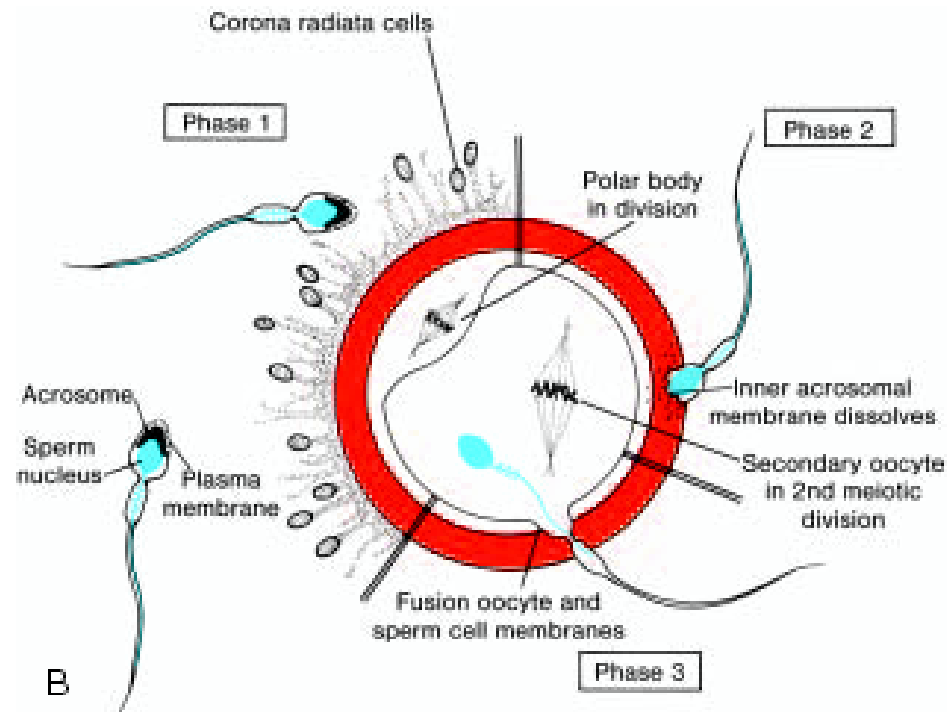


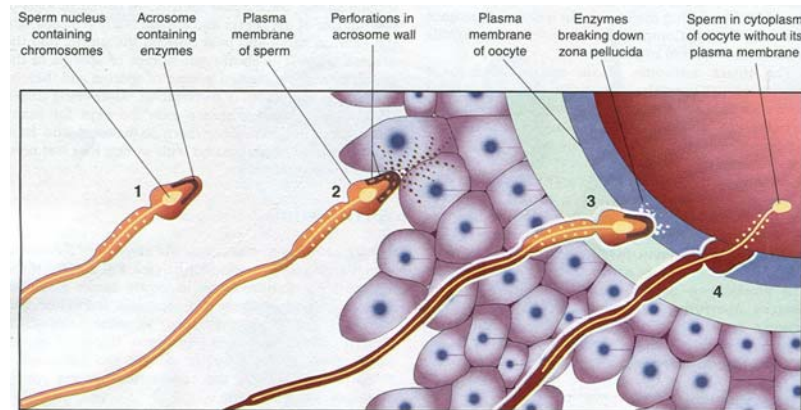
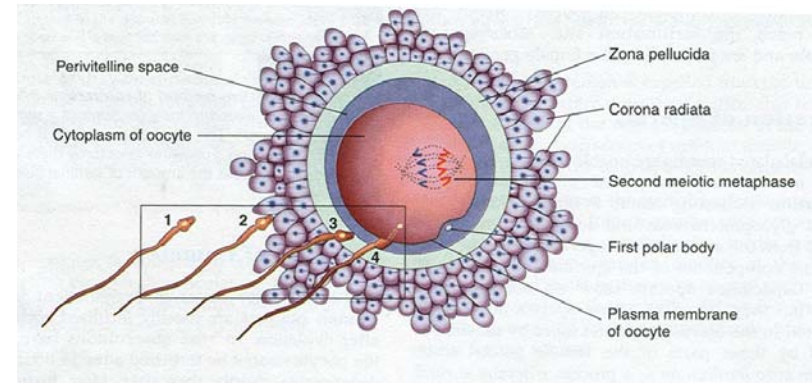
Fertilization

Process of fusion of male and female gametes in the ampullary region of the fallopian tube.

- Entrance of sperms in the female genital tract.
- Capacitation
- Acrosome reaction



- Penetration of corona radiata
- Penetration of zona pellucida
- Fusion of oocyte and sperm cell membrane

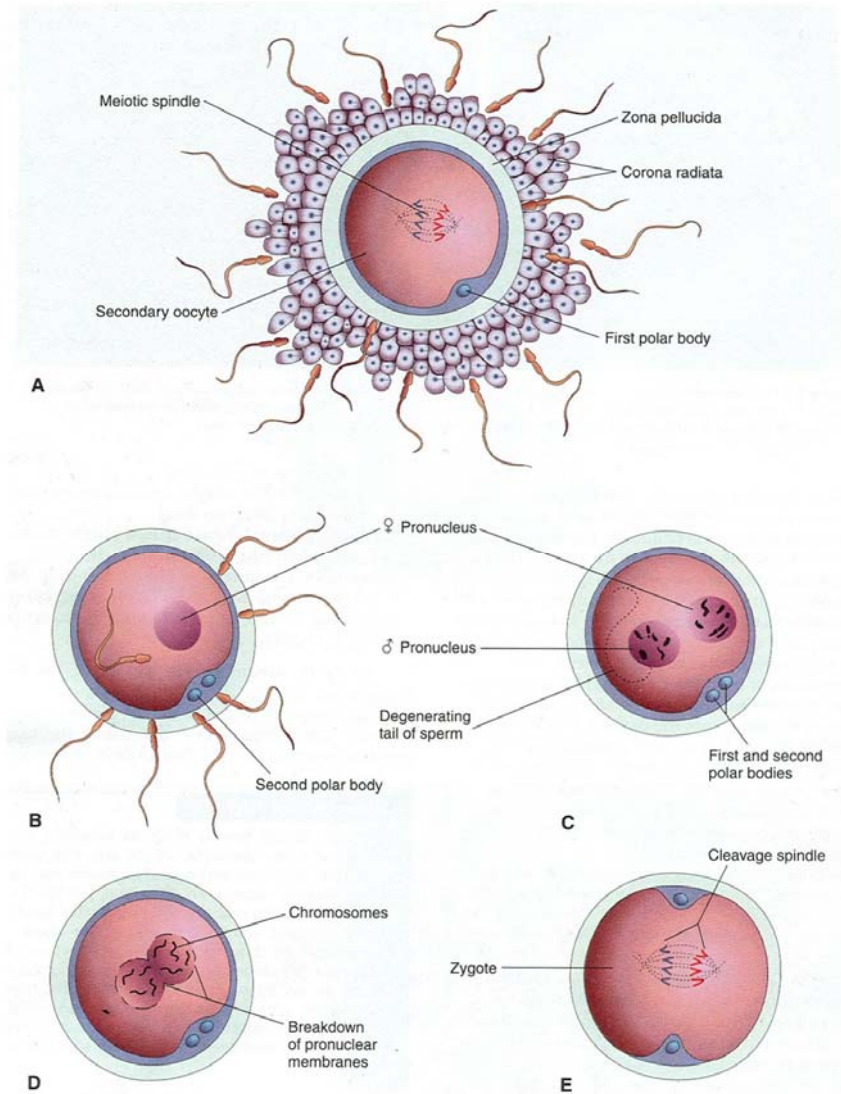
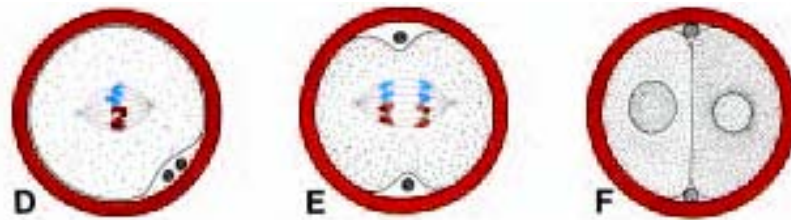
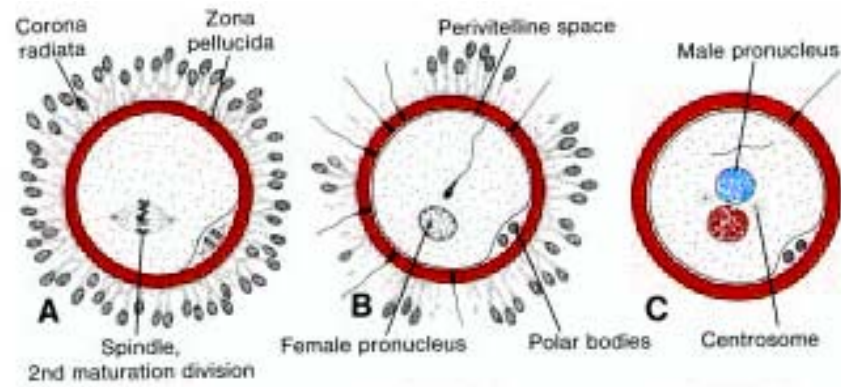


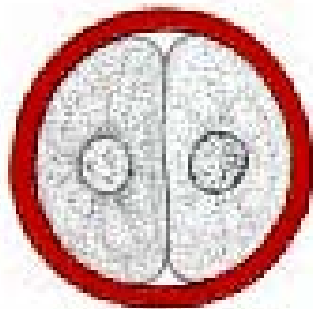
Response of ovum

- Cortical and zona reactions.
- Resumption of Meiosis II
- Metabolic activation of the egg.

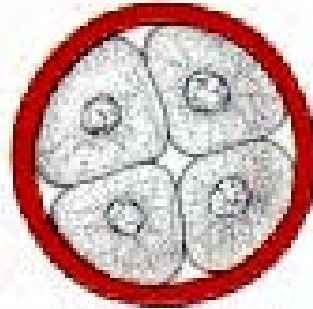
Results of fertilization

- Determination of sex
- Restoration of diploid number of chromosomes
- Initiation of cleavage





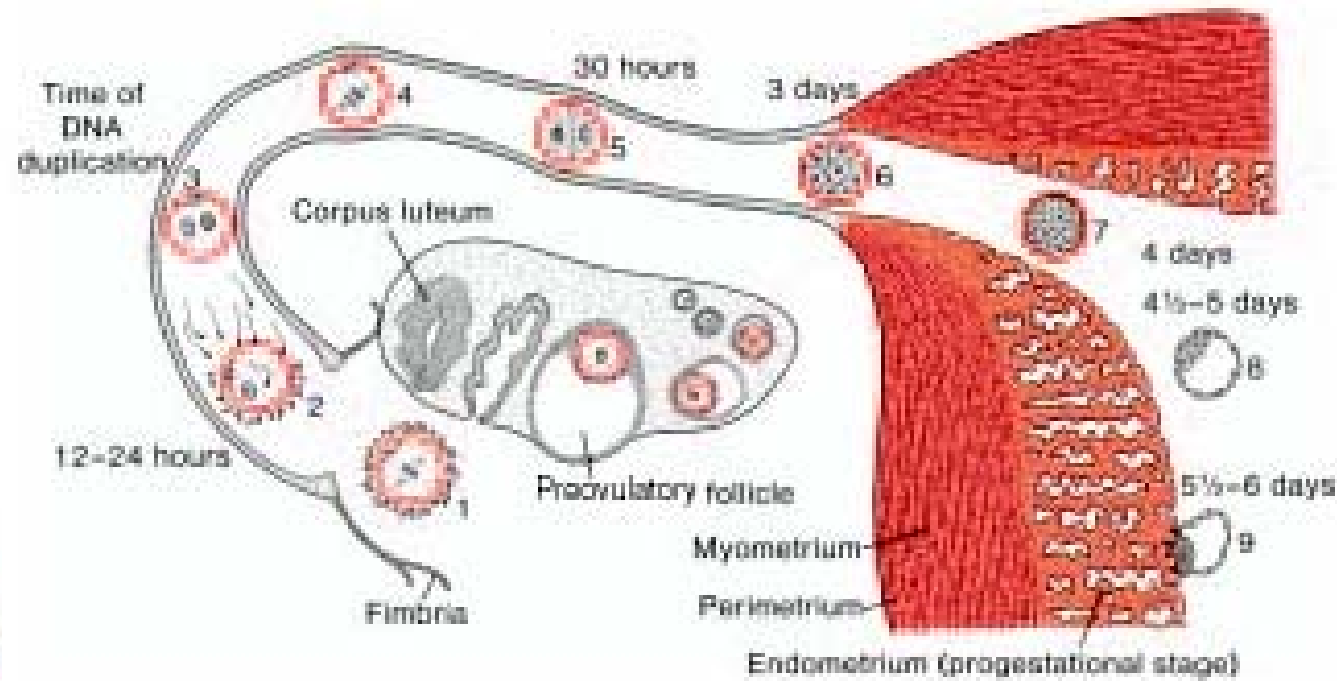
Two-cell stage



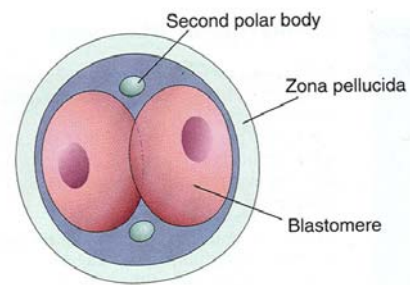
Four-cell stage



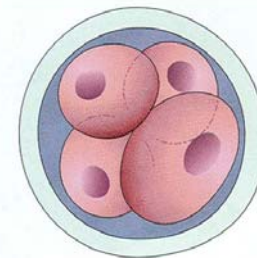
Morula



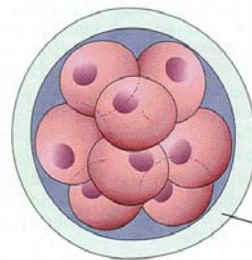
- Zygote is
- 2 celled at 30 hrs
 - 4 celled at 40 hours
 - 12 celled at 3 days
 - 16 celled at 4 days
- This 16 celled stage is –morula
 - Compaction:
morula cells form an inner and outer cell mass
 - zona pellucida disappears at 4th day



