

## FETAL DEVELOPMENT OF THE UNBORN CHILD

Conception begins on the day a woman's egg is fertilized by a sperm penetrating it. Within a day, the egg begins to develop rapidly. Within a few days the cluster of between 13 and 32 cells leave the fallopian tube and move into the uterus. This group of cells is now called a blastocyst and has increased in size to hundreds of cells. By the eighth day after conception the blastocyst has begun to attach to the wall of the uterus where it will grow at a rapid rate.

The term embryo refers to a developing human from implantation until the eighth week of pregnancy. After the eight week, the unborn child is referred to as a fetus. Ages in this handbook are listed from both the estimated day of conception and from the first day of the last normal menstrual period. Lengths are measured from the top of the head to the rump.

A pregnant woman may notice her first missed menstrual period at the end of the second week after conception, or about four weeks after the first day of her last normal period. There are different kinds of tests for pregnancy. Some may not be accurate for up to three weeks after conception, or five weeks after the first day of the last normal period.

### FIRST TRIMESTER

#### 2 WEEKS

*(4 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- Following implantation the blastocyst is called an embryo.
- The embryo is about 1/100 of an inch long at this time.
- The embryo continues to grow.





## 4 WEEKS

(6 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)

- The embryo is about 1/6 to 1/4 inch long and has developed a head and a trunk.
- Structures that will become arms and legs, called limb buds, begin to appear.
- A blood vessel forms which will later develop into the heart and circulatory system. Blood is beginning to be pumped and is visible by ultrasound.
- At about the same time, a ridge of tissue forms down the length of the embryo. That tissue will later develop into the brain and spinal cord.

## 6 WEEKS

(8 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)

- The embryo is about 1/2 to 3/4 inches.
- The heart now has four chambers.
- Fingers and toes begin to form.
- Reflex activity begins with the development of the brain and nervous system.
- Cells are starting to form the eyes, ears, jaws, lungs, stomach, intestines and liver.





## 8 WEEKS

*(10 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus, until now called an embryo, is about 1-1/4 to 1-1/2 inches long (with the head making up about half this size) and weighs less than 1/2 ounce.
- The beginnings of all key body parts are present, although they are not completely positioned in their final locations.
- Structures that will form eyes, ears, arms and legs are identifiable.
- Muscles and skeleton are developing and the nervous system becomes more responsive.

## 10 WEEKS

*(12 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 2-1/2 inches from head to rump, weighing about 1-1/2 ounces.
- Fingers and toes are distinct and have nails.
- The fetus begins small, random movements, too slight to be felt.
- The fetal heartbeat can be detected with a doppler or heart monitor.
- All major external body features have appeared.
- Muscles continue to develop.





## 12 WEEKS

*(14 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 3-1/2 inches from head to rump and weighs about 2 ounces.
- The fetus begins to swallow, the kidneys make urine, and blood begins to form in the bone marrow.
- Joints and muscles allow full body movement.
- There are eyelids and the nose is developing a bridge.
- External genitals have been developing so that the sex can be identified.

## SECOND TRIMESTER

### 14 WEEKS

*(16 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 4-3/4 to 5 inches from head to rump and weighs 4 ounces.
- The head is erect and the arms and legs are developed.
- The skin appears transparent.
- A fine layer of hair has begun to grow on the head.
- Limb movements become more coordinated.





## 16 WEEKS

*(18 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 5 to 5-1/2 inches from head to rump and weighs about 6 to 8 ounces.
- The skin is pink and transparent and the ears are clearly visible.
- All the body and facial features are now recognizable.
- The fetus can now blink, grasp, move its mouth.
- Hair and nails begin to grow.
- The fetus has begun to kick, although women may not be able to feel the movement.

## 18 WEEKS

*(20 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 6-1/4 inches from head to rump, weighing about 10 to 12 ounces.
- All organs and structures have been formed, and a period of simple growth begins.
- The skin is covered with vernix - a greasy material that protects the skin.
- Respiratory movements occur, but the lungs have not developed enough to permit survival outside the uterus.
- By this time, the woman may feel the fetus moving.
- If an ultrasound is performed at this-time, the parents may be told the sex.





## 20 WEEKS

*(22 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 7-1/2 inches from head to rump, has fingerprints and perhaps some head and body hair, weighing about one pound (16 ounces).
- Fetus may suck thumb and is more active.
- Time of extremely rapid brain growth.
- Fetal heartbeat can be heard with a stethoscope.
- The kidneys are starting to work.
- There is little chance that a baby could survive outside the woman's body.

## 22 WEEKS

*(24 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 8-1/4 to 8-1/2 inches from head to rump and weighs about 1-1/4 pounds.
- Bones of the ears harden making sound conduction possible. Fetus hears mother's sounds such as breathing, heartbeat and voice.
- The first layers of fat are beginning to form.
- This is the beginning of substantial weight gain for the fetus.
- Changes are occurring in lung development so that some babies are able to survive (with intensive care services).
- Surviving babies may have disabilities and require long-term intensive care.



## THIRD TRIMESTER



### 24 WEEKS

*(26 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 9 inches from head to rump and weighs about 2 pounds.
- The fetus can respond to sound from both inside and outside the uterus.
- Reflex movements improve and body movements are stronger.
- Lungs continue to develop.
- The fetus now wakes and sleeps.
- The skin has turned red and wrinkled and is covered with fine hair.
- Almost 8 out of 10 babies born now may survive (with intensive care services).

### 26 WEEKS

*(28 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 10 inches from head to rump and weighs about 2-1/2 pounds.
- Mouth and lips show more sensitivity.
- The eyes are partially open and can perceive light.
- Brain wave patterns resemble those of a full term baby at birth.
- About 9 out of 10 babies born now will survive (with intensive care services).





## 28 WEEKS

*(30 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 10-1/2 inches from head to rump and weighs almost 3 pounds.
- The fetus has lungs that are capable of breathing air, although medical help may be needed.
- The fetus can open and close its eyes, suck its thumb, cry and respond to sound.
- Rhythmic breathing and body temperature are now controlled by the brain (or Central Nervous System).
- Nearly all babies born now will survive (with intensive care services).

## 30 WEEKS

*(32 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 11 inches from head to rump and weighs more than 3 pounds.
- Skin is thicker and more pink.
- There is an increase in the connections between the nerve cells in the brain.
- From this stage on, fetal development centers mostly around growth.
- Almost all babies born now will survive (with intensive care services).







## 32 WEEKS

*(34 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 11-3/4 to 12 inches from head to rump and weighs about 4-1/2 pounds.
- Ears begin to hold shape.
- Eyes open during alert times and close during sleep.
- The skin is now pink and smooth.
- Almost all babies born now will survive (some will need intensive care services).

## 34 WEEKS

*(36 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 12-1/2 inches from head to rump and weighs about 5-1/2 pounds.
- Scalp hair is silky and lays against the head.
- Muscle tone has now developed and the fetus can turn and lift its head.
- Almost all babies born now will survive.





### 36 WEEKS

*(38 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 13-1/2 inches from head to rump and weighs about 6-1/2 pounds.
- Lungs are usually mature.
- The fetus can grasp firmly.
- Fetus turns toward light sources.
- Almost all babies born now will survive.

### 38 WEEKS

*(40 WEEKS AFTER THE FIRST DAY OF THE LAST NORMAL MENSTRUAL PERIOD)*

- The fetus is about 14 inches from head to rump, may be more than 20 inches overall, and may weigh from 6-1/2 to 10 pounds.
- At the time of birth, a baby can display more than 70 reflex behaviors which are automatic and unlearned behaviors necessary for survival.
- The baby is full-term and ready to be born.

