

# Fetal Development

## From Fertilization to Birth

Conception occurs when a woman's egg is fertilized by a man's sperm. The union of egg and sperm usually occurs in the woman's fallopian tube. The cell, now containing a complete set of genetic material, begins to divide into more cells while traveling down the fallopian tube to the uterus. This journey takes about a week.

By the eighth day after fertilization the ball of cells has begun to attach itself to the wall of the uterus where it can obtain nutrients to continue its growth. The growing body of cells is called an embryo from the time of attachment in the uterus until it begins its ninth week of growth.

Thereafter, it is appropriately referred to as a fetus. "Fetal age" in this website refers to the time from conception. "Gestational age" is two weeks longer than the fetal age because it is counted from the beginning of the woman's last menstrual period. Fetal size is measured by weight and by length. Length is measured from the top of the head (crown) to the rump, called crown-rump length (CRL).

The descriptions of fetal development are not intended to be complete. For more information and readings on fetal development, go to the [reference lists](#).

## First Trimester

Throughout this section, fetal development is described in terms of number of weeks from conception and number of weeks from last menstrual period (LMP); LMP is the description medical providers commonly use when calculating a due date.

### 2 weeks after conception

#### (4 weeks after the last menstrual period)

- The embryo is about 1/100 of an inch long.  
[ [View Picture](#) ]
- The ball of cells collapses and begins to form cell layers.

### 4 weeks after conception

#### (6 weeks after the last menstrual period)

- The embryo is about 1/6 inch long.
- Structures that will become arms and legs (limb buds) begin to appear.
- The circulatory system begins to form. The heart is pumping blood and the rate can be measured by ultrasound.
- In the fifth week, the neural tube forms, which later will become the spinal cord and brain.

### 6 weeks after conception

#### (8 weeks after the last menstrual period)

- The embryo is now about 1/2 to 5/8 inches long.  
[ [View Picture](#) ]
- Eyes, ears, and facial features begin to develop.
- Fingers and toes are more distinct.

### 8 weeks after conception

#### (10 weeks after the last menstrual period)

- The embryo has matured and is referred to as a fetus for the rest of the pregnancy.

- The fetus is about 1¼ - 1 ½ inches long from crown to rump.
- Muscles and skeleton are developing and the nervous system becomes mature enough that reflex activity may occur.
- The beginnings of all the key body parts and organs are present, although they are immature and not completely positioned in their final locations.
- The fetal heartbeat can be heard with an electronic monitoring device.

### **10 weeks after conception**

#### **(12 weeks after the last menstrual period)**

- The fetus is about 2½ inches long from crown to rump and weighs 1/3 to ½ ounce.  
[ [View Picture](#) ]
- The fetus makes small, random movements, too small to be felt.
- The eyelids form and cover the eye. The eyes remain closed for now.
- The fingernails appear on the digits.

### **12 weeks after conception**

#### **(14 weeks after the last menstrual period)**

- The fetus is about 3 ½ inches long from crown to rump and weighs about 1 ounce.
- Swallowing movements begin.
- The kidneys begin to make small amounts of urine.
- External genitalia are now formed. An ultrasound may possibly identify the sex of the fetus at this time.

## **Second Trimester**

### **14 weeks after conception**

#### **(16 weeks after the last menstrual period)**

- The fetus is about 4 ¾ inches from crown to rump and weighs about 3 ½ ounces.  
[ [View Picture](#) ]
- The head is more erect and the arms and legs are developed.
- Limb movements become more coordinated because joints will now function.

### **16 weeks after conception**

#### **(18 weeks after the last menstrual period)**

- The fetus is about 5 ½ inches long from crown to rump and weighs between 6 and 7 ounces.
- The skin is transparent. Blood vessels are very easily seen through the skin.
- Hair and nails begin to grow.
- The fetus can now blink, grasp, and move the mouth.

### **18 weeks after conception**

#### **(20 weeks after the last menstrual period)**

- The fetus is about 6 ½ inches long from crown to rump and weighs about 10 ounces.  
[ [View Picture](#) ]
- All organs and structures have been formed and a period of simple growth begins.
- The skin is covered by vernix, a waxy substance that protects the skin.
- Most women feel the fetus moving or kicking.
- The sex of the fetus can now often be more readily identified by ultrasound.
- Some experts have concluded the fetus is capable of feeling physical pain at about this time of development; other experts have concluded the fetus feels pain during later

stages of development. This issue can be explored in the reference section of this website.

