Veterinary Anatomy
(Unit – 8)

Topic

SEGMENTATION OF INTRAEMBRYONIC MESODERM

by

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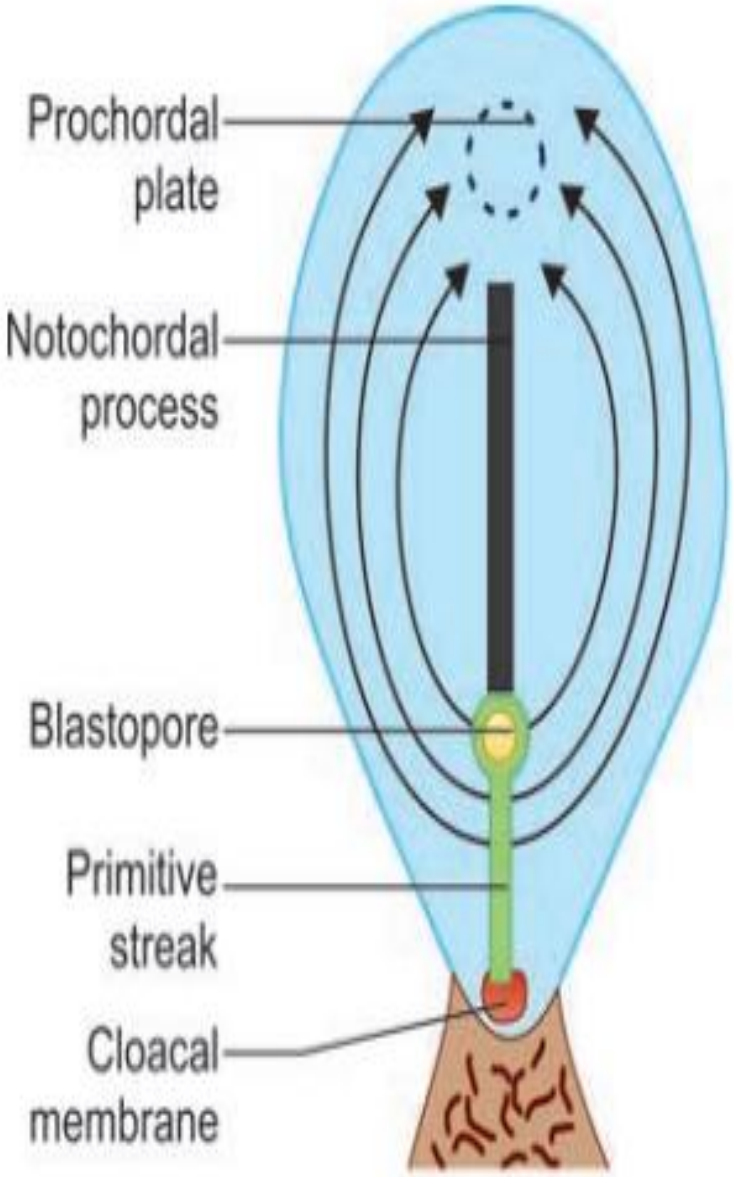
SUBDIVISIONS OF INTRAEMBRYONIC MESODERM

