



# **Folding of the embryonic disc**

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# Allantois

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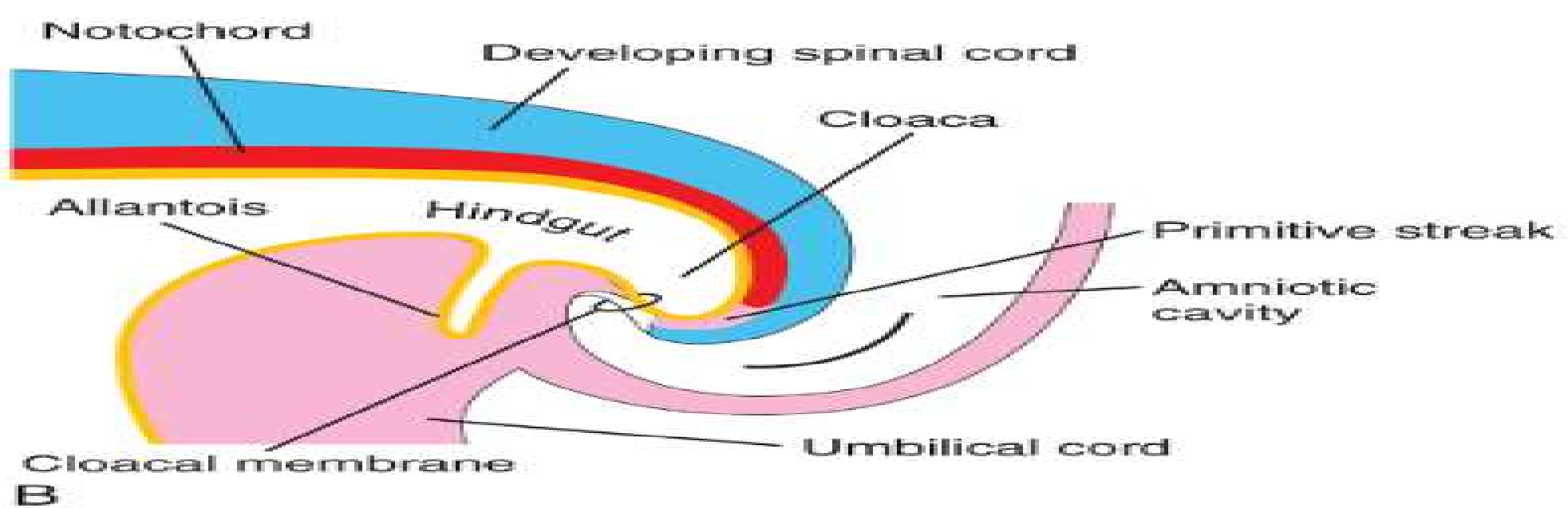
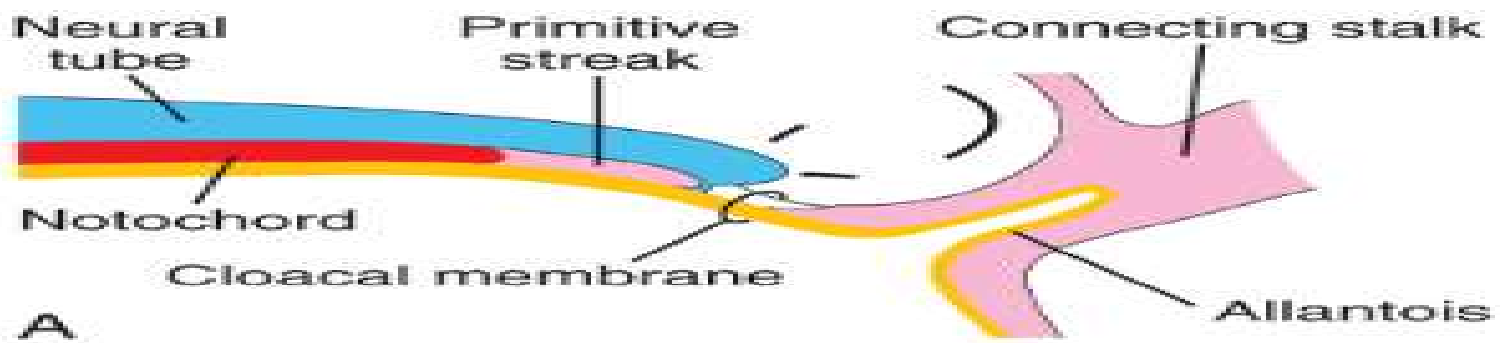
- **It is formed of 2 parts :**

