

NAME; ONTEAGBAKO CHINEMEREM CYNTHIA

MAT NO; 18/MHS01/310

DEPT; MBBS

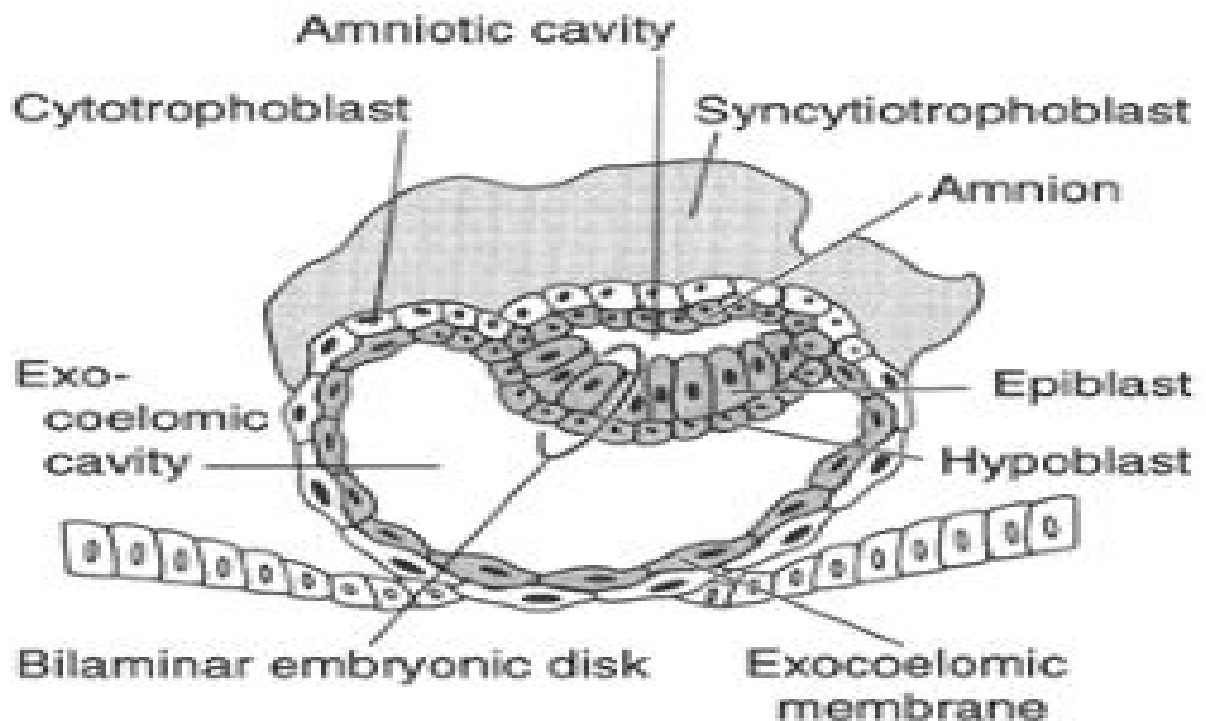
COURSE; GENERAL EMBRYOLOGY ASSIGNMENT

SECOND WEEK OF DEVELOPMENT

During the second week, 3 major events take place namely;

1. Completion of Implantation
2. Formation of bilaminar germ disc(epiblast and hypoblast)
3. Development of extra embryonic structures (amniotic cavity, amnion, umbilical vesicle, connecting stalk, and chorionic sac).