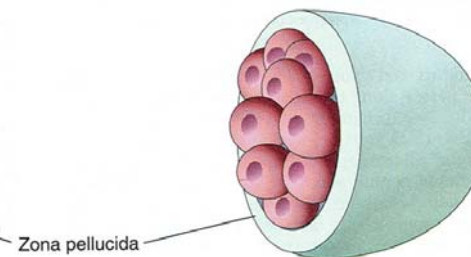
A 2-cell stage



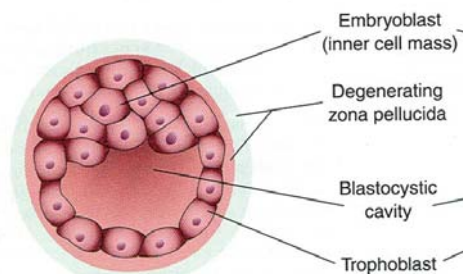
B 4-cell stage



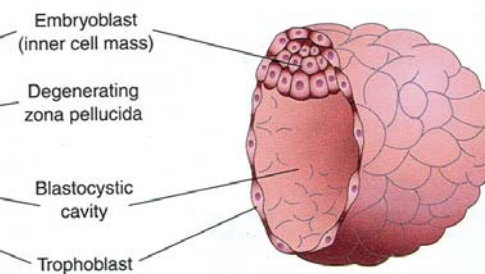
C 8-cell stage



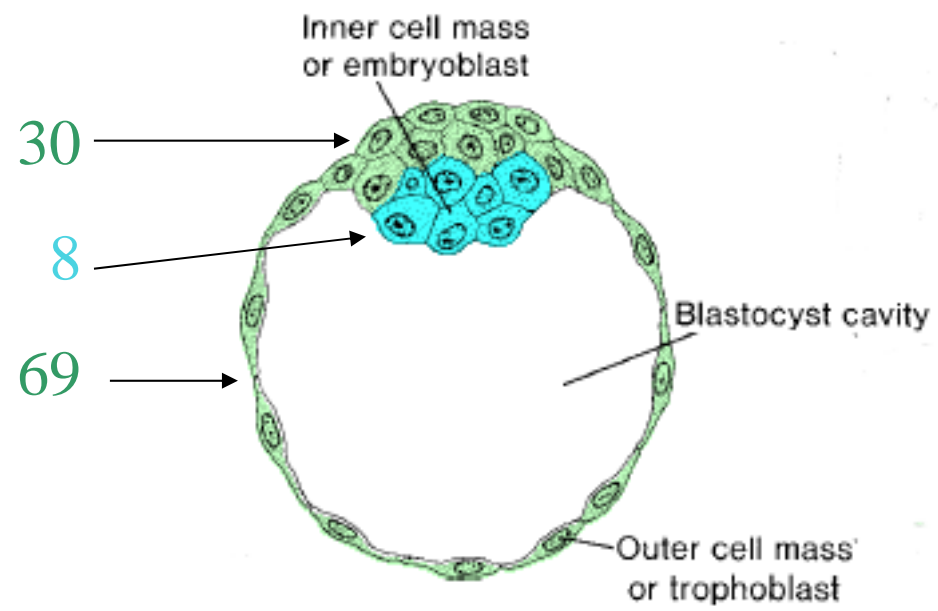
D Morula

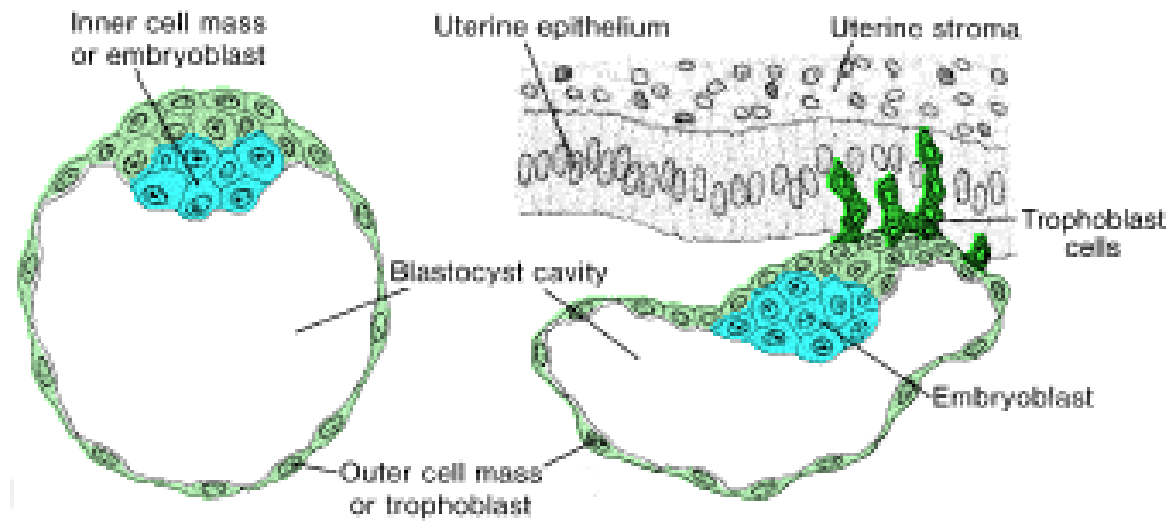


E Early blastocyst



F Late blastocyst





5th day

6th day

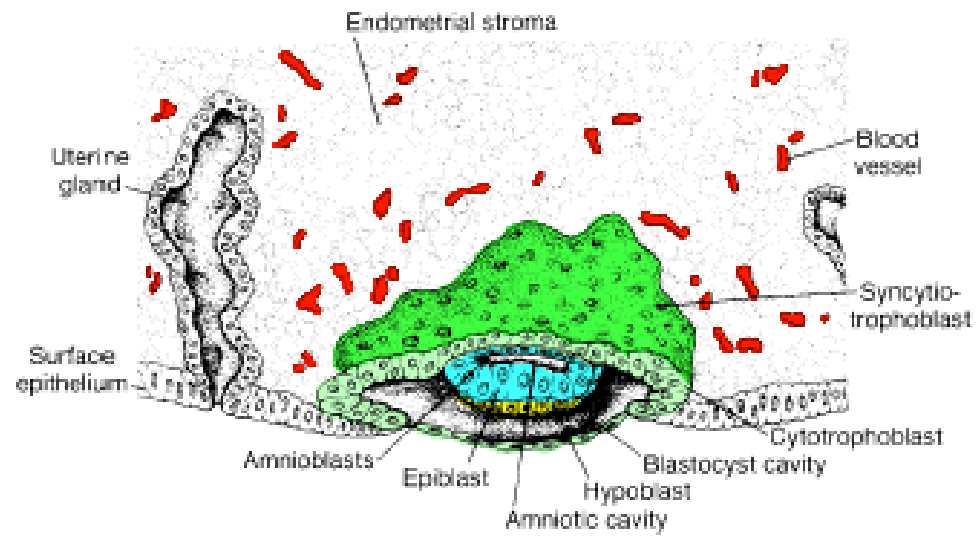
SUMMARY OF DEVELOPMENT IN 1st WEEK AFTER FERILIZATION

