Fetal Health and Development

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The Miracle of Fertilization

- Fetal development week by week
  - Click here to watch the video: http://www.youtube.com/watch?v=RS1ti23SUSw
Fetal Development Video

The Moment of Conception
Basic Definitions of Growth and Development

- **Growth**
  - Increase in mass
  - Result of increase in cell size and number

- **Development**
  - Differentiation of function
  - Increase in complexity
Features of Development

- Developmental milestone
  - Attainment of a skill that typically develops sequentially and is a function of maturation

- Streams of development include ...
  - Motor
  - Cognitive
  - Language
  - Social
  - Emotional/affective
How Long Does It Take a Sperm to Reach an Ovum?

a) One minute

b) One hour

c) One day

d) One week

e) One month
Stages of Embryo Formation

Stages of Development—Early Embryo

- Zygote
- Two-cell stage
- Four-cell stage
- Eight-cell stage
- Morula
- Fimbria
- Unfertilized egg
- Ovary
- Blastocyst
- Implantation
- Endometrium
- Uterus

Fertilization
### Stages

<table>
<thead>
<tr>
<th>Period of dividing zygote, implantation &amp; bilaminar embryo (weeks 1-2)</th>
<th>Embryonic period (weeks 3-8)</th>
<th>Fetal period (weeks 9-38)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Embryonic Stages" /></td>
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<td>Usually not susceptible to teratogens</td>
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<tr>
<td>Prenatal Death</td>
<td>Major Morphological Abnormalities</td>
<td>Physiological Defects &amp; Minor Morphological Abnormalities</td>
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- **Central Nervous System**
  - Heart
  - Arms
  - Eyes
  - Legs
  - Teeth
  - Palate
  - External Genitalia
  - Ear

Preconception Period

- Physical and mental health
  - Chronic Illnesses
  - Family history of chronic illness
  - Mental Illnesses
  - Prior pregnancy losses
Preconception Period

- Social influences
  - Maternal age
  - Paternal age
  - Parity
  - Prior losses
  - Employment
  - Marital status
Preconception Period

- Exposures
  - Environmental: toxins in water, home, workplace
  - Medication use
  - Domestic violence/abuse
The First Trimester

- **Week 6**
  - Skeletal formation begins
  - Neural tube closes
  - Limb buds appear

- **Week 8**
  - Ventricular system of brain elaborates
  - Vertebrae develop
  - Aorta and pulmonary valves present; left and right ventricles present

- **Week 9**
  - Embryo referred to as fetus (previously conceptus)

- **Week 12**
  - Circulatory and gastrointestinal systems start functioning
  - Corpus callosum forms, connecting left and right hemispheres of the brain
Early Pregnancy

- Birth defects
  - Genetic anomalies
  - Structural malformations
    - Chronic disease
    - Drug use
    - Environmental exposures
    - Infections
The Second Trimester

- **Week 14**
  - Head is half the size of the body
  - Chromosomal abnormalities detectable
  - Limb deformities detectable

- **Week 16**
  - Heart beat audible
  - Neural tubes defects detectable
  - Kidney functioning
  - All major organs formed

- **Week 20**
  - Skeletal growth continues
  - Muscle growth (weak kicks)
  - Can respond to loud sounds
Early-Mid Pregnancy

- Miscarriages: prevalence—approximately 13 percent of pregnancies
  - Causes are related to gestation
    - Genetic
    - Structural
    - Hormonal
    - Recurrence
    - Trauma
    - Unknown
The Third Trimester

- **Week 24**
  - Gaining 6 ounces per week
  - Suck begins
  - Lung development with surfactant production
  - Viability

- **Week 28**
  - Eyes formed
  - Lungs capable of breathing
  - Hair growing