

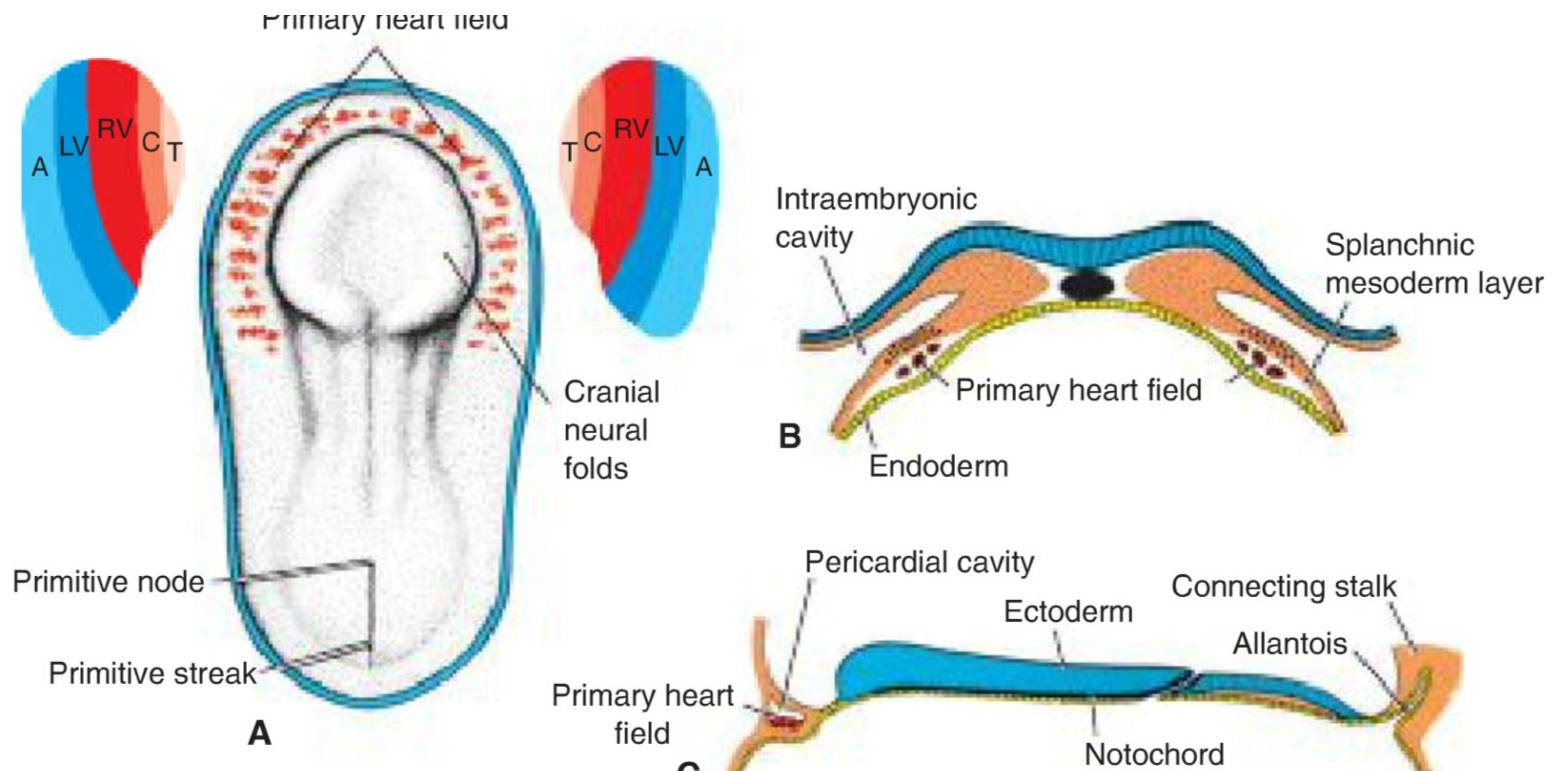
Development and teratology of cardiovascular and lymphatic systems

8.3.2021
Anna Mac Gillavry

Development of the heart

Formation of primary heart field

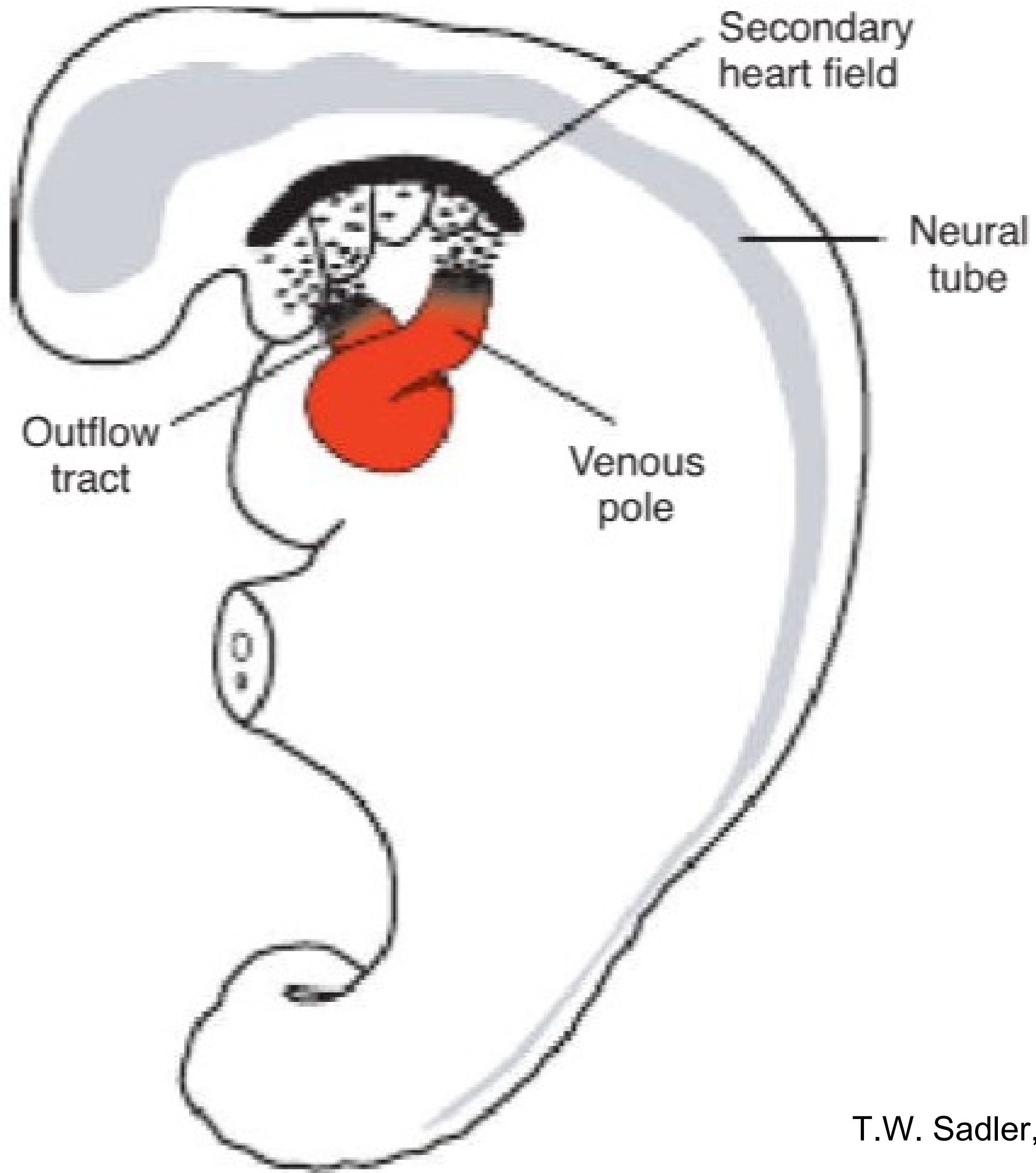
- WHEN? - middle of the 3rd week (day 16)
- WHAT? - progenitor heart cells
- WHERE? - from epiblast through the primitive streak to the visceral layer of lateral plate mesoderm
- DO WHAT? - form PHF