**20 weeks after conception  
(22 weeks after the last menstrual period)**

- The fetus is about 7 ½ inches long from crown to rump and weighs from 14 to 16 ounces (1 pound).
- The fetus is more active, kicking, sucking, and turning in the uterus.
- A period of extremely rapid brain development is beginning.
- The eyelids, eyebrows, and fingernails are well developed.
- Survival rates for fetuses born at 22 weeks' gestation are low.

**22 weeks after conception  
(24 weeks after the last menstrual period)**

- The fetus is about 8 ½ inches long from crown to rump and weighs about 1 ¼ pounds. [\[ View Picture \]](#)
- The bones of the ears harden, enabling sound conduction. The fetus can now hear voices or sounds of its mother's breathing or heartbeat.
- The proportions of the face and body begin to assume the appearance of an infant near its due date.
- A period of substantial weight gain is beginning; fat layers are starting to form.
- Lungs are still immature; a fetus born at this time will attempt to breathe, but is not likely to survive without very intensive care. In Alaska, with optimal care, the survival rate of fetuses born at 23 weeks gestation is approximately 63%. If born at 24 weeks gestation, survival odds improve to 70%.

**24 weeks after conception  
(26 weeks after the last menstrual period)**

- The fetus is about 9 inches long from crown to rump and weighs 1½ to 1 ¾ pound.
- The body is lean and the skin appears wrinkled due to the lack of body fat.
- In Alaska, with optimal care, survival is 80% likely for fetuses born at this gestational age.

## **Third Trimester**

**26 weeks after conception  
(28 weeks after the last menstrual period)**

- The fetus is about 10 inches long from crown to rump and weighs around 2 ½ pounds. [\[ View Picture \]](#)
- The eyes can perceive light, eyes can open and eyelashes are now present.
- The woman may feel fetal respiratory movements as "hiccups".
- Although immature, an otherwise normal fetus born at this time will often survive with expert care. In Alaska around 90% of fetuses born at 28 weeks gestation can survive with good care.

**28 weeks after conception  
(30 weeks after the last menstrual period)**

- The fetus is 10 ½ inches long from crown to rump and weighs almost 3 pounds.
- The lungs develop to the point where breathing air is possible, although help is usually needed. In Alaska, with good care, the survival rate is 96% or better for fetuses of 29 weeks gestation or more.

### **30 weeks after conception**

#### **(32 weeks after the last menstrual period)**

- The fetus is about 11 inches long from crown to rump and generally weighs more than 3 pounds.  
[\[ View Picture \]](#)
- The skin is pink and no longer so transparent.
- Toenails are now present.
- From this stage on, fetal development is essentially complete, and growth is the primary change noted.

### **32 weeks after conception**

#### **(34 weeks after the last menstrual period)**

- The fetus is about 12 inches long from crown to rump and generally weighs 4 to 4 ½ pounds.
- Eyes close during sleep and open during alert times.
- The skin becomes smoother and pink.

### **34 weeks after conception**

#### **(36 weeks after the last menstrual period)**

- The fetus is 13 inches long from crown to rump and generally weighs about 5 to 5½ pounds.  
[\[ View Picture \]](#)
- Scalp hair is silky and lays against the head.
- Muscle tone improves so the fetus can turn and lift its head.

### **36 weeks after conception**

#### **(38 weeks after the last menstrual period)**

- The fetus is 13 ½ inches long from crown to rump and generally weighs between 5 ½ to 6 ½ pounds.
- Lungs are usually mature.
- The fetus can grasp firmly.
- The fetus turns toward light sources.
- The fetus is gaining about ½ ounce per day.

### **38 weeks after conception**

#### **(40 weeks after the last menstrual period)**

- The fetus averages 14 ½ inches from crown to rump and an average of 20 inches in length from head to toe. [\[ View Picture \]](#)
- The average weight is around 7 ½ pounds.
- This is a "full-term" fetus ready to be born.