddard Blythe, S. (2005). *The well balanced child: Movement and early learning.* (Rev. ed.). Gloucestershire, UK: Hawthorn House.

Goddard Blythe, S. (2008). *What babies and children really need.* Gloucestershire, UK: Hawthorn House.

Goddard Blythe, S., Beuret, J. L., & Blythe, P. (2009). *Attention, balance, and coordination: The A.B.C. of learning success.* West Sussex, UK: Wiley-Blackwell.

Janora, A. (2016). *International post graduate training course in the INPP method.* (PowerPoint slides and lecture notes)

Kalat, J. W. (2013). *Biological Psychology.* (11th ed.). T. Matray, R. Deljion, V. Malinee, P. Leeds, L. Moody, & L. Keyes. (Eds.). Belmont, CA: Wadsworth.

Upledger, J. E. (2010). *A Brain Is Born.* Berkley, CA: North Atlantic Books.

Varney, H. (1997). *Varney's midwifery.* (3rd ed.). Sudbury, MA: Jones and Bartlett Publishers.

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Questions?

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