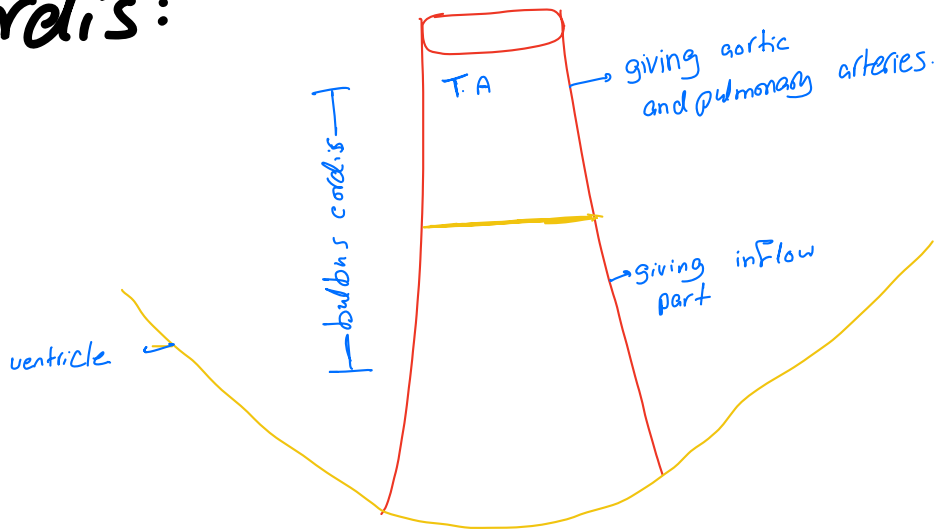
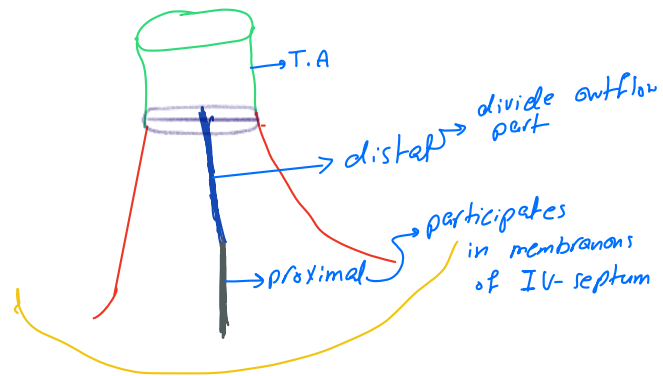


Bulbus cordis:

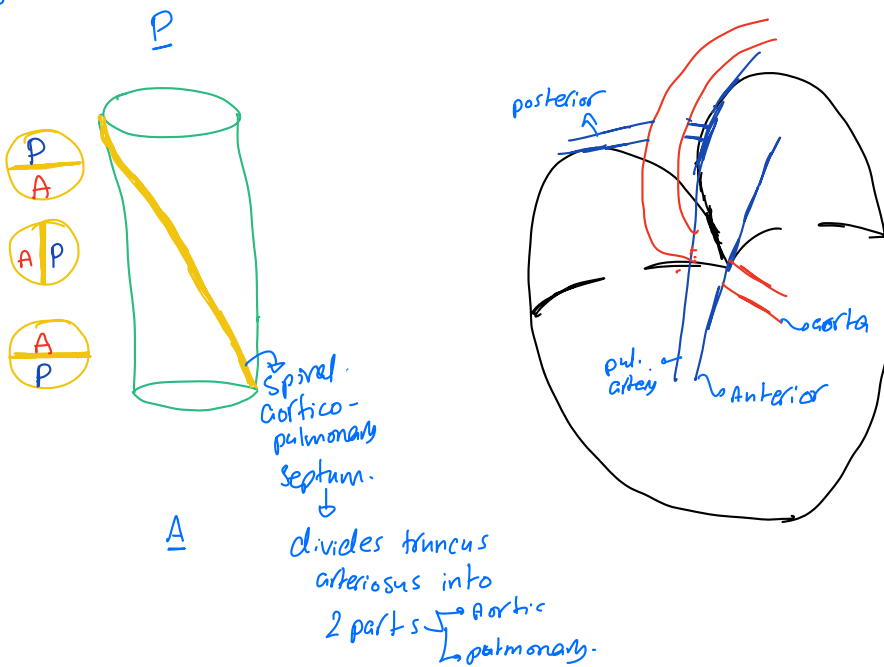
1



2



3



I) Parts of the bulbus cordis:

1-**The proximal-portion part** (conus cordis): is absorbed into the ventricles forming the outflow tracts of the both ventricles.

3-**The distal part (truncus arteriosus)**: is divided by the spiral aortico-pulmonary septum into roots and proximal portions of the ascending aorta and pulmonary trunk.