Cleavage

Morula

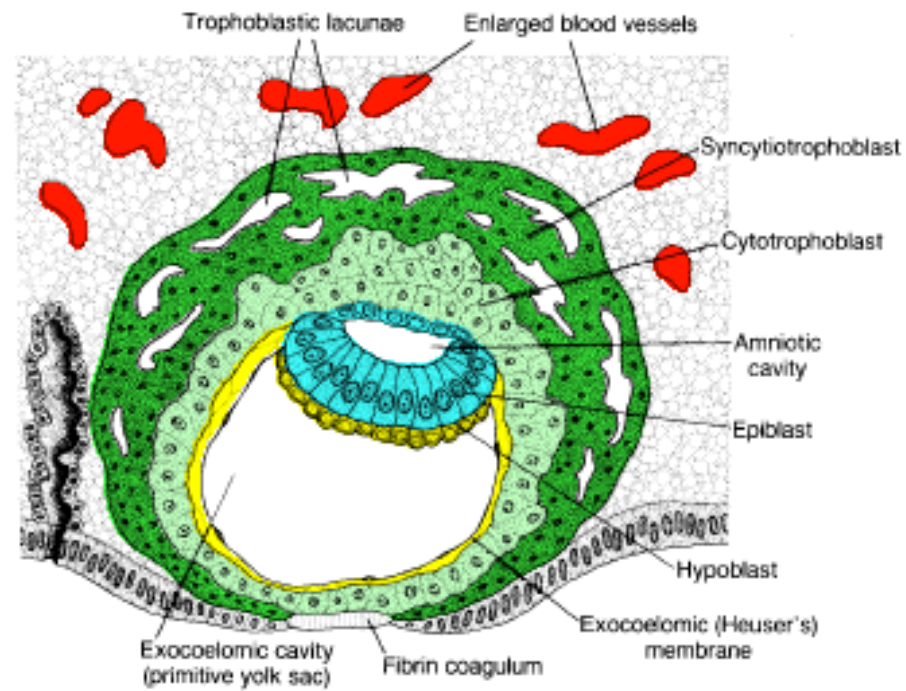
Blastocyst formation

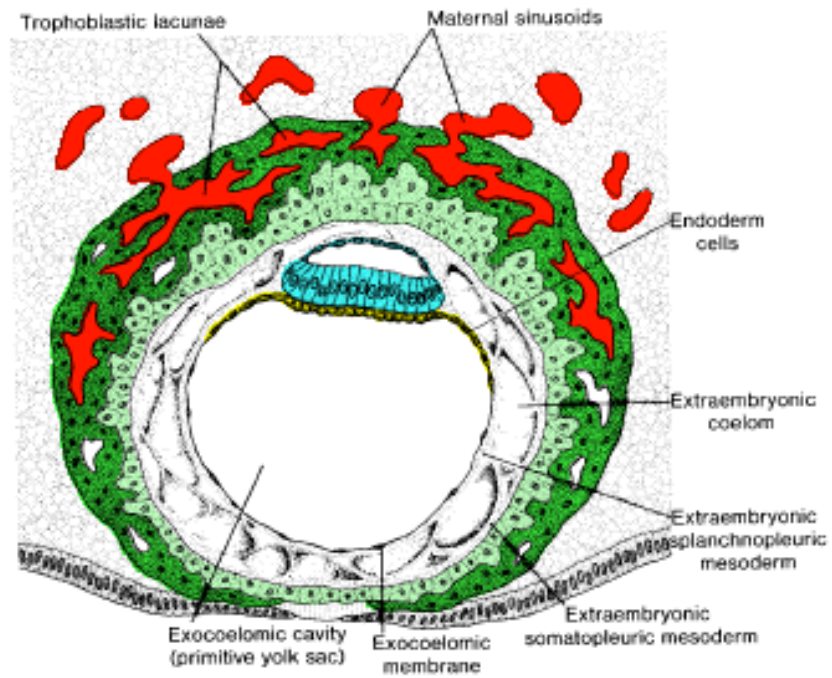
Implantation



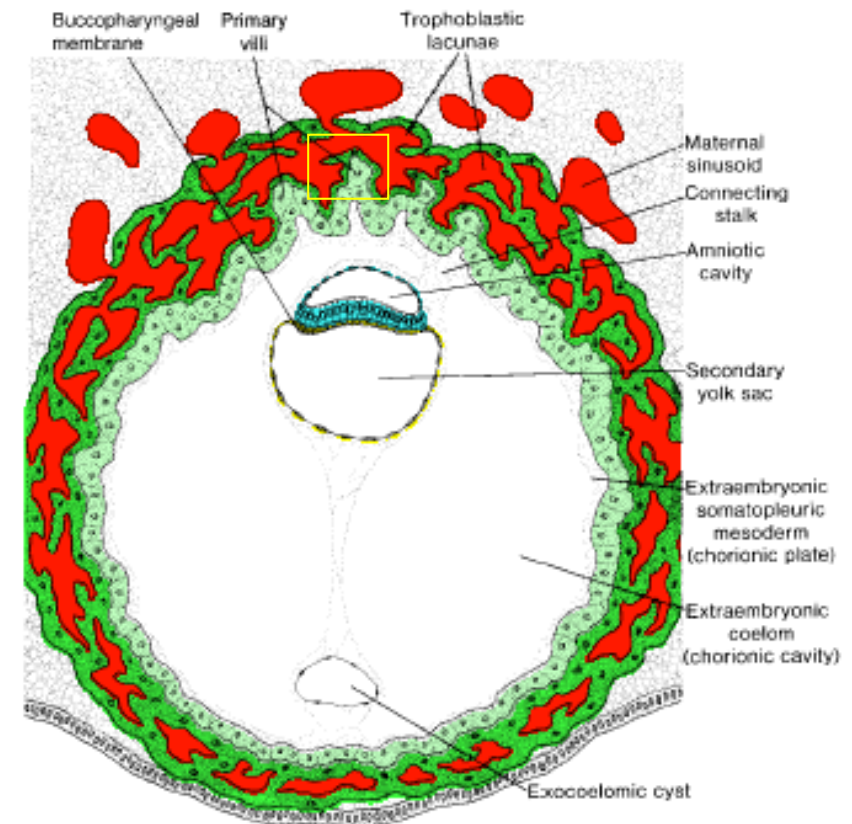
8th day

9th day

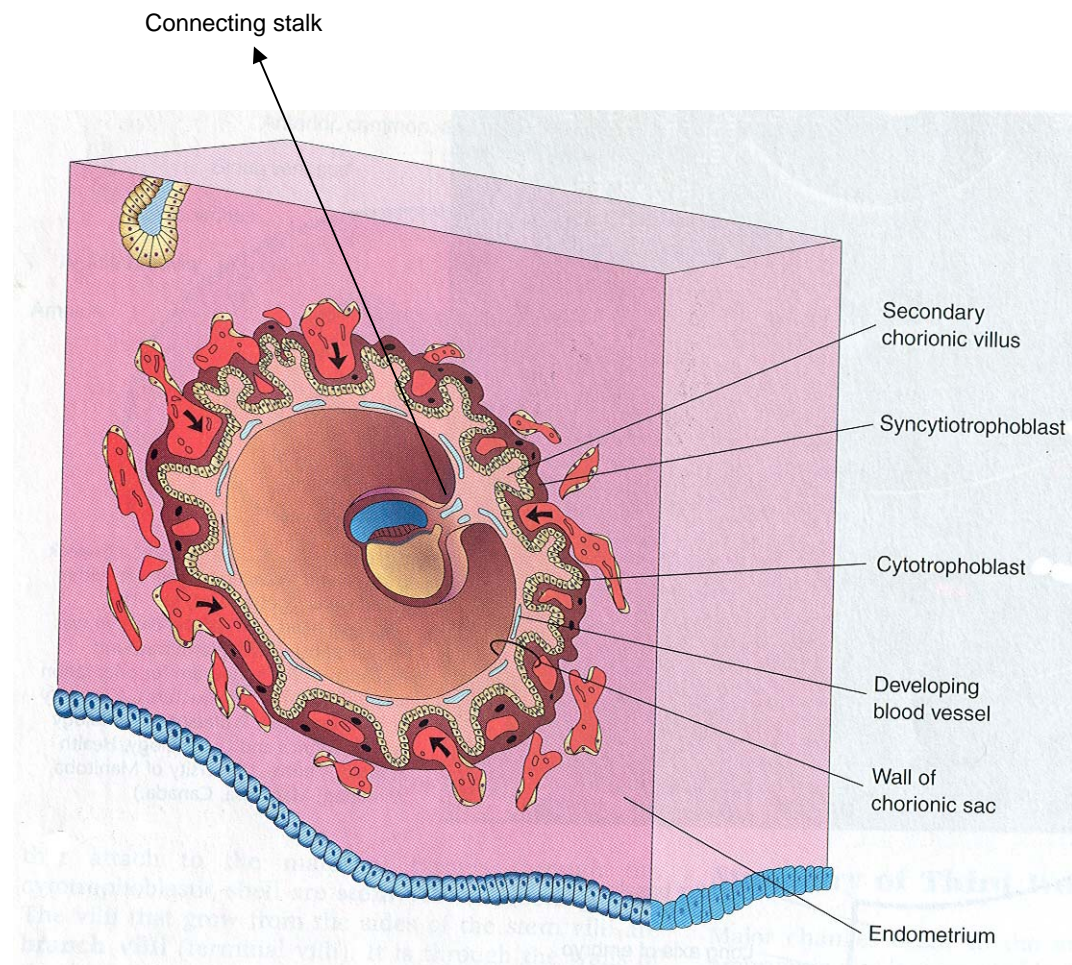


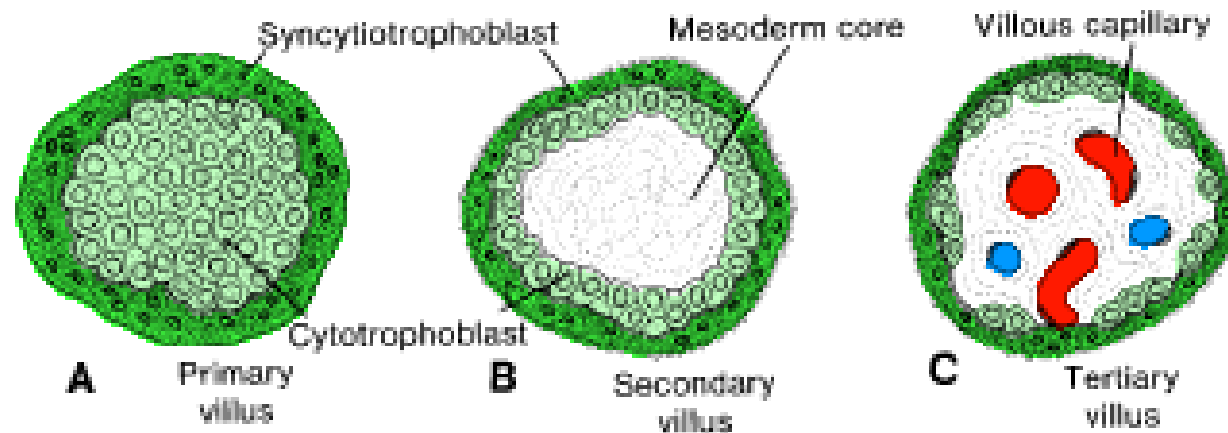
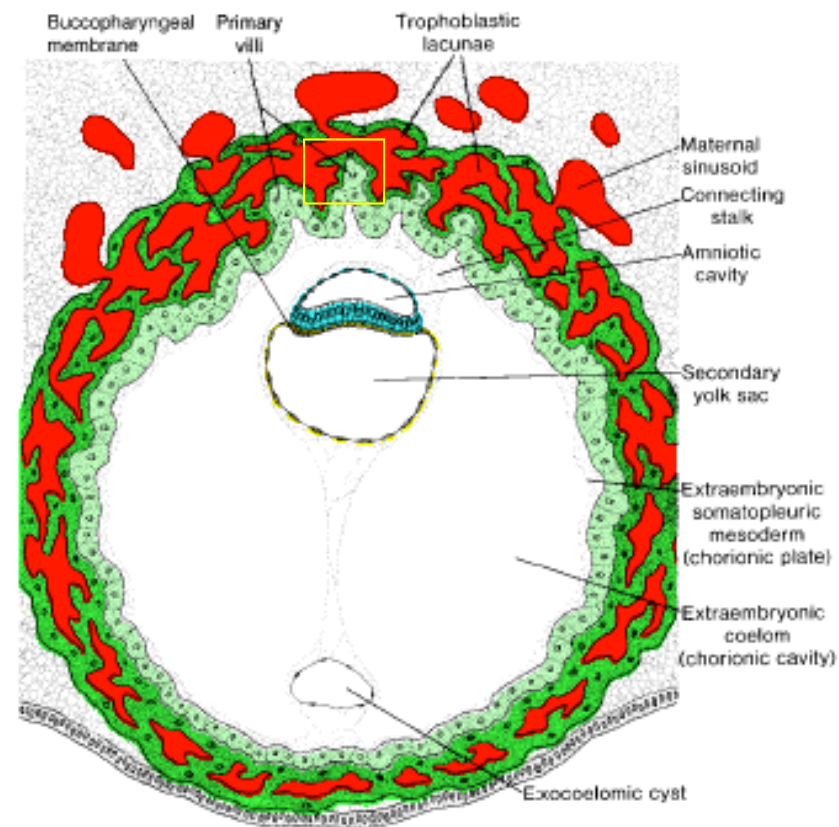


