

Physical Development During The First Three Years



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Generations of Childbirth Customs

- **Pre 20th Century:**
 - Birthing was a modest 'female only' ritual
 - Use of midwives was predominant
 - Death rates high for mother and baby
 - 1 out 4 babies died in first year
- **Modern Generations:**
 - Dramatic reductions in death rate due to:
 - Antibiotics
 - Prenatal care

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'Humanizing' Childbirth: A Social Trend

- Home births have brought back intimacy of event
- Birthing centers & hospital
 - Soft lights
 - Father or partner as coach
 - Baby stays in room

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Birth Process

- **Parturition** – brings on labor
 - 2 weeks before delivery
 - Uterine contractions
 - Cervix becomes flexible
 - Stimulated by rising estrogen levels

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3 Stages of Vaginal Childbirth



(a) First stage

This is the longest stage, lasting 12 hours or more. During this stage uterine contractions cause the cervix to dilate



(b) Second stage

The second stage last about an hour. This stage begins when the baby's end begins to move through the cervix and ends when the baby is delivered.



(c) Third stage

During the third stage, which last 5 – 30 minutes, the placenta and the remainder of the umbilical cord are expelled.

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Cesarean Delivery

- Surgically removing baby from uterus through abdomen
- Almost 30% of all USA births
- Often used when labor progresses slowly
- Common with:
 - First and/or large babies
 - Older moms
 - Mothers with previous C-sections



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Medicated Deliveries

- Local or regional anesthesia
 - Blocks pain receptors in brain
- Relaxing analgesic
- Approximately 60% of women choose pain relief during labor



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Un-medicated Delivery

- **Natural Childbirth**
 - Mother receives training in fitness, breathing, and relaxation
- **Traditional cultures - Use of 'doula'**
 - Experienced helper furnishing mother with emotional support
- **Prepared Childbirth**
 - **Lamaze**
 - Mother learns to substitute other responses for feelings of pain

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Size and Appearance of the Newborn

- Average newborn is:
 - 20 inches long & 7.5 pounds
- **Fontanel**s – soft plates of head
- **Lanugo** – fuzzy prenatal hair
- **Vernix caseosa** – oily protection against infection



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Body Systems of the Newborn

- **Meconium**
 - Stringy waste in fetal intestinal tract
- **Neonatal Jaundice**
 - Yellowing of skin and eyeballs
 - Caused by immaturity of the liver
 - Half of all babies experience
 - Usually baby does not need treatment

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Apgar Scale

Sign	0	1	2
Appearance	Blue & Pale	Body Pink, Limbs Blue	All Pink
Pulse	Absent	Slow (<100)	Rapid
Grimace	None	Grimace	Coughing & Crying
Activity	Limp	Weak	Strong
Respiration	Absent	Irregular, slow	Good, Crying

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Brazelton NBAS

- Tests responses to physical and social environment
 - Motor Organization
 - Reflexes
 - Attention and interactive capacity
 - CNS instability

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Neonatal Screening Tests

- Help detect correctable disorders:
 - PKU
 - Galactosemia
 - Hypothyroidism

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Infant Arousal States

State	Eyes	Breathing	Movement
Regular Sleep	Closed	Regular, Slow	None
Irregular Sleep	Closed	Irregular	Twitching
Drowsiness	Open or closed	Irregular	Some Activity
Alert Inactivity	Open	Even	Quiet
Wakeful and Crying	open	Irregular	Much Activity

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Childbirth Complications

- Birth trauma
- Post-maturity
- Prematurity
- Low birthweight

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Mother Traits Increasing Risk of Low Birthweight

- Underage or over-age
- Uneducated and poor
- Poor nutrition
- Smoking and drinking
- Stress
- Infections and high blood pressure

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Immediate Treatment for Prematurity

- Intravenous feeding
- Surfactant
- **Isolette** – controlled environment, like an incubator
- Massage, gentle handling



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Long-term Outcomes of Low Birthweight

- Greater risk of:
 - Neurological and cognitive impairment
 - Lower academic achievement
 - Social, behavioral, and attention problems

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Overcoming Birth Complications

- Higher family SES
- Quality early environment
- Educational day care
- Educating parents about children's health



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Protective Factors for Development

- Individual traits
 - Sociability
 - Intelligence □
- At least one supportive adult in child's life
- Child has a 'sense of meaning'
 - Rewarded at school or work