DAY 8



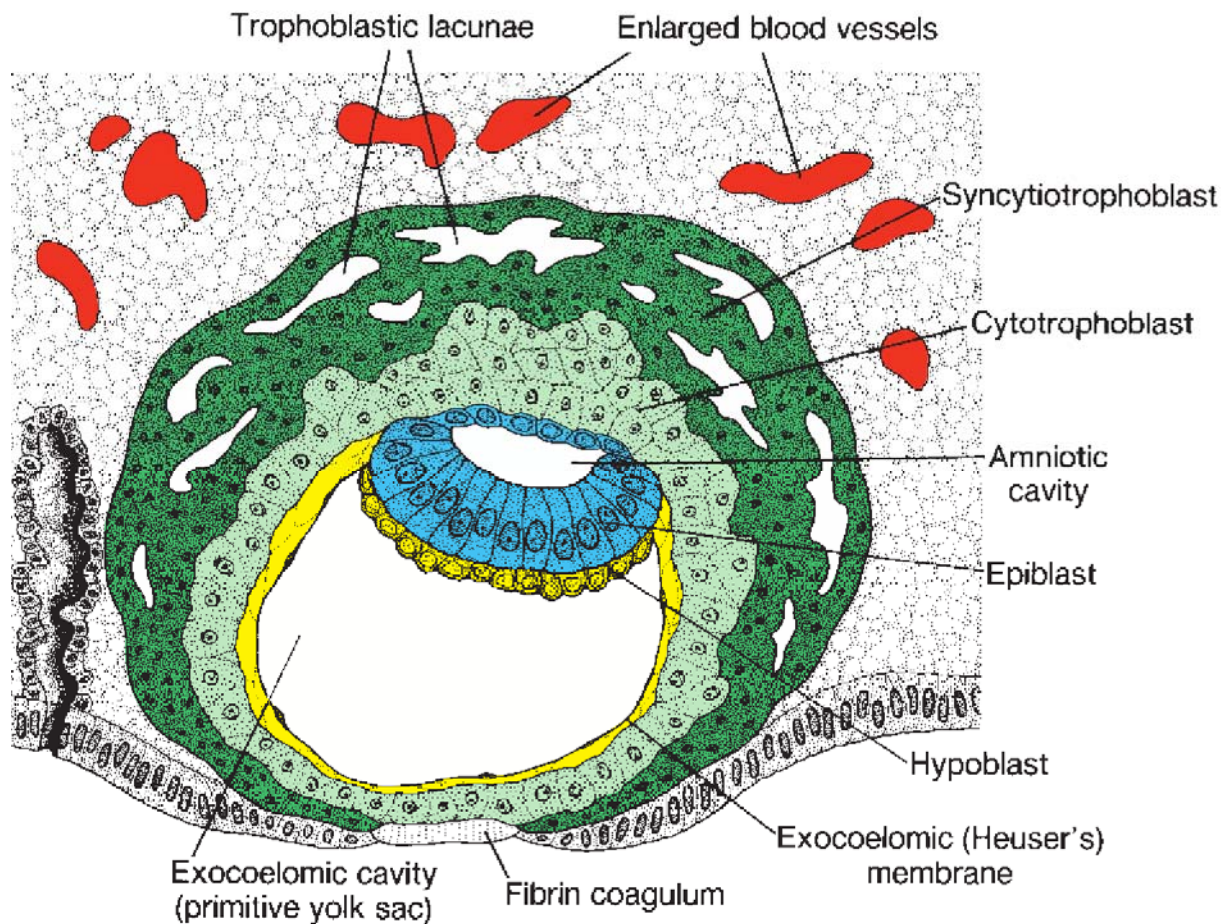
At the eight day of development, the blastocyst is partially embedded in the endometrium. Meanwhile, the syncytiotrophoblast will continue to erode the endometrium. As it is doing so, the cytotrophoblast will continue to divide and migrate into the region of the syncytiotrophoblast where they fuse and lose their individual cell membranes. The inner cell mass will divide into two types of cells;

- Cuboidal also called HYPOBLAST.
- Columnar also called EPIBLAST

The hypoblast and epiblast layers **together** form a flat ovoid shaped disc called the bilaminar **embryonic disc**. Cells of the epiblast which are adjacent to the cytotrophoblast are referred to as 'AMNIOBLAST'. Both the amnioblast and the epiblast surround a cavity known as the 'amniotic cavity'.

- The endometrium adjacent to the implantation site is edematous and highly vascular

DAY 9



The blastocyst is DEEPLY embedded in the endometrium.

Surface epithelium is closed by 'FIBRIN COAGULUM'.

As development continues, another membrane is formed, lying adjacent to the CYTOTROPHOBLAST, called THE HEUSER'S MEMBRANE OR EXOCOELOMIC MEMBRANE.

