

# Fetal Development

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## 1 Birth age

### Age definitions

- Term birth: 38-40 weeks gestation
- Premature: born prior to 37 weeks gestation
- Gestational age: number of months/days in utero (how long in utero, date of last menstrual period to when baby was born)
- Chronological age: Time since date of birth

- Adjusted age: (40 weeks - gestational age) - chronological age

How to calculate age for premature babies

## 2 Periods

Broken down into 3 period

1. Germinal period (~2 wk)
2. Embryonic period (3-7wk)
3. Fetal period (wk8-birth)

### 2.1 Germinal Period

- Time: fertilization to -2 weeks
- Implantation

### 2.2 Embryonic period

Occurs from Week #3-7

#### Caution

- Especially vulnerable to teratogens (she says teratogens = can be drugs, malnutrition, radiation, anything that can cause damage)
- Why important: you might not know you're pregnant until this embryonic window has closed
  - This can be an issue!
  - Neural tube defects can occur
    - \* Folic acid can help prevent this!
  - Those who are of child bearing age= just take folic acid
  - Even if thinking ur not going to have kids

### 2.3 Fetal period

- 8 weeks to birth
- Phase of rapid growth

## **3 Week based development**

### **3.1 First 4 Weeks**

- 2-3 weeks: neural plate begins for brain and heart begins as a single tube
- 3 weeks: cell differentiation into 3 layers
  - Ectoderm
  - Mesoderm
  - Endoderm
- 4 weeks- head region differentiated , primitive brain and spinal cord, initial limb buds

### **3.2 8 Weeks**

- Organs become functional
- Limb buds grow and differentiate – muscle , nerves

### **3.3 12 Weeks**

- More activity, moves head and extremities but mvmts not yet felt by pregnant person
- All organs, limbs, bones, mm are present and will continue to develop in order to become fully functional

### **3.4 16 Weeks**

Fetus starts to make sucking motion w mouth, ears, developed enough to hear sounds, voices

### **3.5 20 Weeks**

- Preg person starts to feel mvmt
- Sleep/wake patterns develop
- Heart can be heard w stethoscope
- In weeks 17-20 fetus develops fat and lanugo: peach like fuzz like hair, helps keep fetus warm and provides layer of protection

### 3.6 23 Weeks

- If born now, potentially viable if received specialized medical care
- The baby should begin to excrete Surfactant by the alveoli which is essential for lung function

#### **i** Surfactant information

Surfactant, which is essential to lung function, is starting to be excreted by alveoli cells (1) Lowering surface tension at the air-liquid interface and thus preventing alveolar collapse at end-expiration, (2) interacting with and subsequent killing of pathogens or preventing their dissemination, and (3) modulating immune responses.

### 3.7 24 Weeks

Lungs fully developed but not well enough to function independently outside uterus

### 3.8 28 Weeks

Brain developing rapidly

### 3.9 32 Weeks

- Hears sounds and responds w mvmt
- Suck swallow reflex developing
- Lanugo falling off
- Organs well developed, except lungs and brain

### 3.10 36 Weeks

- CNS greater control over body functions
- Increasing levels of surfactant production

### 3.11 40 Weeks

- Movement more confined
- Adequate surfactant levels
- Physiological flexion developed (bc they run out of space in womb, but super important bc that is how u develop proprioception and kinesthetic awareness) (especially in hands and feet)