

Development Before Birth

Unit 4.5

4.5 Journal

There are many factors to consider before having children. Write a short paragraph describing what you think couples should consider before starting their family.



Objectives

- Summarize the events that occur during the first week after fertilization.
- Describe the structures that protect and nourish the embryo and fetus.

The Beginning of the Life Cycle

- If a couple wants to start a family, they will try to get pregnant or try to "conceive"
- During sexual intercourse, sperm from the man are deposited into the vagina
 - Some of these sperm will travel through the uterus into the fallopian tubes in search of an egg to fertilize

Step 1: Ovulation

- About once a month, the ovary releases a mature egg
- The mature egg begins to travel through the fallopian tube.

Step 2: Fertilization

- Only a few hundred sperm of the hundreds of millions that enter the vagina make it to the egg
- Only ONE can fertilize it.
- Within seconds of fertilization, the surface of the egg changes so that no more sperm can enter the egg.

Step 3: Cell Division

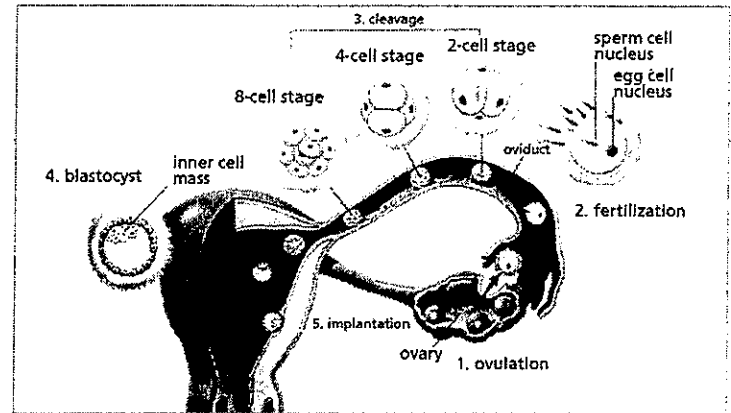
- Zygote - the term used for the united egg and sperm
 - Within 36 hours, while the zygote is still traveling through the fallopian tube, it begins to divide.
- In embryology, cleavage is the division of cells in the early embryo.
 - Original cell divides to make two cells, then four, eight and so on.
 - Structure remains the same size as original zygote
- Embryo - the term used for the structure from the 2-cell stage until about 9 weeks after fertilization.

Step 4: The Blastocyst

- About 5 days after fertilization, the embryo reaches the uterus.
- After a few more days, it is made up of 50 to 100 cells.
- This structure, a blastocyst, is no longer a solid mass of cells, but a sphere of cells surrounding a hollow center.

Step 5: Implantation

- Once the blastocyst forms, it begins to attach itself to the wall of the uterus.
- The process is called implantation.



Development in the Uterus

- While the embryo grows, there are several structures that protect and nourish the developing embryo, and later the fetus.
 - Amniotic Sac
 - Placenta
 - Umbilical Cord

Amniotic Sac

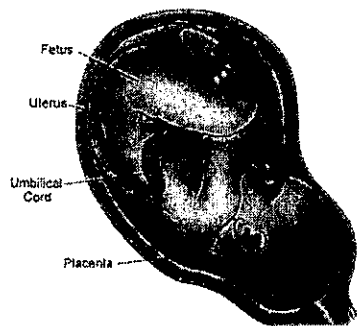
- Amniotic Sac - a fluid-filled bag of thin tissue
- Functions:
 - Cushions the embryo from shock
 - Helps keep the embryo's temperature constant

Placenta

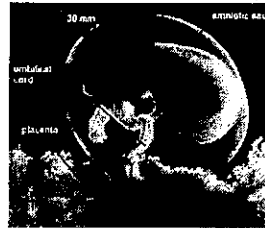
- The attachment holding the embryo to the wall of the uterus develops into a structure called the placenta.
- Function:
 - Oxygen and nutrients move from mother's blood into tiny blood vessels that lead to the embryo
- Dangerous substances can also pass to baby from the placenta and harm the baby

Umbilical Cord

- After about 25 days after fertilization, a ropelike structure called the umbilical cord develops between the embryo and the placenta.
- Functions:
 - Carries nutrients and oxygen from placenta to the embryo, and carries wastes away
- Also known as "the baby's lifeline"



An 8-Week-Old Human Embryo



The Growing Embryo

- During first 2 months
 - Major body systems and organs start to form
 - Beating heart, major blood vessels, kidneys, and endocrine glands
- By end of 8 weeks:
 - About an inch long
 - Recognizable features
 - Eyes, ears, arms, legs



The Fetus

- Eight weeks after conception, the developing human is called a **fetus**.
- 3-6 months
 - Fetus begins to move and kick
 - Becomes sensitive to light and sound
- 7-9 months
 - Body fat accumulates
 - Eyelids open and close
 - End of 9 months - Baby is ready to be born!



36 weeks