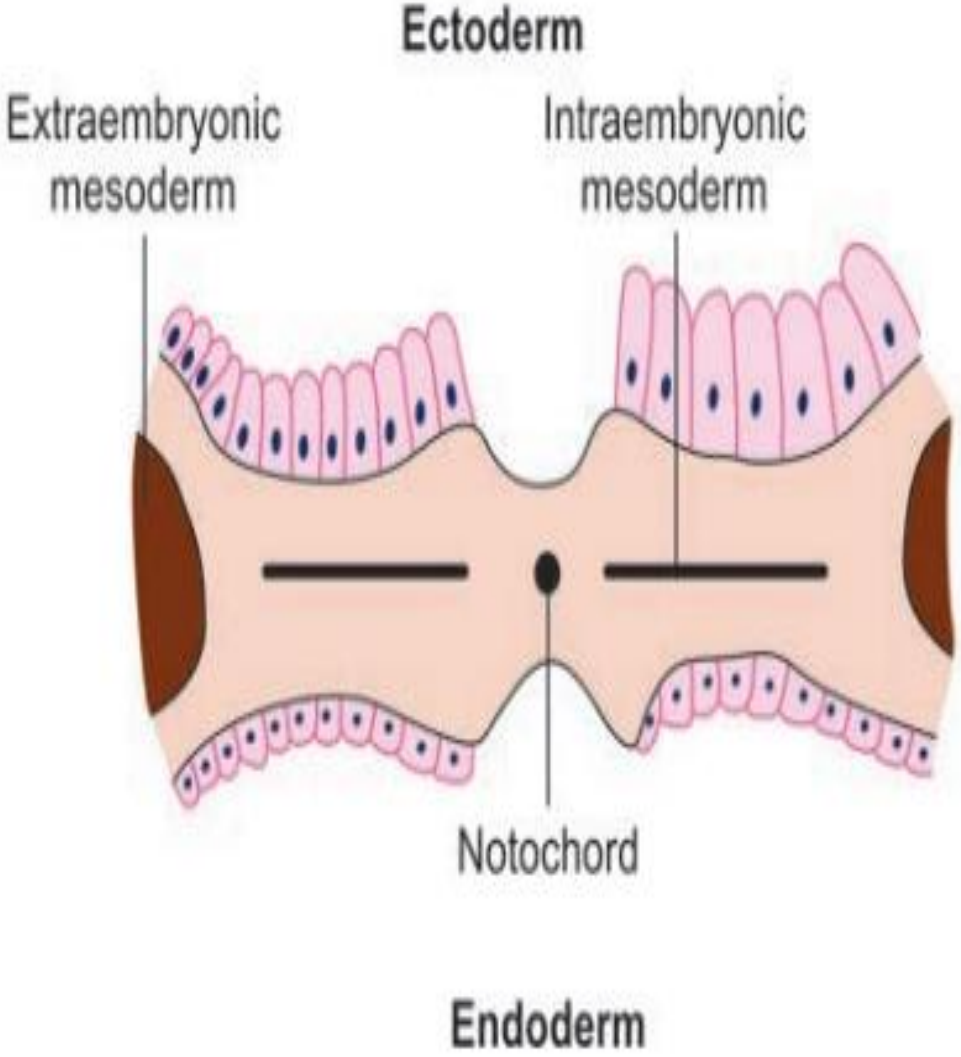
The intraembryonic mesoderm is formed by proliferation of cells in the primitive streak and it separates the ectoderm and the endoderm.