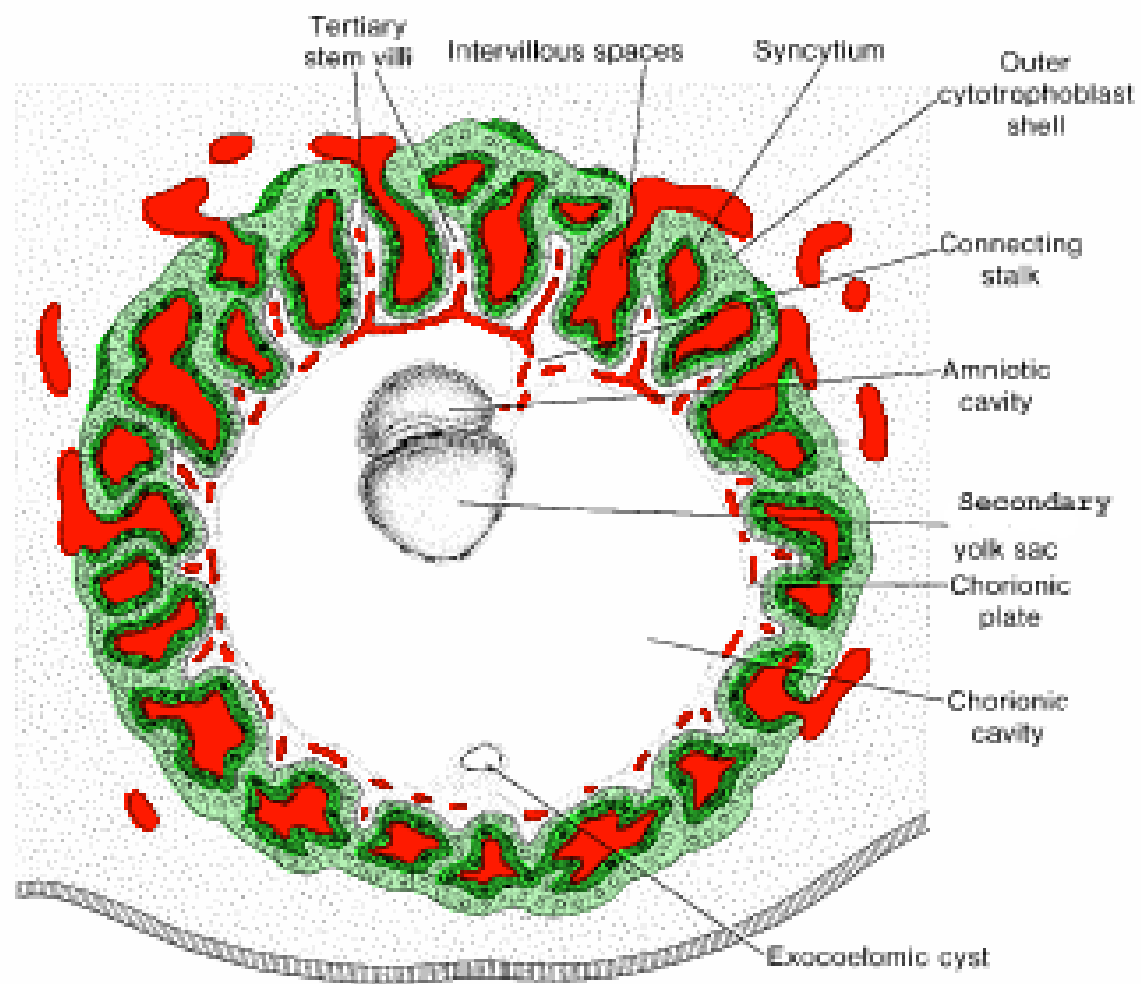
12th day

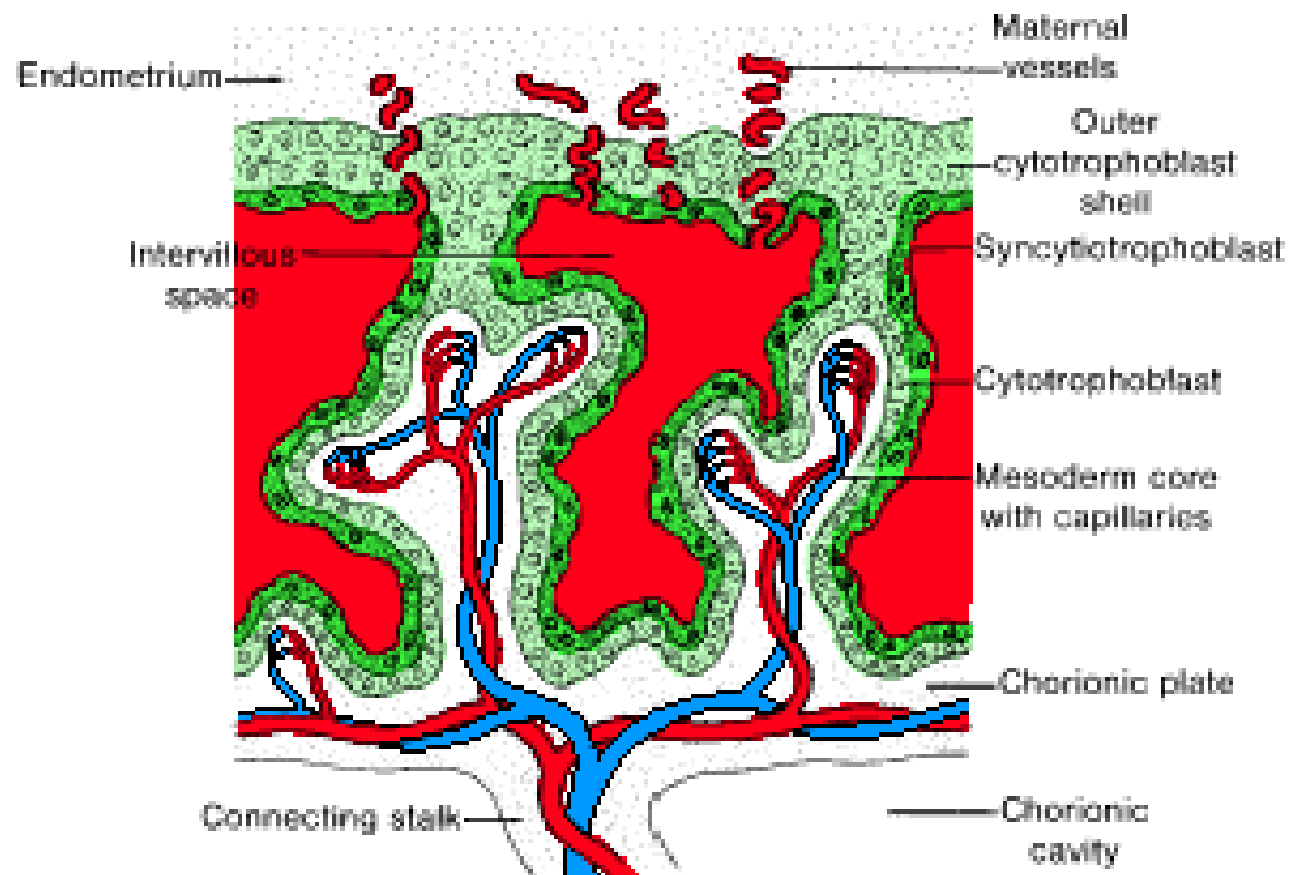


13th day









SUMMARY OF DEVELOPMENT IN 2ND WEEK

Completion of embedding.

TROPHOBLASTS

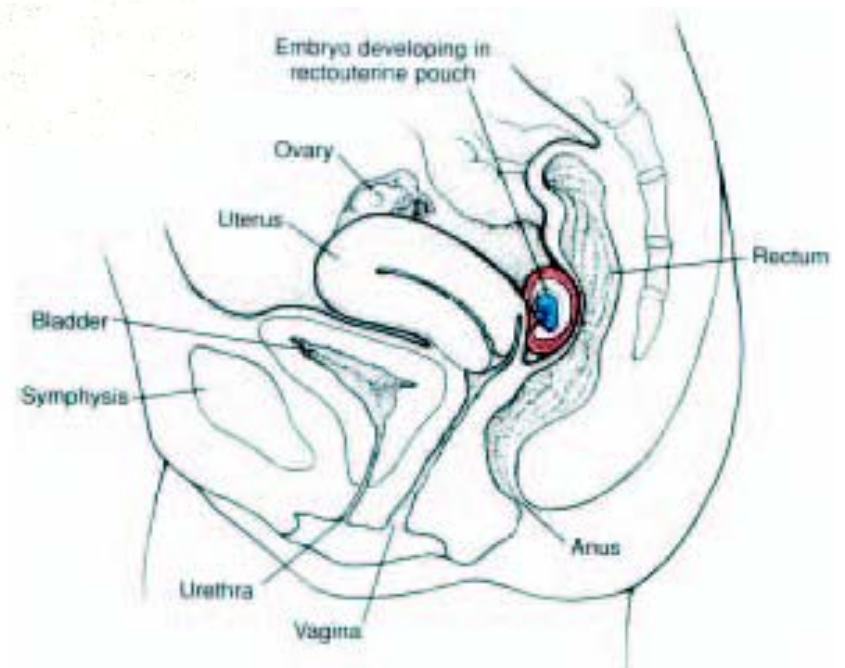
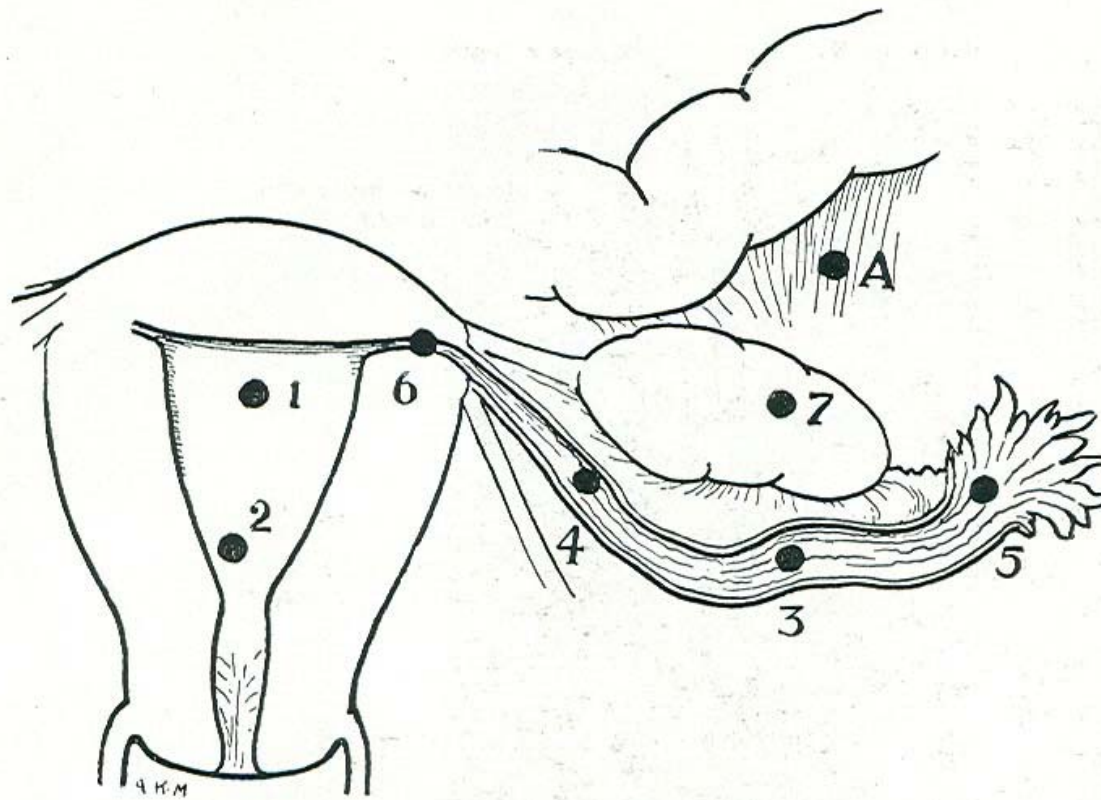
- Differentiate into cytotrophoblast & syncytiotrophoblast
- Lacunae formed & beginning of uteroplacental circulation
- Formation of primary villi

Decidual Reaction:

- Oedema of stroma
- Enlarged glands
- Increased Glycogen content of epithelial cells
- Congestion