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SIDS

Sudden Infant Death Syndrome

- 'Crib Death'
- Sudden death of infant under 1 year of age
- Cause of death unexplained
- May have underlying biological defect
- May be associated with sleeping on stomach

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Immunizations



- About 85% all children are vaccinated today
- Some regions are better vaccinated than others
- No causal connection between vaccines and autism or other disorders

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Nutrition: Breastfeeding

- Breast milk almost always the best food
- Milk is more digestible
- Reduces allergic reactions
- Minimizes numerous infections
- May reduce risk of SIDS
- Better cognitive performance



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Bottle Feeding

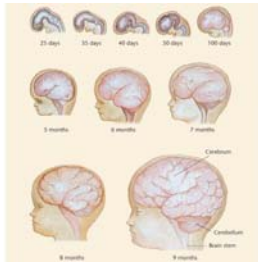
- Formula should be iron-fortified
- Necessary for women with infectious illnesses
- Does NOT reduce emotional bonding between mother and baby.



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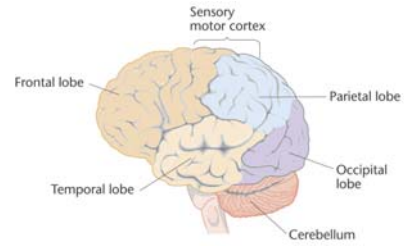
Brain Growth



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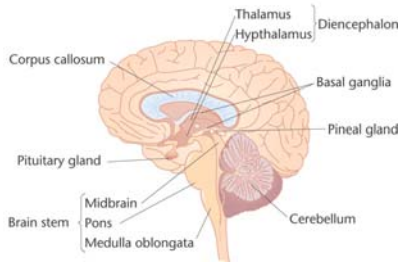
Regions of the Cerebral Cortex



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Parts of the Brain



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Neuronal Growth: Two Processes



- **Integration**
 - Neurons that control groups of muscles
- **Differentiation**
 - Each neuron takes on a specialized function

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Reflexes: Unlearned & Protective Behaviors

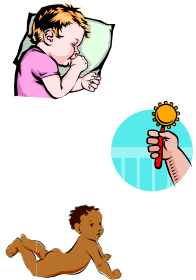
- **Postural**
 - Reactions to changes in posture or balance
- **Locomotor**
 - Resemble later-appearing voluntary movements
 - Walking and swimming reflexes

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Early Human Reflexes

- **Moro**
- **Darwinian**
- **Tonic**
- **Rooting**
- **Babkin and Babinski**



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Role of Experience

- Postnatal brain is molded by development
- 'Plasticity'
- Threats
 - Sensory impoverishment
 - Malnutrition
- Corrective experiences can relieve past deprivations



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Early Sense of Touch & Pain

- Touch
- Pain
 - Able to experience pain at birth
 - First sense to develop
 - Rooting reflex



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Early Senses of Smell & Taste

- Begins to develop in womb
- Newborns prefer sweet tastes
- Fluids and odors may be transmitted through amniotic fluid



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Nature vs. Nurture?

- Odor preference requires experience
 - Six-day-olds prefer mother's breast pad to another nursing mother's
- Certain tastes are innate
 - Sweetened water calms crying newborns whether full-term or premature



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Sense of Hearing

- Functional before birth
- Three-day-olds can tell new speech sounds from ones they've already heard



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Sense of Sight

- The sense least developed at birth
- 20/20 reached by about 6 months
- Binocular vision (depth) develops around 4.5 months



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Milestones of Motor Development

Skill	Age 90% of Children Master
Rolling Over	5.4 mos
Grasping Rattle	3.9 mos
Standing Alone	13.7 mos
Walking well	14.9 mos
Building tower of cubes	20.6 mos
Copying Circle	4 yrs

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Walk & Gibson: The Visual Cliff

- Do infants perceive depth?
- Six-month old babies would approach 'ledge,' but avoided 'drop'
- Demonstrated 'depth perception'



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Ecological Theory of Perception

- Learning occurs through detecting the many features of an environment
- With experience, babies learn to gauge their environment
 - Is that ball moving away from me?
 - Is that ground too rough to walk on?



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Cultural Influences on Motor Development

- Depends on the *Pace* of the culture
- African and West Indian cultures actively encourage early motor strength
 - Bouncing and stepping exercises
- Other cultures discourage...
 - Ache mothers pull infants to their laps when they crawl away



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