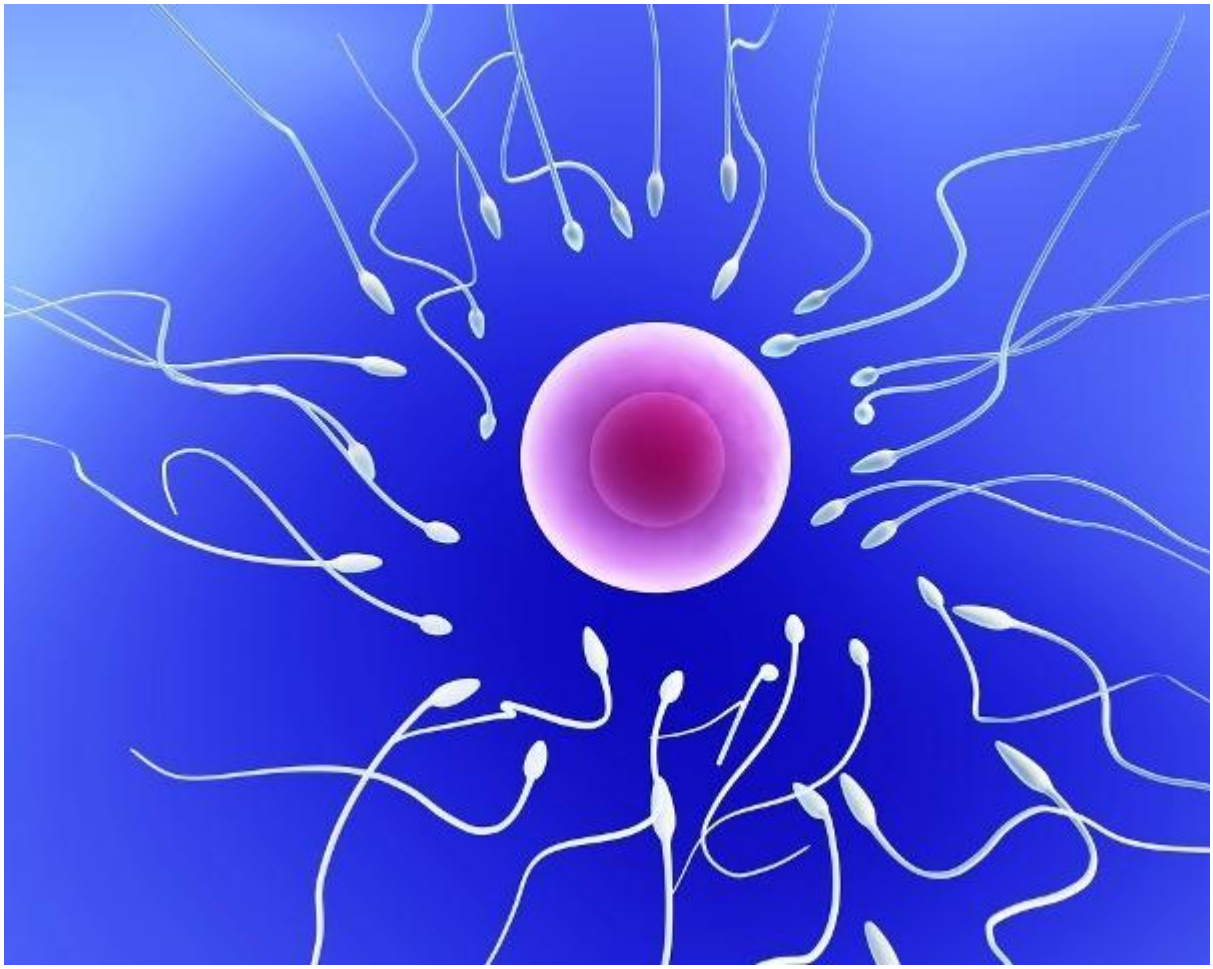
Development of the Fetus

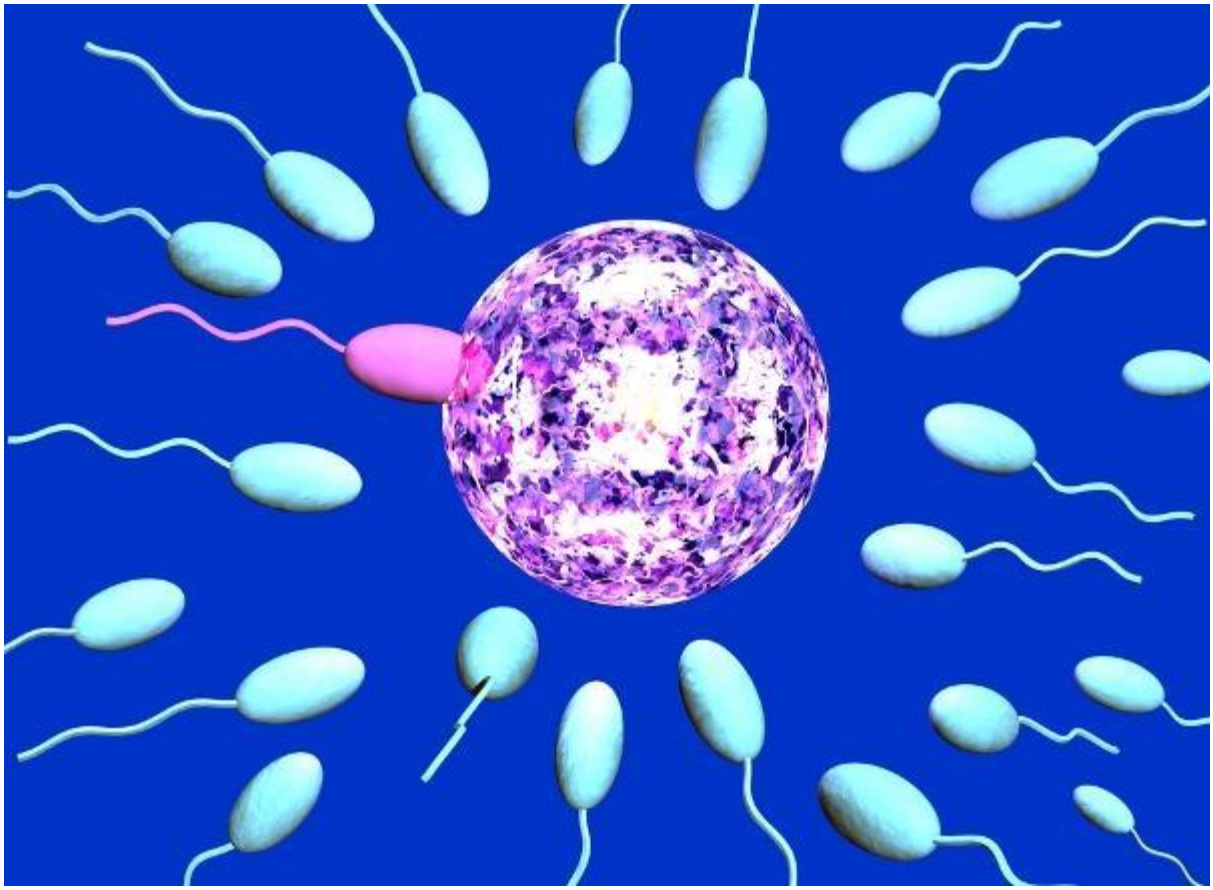
Fertilization

Sperm swimming towards the egg



This is the fusion of the sperm and egg which results in the formation of an embryo. Once a sperm has penetrated an egg in the oviduct the egg secretes some water between its surface and the membrane. The membrane dissociates and the sperm is trapped inside, this prevents other sperms from entering the egg.