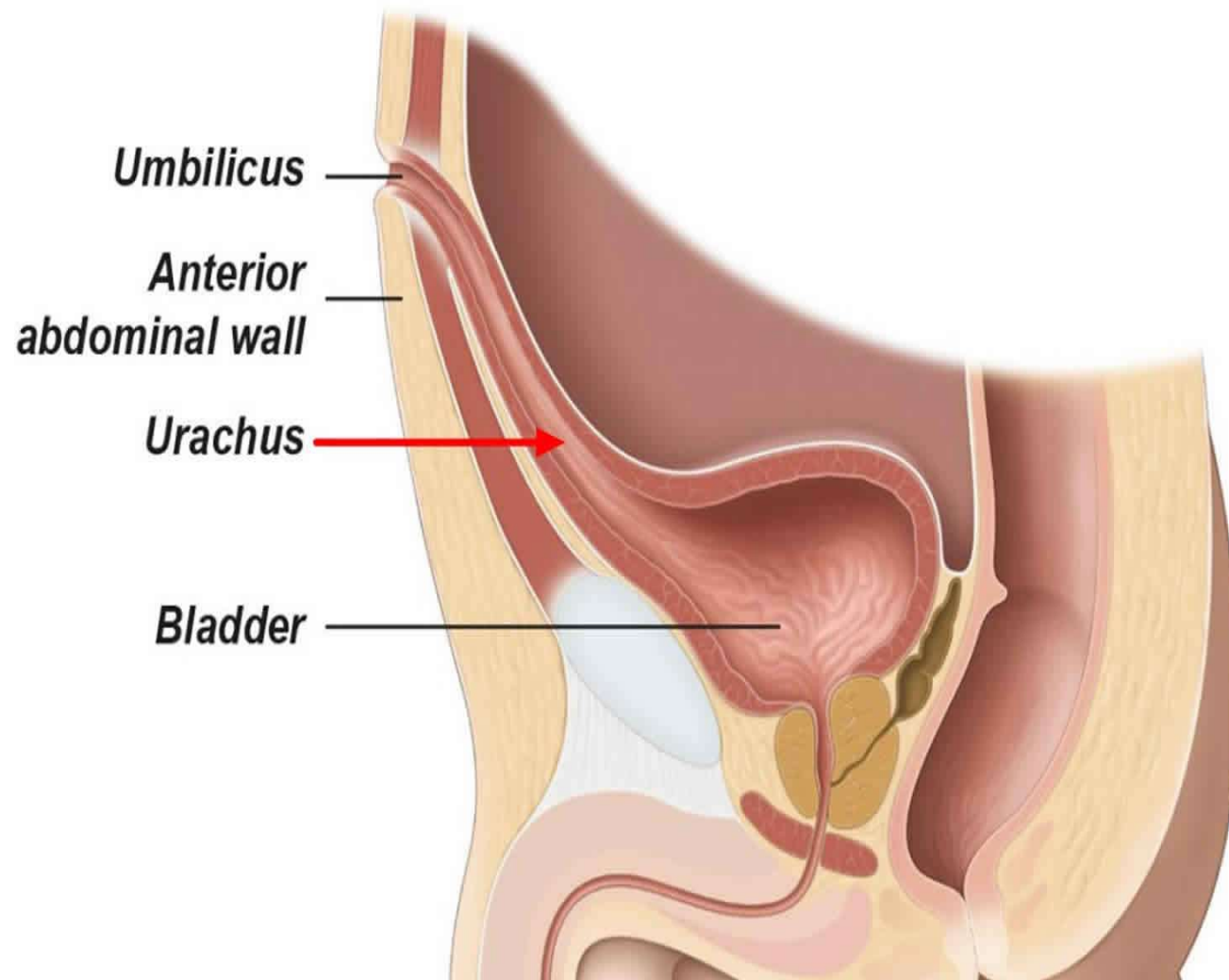
**Intra-embryonic part :**

- **The proximal part :** form the apex of urinary bladder .
- **The distal part , called urachus** connect the urinary bladder to the yolk sac

**Extra-embryonic part :** inside the umbilical cord , become **obliterated** .

**Allantoic vessels** form the **umbilical vessels** .





# Folding of the embryonic disc

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★ At the **end of 3<sup>rd</sup>. week** , the flat embryonic disc starts to **fold** and **bulges** into the amniotic cavity .