Formation of the heart tube

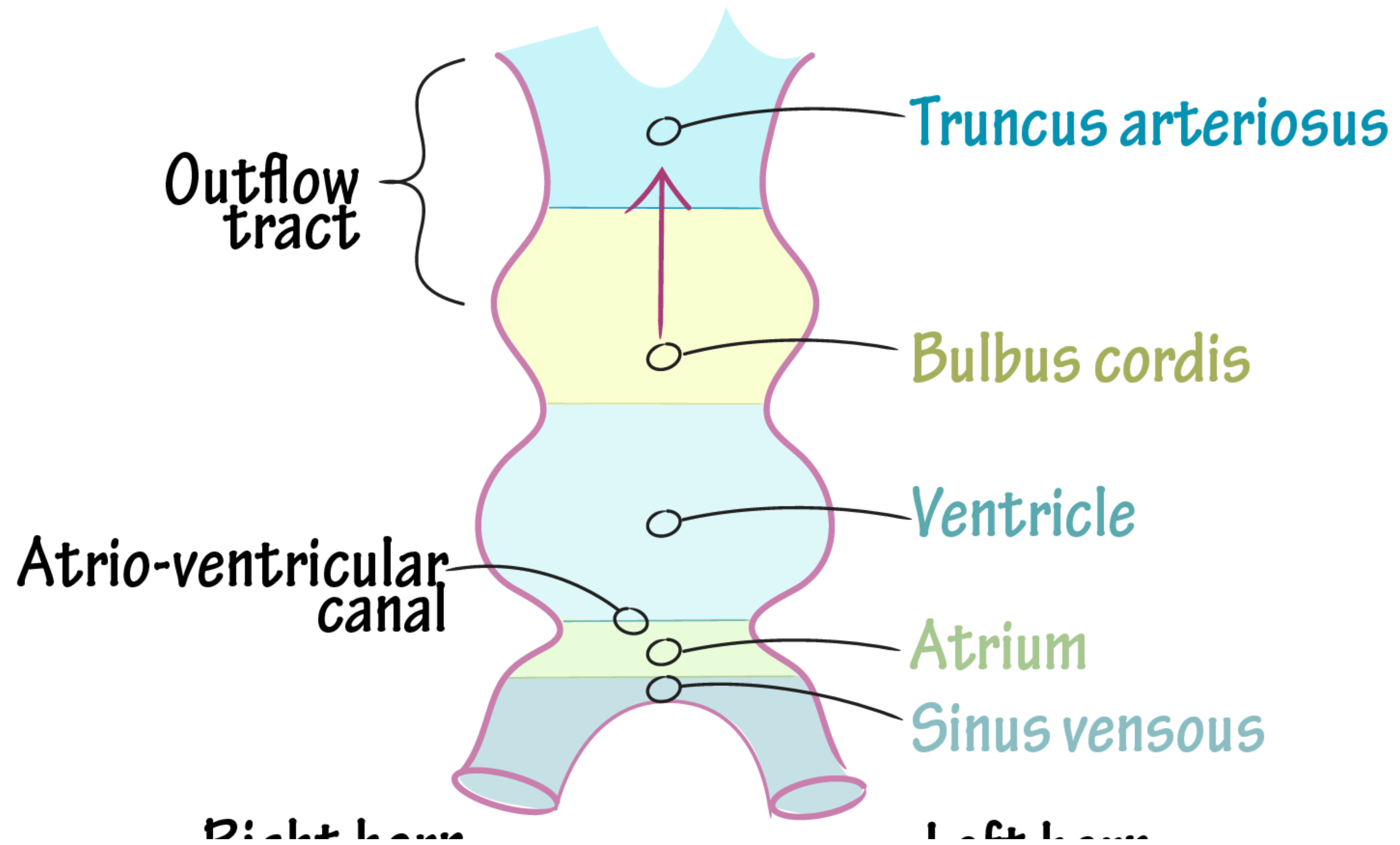
- WHEN? - day 20-22
- WHAT? - the paired heart tubes
- WHERE? - thoracic region
- DO WHAT? - the caudal portion fuse except for the caudalmost part

Heart tube lengthening



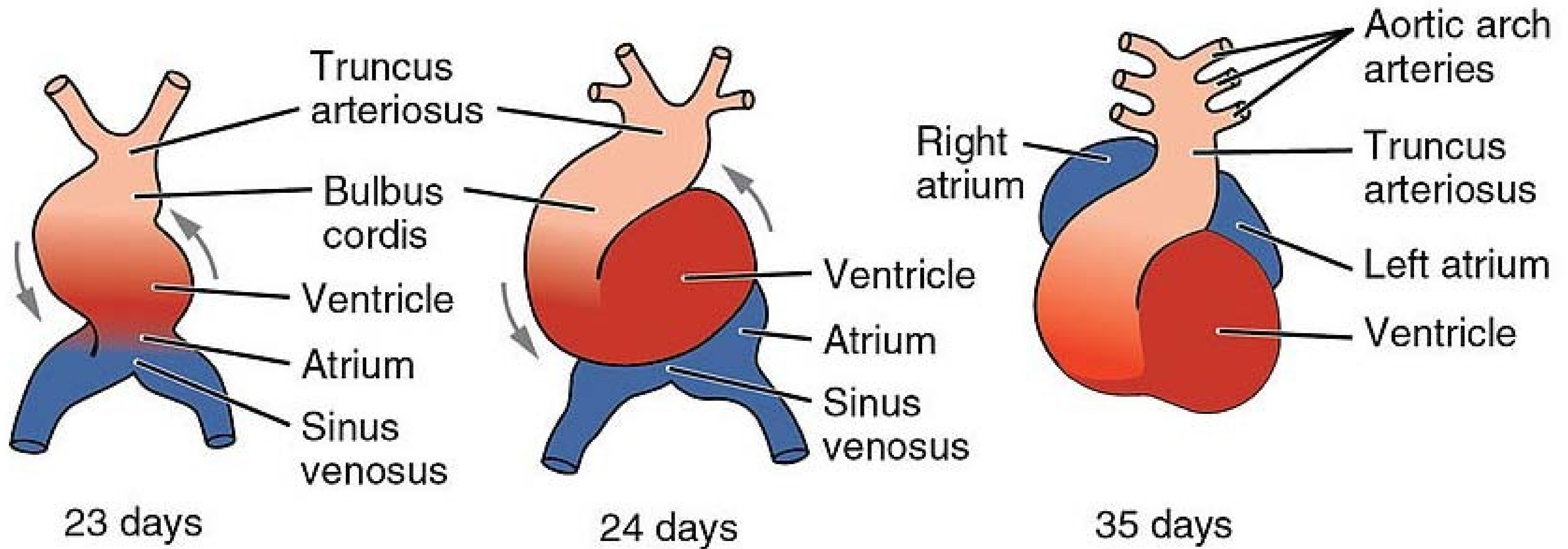
SHF appears on day 20-21 in splanchnic mesoderm ventrally to the posterior pharynx:

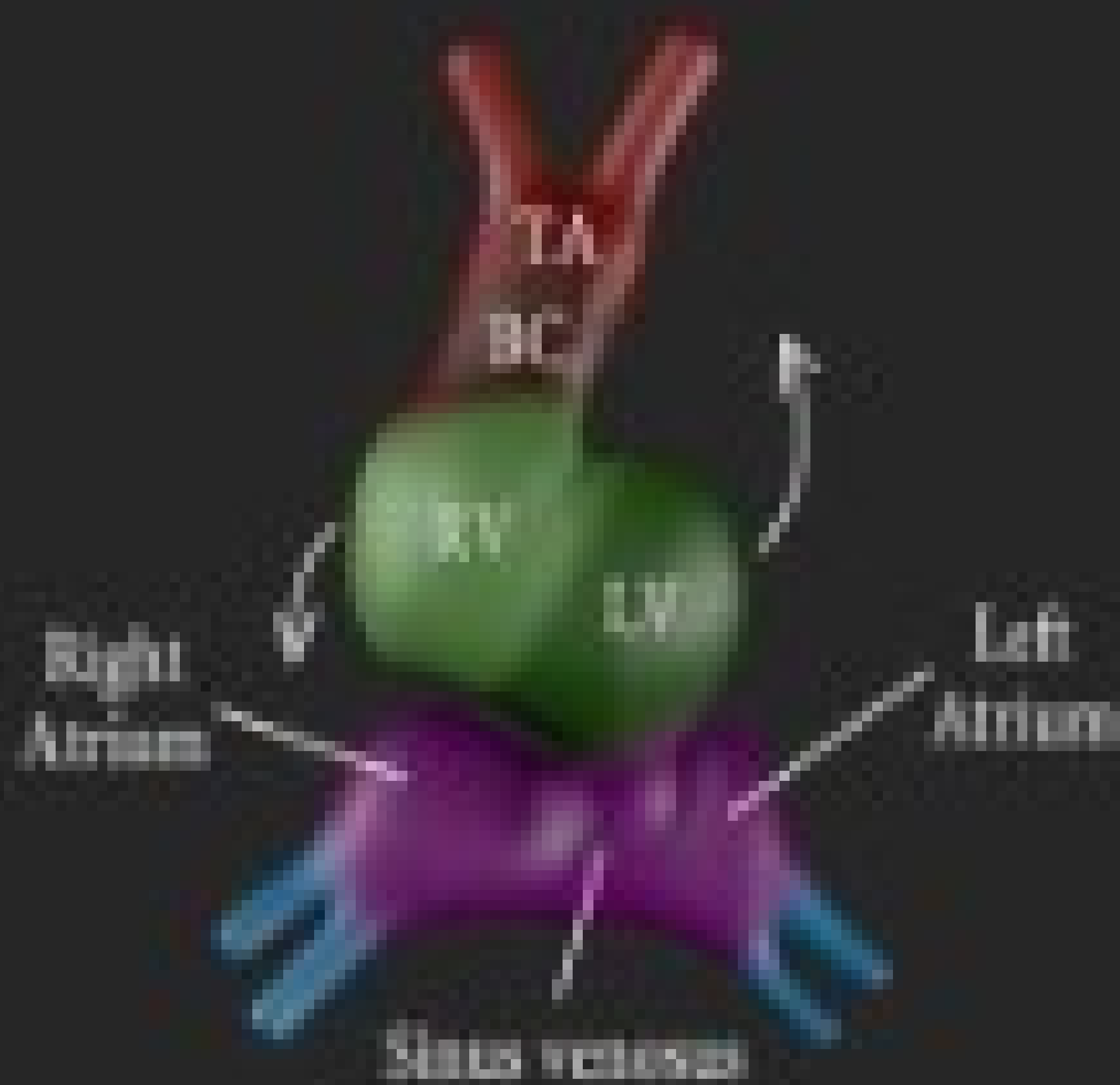
- right ventricle, conus cordis, truncus arteriosus
- atria, sinus venosus



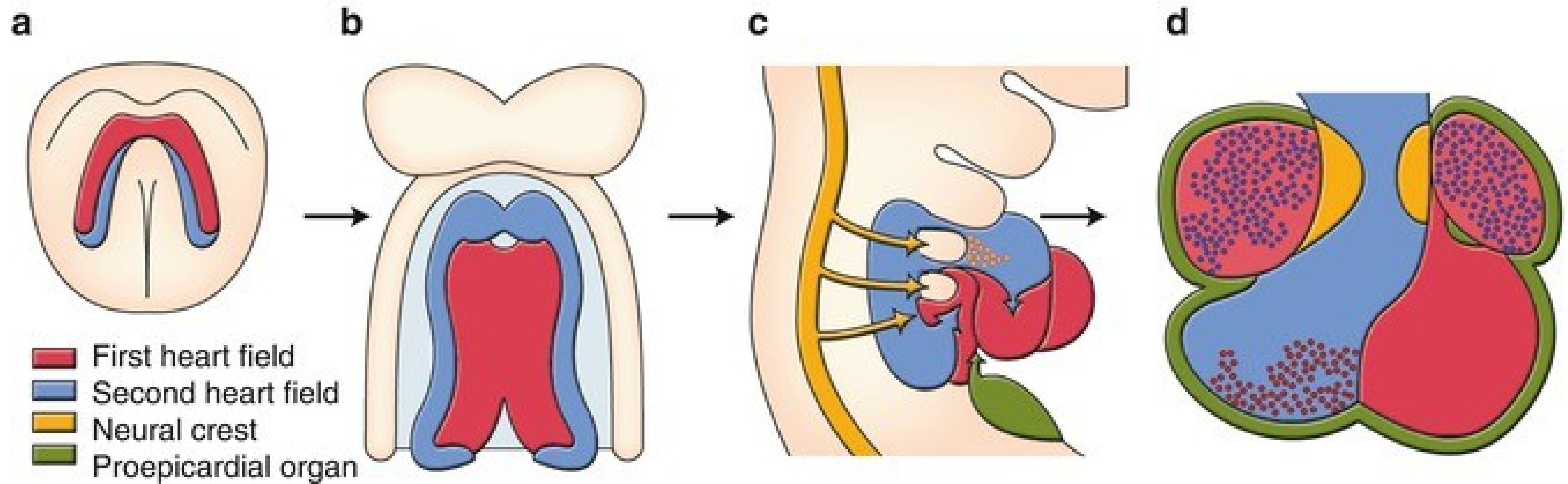
Formation of the heart loop

- WHEN? - day 23-28
- WHAT? - the primitive heart tube
- DO WHAT? - cephalic portion bends ventrally, caudally and to the right; caudal portion bends dorsally, cranially and to the left