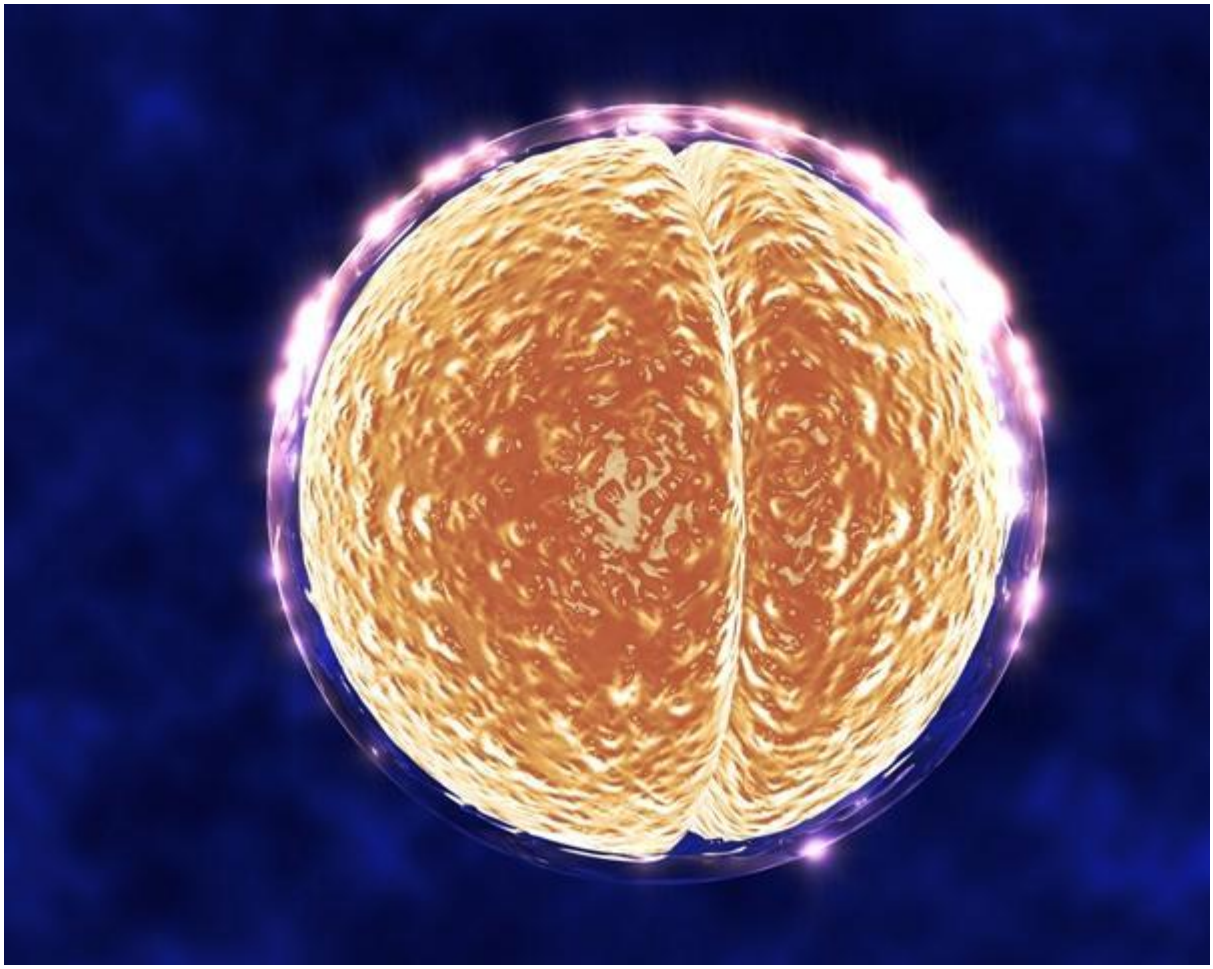
The winning sperm penetrates the egg



The tail of the sperm drops off but the rest of the sperm is engulfed by the egg. The egg is now activated by the penetration of the sperm and so the egg can now go through the final stage of development (it stopped developing at the 2nd oogenesis). The fusion of the two nuclei completes fertilization.

After fertilisation the zygote divides into two. These two cells undergo further division.