### **Two types of folding:**

- The embryonic disc becomes folded in 2 directions simultaneously

#### **1-Cephalo-caudal folding :**

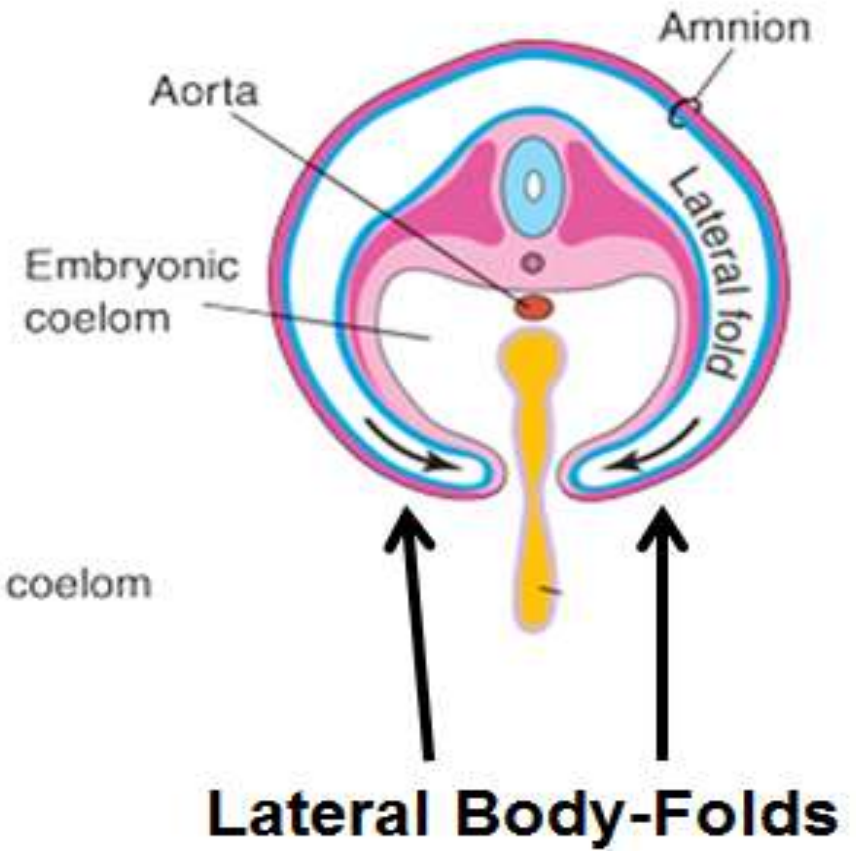
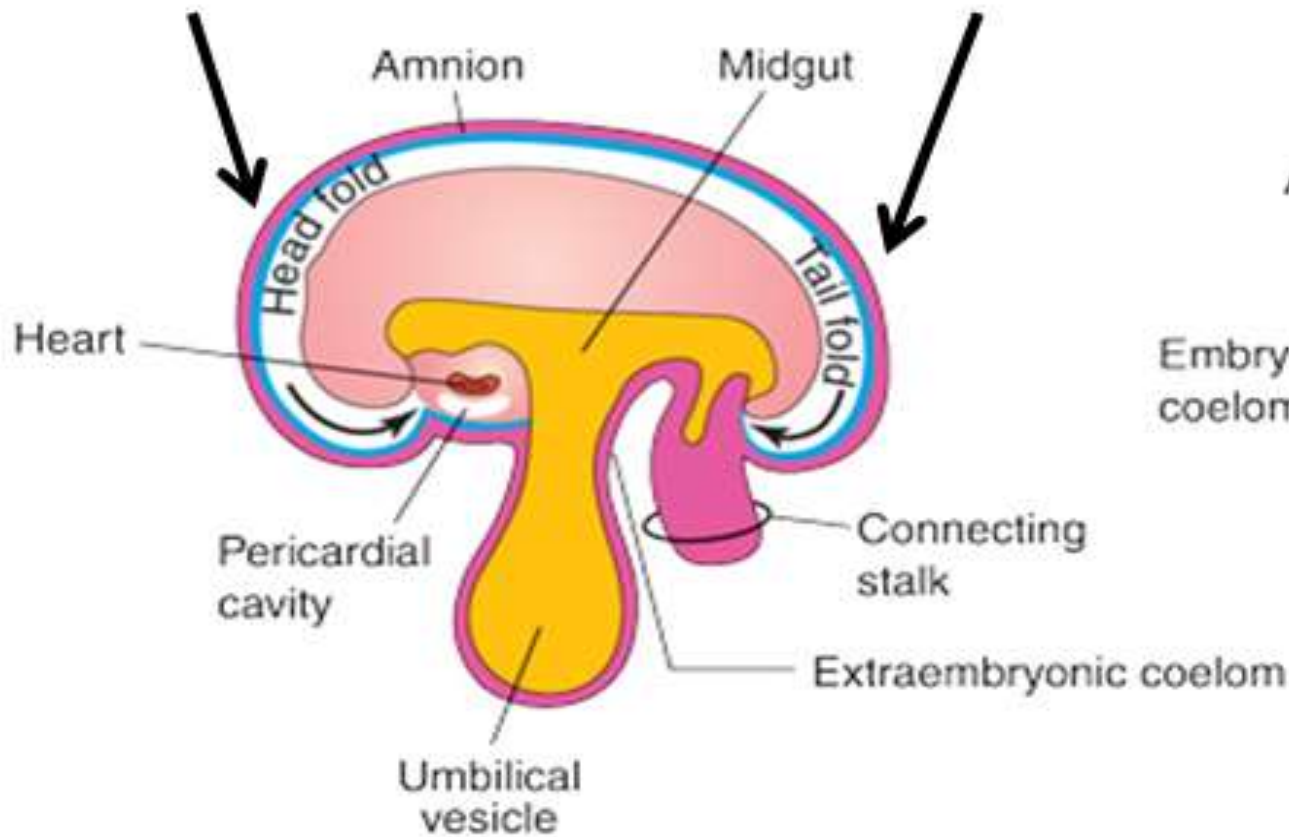
- It leads to formation of **head and tail folds** .