II) Formation of the aortico-pulmonary septum:

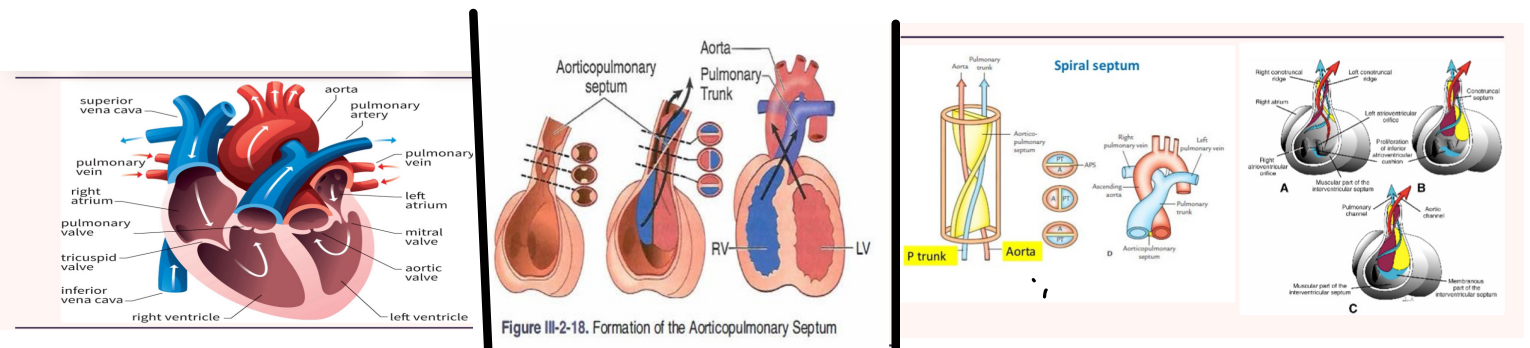
1. During the 5th week, 2 truncal ridges in the truncus arteriosus (right and left) are developed.

2. These ridges grow forming 2 longitudinal ridges .

3. By the 8th week, the 2 ridges become fused to form a spiral aortico-pulmonary septum

dividing the truncus arteriosus into pulmonary trunk and ascending aorta. 5. The spiral course of the aortico-pulmonary septum explains:

- ❖ Adult relations between the ascending aorta and pulmonary trunk; the pulmonary trunk lies anterior then to the left and finally posterior to the aorta
- ❖ The 2 arteries are enclosed in a common tube of visceral pericardium



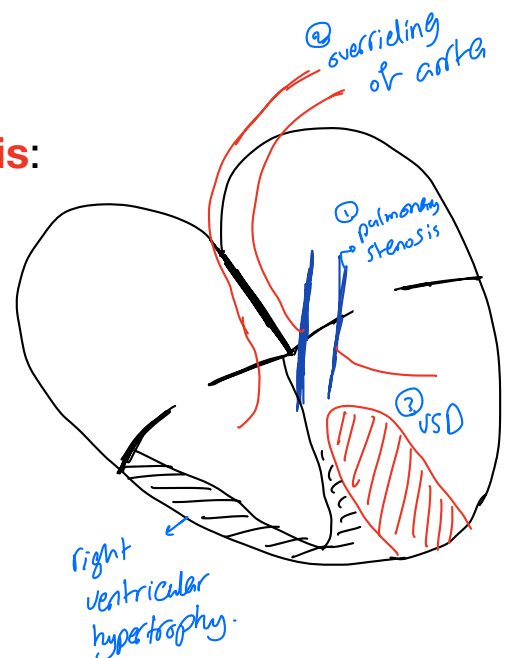
Anomalies of bulbus cordis:

1- Fallot's tetralogy

It is common cyanotic congenital heart disease.

The aortico-pulmonary septum is shifted anteriorly leads to unequal division of the conus.

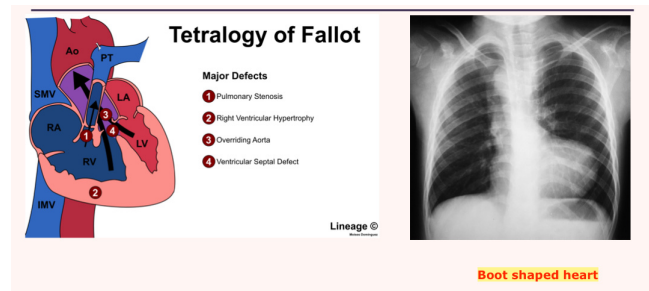
This is cause right to left shunt of the blood.