2 cells dividing

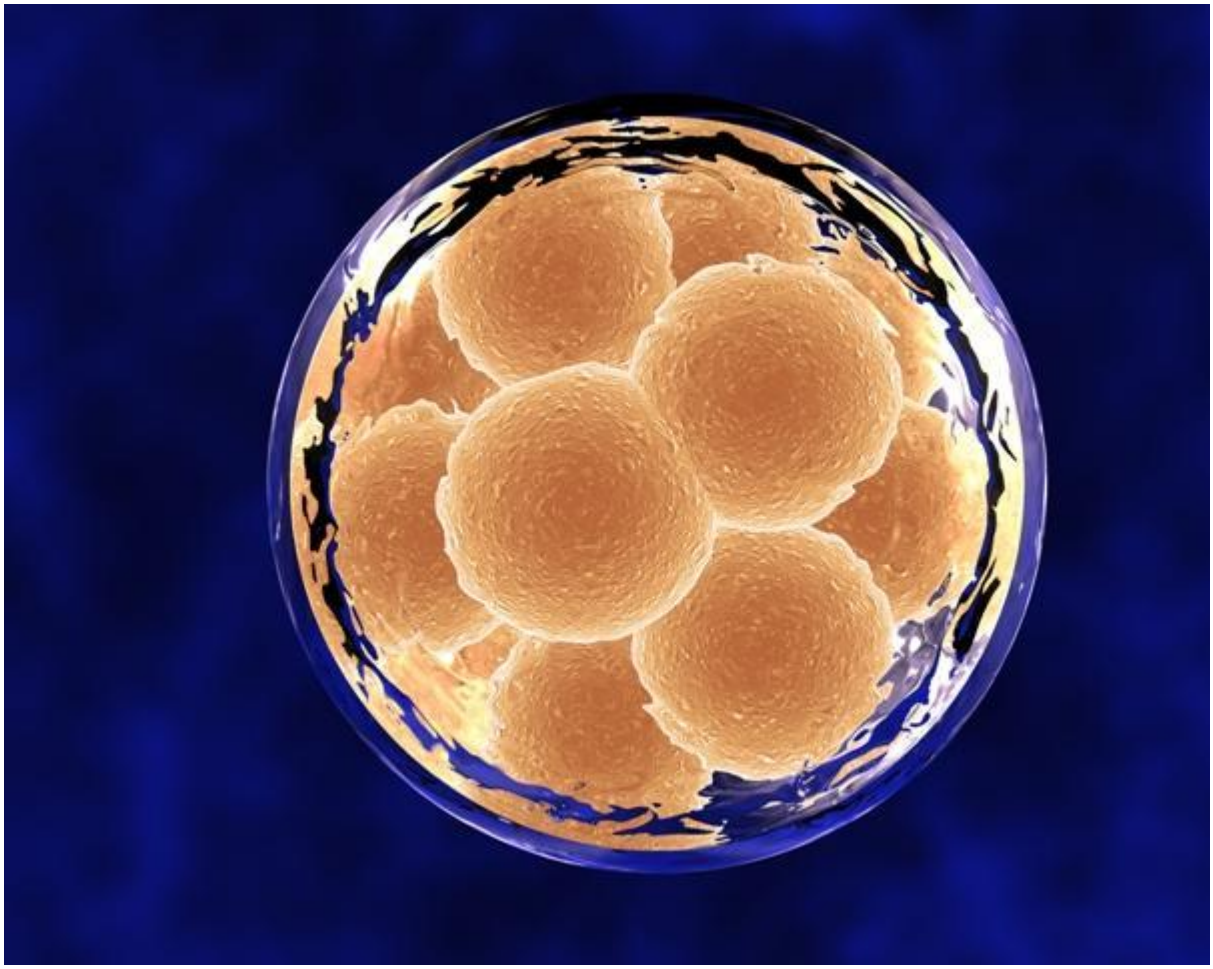


The oestrogen that is produced enriches the uterus wall with blood vessels. After the release of the mature egg from the follicle in the ovary, the follicle is stimulated by the hormone progesterone which prepares the wall of the uterus for the arrival of a developing embryo. The inner lining of the wall thickens forming little pockets while acquiring a rich supply of blood.

A low progesterone level can result in an early miscarriage (spontaneous abortion).

7 days after fertilization, the developing embryo enters the well-prepared uterus and a nutritive and metabolic connection is established between the embryo and the mother. Up to the time when the embryo enters the uterus, it gets its nutrients and energy from a small amount of egg yolk from the egg. The nutritive and metabolic connecting structure is called the placenta. It develops during the first 12 weeks of pregnancy.

12 cell Embryo within a membrane



At the time when the young developing embryo attaches itself to the wall of the uterus it is composed of two sets of cells. One set will develop into the young offspring and the other set will develop into four sets of membranes (ultra-embryonic membranes).

The extra- embryonic membranes include amnion which surrounds the embryo forming a space. The space is filled with amniotic fluid which acts as a shock absorber for the developing embryo. It also prevents the embryo parts from sticking together.

Chorion and allantois becomes closely associated with the wall of the uterus. The chorion develops finger-like projections containing many blood capillaries. They fit into the blood spaces so that mixing of the mother's blood and foetus' blood is prevented. This special area of the chorion and allantois along with the uterus wall form the placenta.