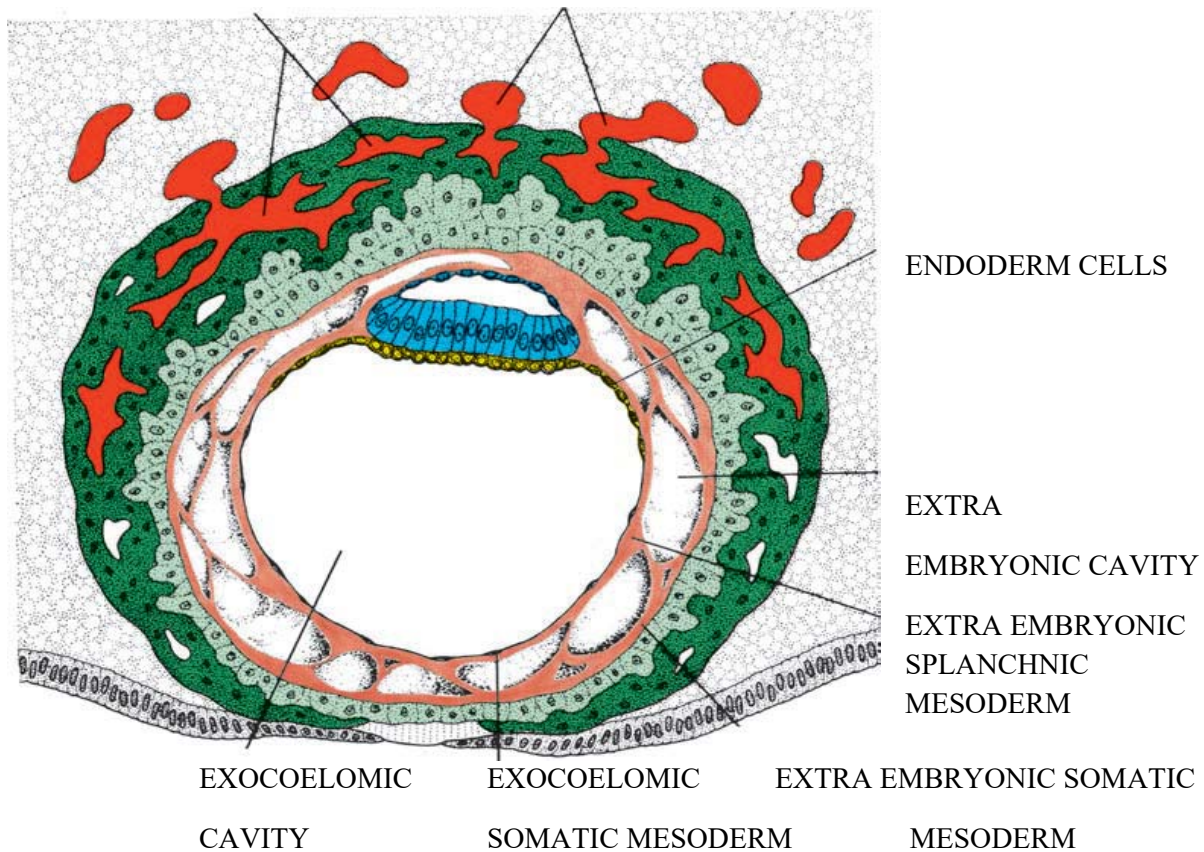
A cavity is surrounded by this membrane which is called the EXOCOELOMIC CAVITY (PRIMITIVE YOLK SAC OR PRIMARY UMBILICAL VESICLE).

Vacuoles develop at the Syncytiotrophoblastic region and these vacuoles are called THE TROPHOBLASTIC LACUNAE (with time, they enlarge).

DAY 11-12

TROPHOBLASTIC LACUNAE

MATERNAL SINUSOIDS.



The Blastocyst FULLY/COMPLETELY embedded in the endometrium.

The syncytiotrophoblast will continue to erode the endometrium.

As the syncytiotrophoblast is eroding, it ruptures some capillaries. These ruptured capillaries are called SINUSOIDS. The ruptured SINUSOID, COMMUNICATES WITH THE TROPHOBLASTIC LACUNAE. At this stage, A PRIMORDIAL UTERO-PLACENTAL CIRCULATION is established. This communication transports nutrients, O₂, and blood to the blastocyst/developing embryo.