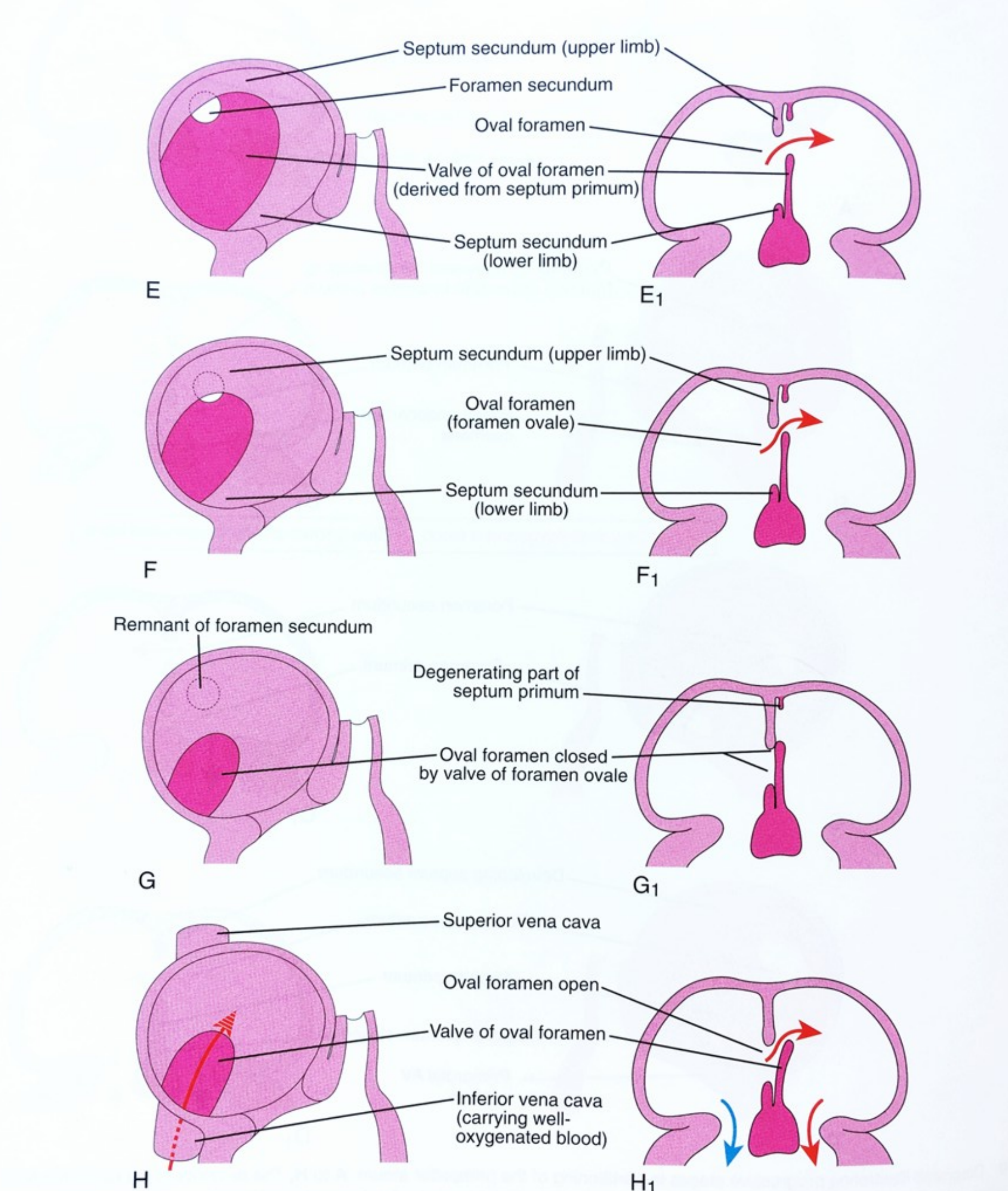
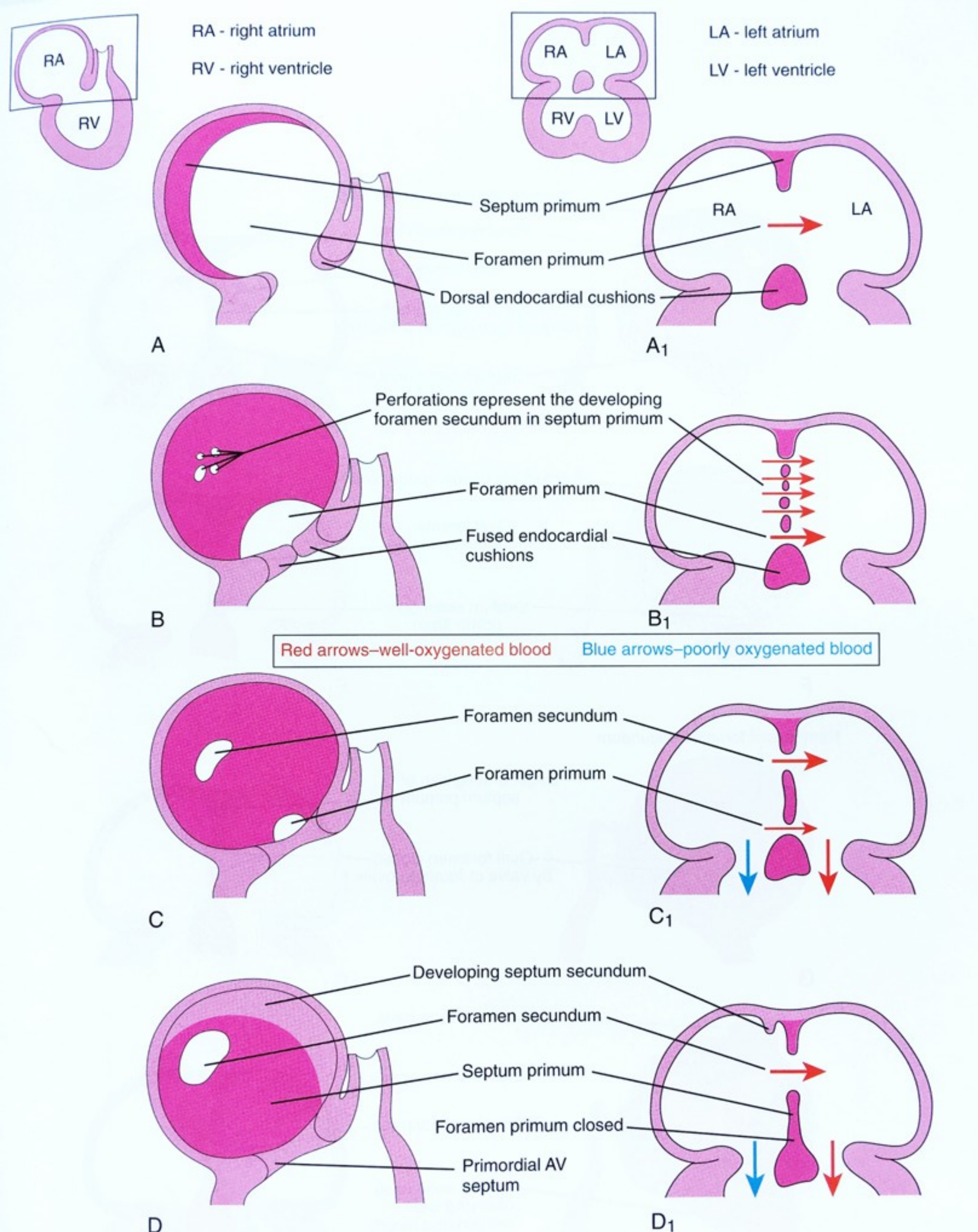
<https://youtu.be/a0qyaglgBPw>