Characters:

- 1-Pulmonary stenosis
- 2-Overriding aorta i.e. the mouth of aorta receives blood from both Right and left ventricles.
- 3-Ventricular septal defect
- 4-Hypertrophy of Right ventricle

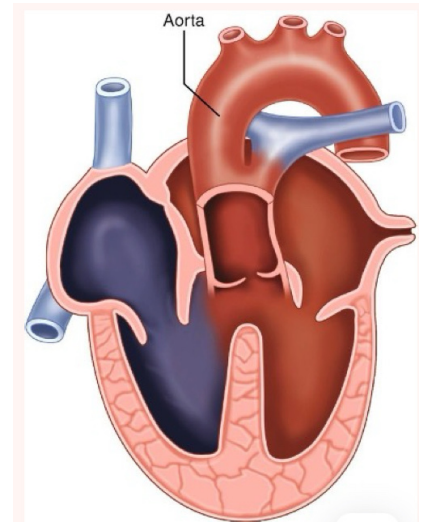
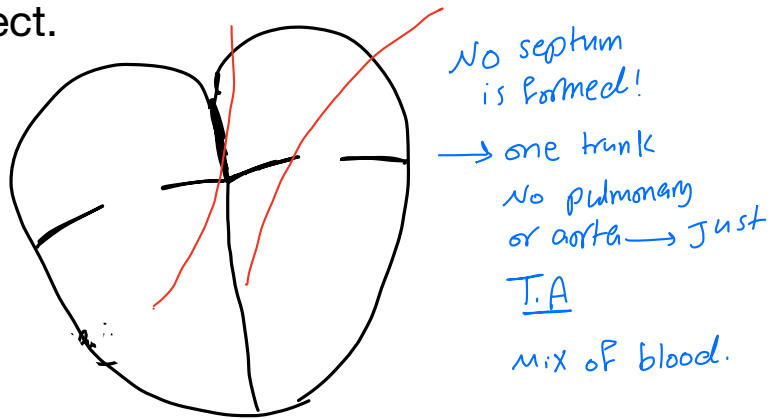
X ray show boot shaped heart due to right ventricle enlargement



2- Persistent truncus arteriosus :

Cause: failure of formation of the aortico-pulmonary septum.

It is accompanied by: membranous ventricular septal defect.

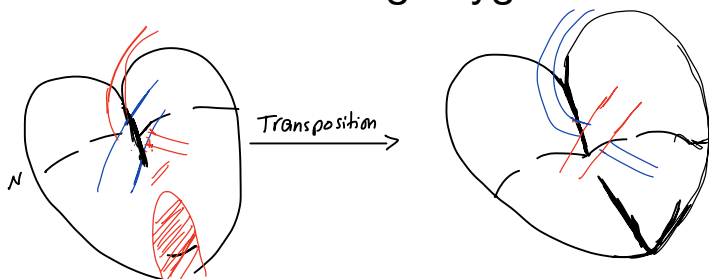
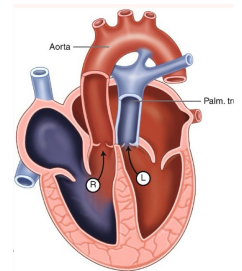


3- Transposition of the Greater Arteries :

Cause: the aortico-pulmonary septum runs a straight course instead of its spiral course.

It leads to:

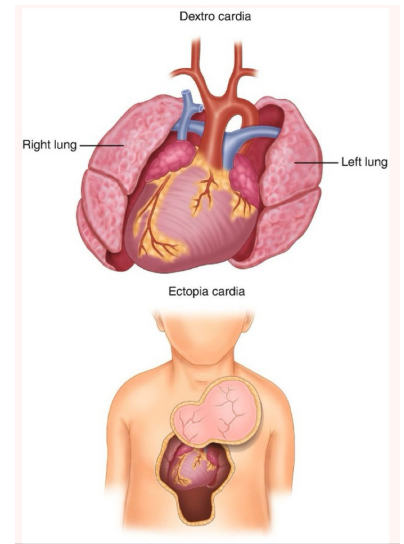
- ❖ Aorta arising from the right ventricle.
 - ❖ Pulmonary trunk arising from from the left ventricle
 - ⊙ This cause right to left shunt of the blood (**Cyanotic**)
 - ⊙ This is cause sever cyanosis and death after birth
 - ⊙ Usually it is accompanied by other defects as ASD ,VSD ,PDA
- Which cause mixing oxygenated and NON oxygenated blood to sustain life



ANOMALIES OF POSITION OF THE HEART:

1- Dextrocardia :

- The heart and its great vessels lie as a mirror image to their normal position.
- This may occur alone or may be associated with reversal of all abdominal organs (**situs inversus totalis**).

