

Infancy: Physical Development

Chapter 5

"The Virgin Mary Nursing Her Child" --Hans Memling

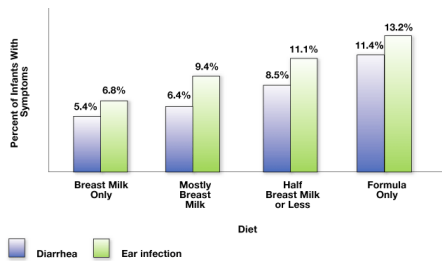




Breast Feeding vs. Bottle Feeding

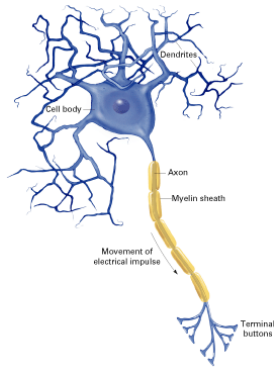
- **Breast milk** contains all the nutrients necessary for growth and offers immunity to various childhood diseases.
- **Breast feeding** offers emotional advantages to mother and child and may cause decreased risk of ovarian and breast cancers to the mother.

Breast Feeding vs. Bottle Feeding



The *nervous system* comprises the brain and the nerves that extend throughout the body.

- Infants are born with between 100 and 200 **billion NEURONS!** (*the nerve cells of the nervous system*).
- As the infant's experience in the world increases, neurons that do not become interconnected become unnecessary and die off.



The Neuron

The basic element of the nervous system

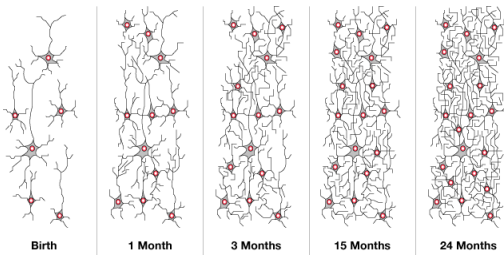
More About Neurons...

- Neurons increase in size.
- Neurons become coated with **MYELIN**, a *fatty substance that helps insulate neurons and speeds transmission of nerve impulses.*
- The brain is made up of neurons, and triples its weight in the first two years of life.
- The infant's brain is 3/4 its adult size by age two

More About Neurons...

- * As they grow, neurons become arranged by function.
- * Some move into the **CEREBRAL CORTEX**, *the upper layer of the brain.*
- * Others move to *subcortical levels*, which regulate fundamental activities such as breathing and heart rate (and are below the cerebral cortex).

Nervous System and the Brain



Over the first two years of life, networks of neurons become increasingly complex and interconnected.

Brain development occurs because of genetic patterns and environmental influences.

PLASTICITY is the degree to which a developing structure (e.g., the brain) or behavior is susceptible to experience

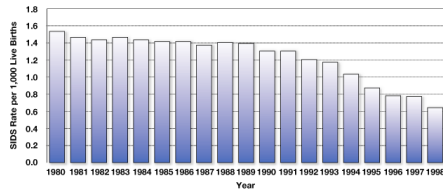
→ The brain is relatively plastic

-- Infants who grow up in severely restricted environments are likely to show differences in brain structure and weight.

Sudden Infant Death Syndrome (SIDS)

- Cause of SIDS is unknown
- 1 in 1,000 infants die a year in the US from SIDS
- No means to prevent SIDS have been found
- Risk factors may include boys, African Americans, low birthweight, low APGAR scores, a mother that smokes during pregnancy, possible brain defect

Sudden Infant Death Syndrome (SIDS)



Motor Development

Reflexes are the unlearned, organized, voluntary responses that occur automatically in the presence of certain stimuli

- Rooting reflex: turning head towards things that touch the cheek
- Stepping reflex: legs move in a stepping fashion when held upright with feet on the floor
- Swimming reflex: paddle and kick motion while on belly
- Moro reflex: activated when support for head removed – arms thrust out and appear to grasp
- Babinski reflex: fanning the toes when outside of foot is stroked
- Startle reflex: flinging of arms outward and arching of back when loud noise occurs
- Eye-blink reflex: rapid opening and closing of eyes to direct light exposure
- Sucking reflex: tendency to suck things that touch the lips
- Gag reflex: clearing the throat of obstructions

Gross Motor Skills

(rolling over, sitting upright, walking)

- By 6 months infants can move by themselves.
- Most can sit unsupported by 6 months
- Crawling appears between 8-10 months.
- Infants can walk holding on to furniture by 9 months and most can walk alone by 1 year.

More about norms...

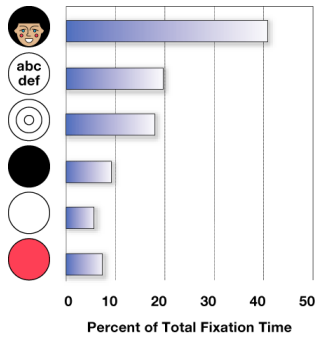
- Norms should be based on *large, heterogeneous samples*.
- The *time* at which specific motor skills appear is in part determined by cultural factors.
- There are certain genetic constraints on how early a skill can emerge

Development of the Senses

- **Sensation** is the stimulation of the sense organs.
- **Perception** is the sorting out, interpretation, analysis, and integration of stimuli involving the sense organs and the brain.

Visual Perception

- Newborn's vision ranges from 20/200 to 20/600, meaning they cannot distinguish beyond 20 feet.
- By 6 months, the average infant has 20/20 vision.
- Binocular vision is achieved by 14 weeks.
- Infants show clear visual preferences from birth.



Auditory Perception

- Hearing begins prenatally.
- Infants are born with preference to certain sound combinations.
- Sound localization, the ability to determine where a sound is coming from, is at adult level by 1 year old.
- By four and a half months, infants can discriminate their own names.

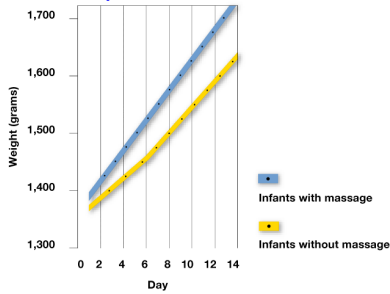
Smell and Taste

- **Sense of smell** is extremely well developed in infants. A 12- to 18-day-old infant can distinguish the smell of the mother.
- **Taste** is also well developed in infants who can distinguish disgust and bitter and show preference for sweet. Infants also develop taste preferences depending on what the mother drank while they were in the womb.

Sensitivity to Pain and Touch

- Infants are born with the capacity to experience **pain**. Pain produces signs of distress such as increased heartbeat, sweating, facial expressions, and changes in intensity and tone of crying.
- **Touch** is one of the most highly developed sensory systems of the newborn and one of the first to develop. Being touched promotes growth and emotional development. Infants reaching out to touch assists in exploring the world.

Sensitivity to Pain and Touch



Multimodal Approach to Perception –

considers how information that is collected by various individual sensory systems is integrated and coordinated

Affordances are action possibilities that a given situation or stimulus provides.

Infants learn they may fall when walking down a ramp, so the ramp affords the possibility of falling. This is crucial information as a child learns to walk.