Formation of the cardiac septa

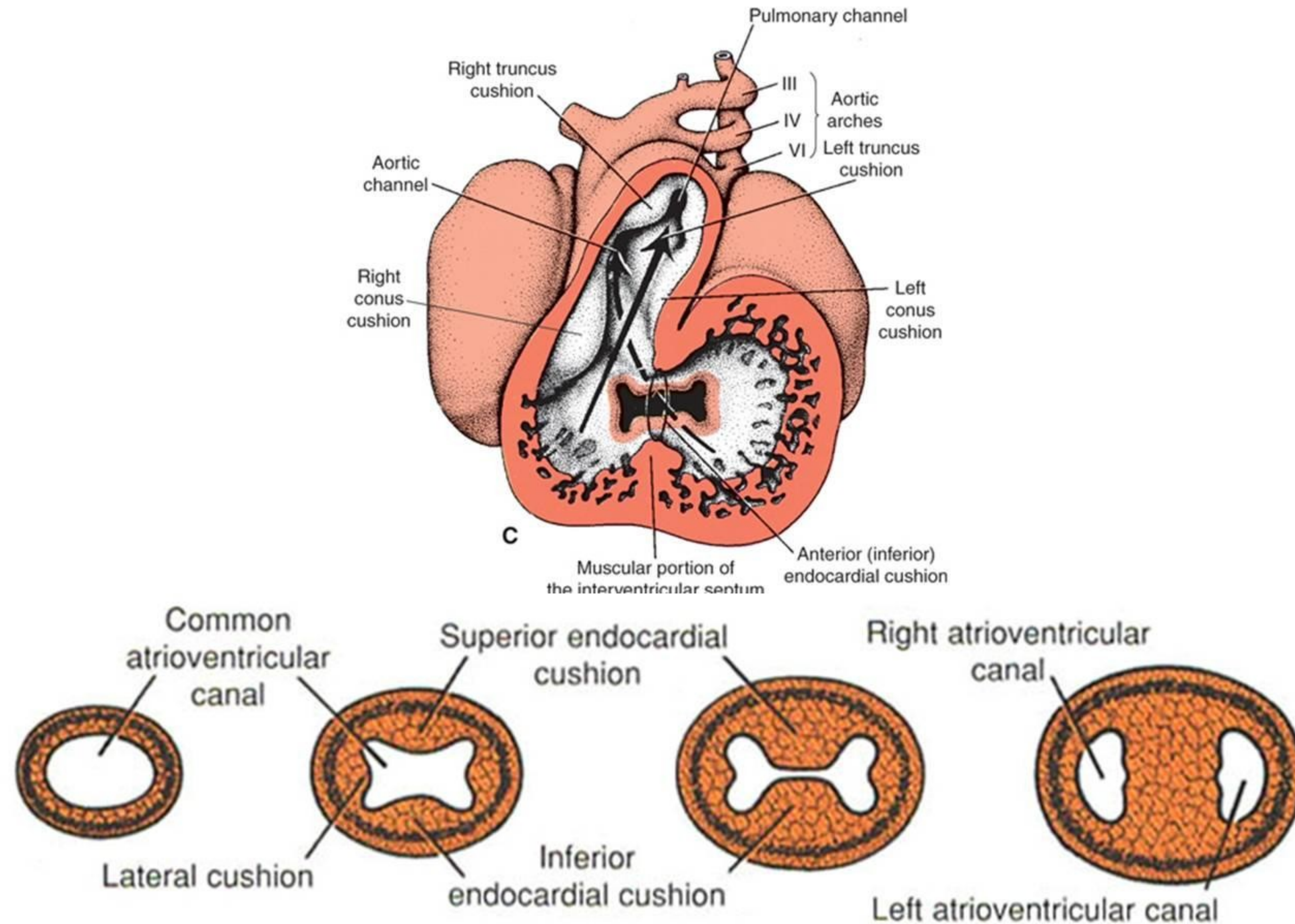
- WHEN? - day 27-37
- WHAT? – septum in the common atrium
 - septum in the atrioventricular canal
 - septum in the truncus arteriosus and conus cordis
 - septum in ventricles

Septum in the common atrium

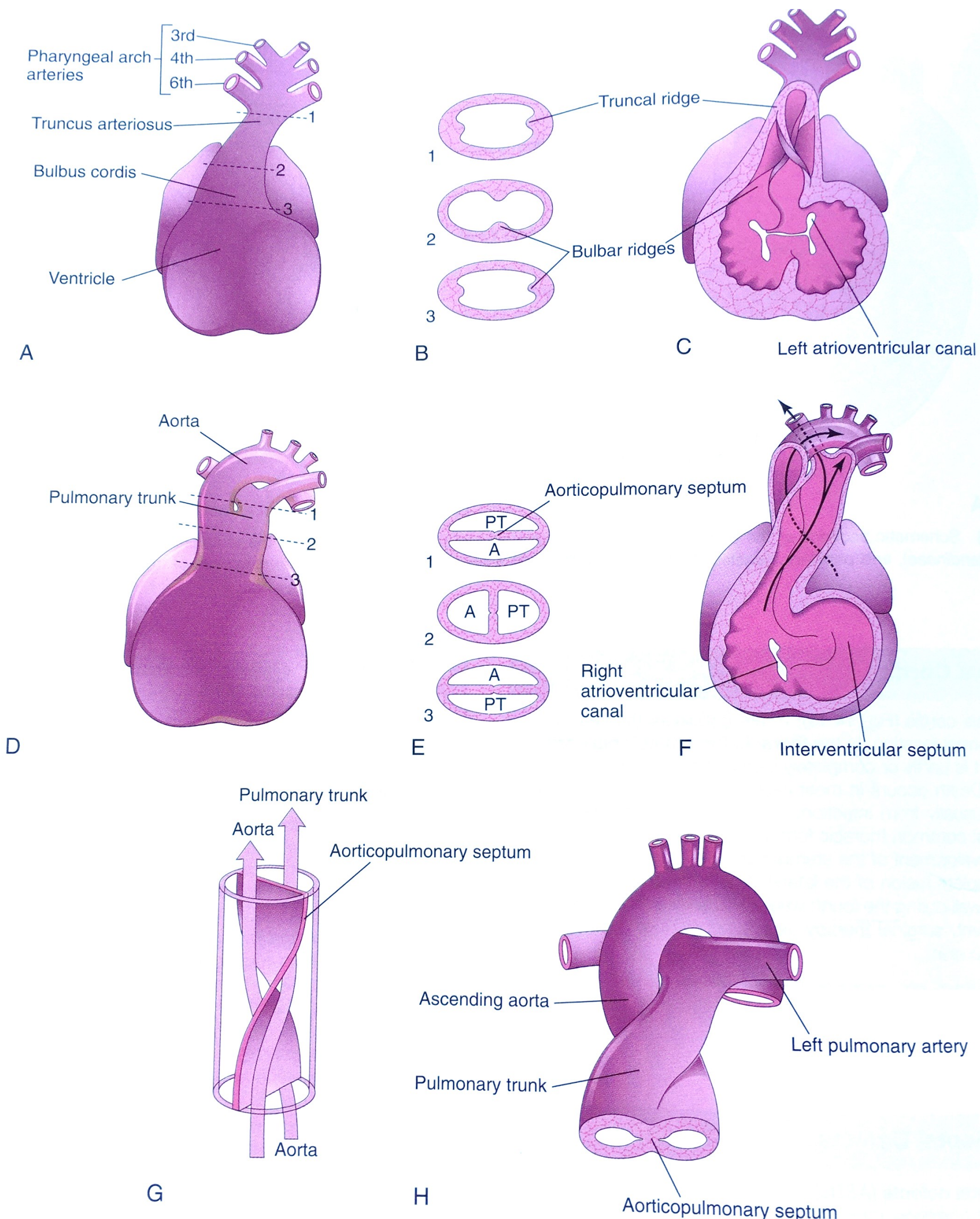


K. Moor, Before we are born

Septum in the atrioventricular canal



Septum in the truncus arteriosus and conus cordis



Congenital heart defects (CHDs)

