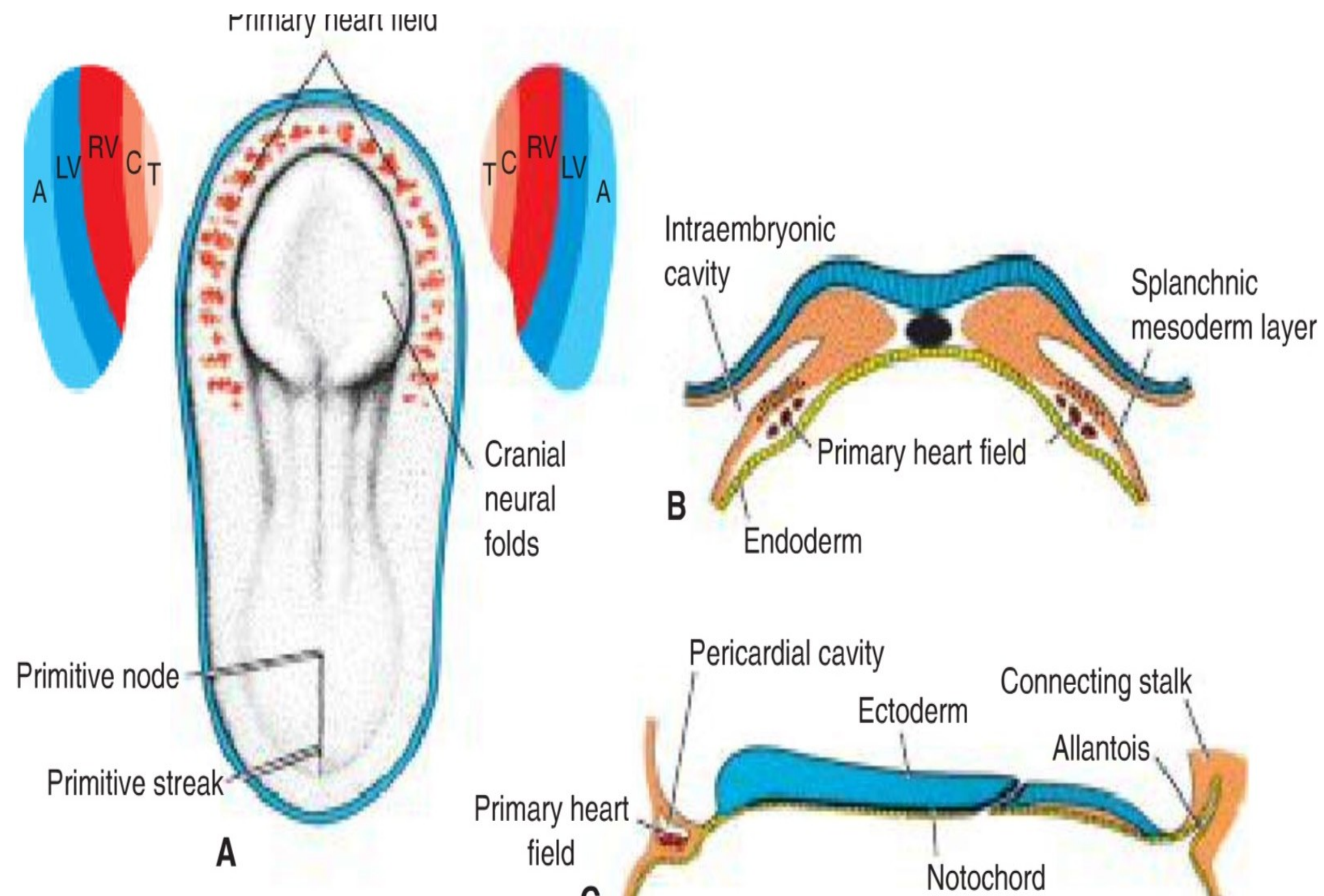


Development and teratology of cardiovascular systems

28.2.2022

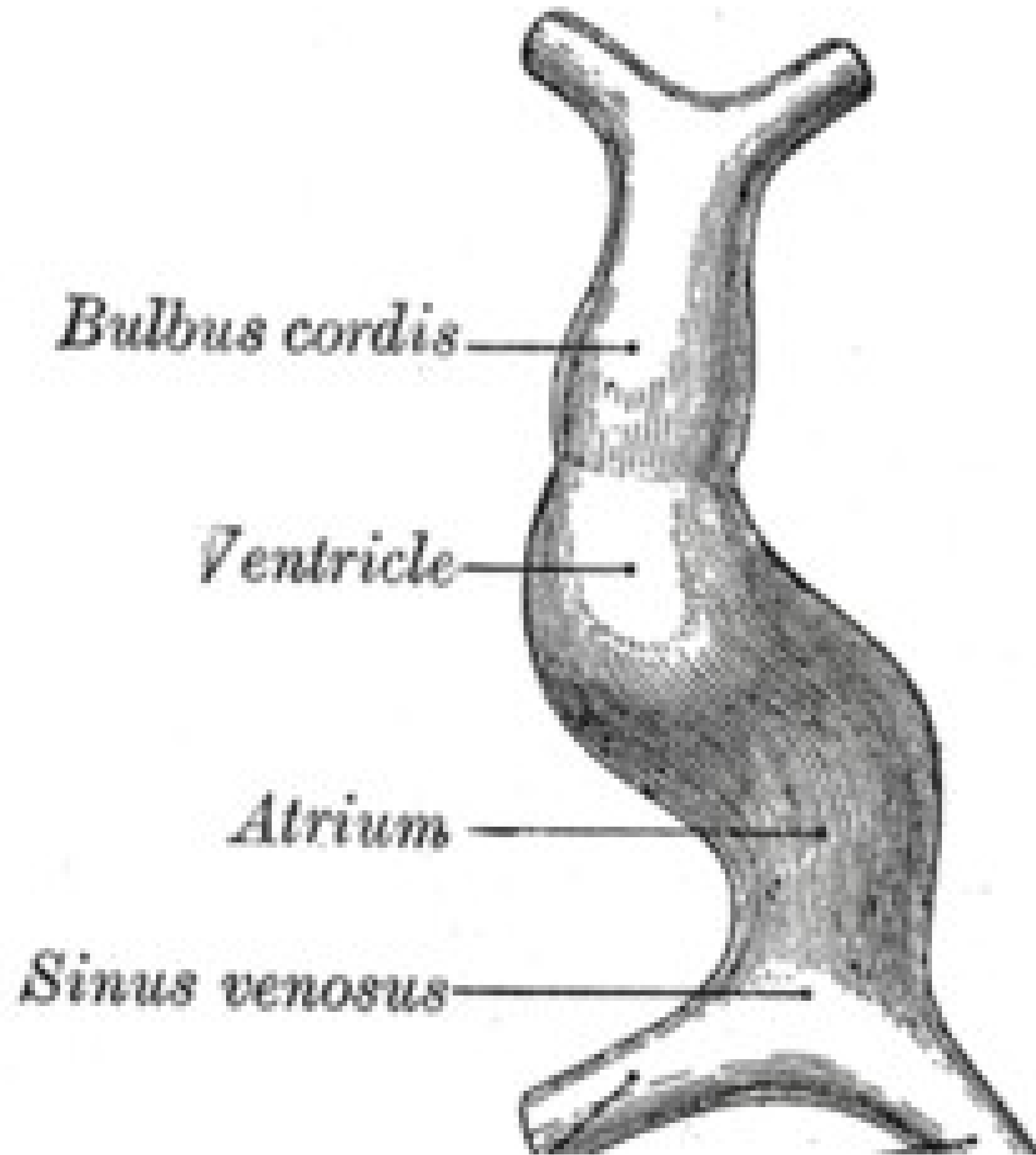