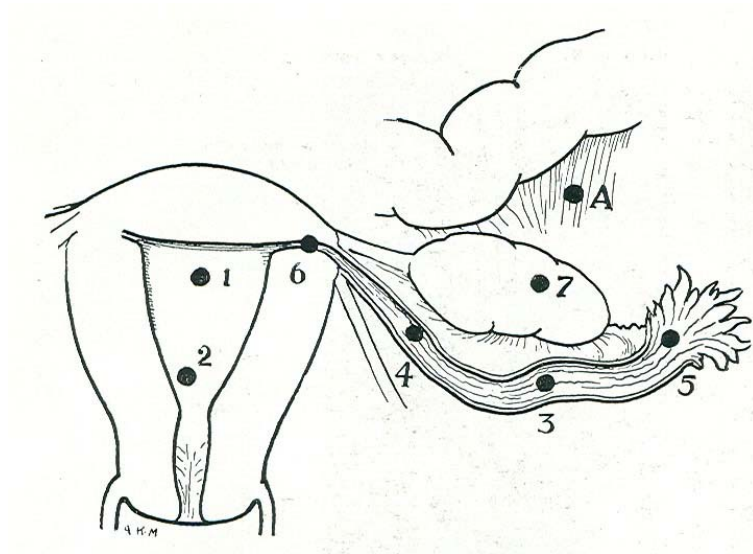
EMBRYOBLASTS

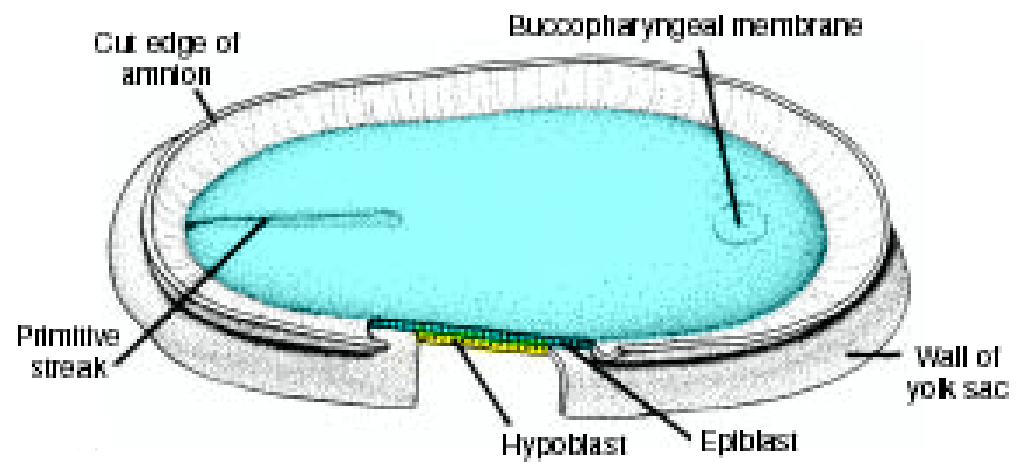
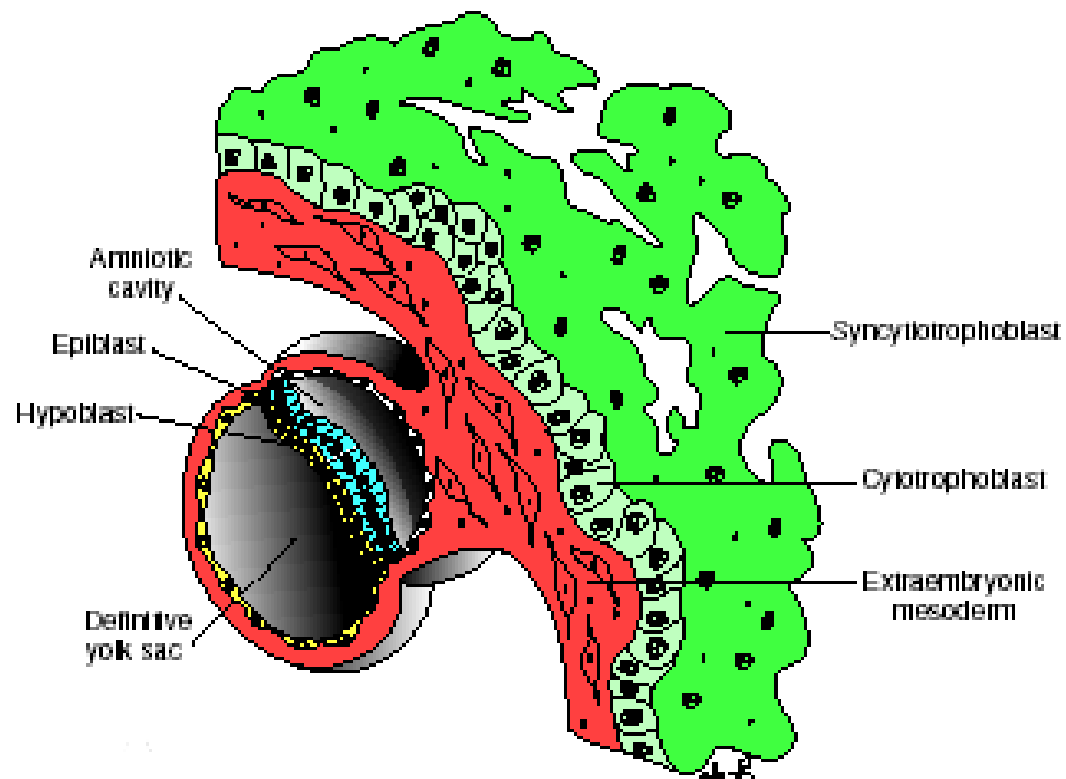
- Differentiate into epiblast & hypoblast
- Formation of amnioblasts and amniotic cavity
- Formation of primary and secondary yolk sacs
- Formation of extraembryonic mesoderm;
ee coelom (chorionic cavity);
ee somatopleuric and splanchnopleuric layers

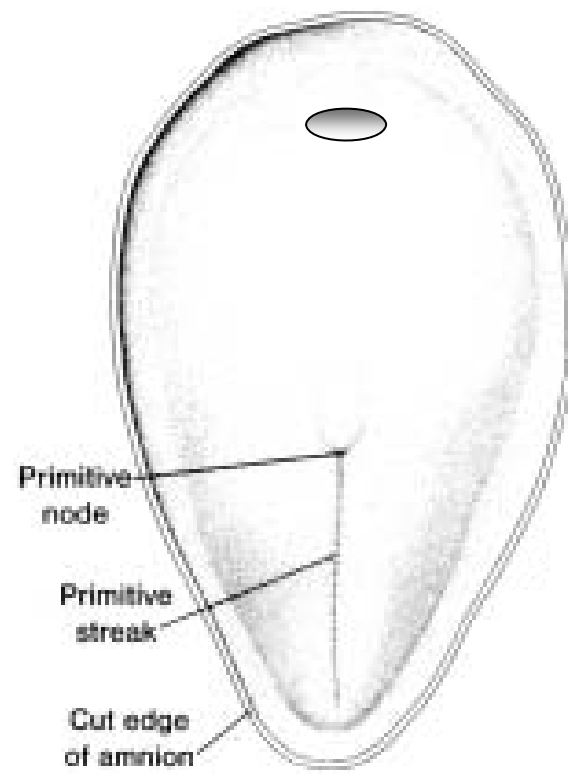


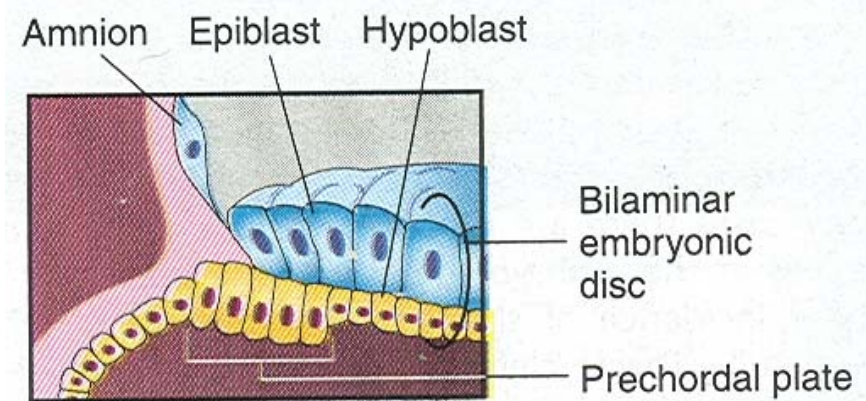
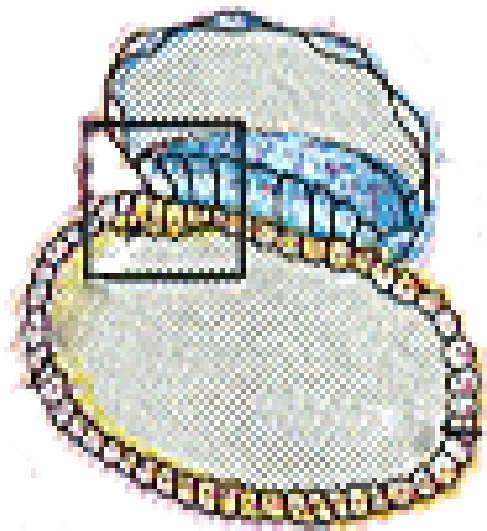
ECTOPIC IMPLANTATION

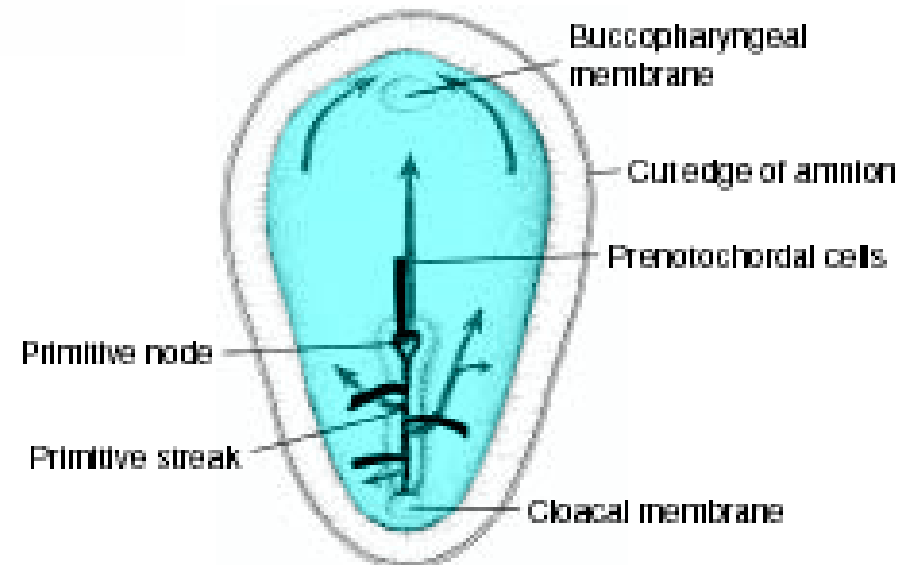
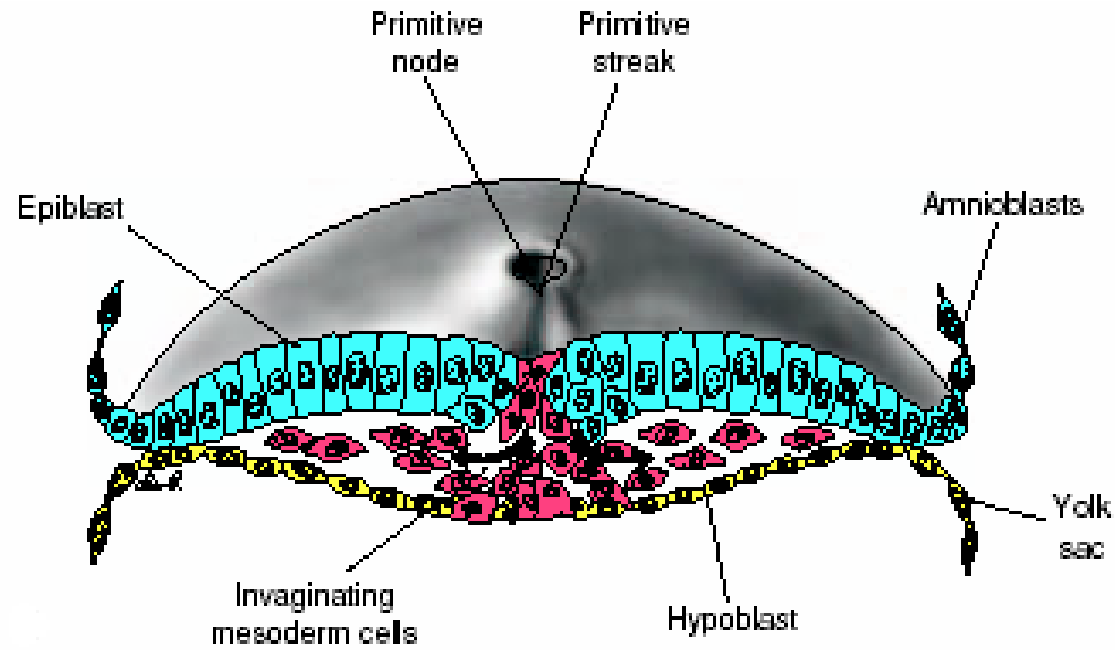
- Tubal
- Ampullary
- Interstitial
- Low uterine
- Ovarian
- Secondary abdominal

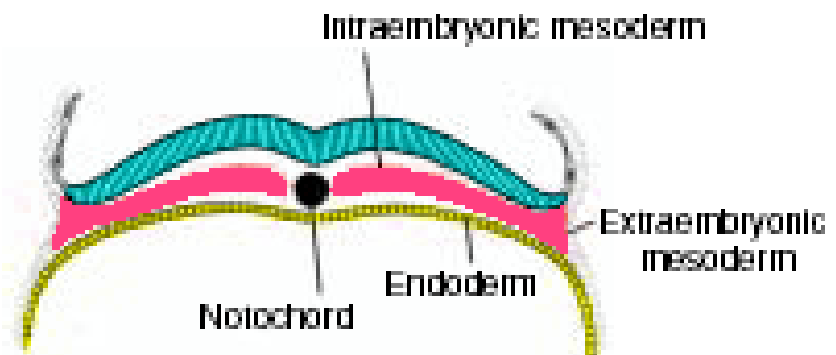
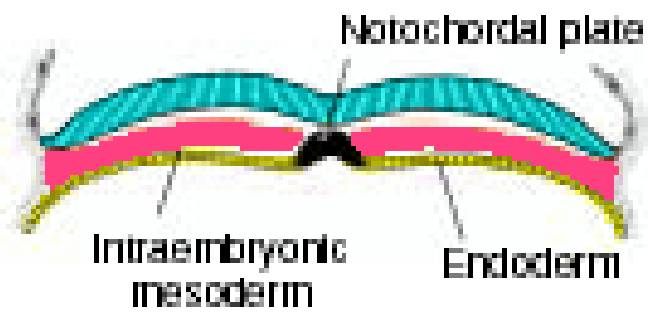
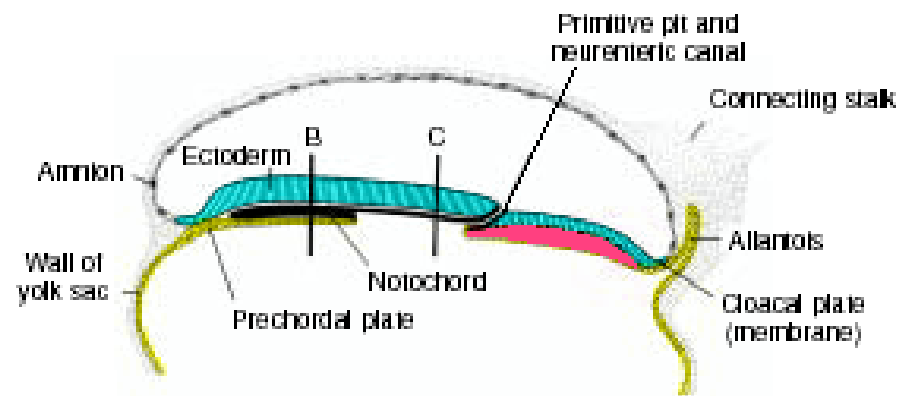