Dextrocardia

Ventricular inversion

Ectopia cordis

Ventricular septa defects (12/10 000)

Persistent truncus arteriosus (0,8/10 000) – always present with VSD

Atrial septal defects (6,4/10 000; 2:1 prevalence in F to M):

- Patent oval foramen

4 clinically significant ASD:

Ostium secundum ASDs

Endocardial cushion defects with a foramen primum

Sinus venosus ASDs

Common atrium - combination of the above

Transposition of great arteries (4,8/10 000)

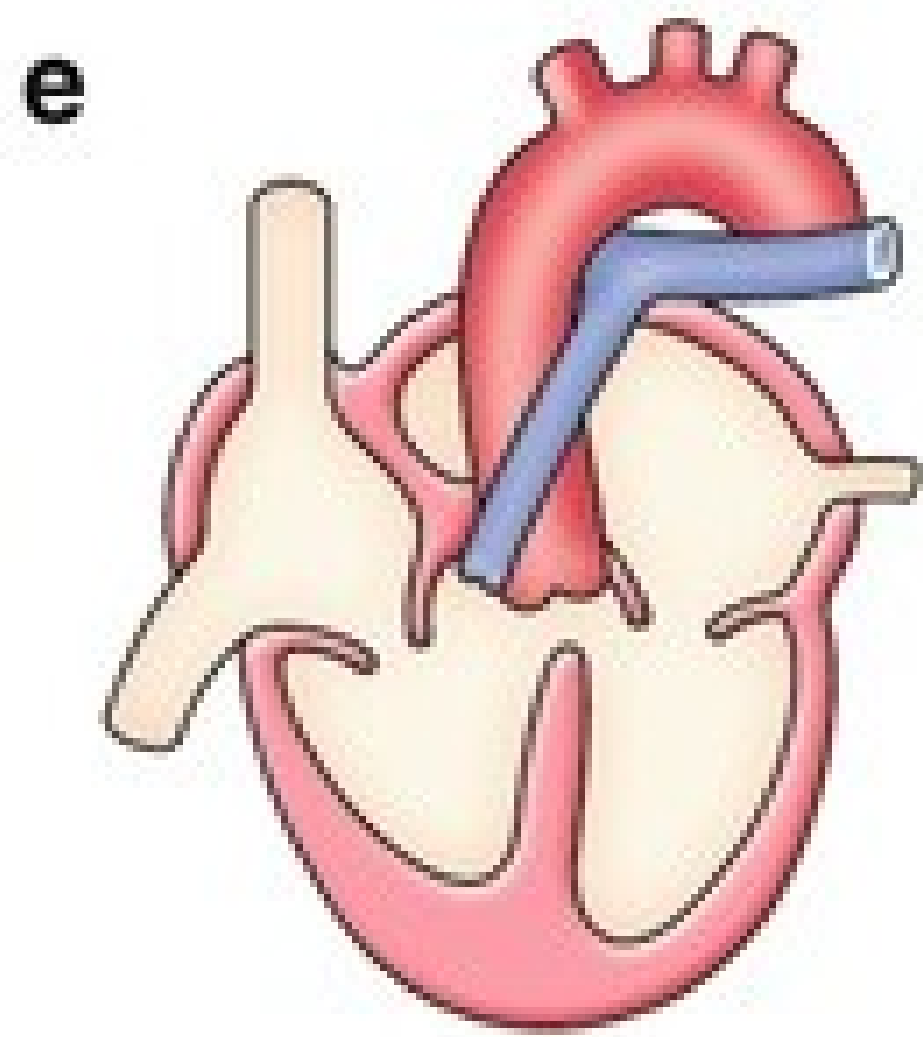
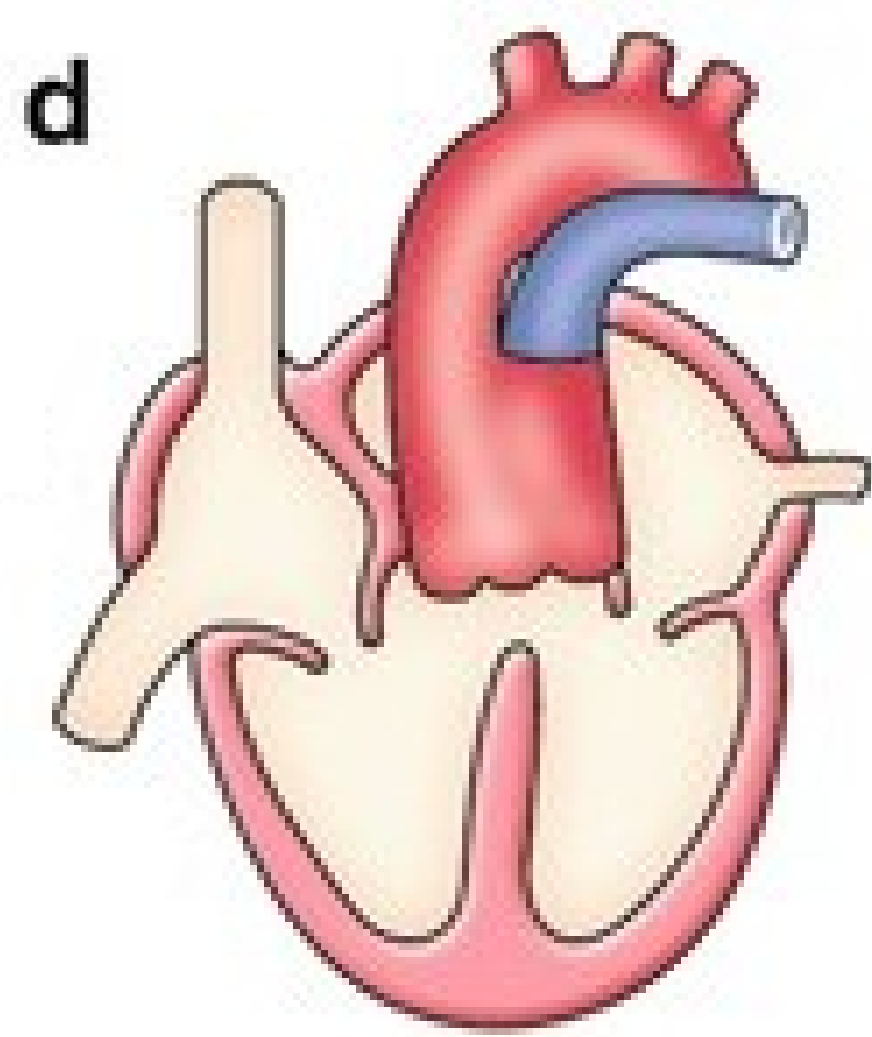
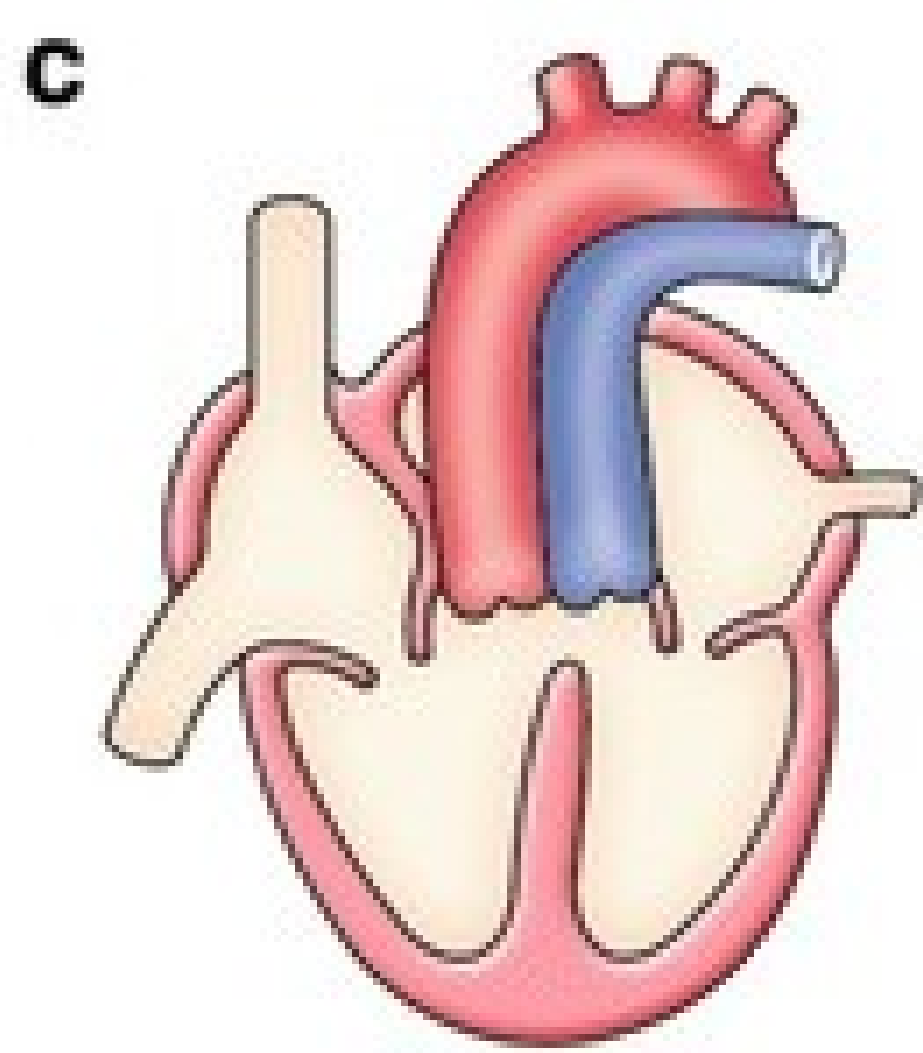
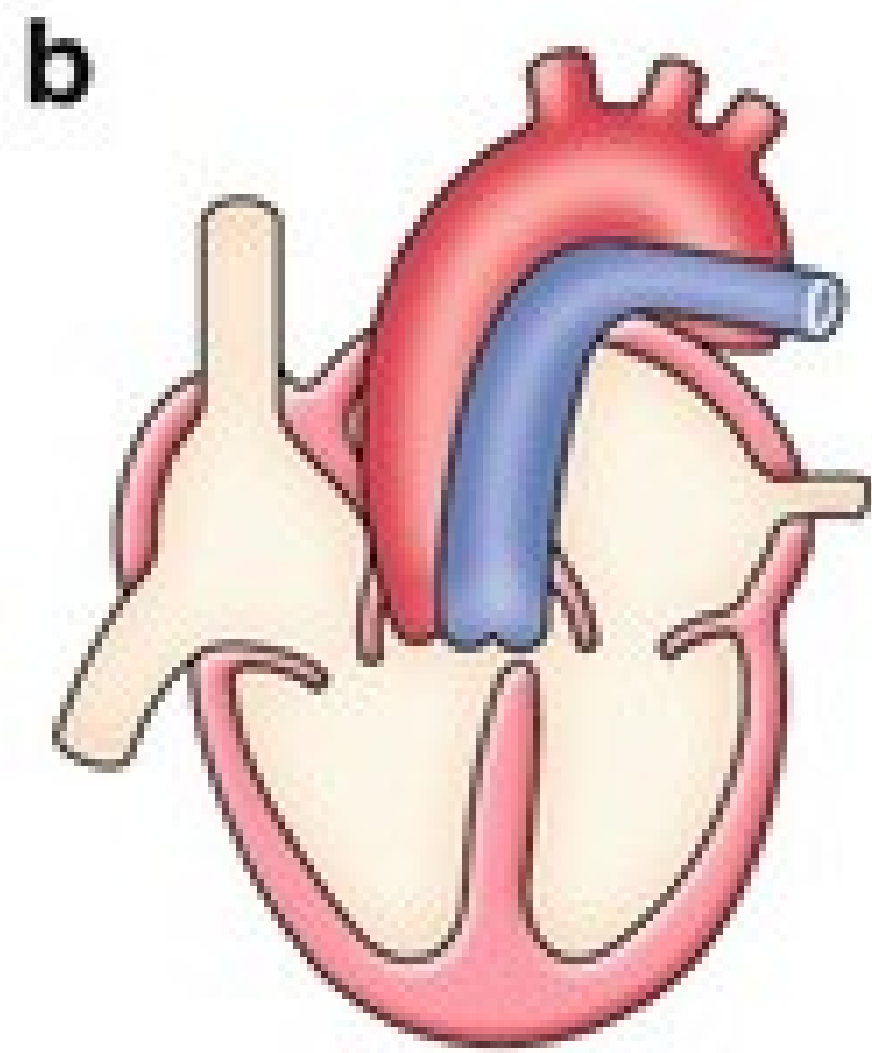
Tetralogy of Fallot (9,6/10 000) – displacement of conotruncal septum:

