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Fetal development

This article discusses how a human baby is conceived and how the baby develops inside the mother's womb.

See also: Gestational age

Information

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

ZYGOTE

When a single sperm enters the mother's egg cell, the resulting cell is called a zygote. The zygote contains all of the genetic information (DNA) needed to become a baby. 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 baby. The blastocyst sticks tightly to the lining, where it receives nourishment via the mother's bloodstream.



Watch this video about:
Cell division

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

WEEK BY WEEK CHANGES

The period of time between conception and birth during which the fetus grows and develops inside the mother's womb is called gestation. In humans, the length of pregnancy, or gestational age, is the time measured from the first day of the woman's last menstrual cycle to the current date. It is measured in weeks. Gestational age may also be called menstrual age.

If you got pregnancy using infertility treatments called assisted reproductive technology, gestational age is determined by adding 2 weeks to the conceptional age.

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

- Week 5 of pregnancy (gestational age)
 - The brain, spinal cord, and heart begin to develop.
 - The gastrointestinal tract begins to develop.
- Weeks 6 - 7 of pregnancy (gestational age)
 - Arm and leg buds become visible.
 - The brain develops into five areas and some cranial nerves are visible.
 - The eyes and ear structures begin to form.
 - Tissue forms that develops into the vertebra and some other bones.
 - The heart continues to develop and now beats at a regular rhythm.
 - Rudimentary blood moves through the main vessels.
- Week 8 of pregnancy (gestational age)
 - The arms and legs have grown longer, and foot and hand areas can be distinguished.
 - The hands and feet have fingers and toes (digits), but may still be webbed.
 - The brain continues to form.
 - The lungs begin to form.
- Week 9 of pregnancy (gestational age)
 - Nipples and hair follicles form.
 - Elbows and toes are visible.
 - All essential organs have begun to form.
- Week 10 of pregnancy (gestational age)
 - The eyelids are more developed.
 - External features of the ear begin to take their final shape.
 - Facial features continue to develop.
 - The intestines rotate.

The end of the 10th week of pregnancy marks the end of the "embryonic period" and the beginning of the "fetal period."

- Weeks 11 to 14 of pregnancy (gestational age)
 - Eyelids close and will not reopen until about the 28th week.
 - The 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 baby's size.
 - The baby can make a fist with its fingers.
 - Tooth buds appear for the baby teeth.
- Weeks 15 to 18 of pregnancy (gestational age)
 - The 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 19 to 21 of pregnancy (gestational age)
 - The baby can hear.
 - The baby makes more movements.
 - The mother may feel a fluttering in the lower abdomen.
- Week 22 of pregnancy (gestational age)
 - Lanugo hair covers entire body.
 - Eyebrows and lashes appear.
 - Nails appear on the fingers and toes.
 - The baby is more active with increased muscle development.
 - The mother can feel the baby moving.
 - The fetal heartbeat can be heard with a stethoscope.
- Weeks 23 to 25 of pregnancy (gestational age)
 - 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).
 - The baby begins to store fat.
- Week 26 of pregnancy (gestational age)
 - Eyebrows and eyelashes are well formed.
 - All eye parts are developed.
 - The baby has a hand and startle reflex.
 - Footprints and fingerprints are forming.
 - Air sacs form in lungs.
- Weeks 27 to 30 of pregnancy (gestational age)
 - Rapid brain development occurs.
 - The nervous system is developed enough to control some body functions.
 - The eyelids open and close.
 - The respiratory system, while immature, has developed to the point where gas exchange is possible.
- Weeks 31 to 34 of pregnancy (gestational age)
 - A rapid increase in the amount of body fat occurs.
 - Rhythmic breathing movements occur, but the lungs are not fully mature.
 - The bones are fully developed, but still soft and pliable.
 - The baby's body begins storing iron, calcium, and phosphorus.
- Week 38 of pregnancy (gestational age)
 - Lanugo begins to disappear.
 - Body fat increases.
 - Fingernails reach the end of the fingertips.
- Weeks 39 to 42 of pregnancy (gestational age)
 - 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.

Alternative Names

Zygote; Blastocyst; Embryo; Fetus

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