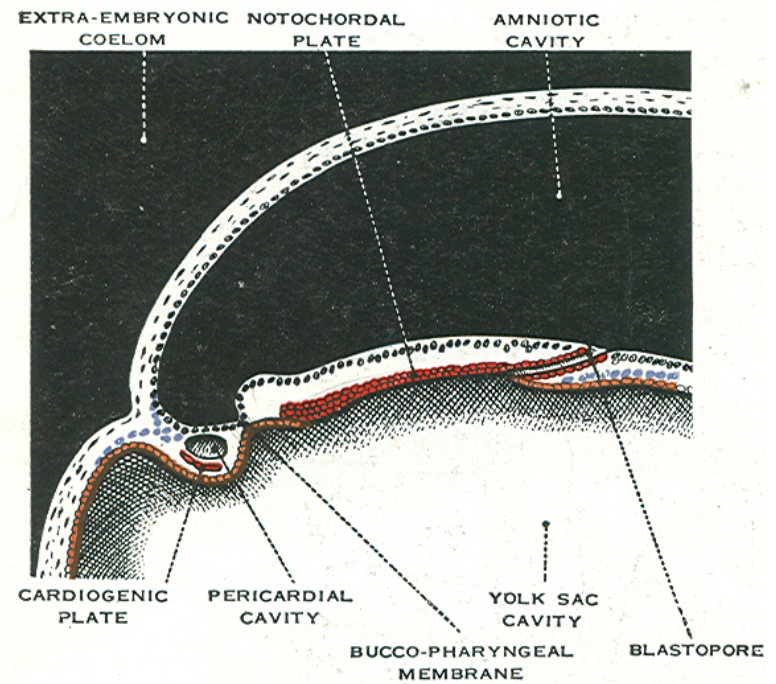
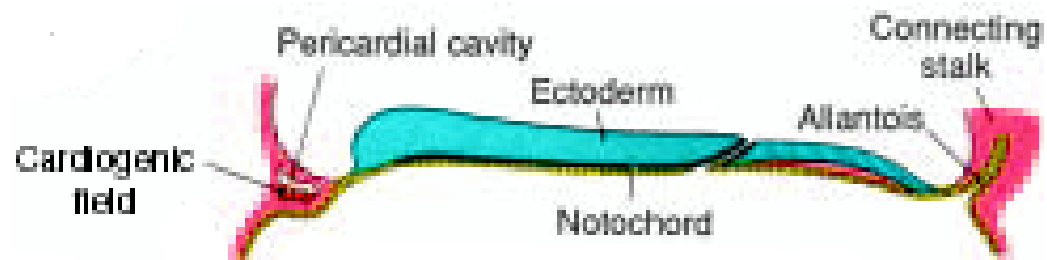










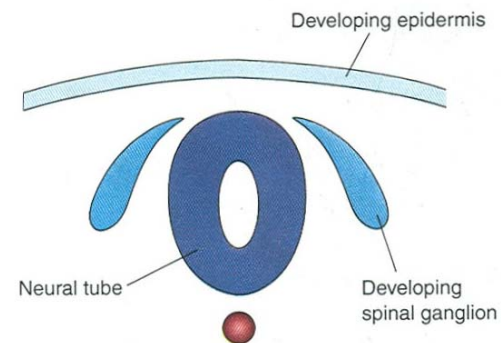
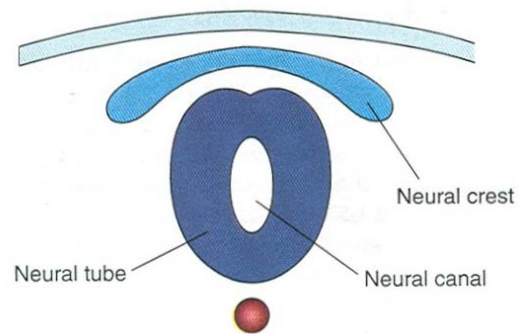
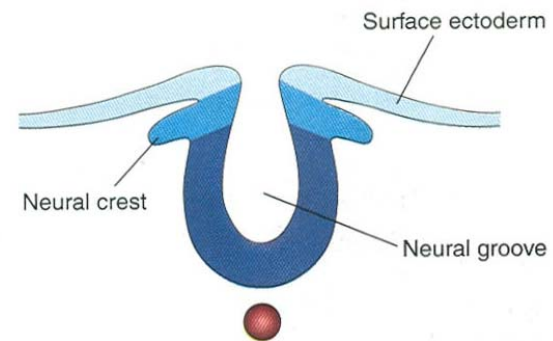
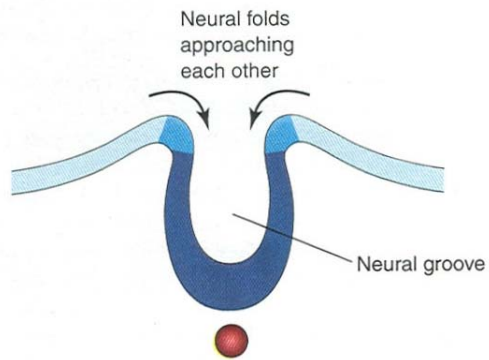
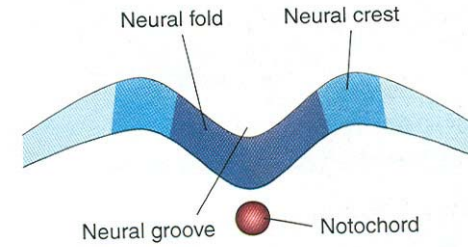
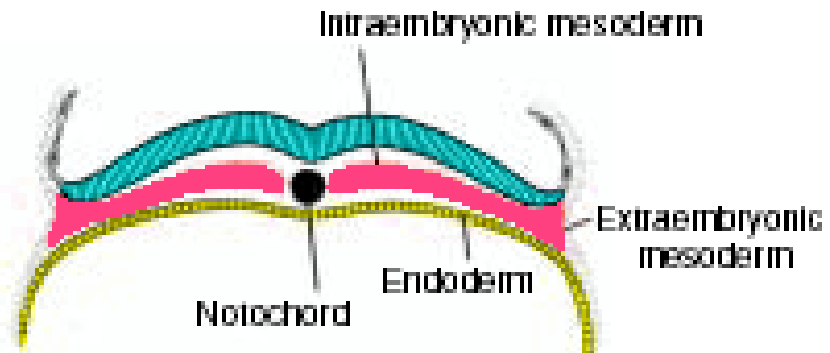


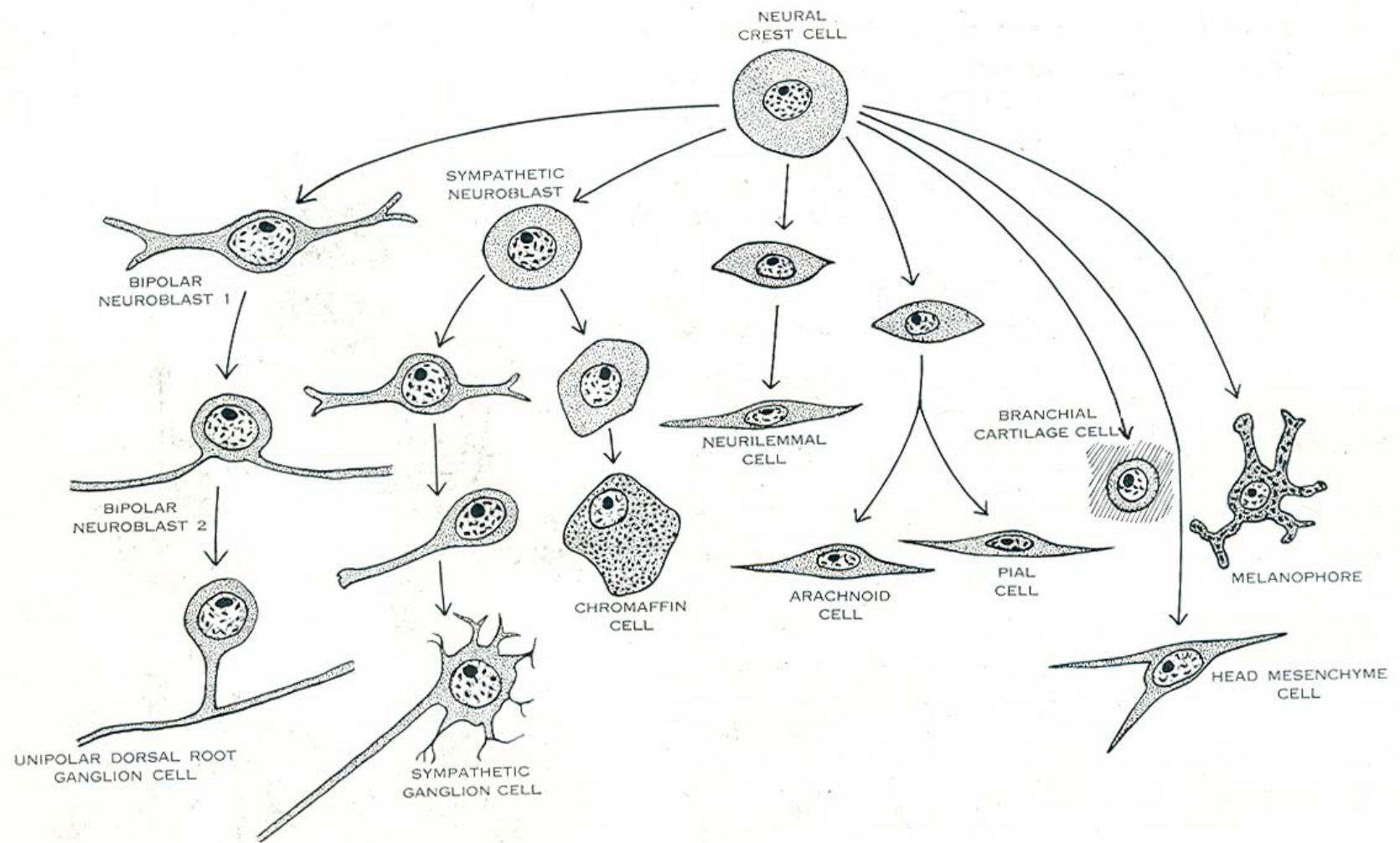
NOTOCHORD

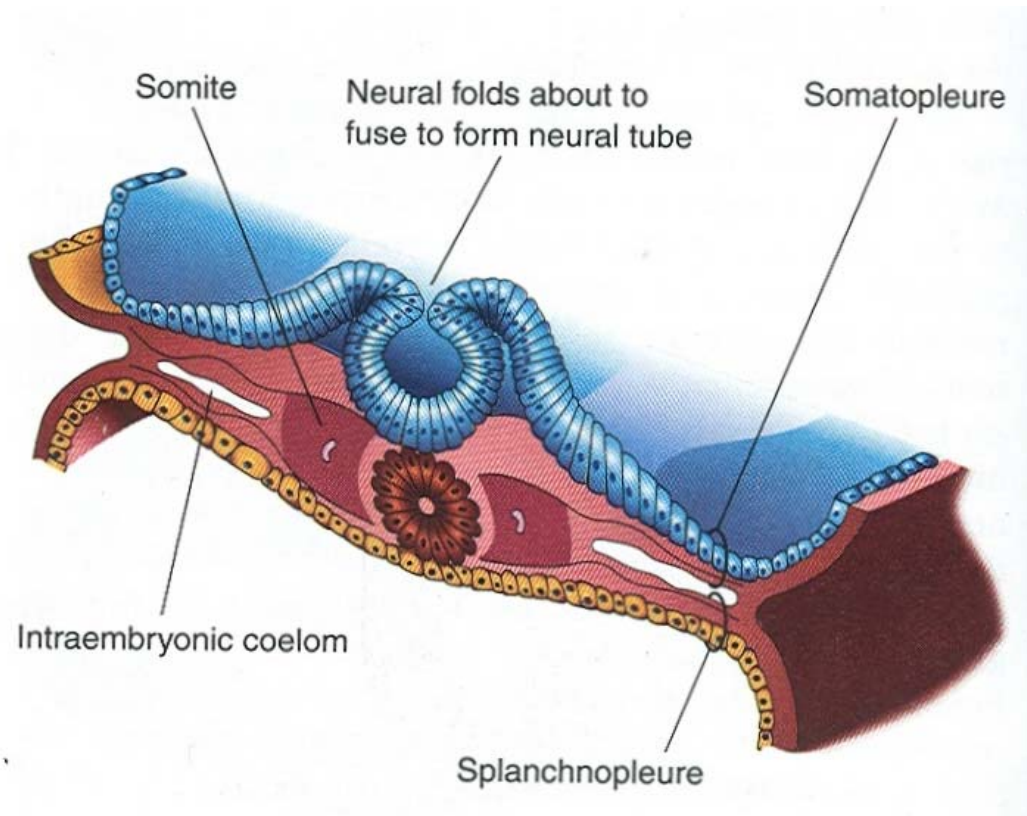
- Provides midline axis to the body.
- Induces formation of neural plate.