Anna Mac Gillavry

Formation of primary heart field



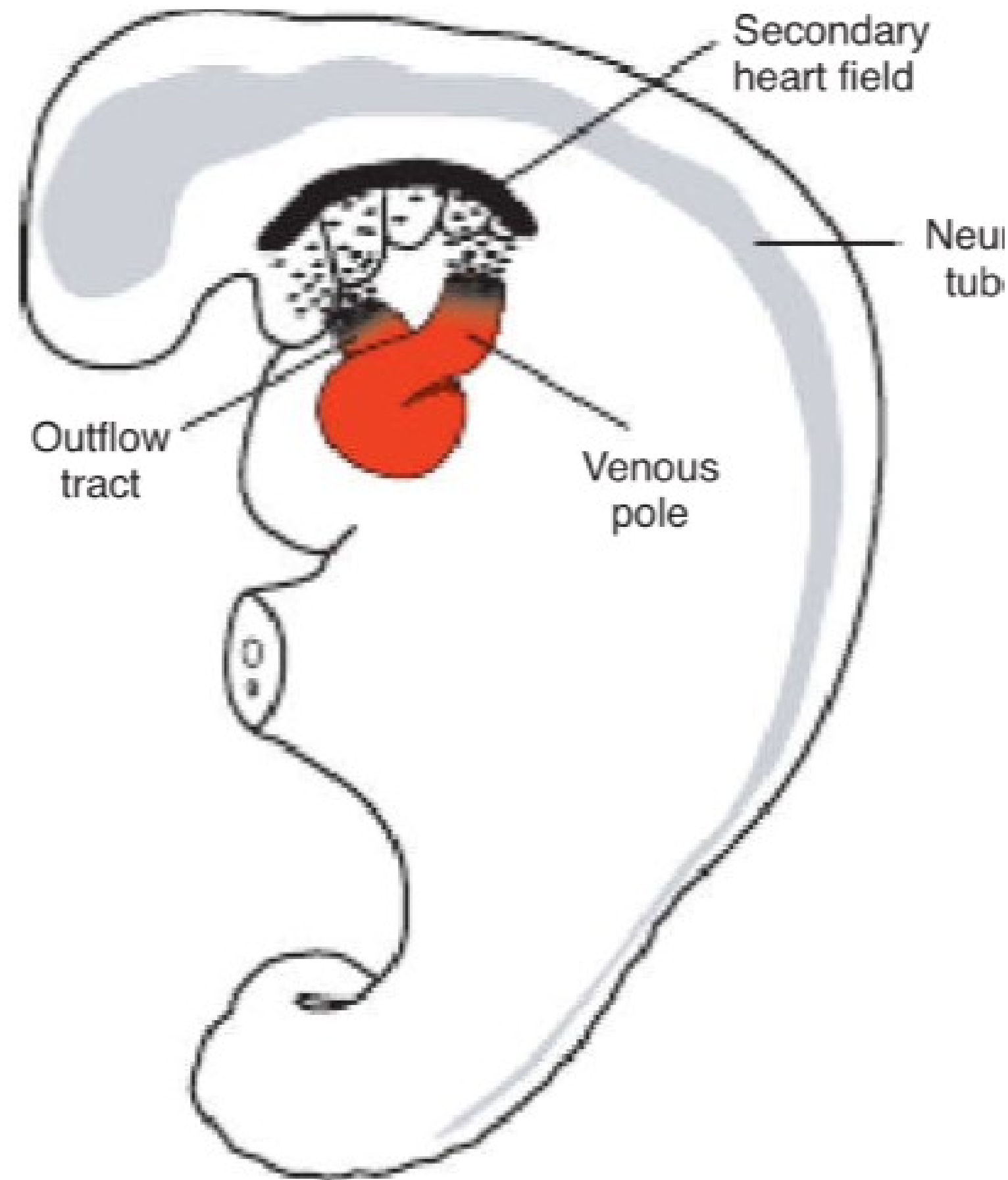
- WHEN? - middle of the 3rd week (day 16)
- WHAT? - progenitor heart cells
- WHERE? - from epiblast through the primitive streak to the visceral layer of lateral plate mesoderm
- DO WHAT? - form PHF