#### **2- Lateral folding :**

- It leads to formation of **lateral folds** .

## Head-Fold

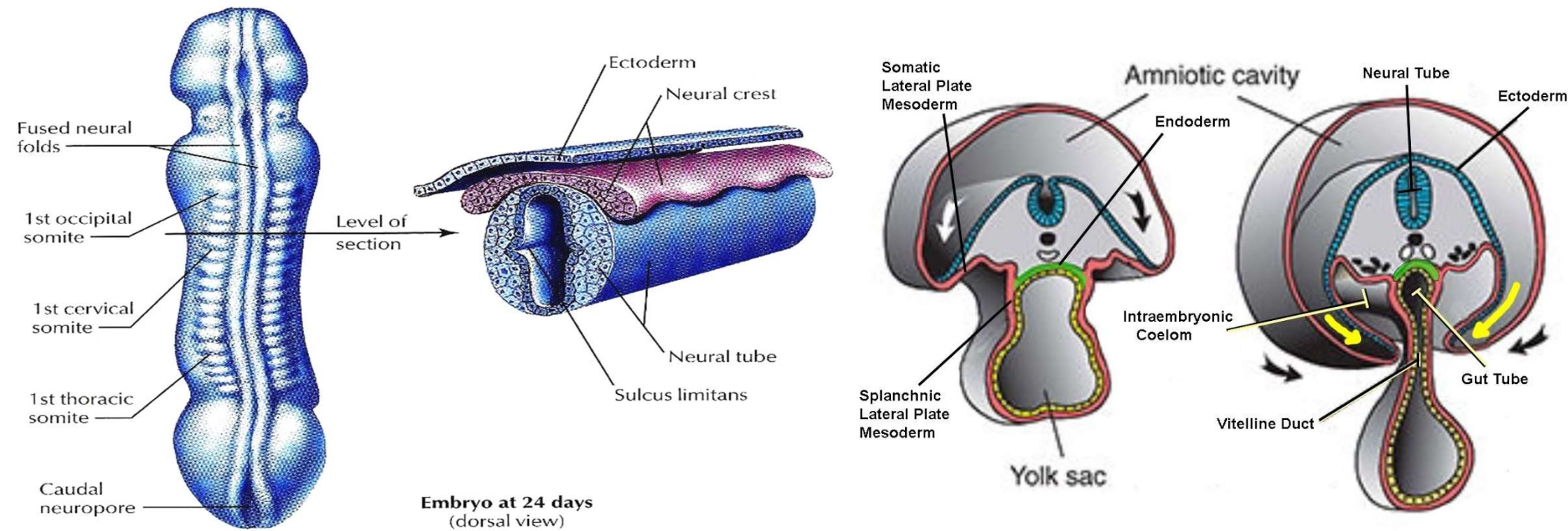
## Tail-Fold





## Causes of folding :

- 1. Rapid growth** of the **central nervous system** and **somites**.
2. Progressive expansion of the **amniotic cavity** .



## Results of folding:

1-The flat shaped **embryonic disc** changes to the ***cylindrical*** appearance with formation of **body cavity**.

2- The **amniotic cavity** surrounds the embryo almost completely .