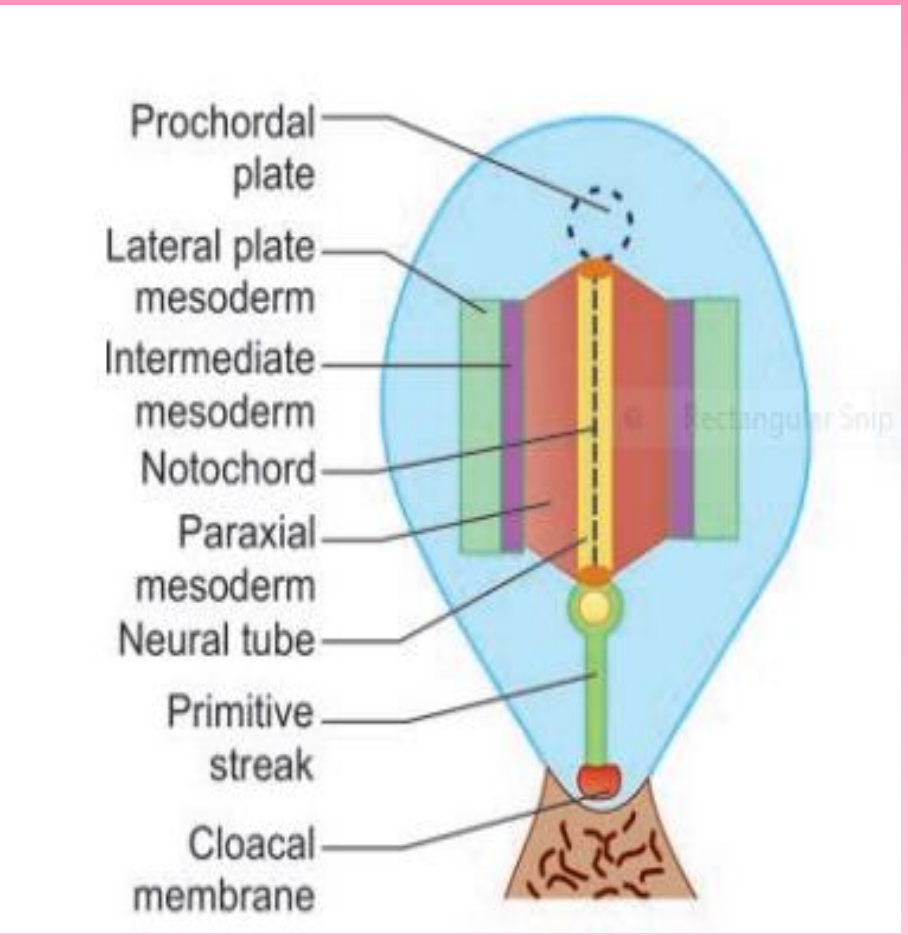
- **Prochordal plate later becomes buccopharyngeal membrane (future oral cavity) representing the junction of primitive mouth and pharynx.**
- **Cloacal membrane later divided into the anal membrane (future anal opening) and urogenital membrane (future urinary and genital openings).**
- **The rupture of these membranes establishes the communication of urinary, genital and digestive systems with the outside.**

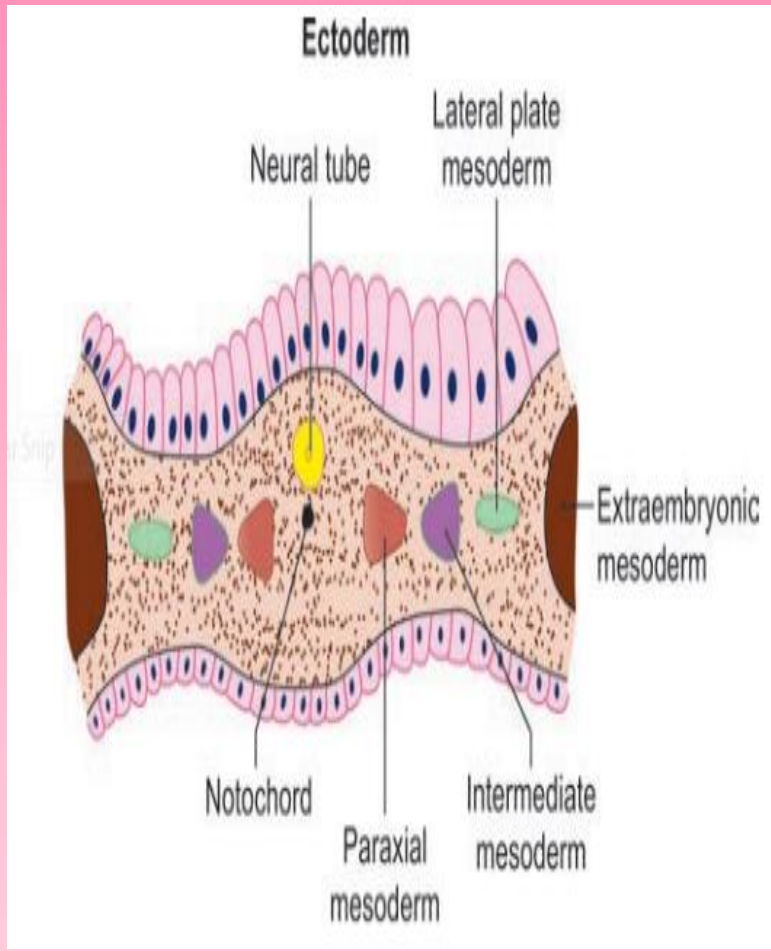
The intraembryonic mesoderm now becomes subdivided into three parts