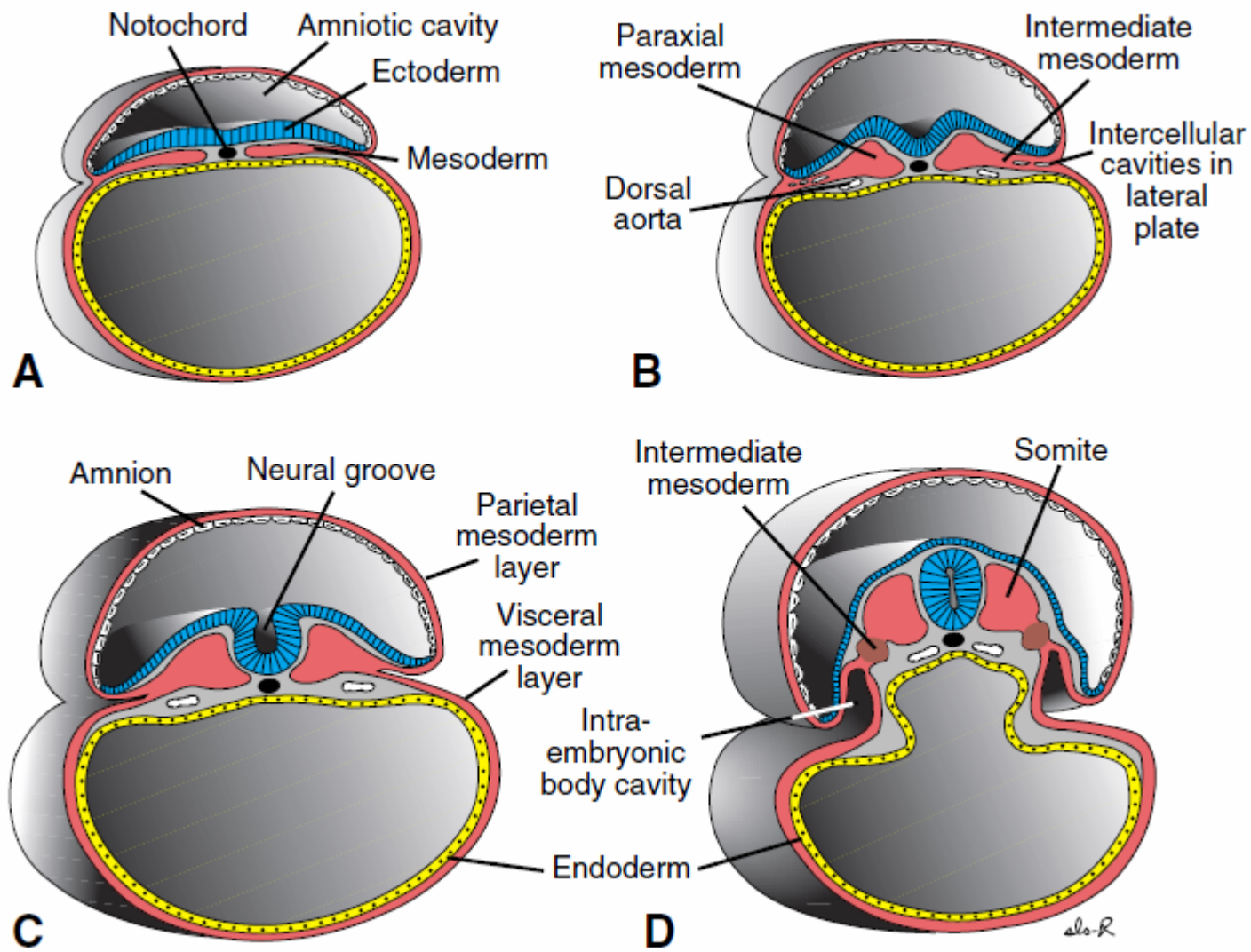
REMAINS OF NOTOCHORD

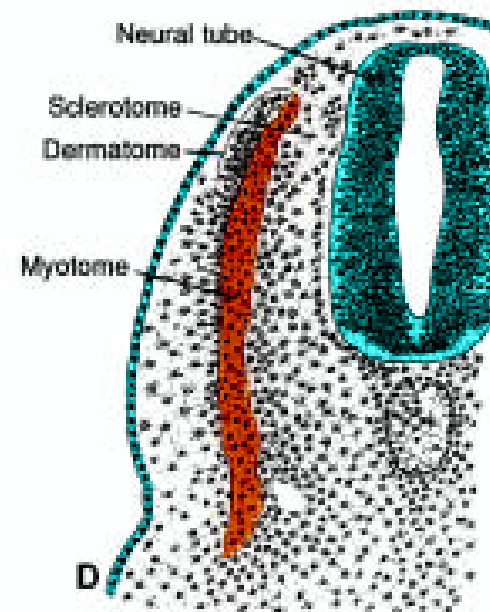
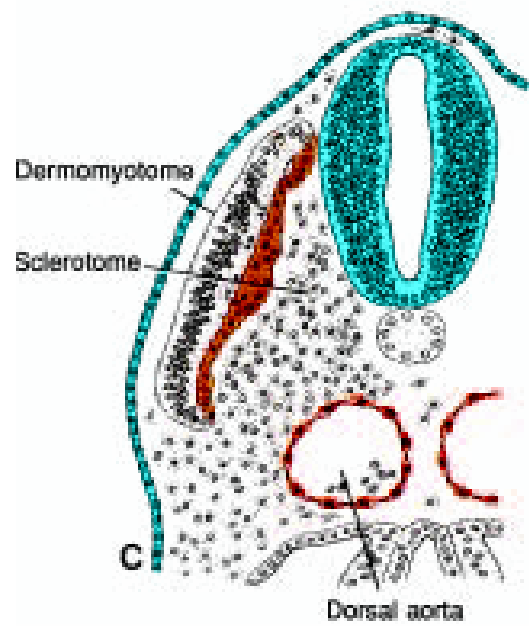
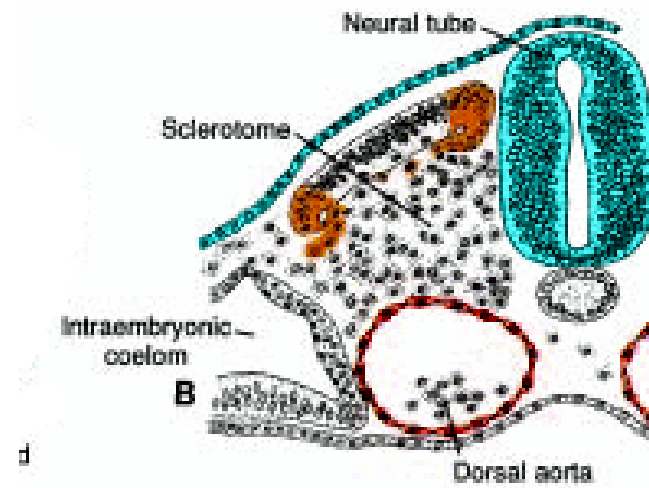
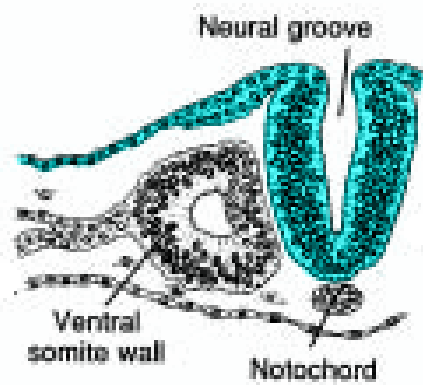
1. Nucleus pulposus.
2. Apical ligament.
3. Its cranial part is incorporated into basiocciput and basisphenoid.