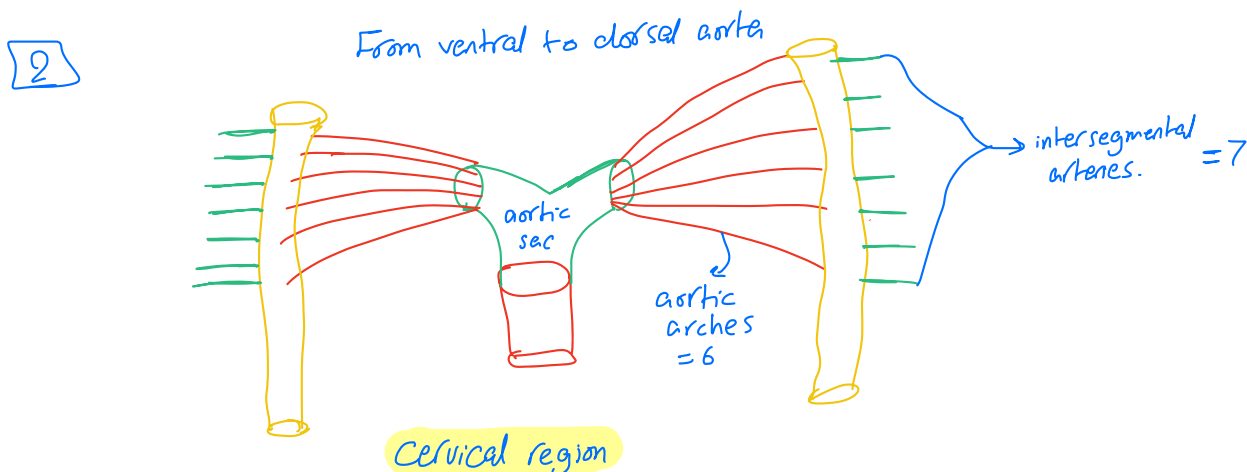
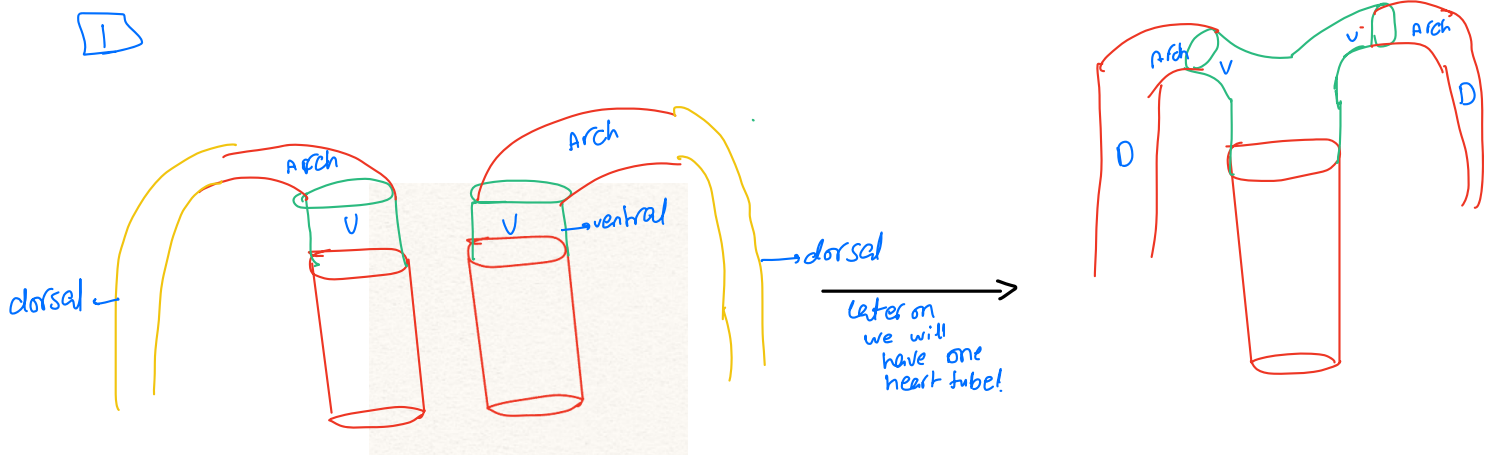


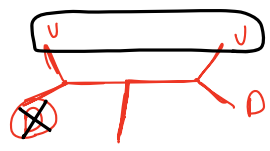
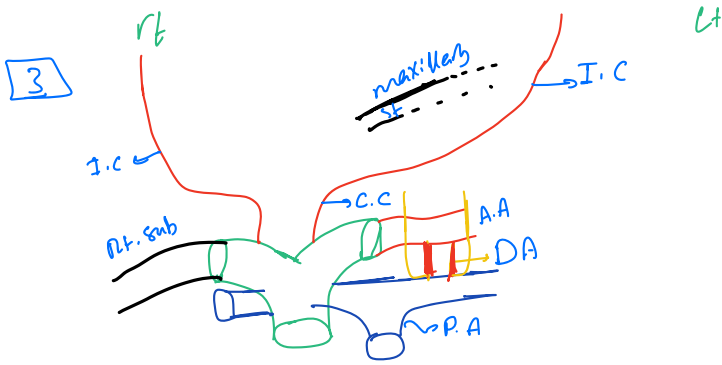
2- Ectopia cordis:

The heart is exposed to the surface of the thorax through a defect in the sternum.