- **Mesoderm, on either side of the notochord, becomes thick and is called the paraxial mesoderm.**
- **More laterally, the mesoderm forms a thinner layer called the lateral plate mesoderm.**
- **Between these two, there is a longitudinal strip called the intermediate mesoderm.**


Prochordal plate
Notochordal process
Blastopore
Primitive streak
Cloacal membrane


Ectoderm
Extraembryonic mesoderm
Intraembryonic mesoderm
Notochord
Endoderm


Prochordal plate
Lateral plate mesoderm
Intermediate mesoderm
Notochord
Paraxial mesoderm
Neural tube
Primitive streak
Cloacal membrane


Ectoderm
Neural tube
Lateral plate mesoderm
Extraembryonic mesoderm
Notochord
Paraxial mesoderm
Intermediate mesoderm

Paraxial Mesoderm

- **At first, the cells of the paraxial mesoderm are homogenously arranged. later the mesoderm gets segmented.**

- **segments are of two categories: (1) somitomeres and (2) somites**

- **Somites are cubical and more distinctly segmented. The most cranial somites are formed in the occipital region. New somites are progressively formed caudal to them. Ultimately there are about 44 pairs of somites (4 occipital, 8 cervical, 12 thoracic, 5 lumbar, 5 sacral and 8–10 coccygeal). Occipital somites form muscles of the tongue. Somites form the axial skeleton, skeletal muscle and part of skin.**
- **Somitomeres are not confined to the region of somites. In the head region, cranial to somites, somitomeres give origin to some mesenchyme.**

