EBRYO, FETUS, INFANT and CHILD

<table>
<thead>
<tr>
<th>STAGE</th>
<th>Time Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embryo</td>
<td>conception 8 wks (2 mos)</td>
</tr>
<tr>
<td>Fetus</td>
<td>8 wks Birth</td>
</tr>
<tr>
<td>Infancy</td>
<td>Birth 15 months (1 yr, 3 mos)</td>
</tr>
<tr>
<td>Toddler</td>
<td>15 months 2 ½ yrs</td>
</tr>
<tr>
<td>Preschool</td>
<td>2 ½ yrs 6 yrs</td>
</tr>
<tr>
<td>Middle</td>
<td>6 yrs 12 yrs</td>
</tr>
</tbody>
</table>

EBRMYO & FETUS

 ✓ **Prenatal period**
 ✓ **Safety of the womb** – internal equilibrium, intrauterine environment
 ✓ **Damage during fetal life** has a global impact compared to damage after birth.
 ✓ Most disorders are *multifactorial*, some are combination of effects, while some are addition.
 ✓ Girls have higher biological vigor than boys due to second X-chromosome.

**Fetal Life**

 ✓ *Fetus* – shape is recognizably human, sucks on thumb & fingers, assumes a position in which its occiput is in an *anterior vertex* position

**Behavior & Nervous System**

 ✓ Pregnant women are extraordinarily sensitive to prenatal movements
 ✓ Nervous system: the following develops accordingly: (1) sensory cortex & motor cortex, (2) association cortex
 ✓ The Brain
   - 360g @ birth
   - 1,450 g @ adulthood
   - (4-fold increase in neocortex)
 ✓ Increase is due to growth and branching of dendrites establishing new connections
 ✓ Uterine contractions contribute to development of the brain.

<table>
<thead>
<tr>
<th>Fetal Stage</th>
<th>Landmarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 months AOG</td>
<td>1st trimester</td>
</tr>
<tr>
<td>16th day</td>
<td>- neural plate (dorsal ectodermal thickening) develops</td>
</tr>
<tr>
<td>6th week</td>
<td>- part of neural tube becomes the cerebral vesicle (later becomes the cerebrum)</td>
</tr>
<tr>
<td>10th week</td>
<td>- cerebral cortex develops</td>
</tr>
<tr>
<td>14th week</td>
<td>- the fetus can be artificially set into total body motion by <em>in utero</em> stimulation of its ventral skin surfaces</td>
</tr>
<tr>
<td>4-6 months AOG</td>
<td>2nd trimester</td>
</tr>
<tr>
<td>16th -20th week</td>
<td>- fetal movements</td>
</tr>
<tr>
<td>17th week</td>
<td>- <strong>Grasp reflex</strong></td>
</tr>
<tr>
<td>18th week</td>
<td>- hearing, responds to loud noises, muscle contractions, movements and inc. HR</td>
</tr>
<tr>
<td>20th week</td>
<td>- bright light causes changes in fetal HR and position, retinal structures become functional</td>
</tr>
<tr>
<td>6th mo. (24th week)</td>
<td>- layers of cerebral cortex appears</td>
</tr>
<tr>
<td>25th week</td>
<td>- <strong>Moro or startle reflex</strong></td>
</tr>
<tr>
<td>7-9 months AOG</td>
<td>3rd trimester</td>
</tr>
<tr>
<td>7th mo. (28th week)</td>
<td>- eyelids open, smell and taste develops, <strong>Sucking reflex</strong></td>
</tr>
</tbody>
</table>

*development of nervous system
Pruning

✓ Refers to programmed elimination during development of neurons, synapses, axons & other brain structures from the original number, present at birth, to a lesser number
✓ Occurs to rid the nervous system of cells that have served their function in the development of brain
  • (E.g. some neurons only exist to produce neurotrophic or growth factors and are programmed to die)

Maternal stress

✓ High levels of stress hormones (E, NE) in the fetal bloodstream increases fetal BP, HR, and activity level
✓ Mothers with high level of anxiety = babies who are hyperactive, irritable, low BW
✓ Fever = fetal T rises

Genetic Disorders

✓ Diagnostic techniques
  • amniocentesis (14th and 16th week), ultrasound, X-ray, fetoscopy, fetal blood and skin sampling, chorionic villus sampling, α-fetoprotein screening
✓ In about 2% of women, results are (+) for
  • X-linked disorders, neural tube defects (↑α-fetoprotein), chromosomal disorders (Trisomy 21), IEM (Tay-Sachs disease and lipidoses)
✓ Diagnostic tests carry a risk (miscarriage).
✓ Prenatal testing recommended for women over 35 years of age and those with family history