Formation of the heart tube

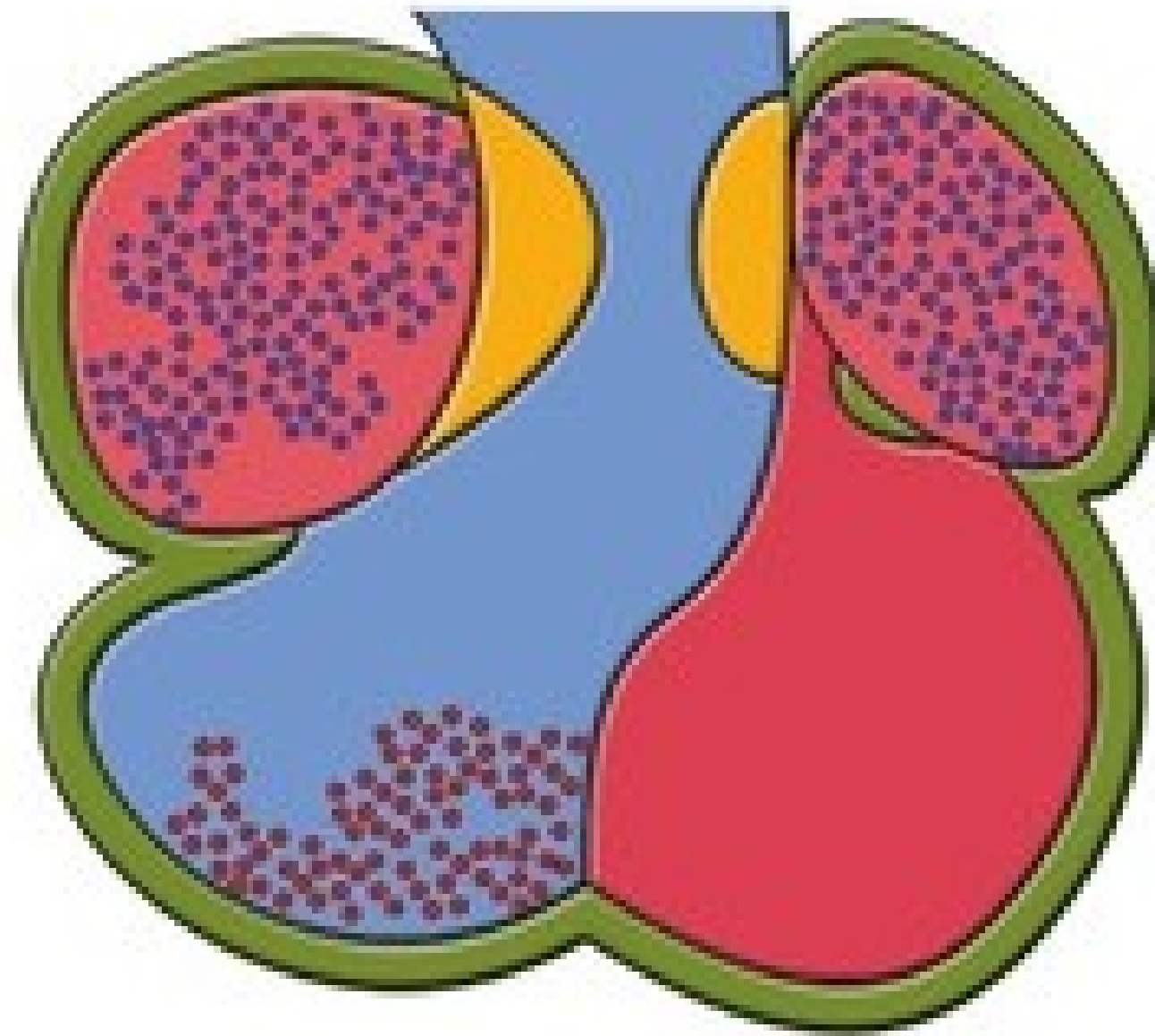


- WHEN? - day 22-28
- WHAT? – cells of the PHF
- DO WHAT? – form cardiac myoblasts and the blood islands ---> the horseshoe-shaped endothelial-lined tube surrounded by myoblast (=cardiogenic region/field), further the caudal portion fuse except for the caudalmost part

The heart tube lengthening



- WHEN? - day 22-28