3-The **amnio-ectodermal junction** shifts to the ventral aspect of the body to form the **primitive umbilical ring**

4-The **connecting stalk** and **allantois** shift to the ventral side of the body with the connecting stalk into the **primitive umbilical ring**

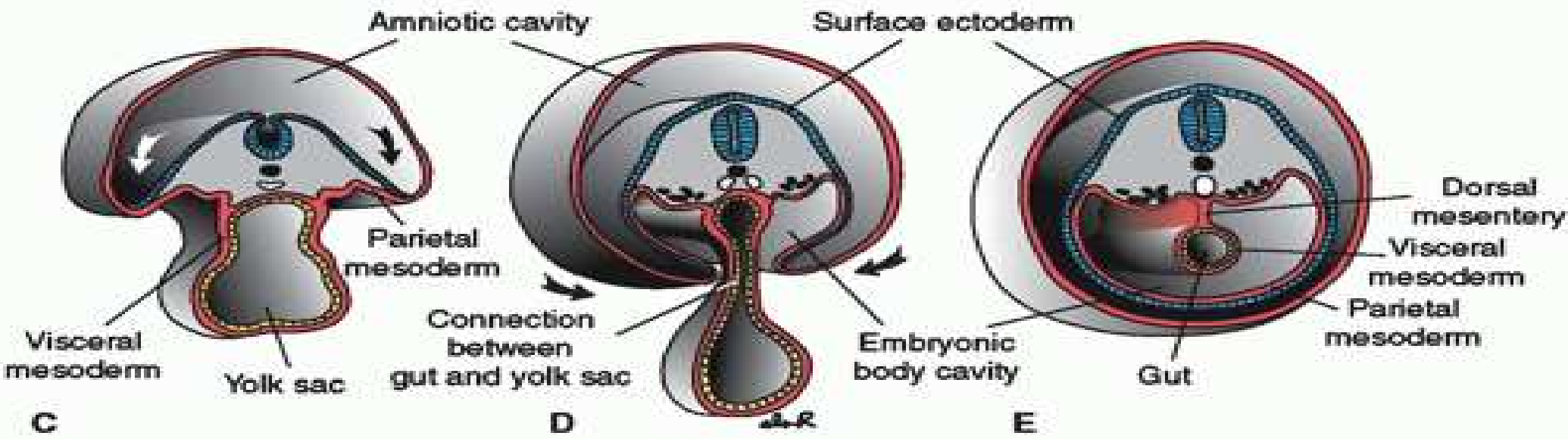
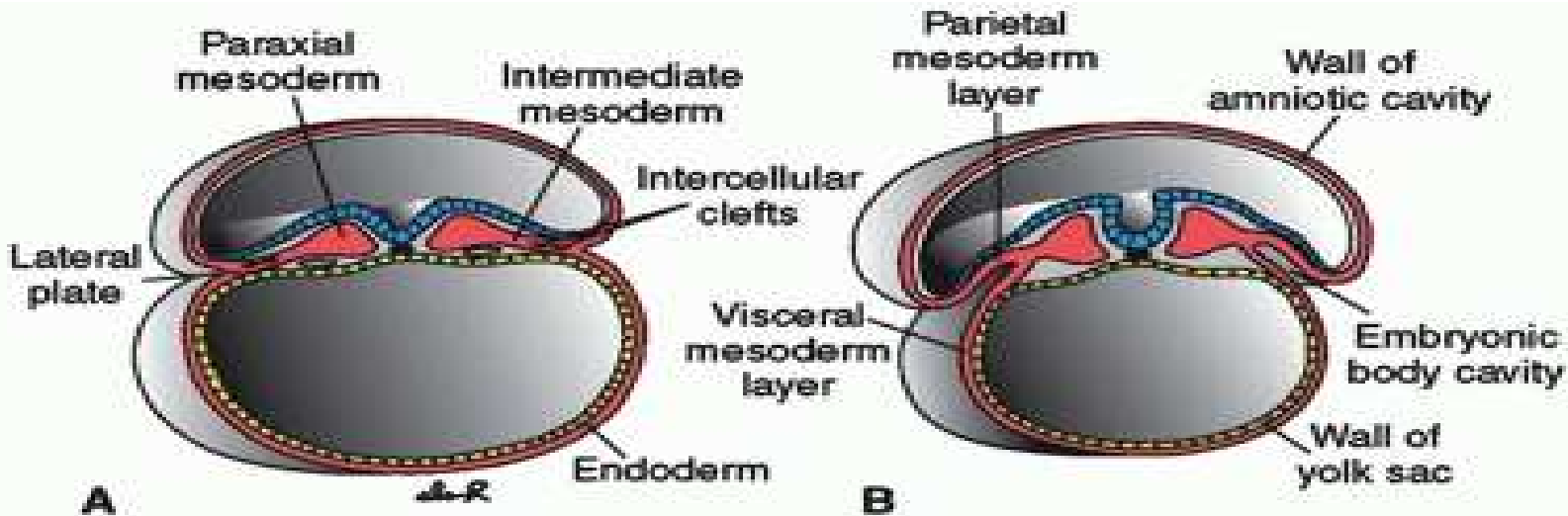
5- A large part of the cavity of the **yolk sac** is incorporated into the body of the embryo forming the **primitive gut** which is lined by endoderm.