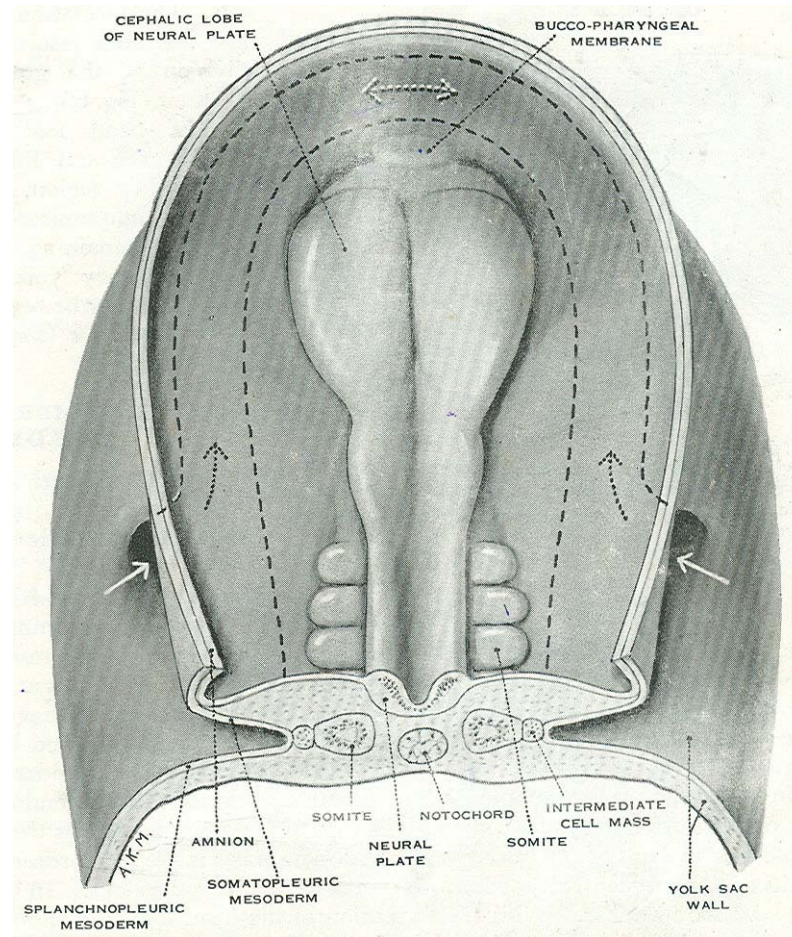








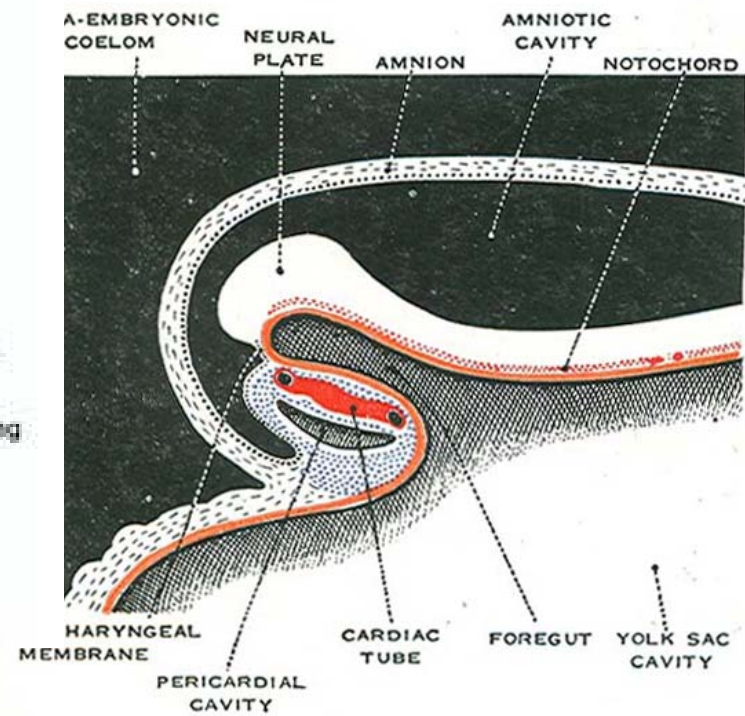
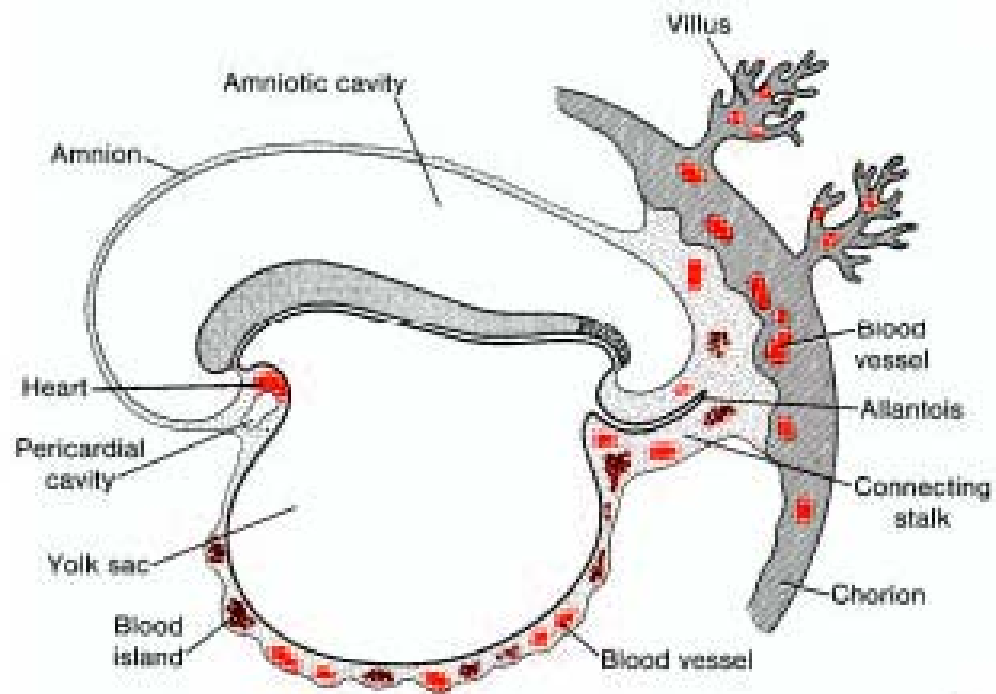


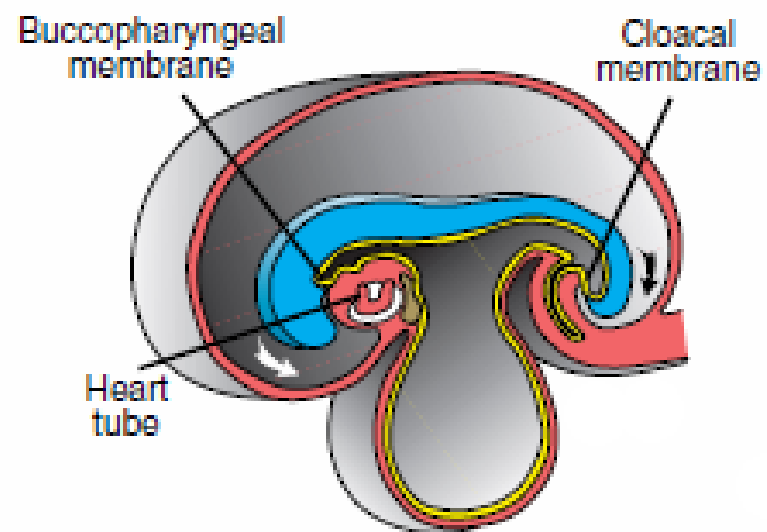
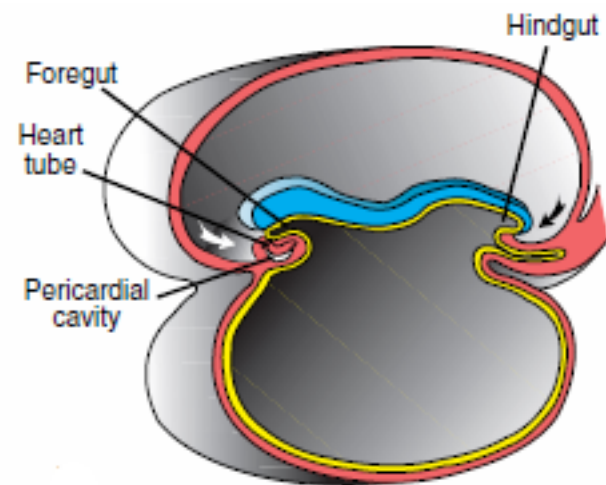
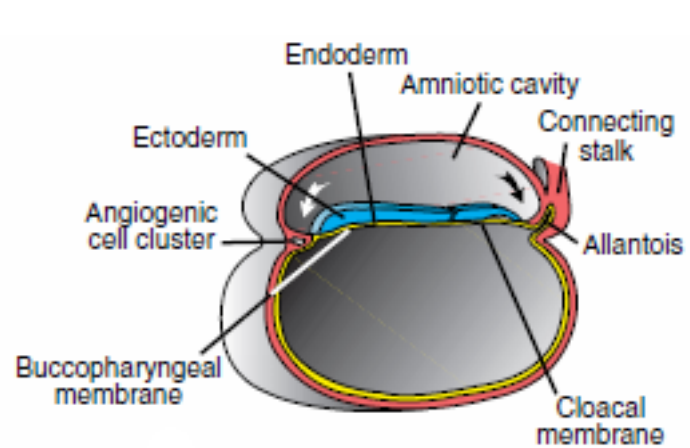


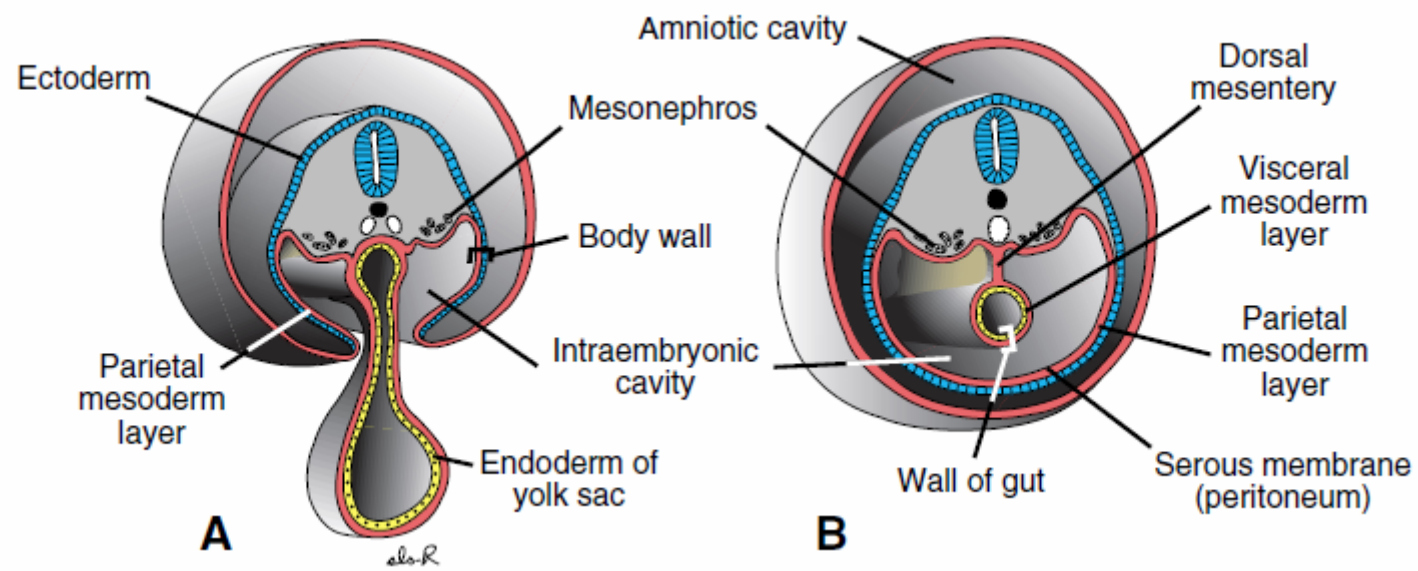
Approx. Age (Days)	No. of Somites
20	1-4
21	4-7
22	7-10
23	10-13
24	13-17
25	17-20
26	20-23
27	23-26
28	26-29
30	34-35
35	42-44

REGIONAL DISTRIBUTION OF SOMITES

Occipital	4 (1st disappears)	Cervical	7
Thoracic	12	Lumbar	5
Sacral	5	Coccygeal	8-10
		(Last 5-7 disappear)	







3RD Week of Development

A. EMBRYONIC DISC

- Gastrulation
 - Establishment of three germ layers
 - Formation of primitive streak
 - Node
 - Pit
 - Notochord
 - Intraembryonic mesoderm
 - Cardiogenic area
 - Septum transversum
 - Cloacal membrane
 - Allantois
 - Growth of Embryonic disc

B. TROPHOBLAST

- End of 2nd week – Primary Villi
- Middle of 3rd week – Secondary Villi
- End of 3rd Week – Tertiary Villi
- Formation of Cytotrophoblastic shell
 - Stem (anchoring) Villi
 - Free (terminal) Villi
- Elongation of connecting stalk (Later = Umbilical cord)

SEQUENCE OF EVENTS IN EARLY DEVELOPMENT

EMBRYOGENIC CELLS

Embryonic disc
 Endoderm & Ectoderm
 Yolk Sac & Amnion
 Prochordal plate
 Primitive Streak
 Node
 Pit
 Notochord (17th day)
 Intra Embryonic Mesoderm
 Bucco Pharyngeal Membrane (18-19th Day)
 Cloacal Membrane

(Neurulation) (19-21st day)

Division of Intra Embryonic Mesoderm

Paraxial	Somites: 20 th Day – 1-3
	↓
Intermediate	3 per day
	↓
Lateral	42-44
↓	
I.E. Coelom	

TROPHOBLASTS

Extra Embryonic Mesoderm
 Coelom
 Connecting stalk
 Chorion

Derivatives of Germ Layers

ECTODERM

1. Lining Epithelia of

- i. Skin
- ii. Lips, cheeks, gums, part of floor of mouth
- iii. Parts of palate, nasal cavities and paranasal sinuses
- iv. Lower part of anal canal
- v. Terminal part of male urethra
- vi. Labia majora and outer surface of labia minora
- vii. Epithelium of cornea, conjunctiva, ciliary body, iris
- viii. Outer layer of tympanic membrane and membranous labyrinth

ECTODERM (contd.):

2. Glands

- Exocrine – Sweat glands, sebaceous glands
Parotid, Mammary and lacrimal

3. Other derivatives

- i. Hair
- ii. Nails
- iii. Enamel of teeth
- iv. Lens of eye; musculature of iris
- v. Nervous system

MESODERM:

- All connective tissue including loose areolar tissue, superficial and deep fascia, ligaments, tendons, aponeuroses and the dermis of the skin.
- Specialised connective tissue like adipose tissue, reticular tissue, cartilage and bone
- All muscles – smooth striated and cardiac – except the musculature of iris.
- Heart, all blood vessels and lymphatics, blood cells.
- Kidneys, ureters, trigone of bladder, parts of male and female urethra, inner prostatic glands.
- Ovary, uretrus, uterine tubes, upper part of vagina.
- Testis, epidydimis, ductus deferens, seminal vesicle ejaculatory duct.
- Lining mesothelium of pleural, pericardial and peritoneal cavities; and of tunica vaginalis.
- Living mesothelium of bursae and joints.
- Substance of cornea, sclera, choroid, ciliary body and iris.

ENDODERM:

1. Lining Epithelia of

- i. Part of mouth, palate, tongue, tonsil, pharynx.
- ii. Oesophagus, stomach, small and large intestines, anal canal (upper part)
- iii. Pharyngo–tympanic tube, middle ear, inner layer of tympanic membrane, mastoid antrum, air cells.
- iv. Respiratory tract
- v. Gall bladder, extraphepatic duct system, pancreatic ducts
- vi. Urinary bladder except trigone
- vii. Female urethera except part of its posterior wall
- viii. Male urethera except part of posterior wall of prostatic part
- ix. Greater part of vagina, vestibule and inner surface of labia minora

ENDODERM (contd.)

2. Glands

- i. Endocrine: Thyroid, parathyroid,
thymus & islets of Langerhans
- ii. Exocrine : Liver, pancreas, glands in G.I.T. ;
prostatic glands and its female homologues