- WHAT? – SHF in splanchnic mesoderm ventrally to the posterior pharynx
- WHERE? - thoracic region
- DO WHAT? – provides cells to lengthen both poles of the heart tube: atria and sinus venosus, right ventricle and conus cordis and truncus arteriosus



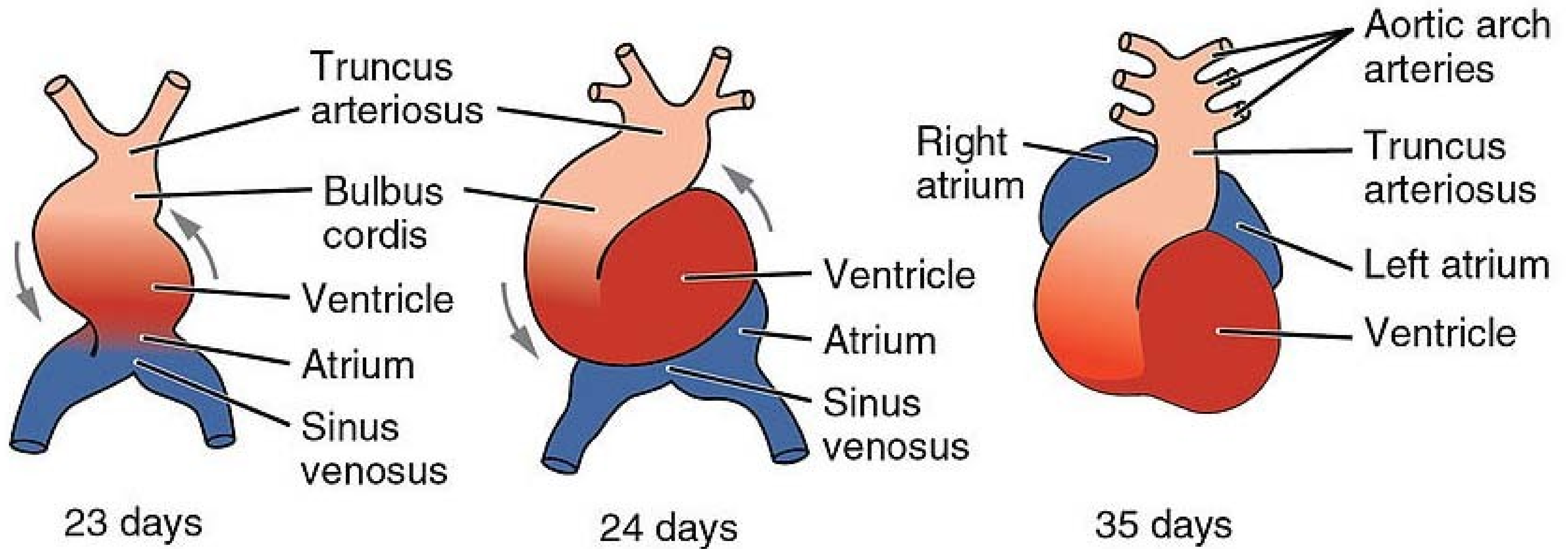
- First heart field
- Second heart field
- Neural crest
- Proepicardial organ