A mesodermal space develops between the region of amnion and cytotrophoblast and between the exocoelomic membrane and cytotrophoblast. This space is called the EXTRA EMBRYONIC MESODERM. It covers except at the point where there is a connective stalk.

Inside the extra embryonic mesoderm, some cavities are being developed which are called EXTRAEMBRYONIC CAVITY OR EXTRAEMBRYONIC COELOM.

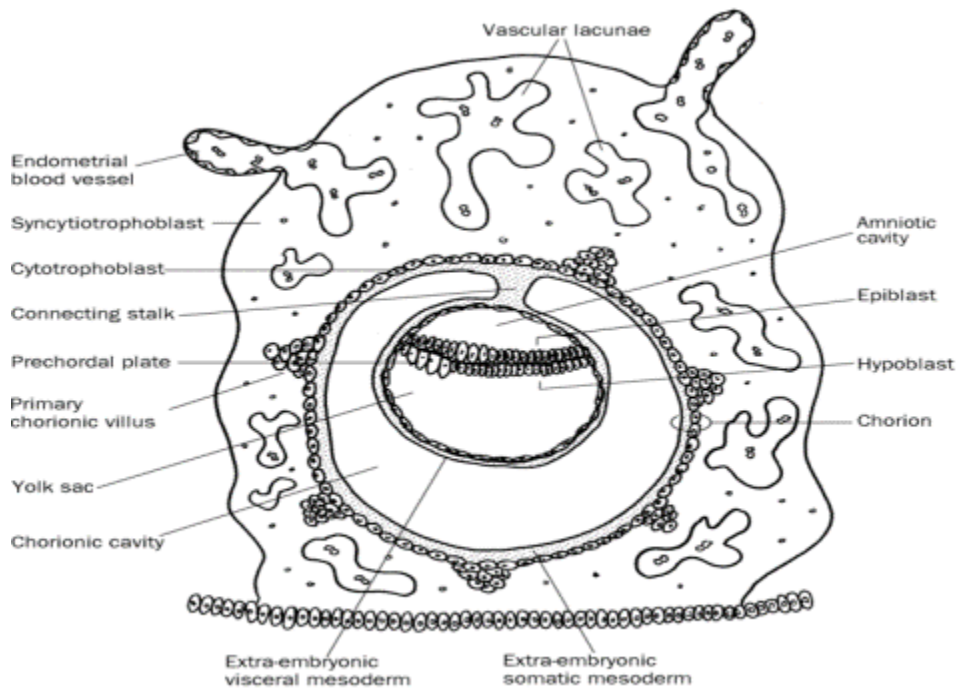
This cavity divides the mesoderm into two parts.

- The part which lines the cytotrophoblast is called 'THE EXTRA EMBRYONIC SOMATIC MESODERM'.
- The part which lines the amnion and exocoelomic membrane is called 'THE EXTRA EMBRYONIC SPLANCHNIC MESODERM'.

DECIDUAL REACTION

As development continues, a reaction called 'A DECIDUAL REACTION', takes place. During this reaction, the cells of the endometrium swells as a result of glycogen and lipid accumulation in their cytoplasm. They are also known as DECIDUAL CELLS.

The primary function of the decidual reaction is to provide nutrition for the early embryo and an immunologically privileged site for the conceptus.



DAY 13

Cells of the cytotrophoblast acquire a syncytium, giving rise to a shape which looks like villi. When this occurs, they are referred to as 'PRIMARY VILLI' (in the region of the syncytiotrophoblast).

The connecting stalk forms the UMBILICAL CORD.

The extra embryonic cavity/ extra embryonic coelom enlarges and forms the 'CHORIONIC CAVITY'.

The primary yolk sac which was previously large, becomes smaller as development continues thereby forming THE SECONDARY YOLK SAC OR SECONDARY UMBILICAL VESICLE.