Maternal Drug Use

<table>
<thead>
<tr>
<th>Alcohol</th>
<th>- major cause of birth defects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- each year, up to 40,000 babies</td>
</tr>
<tr>
<td></td>
<td>(alcohol-related damage)</td>
</tr>
<tr>
<td></td>
<td>- Fetal alcohol syndrome (affects 1/3 of all infants born to alcoholic mothers)</td>
</tr>
<tr>
<td></td>
<td>FAH: growth retardation, microphthalmia (small eyeballs), short palpebral fissures, midface hypoplasia, smooth or short philtrum, thin upper lip, CNS manifestations (microcephaly), delayed development, hyperactivity, attention-deficits, learning disabilities, intellectual deficits, seizures</td>
</tr>
<tr>
<td></td>
<td>- contribute to ADHD</td>
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</tbody>
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Smoking

- premature births and below average infant BW
- sudden infant death syndrome (SIDS)

Other Substances

Marijuana – (used by 3% of pregnant women), low infant BW, prematurity, withdrawal-like syndrome, excessive crying, tremors, hyperemesis
Cocaine – (1%), increased irritability, crying, desire for human contact
Heroin
Narcotics – withdrawal syndrome at birth
Common drugs – (antibiotics, anticonvulsants, carbamazepine, phenytoin, progesterone-estrogens, lithium, warfarin), teratogenic effects
SSRI (in utero selective serotonin reuptake inhibitor) – (exposure of mother during last month of pregnancy) neonatal behavioral syndrome

Radiation

Between weeks 2 and 15 AOG
- gross deformities, stunted growth, abnormal brain function, cancer
Hiroshima and Nagasaki – (8th to 15th week), brain damage

INFANCY

✓ starts at birth
✓ Average newborn wt.: 3,400g (7.5 lb)
✓ SGA occurs in about 7% of all pregnancies
✓ Premature fetuses have good chance of survival at 26th to the 28th week.
✓ Premature infants:
  • Gestation < 34 weeks
  • BW < 2,500g (5.5 lb)
  • With each 100g increment of weight beginning at about 1,000 g (2.2 lbs), infants have better chance of survival
✓ Postmature infants:
  • Born 2 weeks beyond expected date
  • Pregnancy is calculated 40 weeks from LMP

Developmental Landmarks

<table>
<thead>
<tr>
<th>Stage</th>
<th>Developmental Landmarks</th>
</tr>
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</table>
| Newborn | Reflexes
  - Rooting reflex
  - Knee reflex
  - Abdominal reflexes
  - Grasp reflex, Startle (Moro) reflex, Tonic neck reflex – gone by 4th mo.
  - Plantar (Babinski) reflex – disappears by 12th mo. |
Survival systems
- Breathing
- Sucking
- Swallowing
- Circulatory and Temp. homeostasis
- REM and non-REM sleep
- Crying, Smiling and Penile erection
- Development of neurophysiologic functions by stimulatory reinforcement of external environment (touching, etc.)

Language and Cognitive Development
- can make noises

<table>
<thead>
<tr>
<th>Age</th>
<th>Ability Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 day old</td>
<td>Can detect the smell of mother’s milk</td>
</tr>
<tr>
<td>3 days old</td>
<td>Distinguish mother’s voice</td>
</tr>
<tr>
<td>3 weeks</td>
<td>Emotional and Social Development</td>
</tr>
<tr>
<td></td>
<td>- can imitate facial movements</td>
</tr>
<tr>
<td>8 weeks</td>
<td>Can vocalize guttural or babbling sounds</td>
</tr>
<tr>
<td>&lt;2 months</td>
<td>Endogenous smiling (1st Phase)</td>
</tr>
<tr>
<td>16th week</td>
<td>Exogenous smiling (2nd Phase)</td>
</tr>
<tr>
<td>End of Infancy (2 years)</td>
<td>- Transformed reflexes to voluntary actions (building blocks of cognition)</td>
</tr>
<tr>
<td></td>
<td>- Intentional actions</td>
</tr>
<tr>
<td></td>
<td>- Use symbolic play and language</td>
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</tbody>
</table>

*The caregiving person provides major stimulus for all aspects of mental growth.

Temperamental Differences

Temperament – Newborn to 6 Years
by Chess and Thomas

<table>
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<th>Dimension</th>
<th>Description</th>
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<tbody>
<tr>
<td>Activity level</td>
<td>Percent of time spent in activities</td>
</tr>
<tr>
<td>Distractibility</td>
<td>Degree to which stimuli are allowed to alter behavior</td>
</tr>
<tr>
<td>Adaptability</td>
<td>Ease moving into change</td>
</tr>
<tr>
<td>Attention span</td>
<td>Amount of time spent on attending</td>
</tr>
<tr>
<td>Intensity</td>
<td>Energy level</td>
</tr>
<tr>
<td>Threshold of responsiveness</td>
<td>Intensity required for response</td>
</tr>
<tr>
<td>Quality of mood</td>
<td>Amount positive compared to amount negative behavior</td>
</tr>
<tr>
<td>Rhythmicity</td>
<td>Regulation of functions</td>
</tr>
<tr>
<td>Approach/withdrawal</td>
<td>Response to new situations</td>
</tr>
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Attachment – relationship the baby develops with his/her caregivers