It is due to failure of the embryo to close in the middle line.

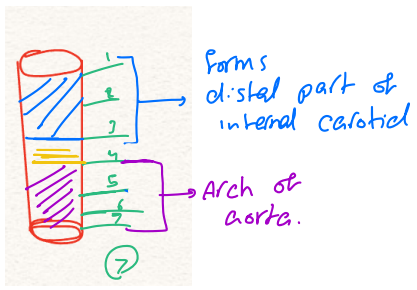
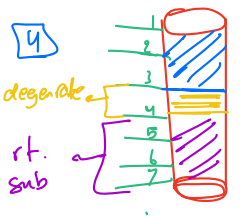
Development of Great Arteries



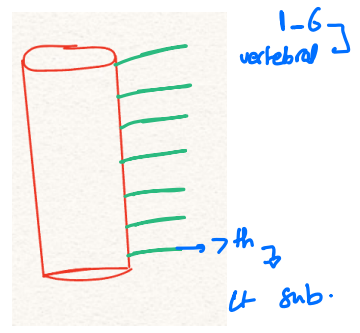
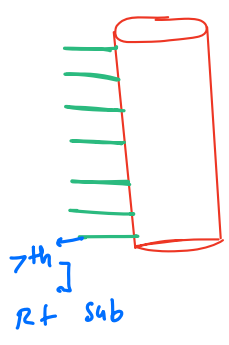
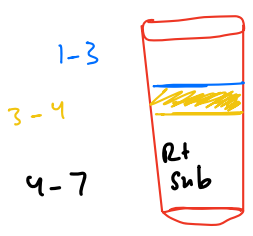


Rt. subclavian

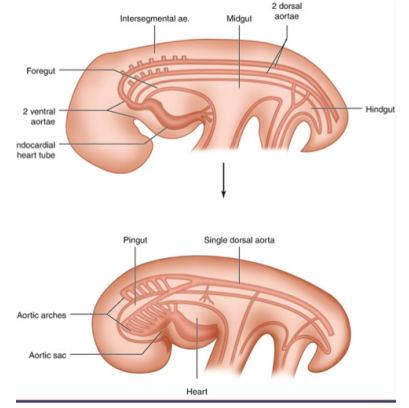
Arch of aorta



4



- * The vessels of the embryo is developed from 3 sources :
- 1- Aortic sac .
 - 2- Aortic arches .
 - 3- Dorsal & common aorta



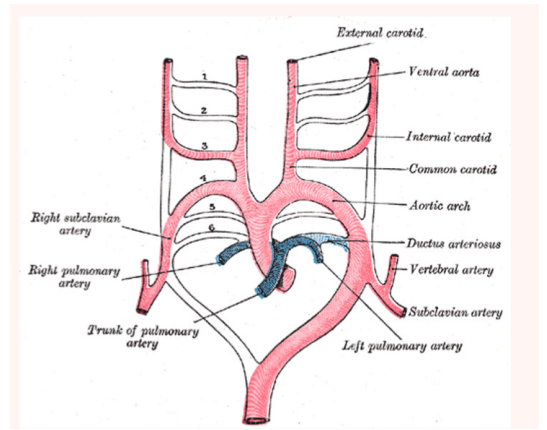
so

Fate of aortic sac

The aortic sac has two horns (right and left)

- The **right horn** forms the **brachiocephalic artery**.
- The **left horn** form the **proximal part of the arch of aorta**.

Note: slides 15+16 are "read only" slides, I did not add them here.

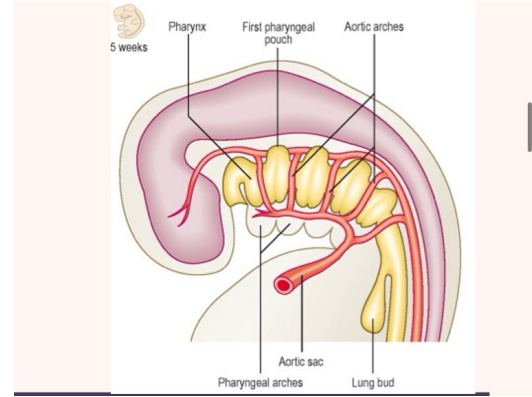


AORTIC ARCHES

They are 6 pairs of arteries, which connect the aortic sac ventrally with the 2 dorsal aorta dorsally.

