The central nervous system begins development very early in gestation. It is a highly complex, integrated system that takes many years to fully develop. In the not-too-distant past, scientists believed that brain growth was complete by age 10. We now know that the brain continues to develop throughout adolescence, and into the twenties. There are also studies that suggest the brain continues to grow and develop new cells throughout adulthood.

This process of brain maturation can be observed throughout infancy, childhood, and adolescence as the child learns new skills and information, and develops increasing physical, social, intellectual, and psychological abilities during this time.

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2. Describe the role of the healthcare provider in neurologic assessment of neonatal reflexes and related parent education.

Behavioral Objectives

After reading this newsletter the learner will be able to:

- Discuss assessment of neonatal reflexes, including types of reflexes, how to elicit them, and the newborn’s response.
- Describe the role of the healthcare provider in neurologic assessment of neonatal reflexes and related parent education.

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This newsletter will discuss assessment of neonatal reflexes. An overview of neurologic development in utero will be covered, as well as types of reflexes, how to elicit them, and the newborn’s response. The role of the healthcare provider in neurologic assessment of neonatal reflexes and related parent education will also be described.

Neurologic Development - Overview

In humans, the central nervous system is one of the first systems to begin development, and the last to finish complete development. Within 2 - 3 weeks after conception, the cells that will become the neural tube begin organizing. At 4 weeks the neural tube is closed, and the brainstem and spinal cord begin forming. The brainstem, which controls breathing, heart rate, and gross motor movements, is formed by 7-8 weeks, but continues to develop throughout gestation and infancy. By 8-10 weeks, therefore, the fetus is able to spontaneously move his/her head, trunk, and extremities.

The higher brain functions develop later in gestation, and continue to fully develop throughout childhood, adolescence, and perhaps, throughout adulthood, as well. This early and well-functioning brainstem helps to explain why some reflexes are present in the newborn period, and then disappear permanently. The newborn’s primitive reflexes are controlled by the brainstem. The higher functions of the brain, which develop during the first year of extrauterine life and beyond, exert increasingly more control over the baby’s movements. These functions eventually inhibit many of the primitive reflexes, and most of them disappear within the first year of life. When primitive reflexes persist abnormally, this may indicate neurologic deficit in these higher brain functions.

Neonatal Reflexes

There are a wide variety of neonatal reflexes, affecting not only specific body parts, but the body as a whole. Some of these reflexes serve useful purposes, such as the importance of the rooting and sucking reflexes to the feeding process, or the palmar grasp in promoting attachment to other humans during this early period of life. Healthy newborns are equipped with the normal protective reflexes they will maintain for life, including blink, gag, cough, sneeze, pupillary, and deep tendon reflexes, such as the knee jerk. They also have the ability to draw away from a painful stimulus.

Selected reflexes occurring in the neonatal period include:

Rooting: The rooting reflex serves to help the newborn find food, as it is a searching motion with the mouth. It can be elicited by light stroking on the lips or cheek of a hungry newborn. The newborn should turn toward the stimulus and move her face and mouth around in a circular motion. A newborn who has recently fed may not exhibit rooting.
NEUROLOGIC ASSESSMENT... NEONATAL REFLEXES

1. Brain growth and development is believed to continue until which age group?
   a. Preschool-age
   b. School-age
   c. Adolescence
   d. Adulthood

2. Many of the primitive reflexes present during the newborn period are not normally present during later life because:
   a. older children and adults are able to voluntarily suppress these reflexes.
   b. higher functions of the developing brain eventually inhibit them.
   c. when the child learns to stand and walk, the neurologic connections change permanently.
   d. the neurologic impulses causing the reflexes cease to function several weeks after birth.

3. Which of the following is the best example of a protective reflex of the newborn?
   a. plantar grasp
   b. rooting
   c. pupillary
   d. stepping

4. When the newborn’s lips or cheek are touched, the newborn’s normal response should be to:
   a. begin sucking
   b. push the tongue forward
   c. turn toward the stimulus
   d. extend the arm and leg on the same side

5. In assessing a term newborn, the healthcare provider is unable to elicit a rooting or sucking reflex. The first response of the healthcare provider should be to:
   a. check the labor record to see what medications were used
   b. verify her gestational age
   c. determine when her last feeding was
   d. assess her temperature

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