Types of Attachment

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<tr>
<td>Secure</td>
<td>Few adjustment problems</td>
</tr>
<tr>
<td>Insecure/Avoidant</td>
<td>From parents who are insecurely attached to their families</td>
</tr>
<tr>
<td>Insecure/Ambivalent</td>
<td>From parents who are neglecting, disorganized and inattentive</td>
</tr>
</tbody>
</table>

Fathers and Attachment

- Mothers = caregiving
- Fathers = play

Stranger Anxiety

- Noted at about 26 weeks of age
- Fully developed at 32 weeks (8 mos.)
- At an approach by stranger, infants cry and cling to their mothers.
- Result from baby’s growing ability to distinguish caregivers from others

Separation Anxiety

- 10 to 18 months
- Infant crawls back to mother for reassurance

Infant Care

Parental Fit – how well a mother/father relates to the newborn, takes into account temperamental characteristics of both parents and child

- Temperament – collective term for innate psychophysiologic characteristics
- Chess and Thomas Temperamental Patterns
  - Difficult children (10%)
  - Easy children (40%)
  - Mix types (50%)
- Goodness of fit – characterize harmonious and constant interaction between mother and child in their motivations, capacities, and styles of behavior

Good-Enough Mothering – mother supply a holding environment in which infants are contained

Attachment

- Bonding – intense emotional and psychological relationship a mother develops for her baby
**TODDLER**

- Marked by *accelerated motor and intellectual development*
- Ability to walk
- Acquisition of speech
  - Children learn “no” before “yes”
  - Negativism is vital to independence
- Learning language

**Developmental Landmarks**

<table>
<thead>
<tr>
<th>Aspect of Development</th>
<th>Landmarks</th>
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</table>
| Language and Cognitive | - listen to explanations that can help them tolerate delay  
- originality  
- engage in symbolic activities  
- varying concentration and self-regulation |
| Emotional and Social | - Social Referencing – children look at parents for emotional cues about how to respond to novel events  
- Pleasure in developing new behavior (e.g. teasing, surprising, fooling)  
- organized demonstration of love (kisses parents, hugs, etc.) |
| Sexual | - sex typing  
- curiosity about anatomical sex  
- Gender identity - unshakeable conviction of being male or female, manifests at 18 mos. and fixed by 24 to 30 mos.  
- Gender role – by society |
| Sphincter Control and Sleep | - Toilet training  
- control of daytime urination (2 ½ yr)  
- control of nighttime urination and bowel (4 yrs)  
- sleeping, fear of dark  
- sleeps 12 hrs a day, with a 2-hr nap  
- Ave. 2 yr old takes about 30 minutes to fall asleep |

**Parenting**

- Requires firmness about the boundaries of acceptable behavior and encouragement of the child’s progressive emancipation
- Toddlers struggle for exclusive affection and attention from parents
- Sibling rivalry

**PRESCHOOL PERIOD**

- Marked *physical and emotional growth*
- By 2 to 3 yrs, children reach half of adult height
- The 20 baby teeth are being replaced
- School
- Mastered the tasks of primary socialization – to control urine and bowel, feed and dress themselves, control tears and outbursts

**Developmental Landmarks**

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<tr>
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</table>
| Language and Cognitive | - Use sentences  
- Ego-centric  
- Think intuitively and prelogically  
- Doesn’t understand causal relations |
| Emotional and Social Behavior | - Express complex emotions (love, sad, jealousy, etc.)  
- Emotions influenced by somatic events (hunger, etc.)  
- Capacity for cooperation and sharing  
- Anxiety, guilt  
- Aware of their genitalia  
- Preoccupation to illness, injury *(the Band-Aid phase)*  
- Develop a division between what they want and what they are told to do  
- Conscience |
| Sibling rivalry | - favoritism, displacement of a firstborn can be a traumatic event |
| Play | - distinguish reality from fantasy  
- Pretend games, Dramatic play  
2 ½ yrs: Parallel, solitary play  
3 yrs: Associative play  
4 yrs: Cooperative play  
- by age 3 to 6 years, growth can be traced through drawings |
| Imaginary companions | - toys that are anthropomorphized  
- commonly disappear by age 12 |
| Television | - 3 to 4 hours a day |
MIDDLE YEARS