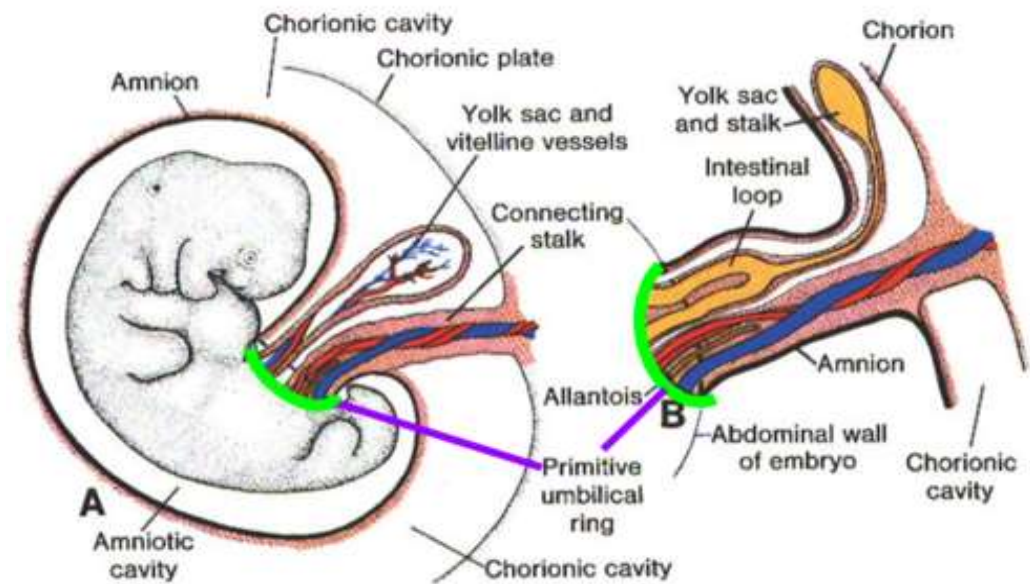
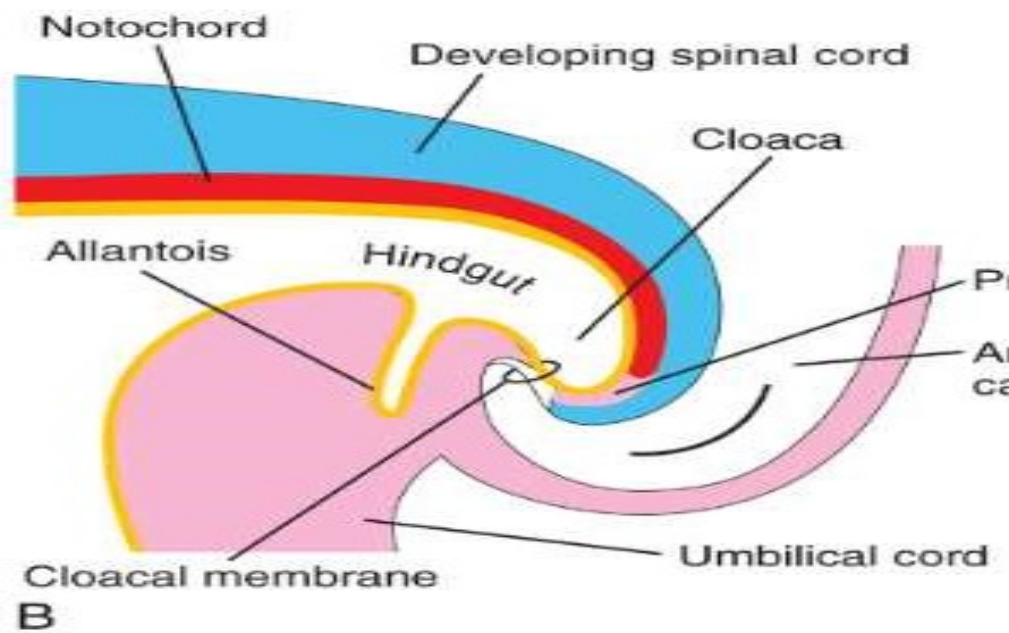
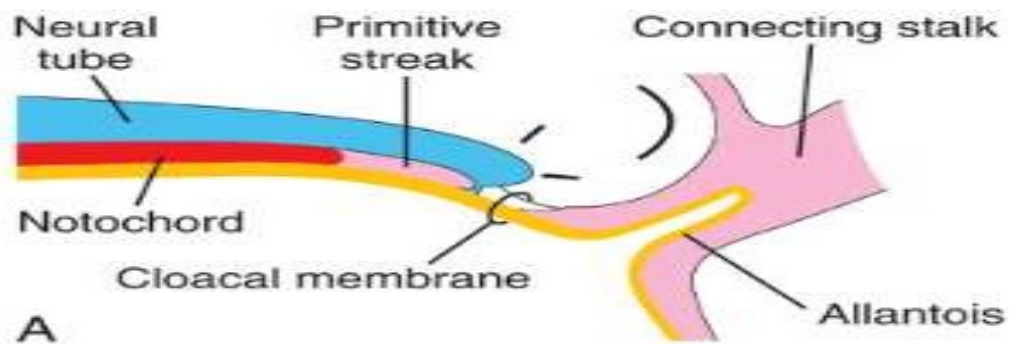
6-The part of the gut found in the **head fold** is called the **foregut**, the part found in the **tail fold** is called the **hind gut**, whereas the part in between within the **lateral folds** is called the **midgut** .