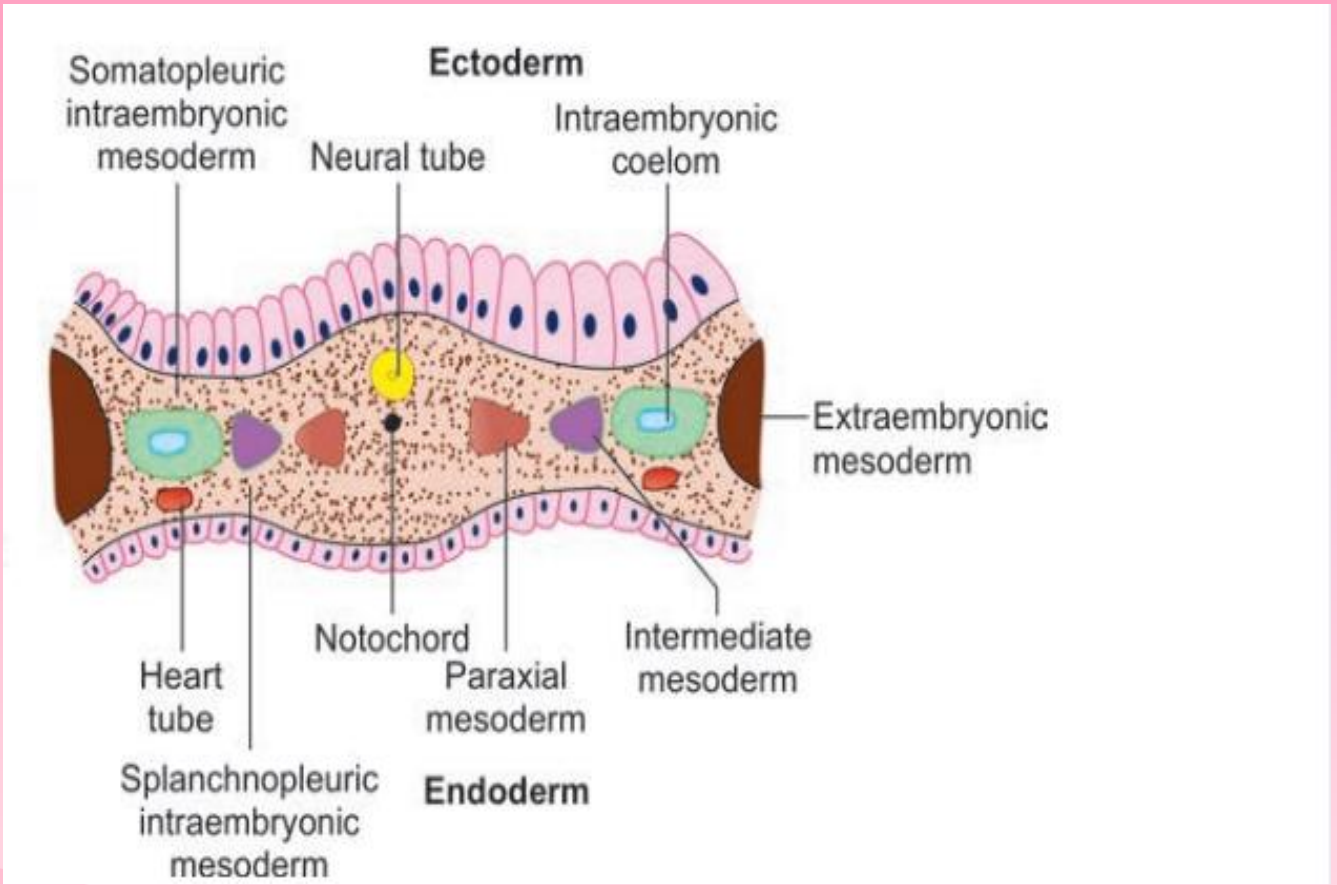
LATERAL PLATE MESODERM AND FORMATION OF INTRAEMBRYONIC COELOM

- **While the paraxial mesoderm is undergoing segmentation, to form the somites, changes are also occurring in the lateral plate mesoderm. Small cavities appear in it. These coalesce (come together) to form one large cavity, called the intraembryonic coelom.**

- **The cavity has the shape of a horseshoe There are two halves of the cavity (one on either side of the midline) which are joined together cranial to the prochordal plate. At first, this is a closed cavity but soon it comes to communicate with the extraembryonic coelom.**

With the formation of the intraembryonic coelom, the lateral plate mesoderm splits into:

- ❑Somatopleuric or parietal layer intraembryonic mesoderm that is in contact with ectoderm.
- ❑Splanchnopleuric or visceral layer of intraembryonic mesoderm that is in contact with endoderm