Formation:

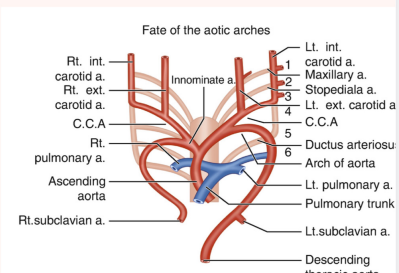
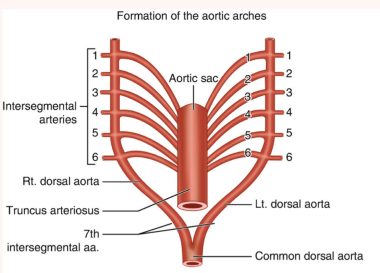
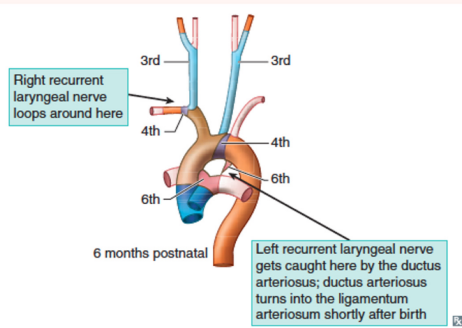
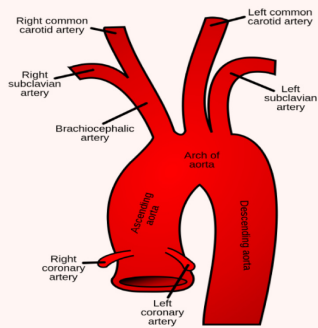
1. As the pharyngeal arches begin to develop, the aortic sac sends a branch to each pharyngeal arch, giving rise to 6 pairs of arteries.



2. Each branch leaves the aortic sac, curves around inside the corresponding pharyngeal arch to end in the dorsal aorta.

Fate of the aortic arches : The aortic arches undergo the following changes:

Aortic arch	Right	Left
1st	Disappears except for a small part which forms the Maxillary artery .	
2nd	Forms the hyoid and Stapedial artery .	
3rd	Forms the Common Carotid Artery and proximal part of the Internal Carotid Artery External carotid is developed from a bud from CCA	
4th	Forms the proximal part of the right subclavian artery .	Forms the middle part of the arch of aorta .
5th	Disappears completely	
6th Ventral	Forms the right pulmonary artery .	Forms the left pulmonary artery .
6th Dorsal	Disappears.	Persists forming the ductus arteriosus which forms a connection between the left pulmonary artery and arch of aorta.



Development of the arch of aorta

* The arch of aorta is developed from:

Its proximal part: arises from the left horn of aortic sac .

Its middle part: arises from the left 4th aortic arch.

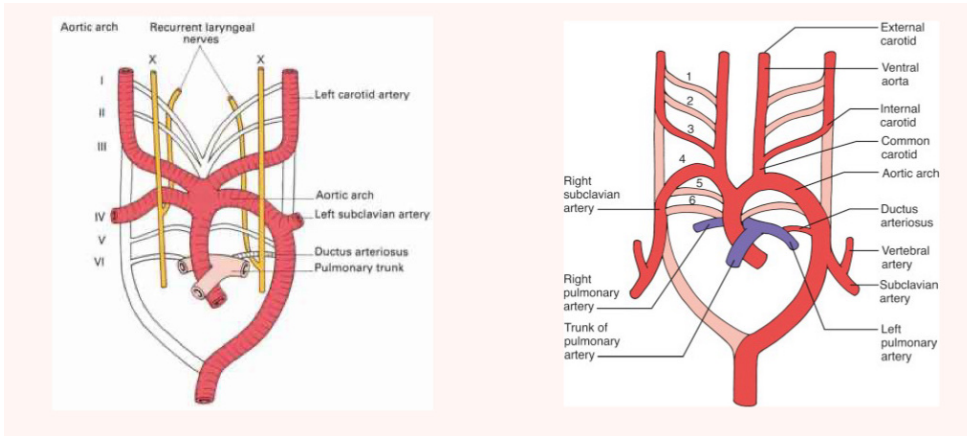
Its distal part: arises from the lower part of the left dorsal aorta to the level of 7th intersegmental artery.

*** N.B.: The difference of the course of the right and left recurrent laryngeal nerves:**

*Initially, these nerves, supply the sixth pharyngeal arches. When the heart descends, they hook around the sixth aortic arches and ascend again to the larynx.

*On the right, the dorsal part of the 6th aortic arch and the 5th aortic arch disappear, the recurrent laryngeal nerve hooks around the right subclavian artery which develops from 4th. aortic arch .

*On the left the nerve does not move up, since the dorsal part of the sixth aortic arch persists as the ductus arteriosus, which later forms the ligamentum arteriosus.



