

Fetal Development

Alternative Names

Zygote; Blastocyst; Embryo; Fetus

Information

When sperm is deposited in the vagina, it travels through the cervix and into the Fallopian tubes.

ZYGOTE

A single sperm penetrates the mother's egg cell, and the resulting cell is called a zygote. The zygote contains all of the genetic information (DNA) necessary to become a child. Half of the genetic information comes from the mother's egg and half from the father's sperm. The zygote spends the next few days traveling down the Fallopian tube and divides to form a ball of cells.

BLASTOCYST

The zygote continues to divide, creating an inner group of cells with an outer shell. This stage is called a blastocyst. The inner group of cells will become the embryo, while the outer group of cells will become the membranes that nourish and protect it.

The blastocyst reaches the womb (uterus) around day 5, and implants into the uterine wall on about day 6. At this point in the mother's menstrual cycle, the lining of the uterus has grown and is ready to support a fetus. The blastocyst sticks tightly to the lining, where it receives nourishment via the mother's bloodstream.

EMBRYO

The cells of the embryo now multiply and begin to take on specific functions. This process is called differentiation. It leads to the various cell types that make up a human being (such as blood cells, kidney cells, and nerve cells).

There is rapid growth, and the baby's main external features begin to take form. It is during this critical period (most of the first trimester) that the growing baby is most susceptible to damage. The following can interfere with the baby's development:

- Alcohol, certain prescription and recreational drugs, and other substances that cause birth defects
- Infection (such as rubella or cytomegalovirus)
- Nutritional deficiencies
- X-rays or radiation therapy

7.5 weeks



ADAM.

8.5 weeks



ADAM.

WEEK BY WEEK CHANGES

The following list describes specific changes that occur in the womb:

- Week 3 of gestation
 - The brain, spinal cord, and heart begin to develop
 - The gastrointestinal tract begins to develop
- Weeks 4 to 5
 - Arm and leg buds become visible
 - Brain develops into five areas and some cranial nerves are visible
 - Eyes and ear structures begin to form
 - Formation of tissue that develops into the vertebra and some other bones
 - Further development of the heart which now beats at a regular rhythm
 - Movement of rudimentary blood through the main vessels
- Week 6
 - Arms and legs have grown longer, and foot and hand areas can be distinguished
 - Hands and feet have fingers and toes (digits), but may still be webbed
 - Brain continues to form
 - Lungs begin to form
- Week 7
 - Nipples and hair follicles form
 - Elbows and toes visible
 - All essential organs have begun to form
- Week 8
 - Eyelids are more developed
 - External features of the ear begin to take their final shape
 - Facial features continue to develop
 - Intestines rotate

The end of the eighth week marks the end of the "embryonic period" and the beginning of the "fetal period".

- Weeks 9 to 12
 - Eyelids close and will not reopen until about the 28th week
 - Face is well formed
 - Limbs are long and thin
 - Genitals appear well differentiated
 - Red blood cells are produced in the liver
 - The head makes up nearly half of the fetus' size
 - The baby can make a fist with its fingers
 - Tooth buds appear for the baby teeth
- Weeks 13 to 16
 - Fetal skin is almost transparent
 - Fine hair called lanugo develops on the head
 - Meconium is made in the intestinal tract
 - More muscle tissue and bones have developed, and the bones become harder
 - The baby begins to make active movements
 - The liver and pancreas produce fluid secretions
 - Sucking motions are made with the mouth
- Weeks 17 to 19
 - Baby can hear
 - Baby makes more movements
 - Mother may feel a fluttering in the lower abdomen
- Week 20
 - Lanugo hair covers entire body
 - Eyebrows and lashes appear
 - Nails appear on fingers and toes
 - The baby is more active with increased muscle development
 - Mother can feel the baby moving
 - Fetal heartbeat can be heard with a stethoscope
- Weeks 21 to 23
 - Bone marrow begins to make blood cells

- The lower airways of the baby's lungs develop but still do not produce surfactant (a substance that allows the alveoli to open for gas exchange)
- Baby begins to store fat
- Week 24
 - Eyebrows and eyelashes are well formed
 - All eye parts are developed
 - The baby has a hand and startle reflex
 - Footprints and fingerprints forming
 - Air sacs form in lungs
- Weeks 25 to 28
 - Rapid brain development
 - Nervous system developed enough to control some body functions
 - Eyelids open and close
 - Respiratory system, while immature, has developed to the point where gas exchange is possible
- Weeks 29 to 32
 - Rapid increase in the amount of body fat
 - Rhythmic breathing movements occur, but lungs are not fully mature
 - Bones are fully developed, but still soft and pliable
 - Baby's body begins storing iron, calcium, and phosphorus
- Week 36
 - Lanugo begins to disappear
 - Body fat increases
 - Fingernails reach the end of the fingertips
- Weeks 37 to 40
 - Lanugo is gone except for on the upper arms and shoulders
 - Fingernails extend beyond fingertips
 - Small breast buds are present on both sexes
 - Head hair is now coarse and thicker

Review Date: 10/19/2007

Reviewed By: Deirdre O'Reilly, MD, MPH, Neonatologist, Division of Newborn Medicine, Children's Hospital Boston and Instructor in Pediatrics, Harvard Medical School, Boston, Massachusetts. Review Provided by VeriMed Healthcare Network.

The information provided herein should not be used during any medical emergency or for the diagnosis or treatment of any medical condition. A licensed medical professional should be consulted for diagnosis and treatment of any and all medical conditions. Call 911 for all medical emergencies. Links to other sites are provided for information only -- they do not constitute endorsements of those other sites. © 1997-A.D.A.M., Inc. Any duplication or distribution of the information contained herein is strictly prohibited.

PRESENTED BY:



Modern Medicine
www.modernmedicine.com