✓ enter Elementary school
✓ academic learning and accomplishment

Developmental Landmarks

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<tr>
<th>Aspect of Development</th>
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</table>
| Language and Cognitive | - complex ideas  
- logic > fantasy  
- conceptual skills develop, thinking becomes organized and logical  
- concentration, abstract terms 
- improved gross motor coordination and muscle strength  
- reasoning  
- peer interaction (school-age)  
- empathy, concern, love, compassion, sharing  
- latency period (psychosexual exploration)  
- Chum period (buddy) 
- School refusal |

OTHER ISSUES IN CHILDHOOD

Sex Role Development

✓ gender identity
✓ Male:  
  o independence  
  o physical play  
  o aggressiveness
✓ Female:  
  o dependence 
  o verbalization 
  o physical intimacy

Dreams and Sleep

✓ 1 yr: reality and fantasy are undistinguishable, dreams are experienced as if they were true 
✓ 3 yrs: dreams are shared 
✓ 4 yrs: dreams are unique  
✓ Disturbing dreams peak at 3, 6 and 10 yrs 
✓ 5 yrs: dreams are not real  
✓ 7 yrs: they create the dream themselves 
✓ Parasomnias – sleepwalking, sleeptalking, enuresis (bed wetting), night terrors; occur during stage 4 sleep when dreaming is minimal

✓ Periods of REM: 60% of the time during first few weeks of life 
✓ Sleep-wake cycle of newborns: 3 hours 
✓ Among adults, the dream-to-sleep ratio is: 20% of sleeping time is for dreaming

Birth Spacing

✓ Repeated childbearing prevents adequate recuperation from the birth process and places mother at risk for complications and injury

Birth Order

✓ Firstborn  
  o highly valued in non-Western  
  o have higher IQ  
  o more achievement-oriented  
  o most authoritarian  
  o conservative and conformists
✓ Second and third children  
  o advantage of their parents’ previous experience  
  o maybe resented by the firstborn  
  o regressive behavior (enuresis) or thumb sucking occurs
✓ Middle child  
  o receives least attention at home  
  o may develop strong peer relations to compensate
✓ Youngest child  
  o receive too much attention, spoiled  
  o independent and rebellious  
  o tend to become prominent people

Children and Divorce

✓ inc. in behavioral and emotional disorders  
✓ physical aggression = common sign of distress

Effects of Divorce on Children

✓ antisocial personality disorder, child conduct disorder, ADHD  
✓ delinquent, engaged in premarital sex, bear children out of wedlock  
✓ function more poorly, psychological problems  
✓ greater risk for injury, asthma, headaches, speech defects  
✓ impulsive, irritable, socially withdrawn, lonely, unhappy, anxious and insecure  
✓ suicidal rates are higher  
✓ 25% have significant adjustment problems as teenagers
Types of Step-families

| Neo-traditional | > resembles “traditional” families  
|                 | > absent biological parent is included at times  
|                 | > discipline, boundaries, etc. are discussed openly  
|                 | > family coalitions are better avoided  
| Romantic        | > expect to be a “traditional” family immediately  
|                 | > absent biological parent is expected to disappear, often criticized  
|                 | > stepparents/stepchild difficulties are common  
|                 | > stress is unbearable  
|                 | > few open discussions  
| Matriarchal     | > run by highly competent mom and a companion  
|                 | > “companion” is a buddy to the children, not to parent  
|                 | > birth of step-sibling causes problems  

| Authoritarian style | Strict, inflexible rules  
|                    | Low self-esteem, unhappiness, social withdrawal  
| Indulgent permissive | Little or no limit setting coupled with unpredictable parental harshness  
|                    | Low self-reliance, poor impulse control, aggression  
| Indulgent neglectful | Noninvolvement in child’s life  
| Authoritative reciprocal | Firm rules and shared decision-making in warm, loving environment  
|                             | Self-reliance, self-esteem, social responsibility  

Adoption

✓ process by which a child is taken into family by one or more adults who are not biological parents but are recognized by the law as the child’s parents  
✓ emotional and behavioral disorders  
✓ the later the age of adoption, the higher the incidence of behavior problems  
✓ strong desire to meet biological parents  

Family Factors in Child Development

Family stability – living under the same roof in harmonious interaction  

Other Family factors – death of parent, working parents, home caregivers  

Day Care Centers – effect still not known, one study proved that it makes children more demanding, more aggressive, and more noncompliant; they showed higher cognitive skills  

Parenting Styles – ways in which children are raised  

Rutter classified parenting styles into four;  

Development and Expression of Psychopathology

✓ delayed speech (do not use words by 18 months or phrases by 2 ½ to 3 years)  
✓ mild mental retardation (elementary school)  
✓ disruptive behavior disorders (peer interaction)  
✓ attention-deficit disorders  
✓ schizophrenia and bipolar disorder

Source:  
Kaplan & Sadock’s Synopsis of Psychiatry 10th Ed