1. Pulmonary stenosis (obstructed right ventricle outflow)
2. VSD
3. Dextroposition of the aorta
4. Right ventricle hypertrophy (as a result of the pulmonary stenosis)

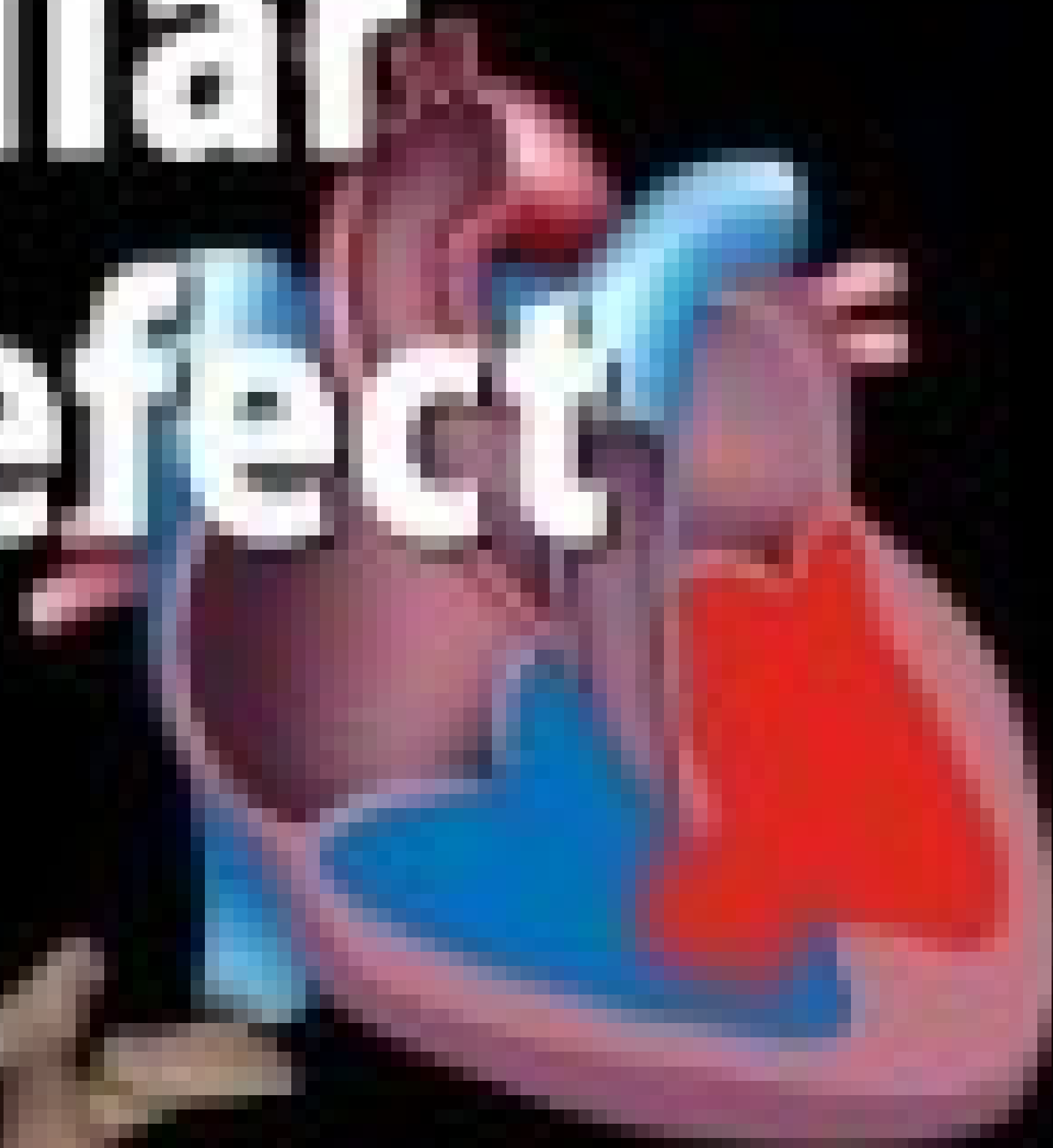
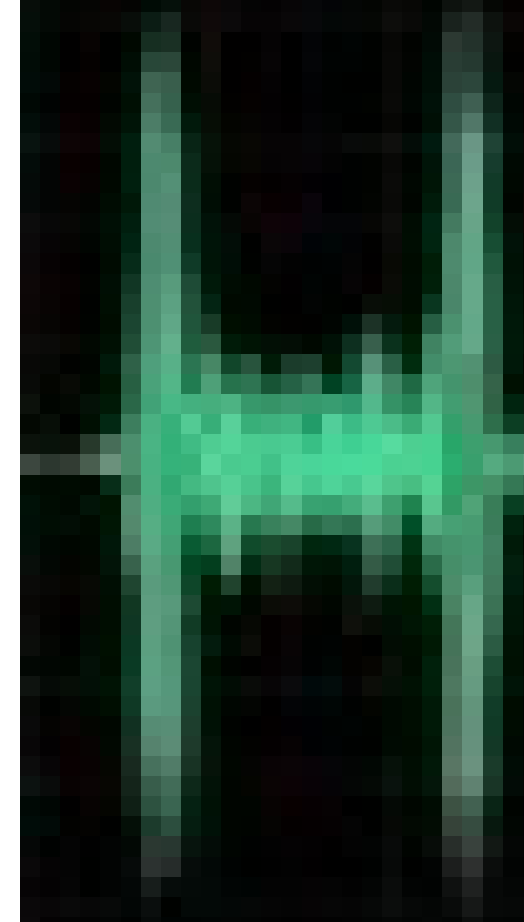
Aortic stenosis and aortic atresia

Unequal division of TA

Pulmonary atresia, pulmonary stenosis



Ventricular Septal Defect

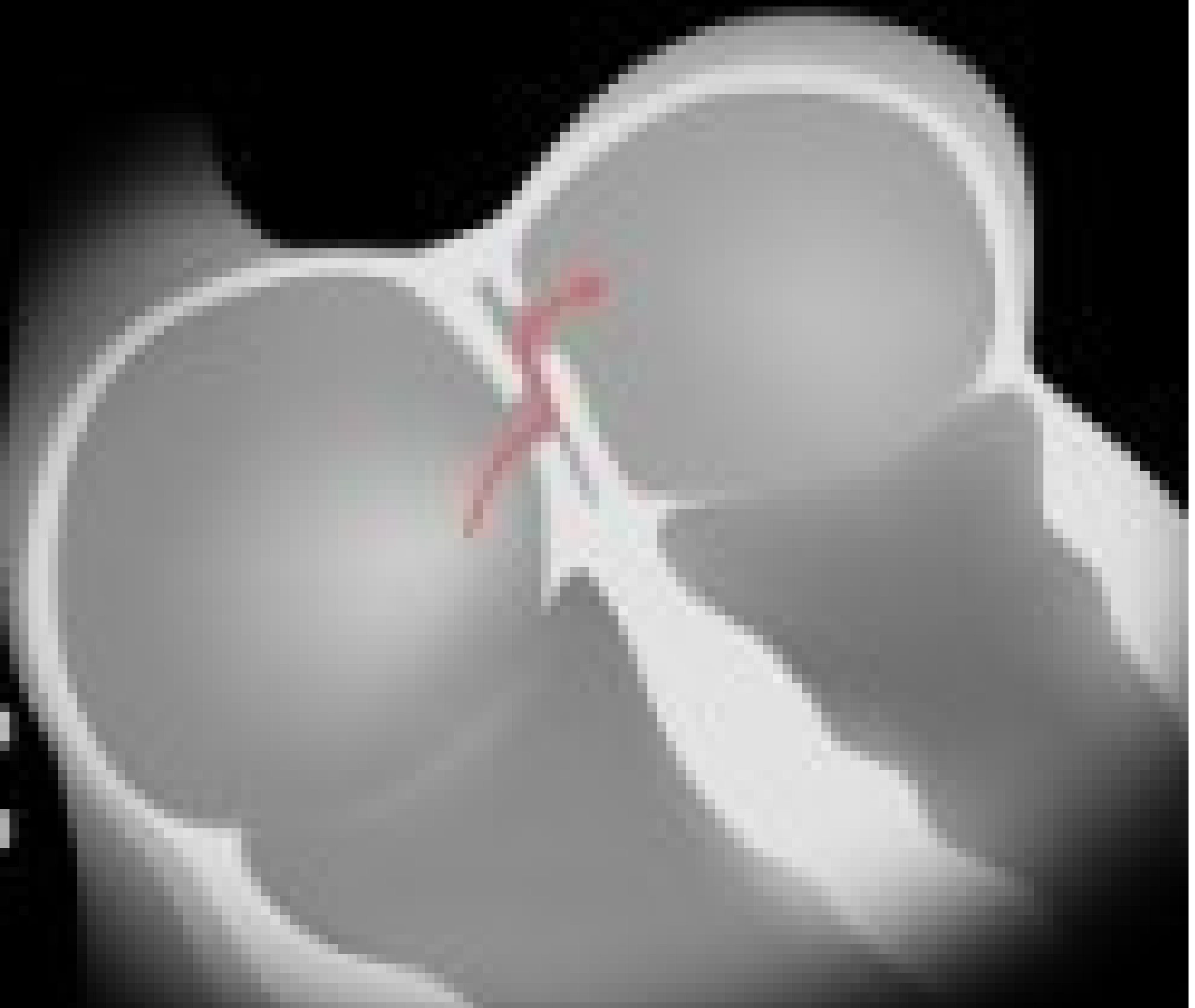


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Tetralogy of Fallot

Atrial Septal Defect



<https://youtu.be/O3b5id9ZIdY>

Lymphatic system development