DORSAL AORTA

Fate of dorsal aorta:

The segment	Right	Left
Cranial to the 3rd aortic arch:	Forms the distal part of the I.C.A.	
Between the 3 rd and 4 th aortic arch (Ductus caroticus):	Disappears.	
Between the 4 th aortic arch and 7th inter-segmental artery:	Forms part of the right subclavian artery.	Forms the distal part of the arch of the aorta
Caudal to the 7th inter-segmental artery and common dorsal aortae:	Disappears.	Forms descending aorta

Branches of dorsal aorta:

I) Branches from 2 dorsal aorta : In the cervical region

#There are **seven cervical intersegmental** arteries arising from each of the right and left dorsal aorta.

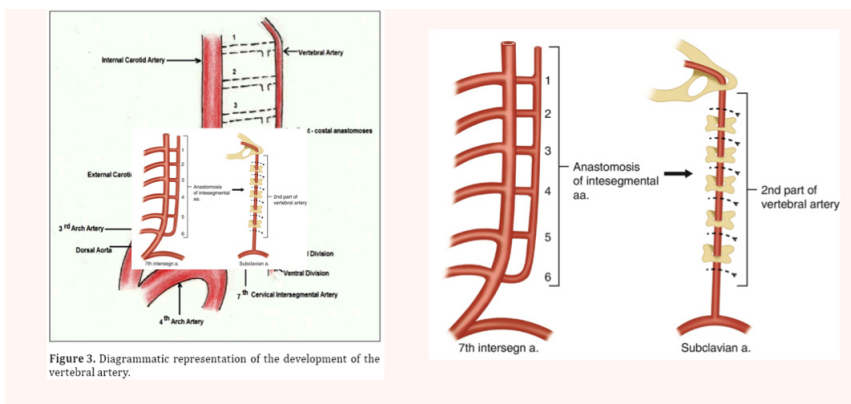
#The **upper six** become connected by **vertical anastomoses** which will give rise to **2nd part of vertebral artery** (and the **deep cervical arteries** as well as the **superior intercostal artery**).

N.B Know 2nd part of vertebral A. only

#7th intersegmental artery forms:

*The lower part of the right subclavian artery on the right side.

*The whole left subclavian artery on the left side.



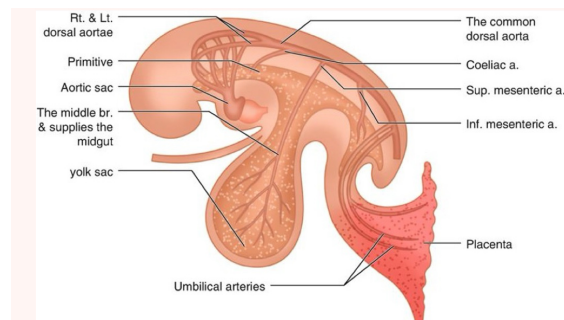
I) Branches from common dorsal aorta :

1-Ventral splanchnic arteries :

a. Coeliac artery: the most cranial and supplies the foregut.

b. Superior mesenteric artery: the middle and supplies the midgut.

c. Inferior mesenteric artery : the most caudal and supplies the hindgut.



2- Lateral splanchnic arteries :

a. Inferior phrenic arteries.

b. Middle suprarenal arteries.

c. Renal arteries.

d. Gonadal arteries.

3- Somatic (intersegmental) arteries → its explanation is in slide 29, read only so it was not added here 🌑

Fate of the intersegmental arteries:

In the thorax: persist as 11 posterior intercostals and subcostal arteries.

In the abdomen: persist as 4 lumbar arteries, while the 5th lumbar becomes common iliac artery . **In the sacral region:** persist as lateral sacral arteries.

4- Terminal (umbilical) arteries :

The 2 umbilical arteries are initially paired ventral branches of the common dorsal aorta.