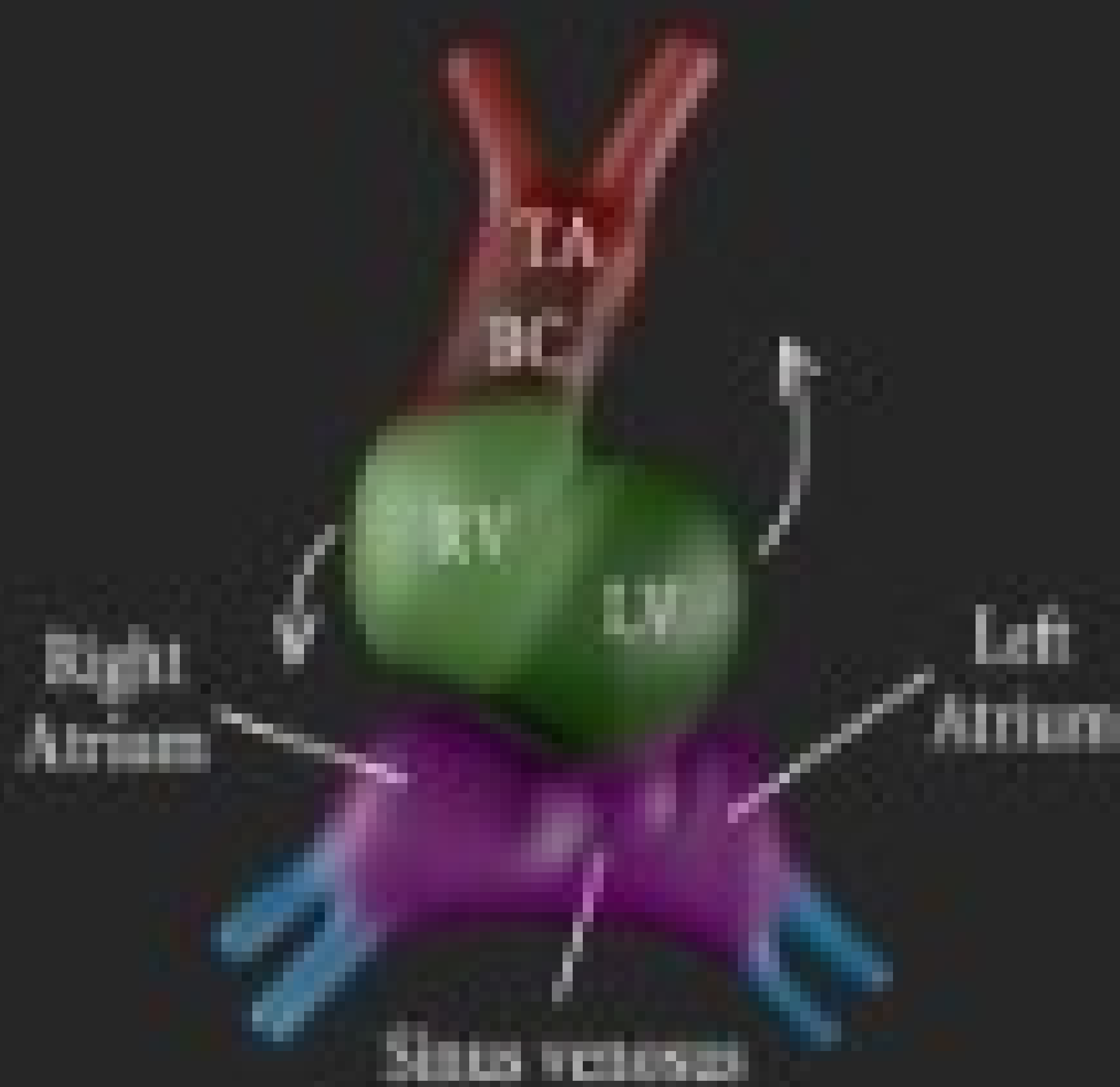
Looping of the heart



24 days