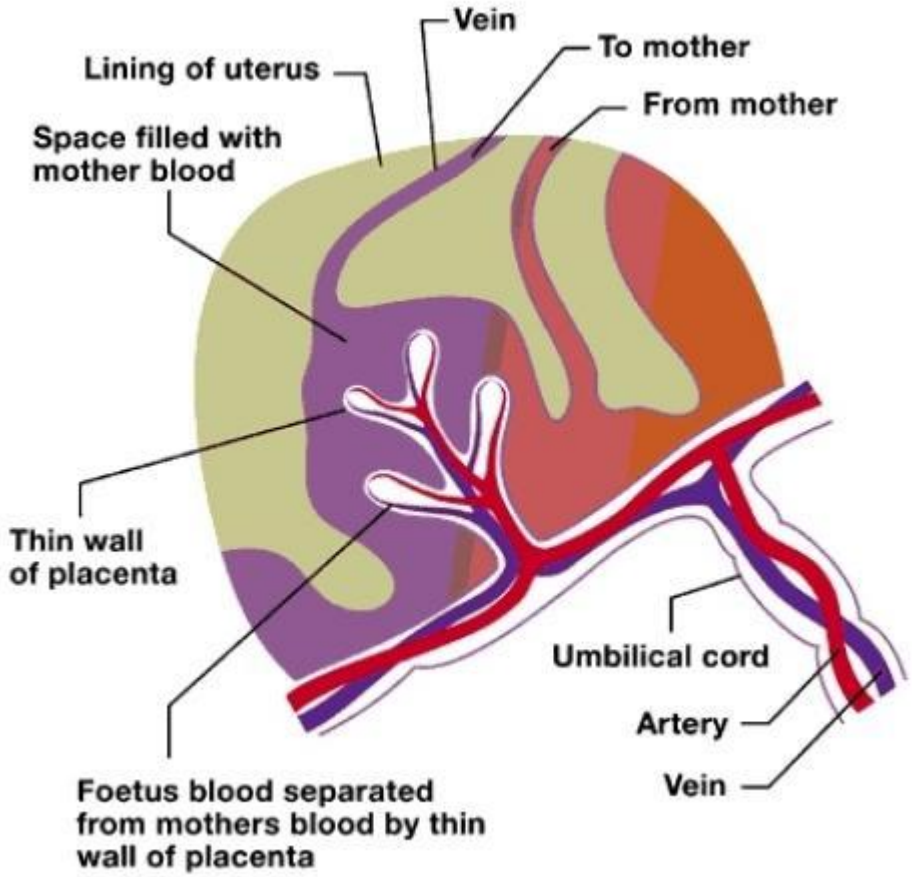
Embryo

The artery leaves the embryo through the umbilical cord and forms capillaries in the placenta. The capillaries join up to form a large vein which leads back through the

umbilical cord to the embryo. After birth the umbilical cord is cut leaving a permanent scar (navel).

The placenta forms a selective barrier. It provides a medium of exchange between mother and foetus. Nutrients and oxygen diffuse from the mother's blood to the foetus' blood. Carbon dioxide and other metabolic waste from the foetus diffuse across the mother's blood. Antibodies, alcohol and drugs can cross the placenta and enter the embryonic circulation.

Diagram of the the placenta



Birth

After 9 months the developing offspring is now fully formed. Just before birth blood is present as the mucus plug that closed the cervix is released. The amnion bursts releasing the amniotic fluid; this is accompanied by rhythmic contractions of the wall of the uterus causing labour pains. There are two stages of labour:

1) When the baby's head is forced against the cervix causing dilation

2) When the baby passes through the cervix and vagina

At the time of birth the placenta is loosened cutting off the supply of oxygen. The carbon dioxide in the baby's circulation builds up and stimulates the breathing centre. The uterus contracts after birth and expels the placenta (after birth) and the umbilical cord.

Foetus at:

6 weeks *10 weeks* *20 weeks* *40 weeks*

During the 9 month of pregnancy, hormones from the placenta cause the mammary glands in the breasts to enlarge as the milk secreting cells mature. The first secretion from the breast is called colostrums-yellowish, rich in protein, vitamins minerals and it contains antibodies.

CONTRACEPTION

Contraception, also known as birth control, is designed to prevent pregnancy.

TABLE SHOWING THE DIFFERENT TYPES OF CONTRACEPTIVES AND THEIR FUNCTION

Types	Names of method	Function
Natural	Abstinence	Not having sexual intercourse

Rhythm	Not having sexual intercourse between the 11th and the 17th after the start of the menstrual cycle
Withdrawal	The man removes his penis before ejaculating.
Artificial	Barrier
Condom	Prevents sperm from entering the vagina
Diaphragm	Placed at the neck of the cervix to prevent sperm from entering the cervix
Hormone	
Contraceptive pills, patches, vagina ring	Contains hormones that stop the release of follicle stimulating hormone (FSH) so that ovulation is prevented.
Intra- uterine Device (IUD)	A loop of steel that is placed in the uterus and prevents implantation
Sterilization	
Vasectomy (males)	Cutting and sealing the vas deferens so sperms cannot pass into the testis.
Tubal Ligation (females)	Oviducts are cut and sealed preventing eggs from passing into the uterus.