- A portion of this is pinched off which forms the EXOCOELOMIC CYST. *The only place where extra embryonic mesoderm traverses the chorionic cavity is in the **connecting stalk***
*With development of blood vessels, the connecting stalk becomes the **umbilical cord**.*

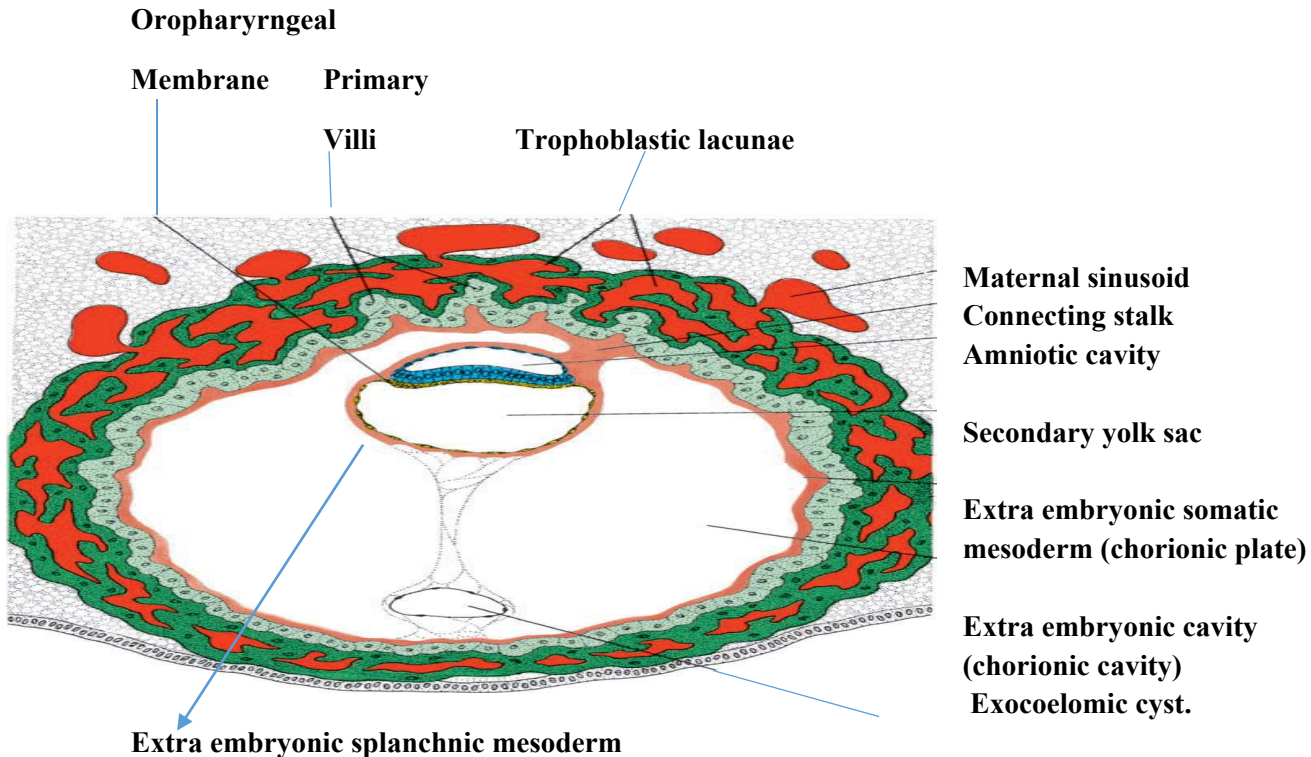


ILLUSTRATION OF THE DEVELOPING HUMAN ON THE 13TH DAY OF DEVELOPMENT.

Clinical correlates

- The syncytiotrophoblast produces a hormone called **the human chorionic gonadotropin (HCG)**, which enters the maternal blood via lacunae keeps the corpus lutein secreting estrogens and progesterone.
- HCG maintains the hormonal activity of the corpus lutein in the ovary during pregnancy.
- HCG can be detected in maternal blood or urine as early as **day 10** of pregnancy and is the basis for pregnancy tests
- Enough HCG is produced by the syncytiotrophoblast at the end of the second week to give a positive pregnancy test, even though the woman is probably unaware that she is pregnant

Extra uterine Implantation

- Blastocysts may implant outside the uterus

- These implantations result in **Ectopic pregnancies**.
- 95% to 98% of ectopic implantations occur in the uterine tubes, most often in the **ampulla** and **isthmus**