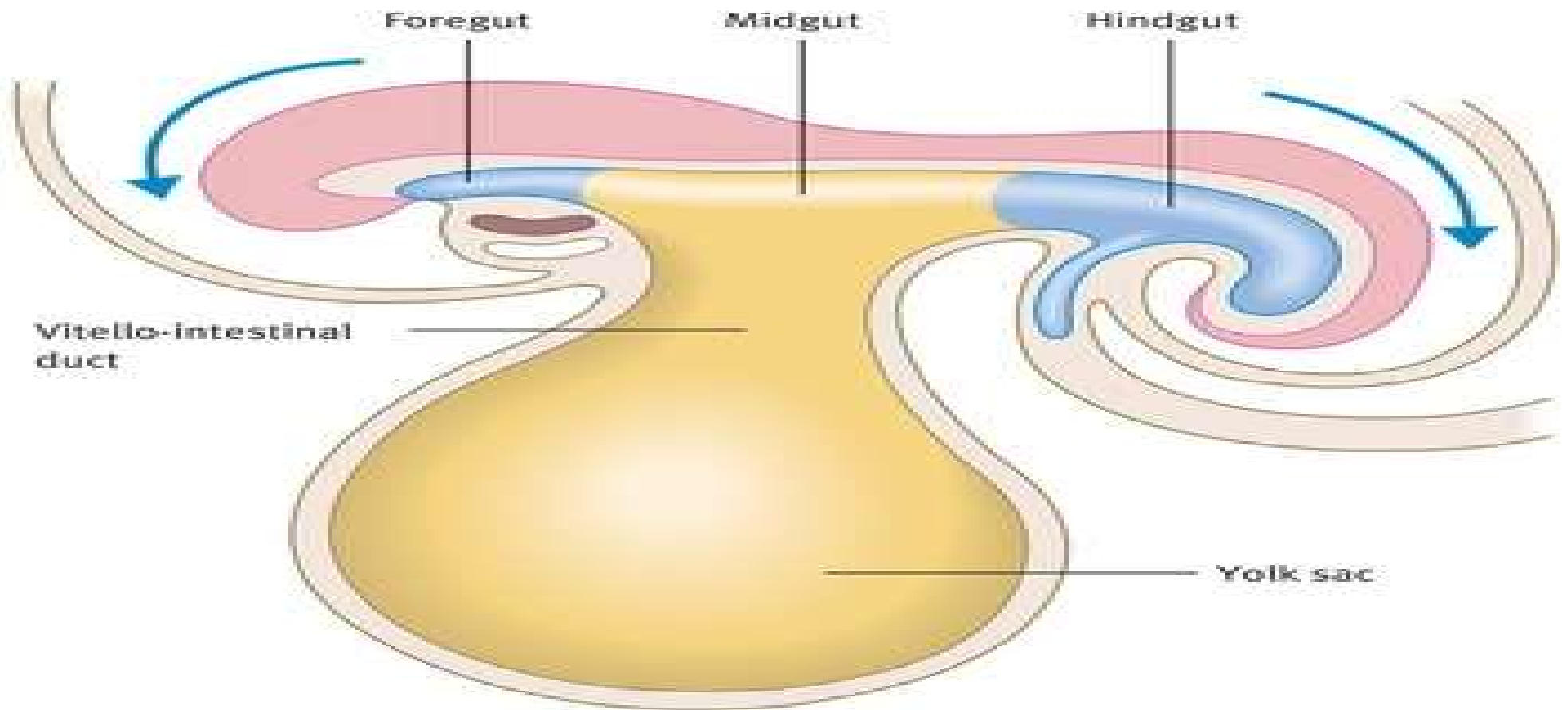
7- The **buccopharyngeal membrane** becomes the **cephalic**, and the **septum transversum** becomes the **caudal** to pericardial cavity , while the pericardial cavity and heart remain in between.