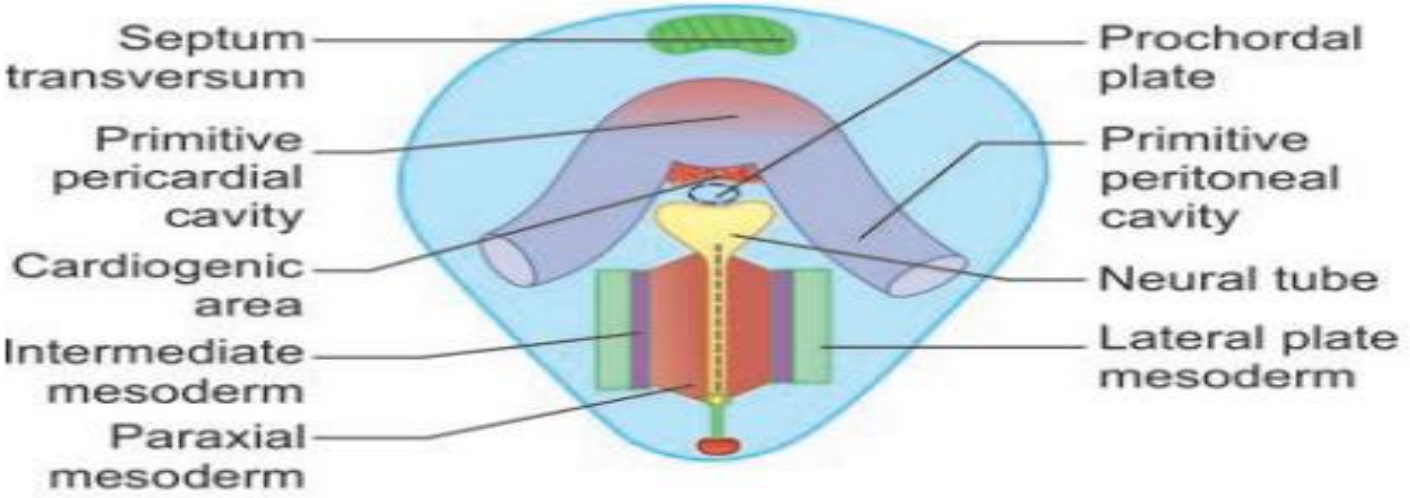


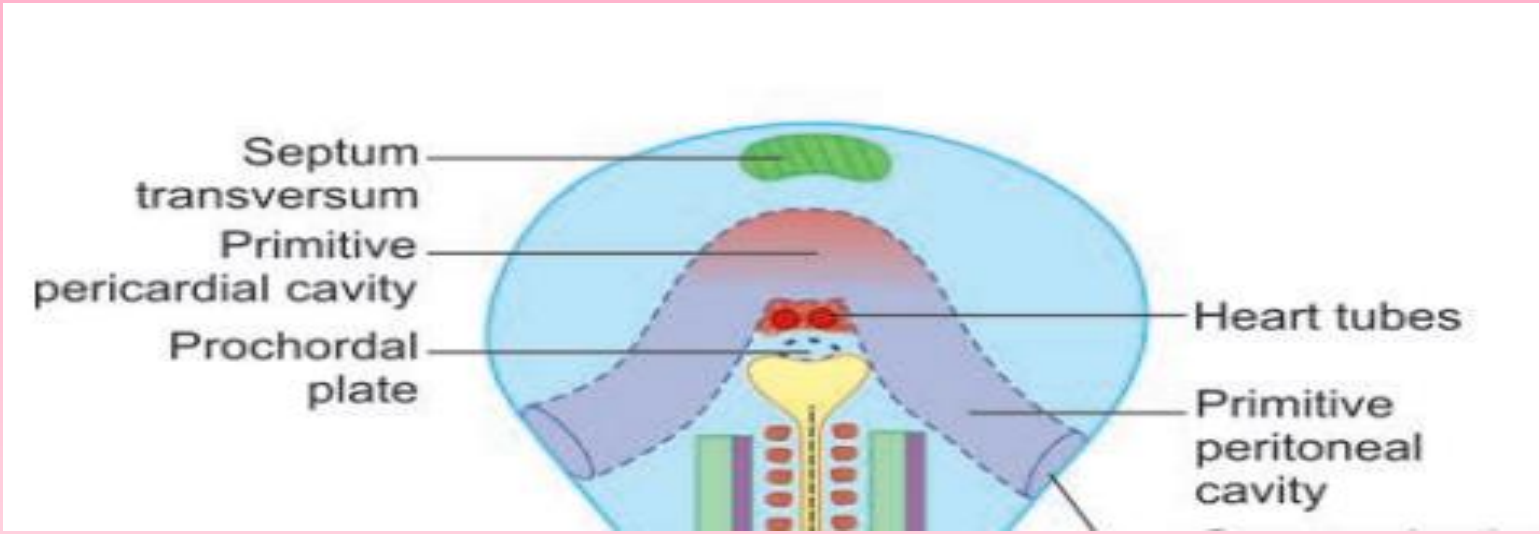
- **The intraembryonic coelom gives rise to pericardial, pleural, and peritoneal cavities.**

- **The pericardium is formed from that part of the intraembryonic coelom that lies, in the midline, cranial to the prochordal plate.**

- **The heart is formed in the splanchnopleuric mesoderm forming the floor of this part of the coelom This is, therefore, called the cardiogenic area (also called cardiogenic plate, heart-forming plate).**