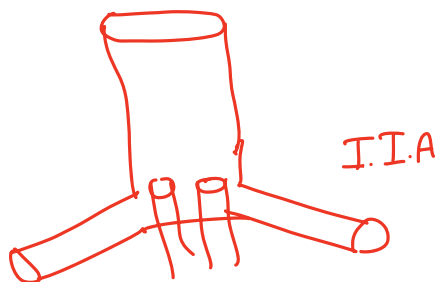
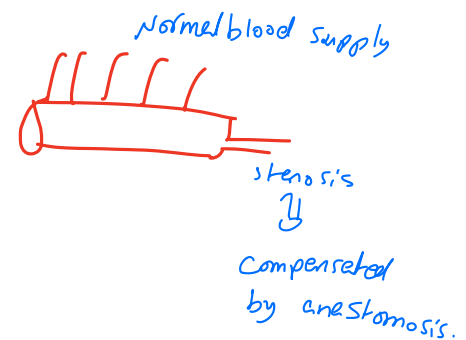
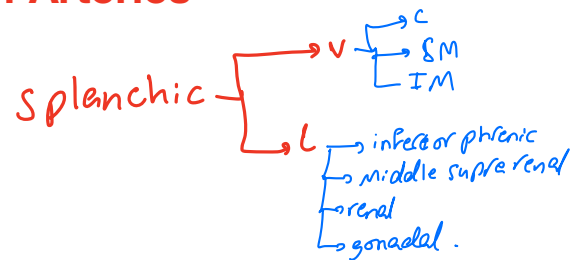
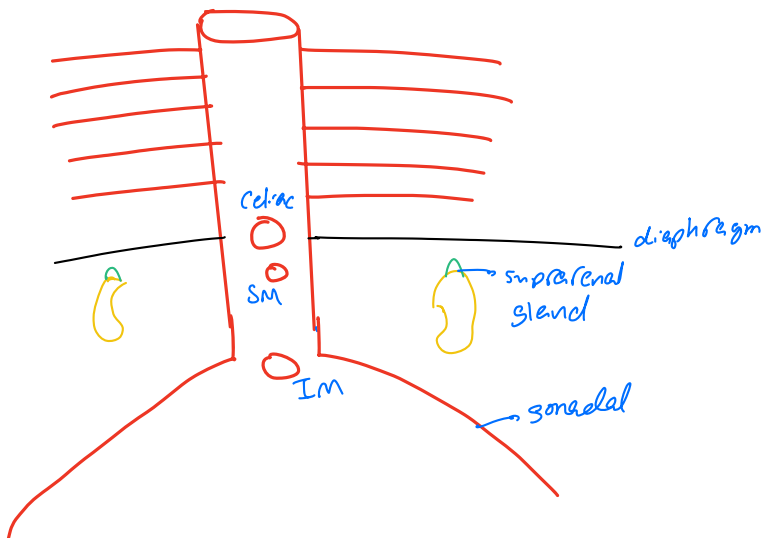
Each artery anastomoses with the 5th lumbar intersegmental artery .

5th lumbar intersegmental artery gives a branch i.e. **External iliac artery**

The proximal part of umbilical artery continues as **internal iliac artery** .

After birth, the distal part of umbilical artery is obliterated to form the medial umbilical ligaments.

Congenital Anomalies of Arteries



1) Coarctation of the aorta :

• Is narrowing of the aorta distal to the origin of left subclavian artery .

There are 2 types:

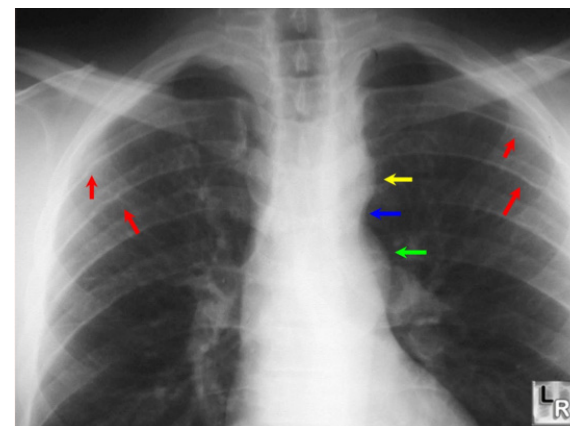
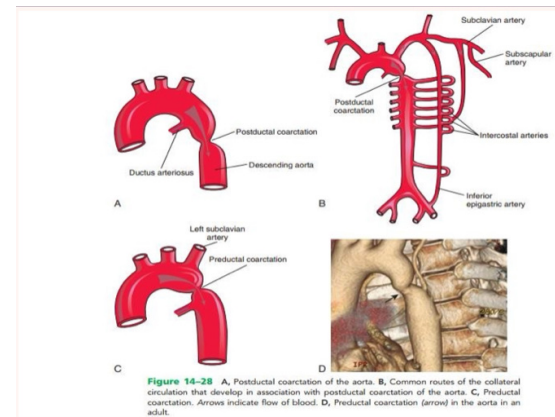
1. **Pre-ductal type:** if the narrowing is proximal to the ductus arteriosus.
2. **Post-ductal type:** if the narrowing is distal to the ductus arteriosus.

- Clinically, absent or diminished pulses in the femoral arteries of both lower limbs is a sign of aortic coarctation.
- To compensate for the diminished volume of blood reaching the lower part of the body, a collateral circulation develops, with dilatation of the internal thoracic, subclavian, and posterior intercostal arteries.
- The dilated intercostal arteries erode the lower borders of the ribs, producing characteristic notching, which is seen on radiographic examination

2) Patent ductus arteriosus :

Normally the ductus arteriosus is closed by contraction of its muscular wall shortly after birth and within 1-3 months fibrosis of the duct is complete.

Failure of this closure results in shunt between arch of aorta and left pulmonary artery.



Slide 34 is “read only” so is was not added

Done by: Rama Harb
Good Luck.