8-The **cranial end** of the folded embryonic disc shows the followings :

- a) **Forebrain swelling** produced by the developing forebrain .
- b) **pericardial swelling** produced by the developing heart .
- c) Depression between the previous 2 swellings called **stomatodeum** .



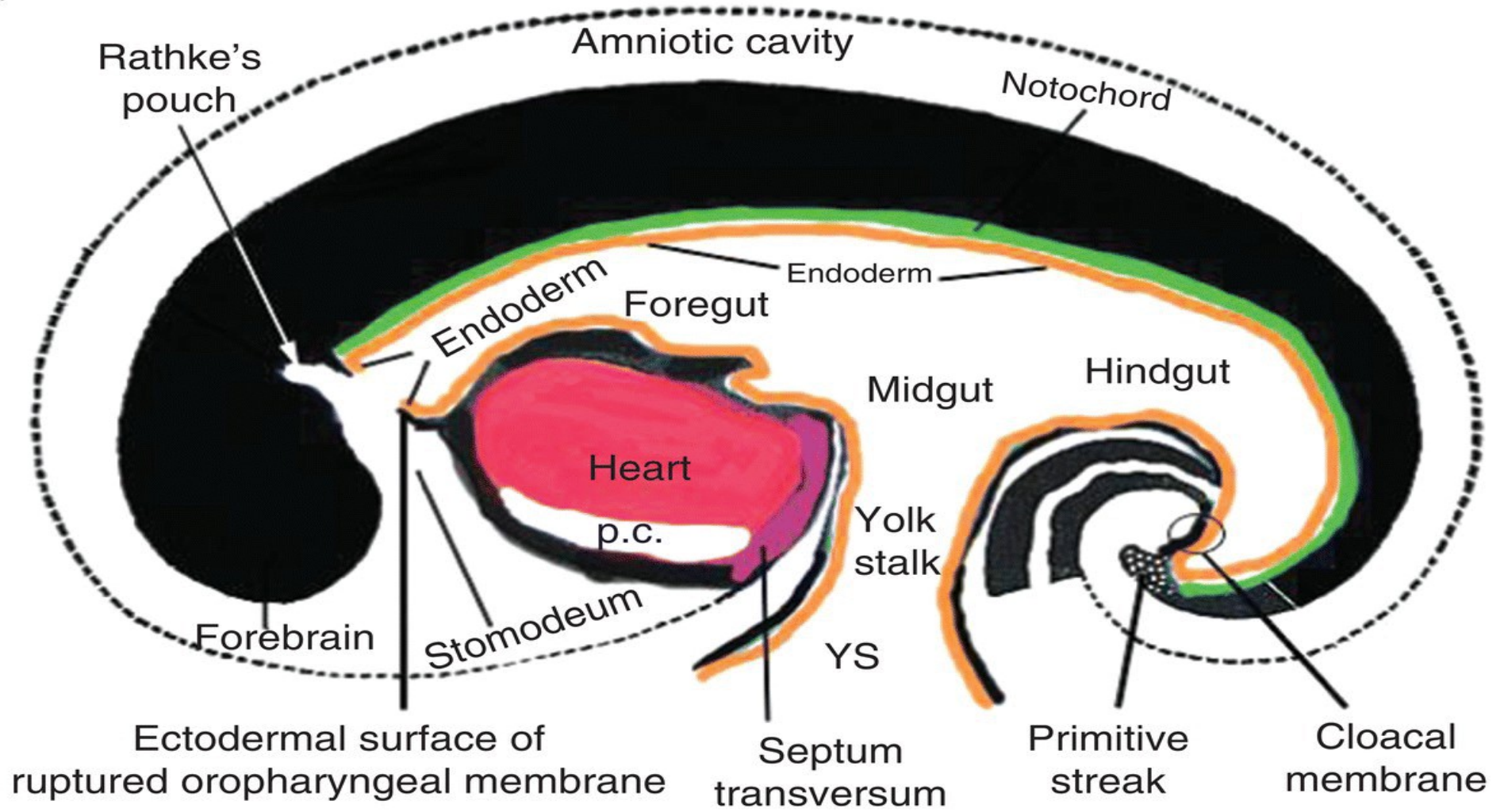




**Arrows indicate the formation of head and tail folds.**

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**Please see the following video :**

<https://www.youtube.com/watch?v=qMnpxP6EeIY>

A newborn baby is lying on its back, looking up at a bright sun in a hazy sky. The baby's face is in the foreground, looking towards the sun. The sun is a large, bright, glowing orb in the center of the frame, surrounded by a soft, hazy atmosphere. The overall color palette is warm, with shades of orange, red, and yellow. The text "THANK YOU" is overlaid in the center of the image in a large, white, serif font.

**THANK YOU**

DR.AHMED SALMAN