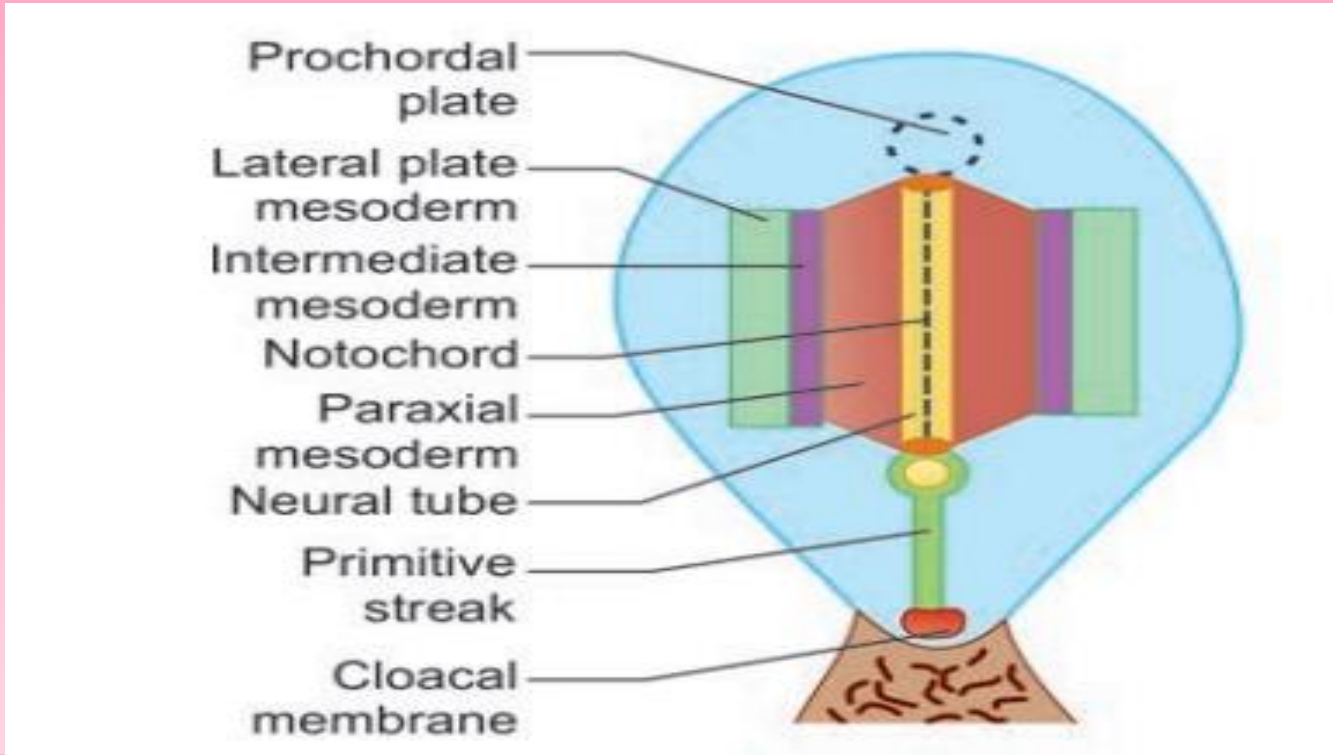
- **Cranial to the cardiogenic area (i.e. at the cranial edge of the embryonic disc) the somatopleuric and splanchnopleuric mesoderms are continuous with each other.**
- **The mesoderm here does not get split, as the intraembryonic coelom has not extended into it. This unsplit part of intraembryonic mesoderm forms a structure called the septum transversum**


Septum transversum
Primitive pericardial cavity
Cardiogenic area
Intermediate mesoderm
Paraxial mesoderm
Prochordal plate
Primitive peritoneal cavity
Neural tube
Lateral plate mesoderm


Septum transversum
Primitive pericardial cavity
Prochordal plate
Heart tubes
Primitive peritoneal cavity

INTERMEDIATE MESODERM

The urinary and genital systems are derived from the intermediate mesoderm.



THANKS