- 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

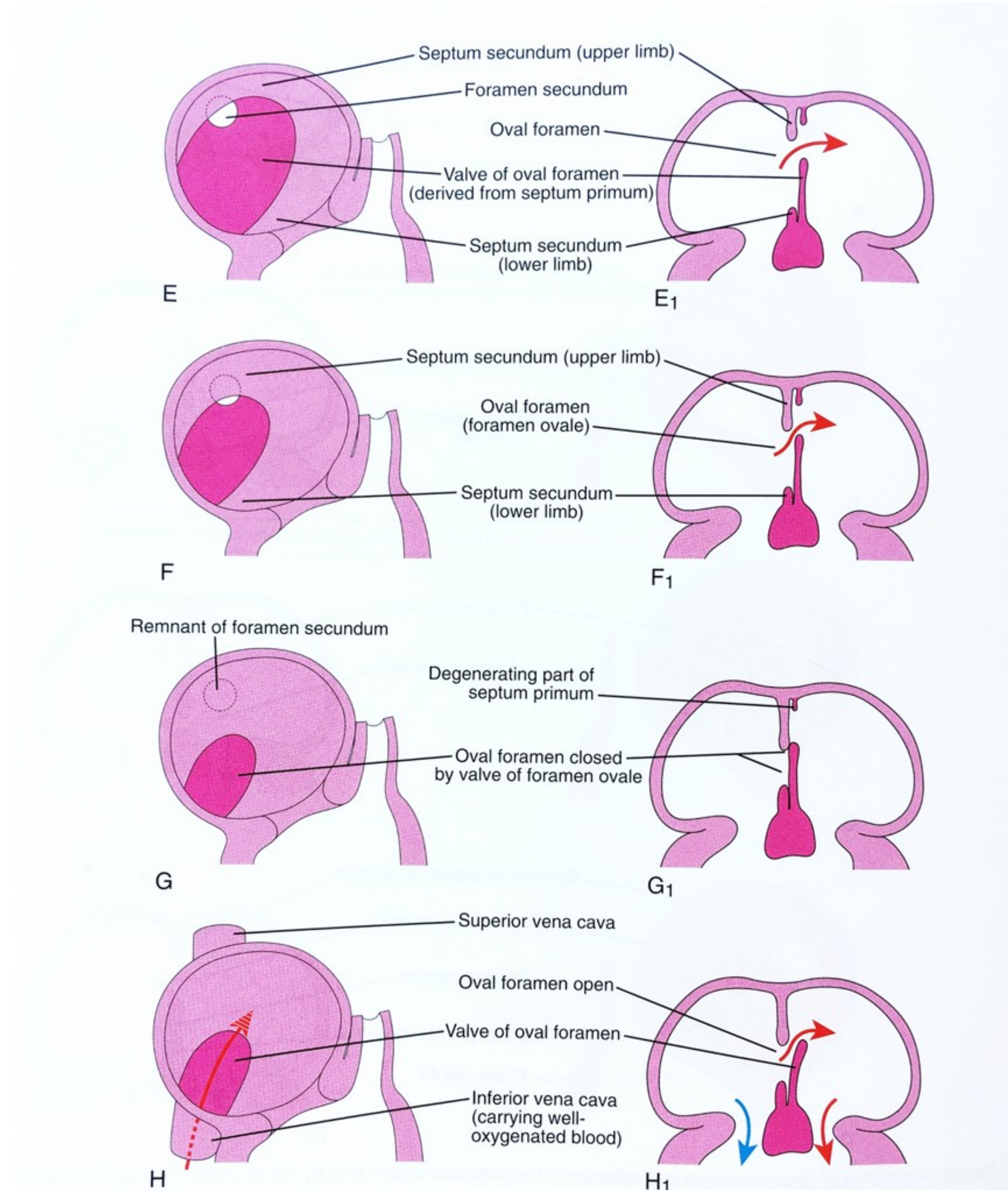
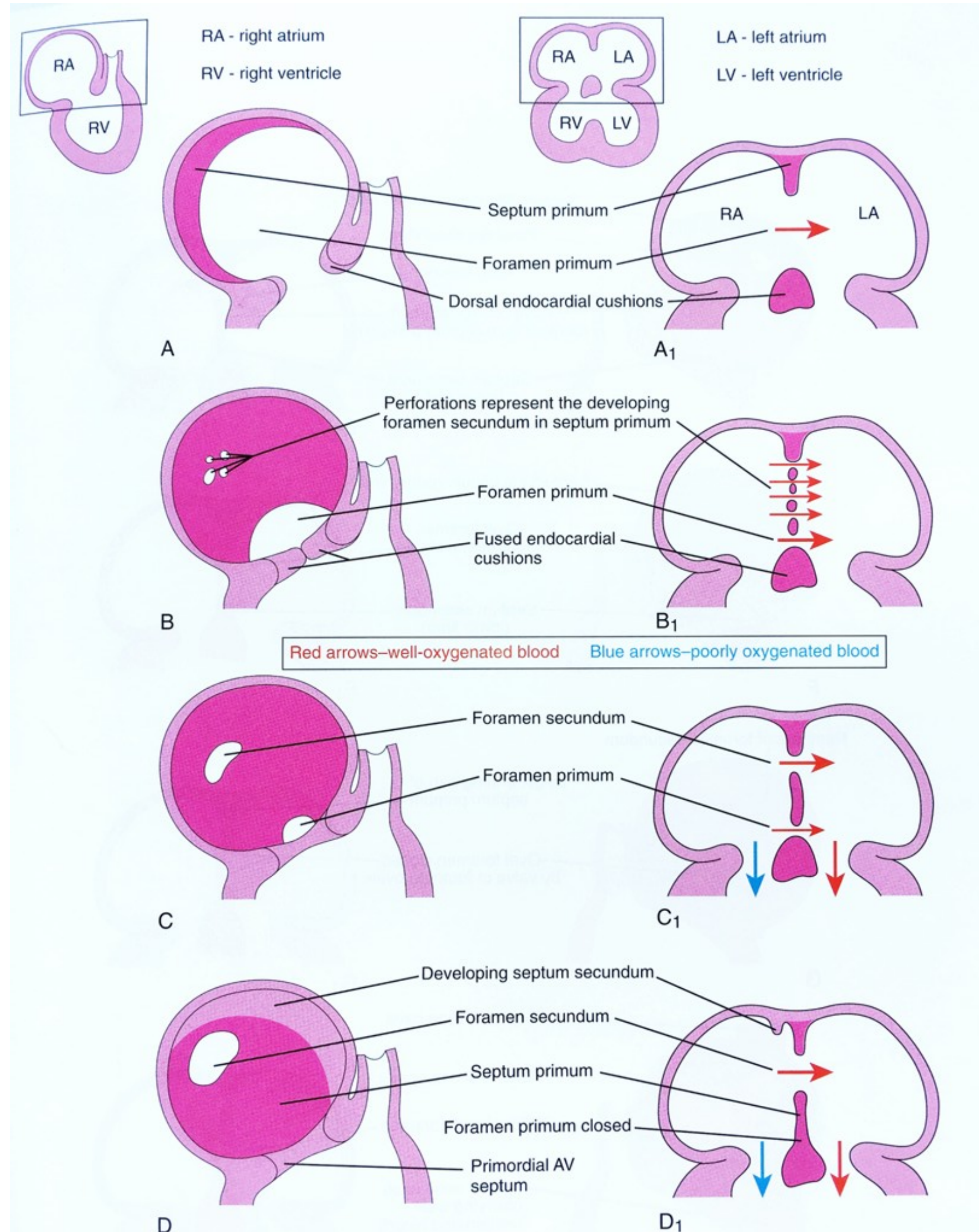




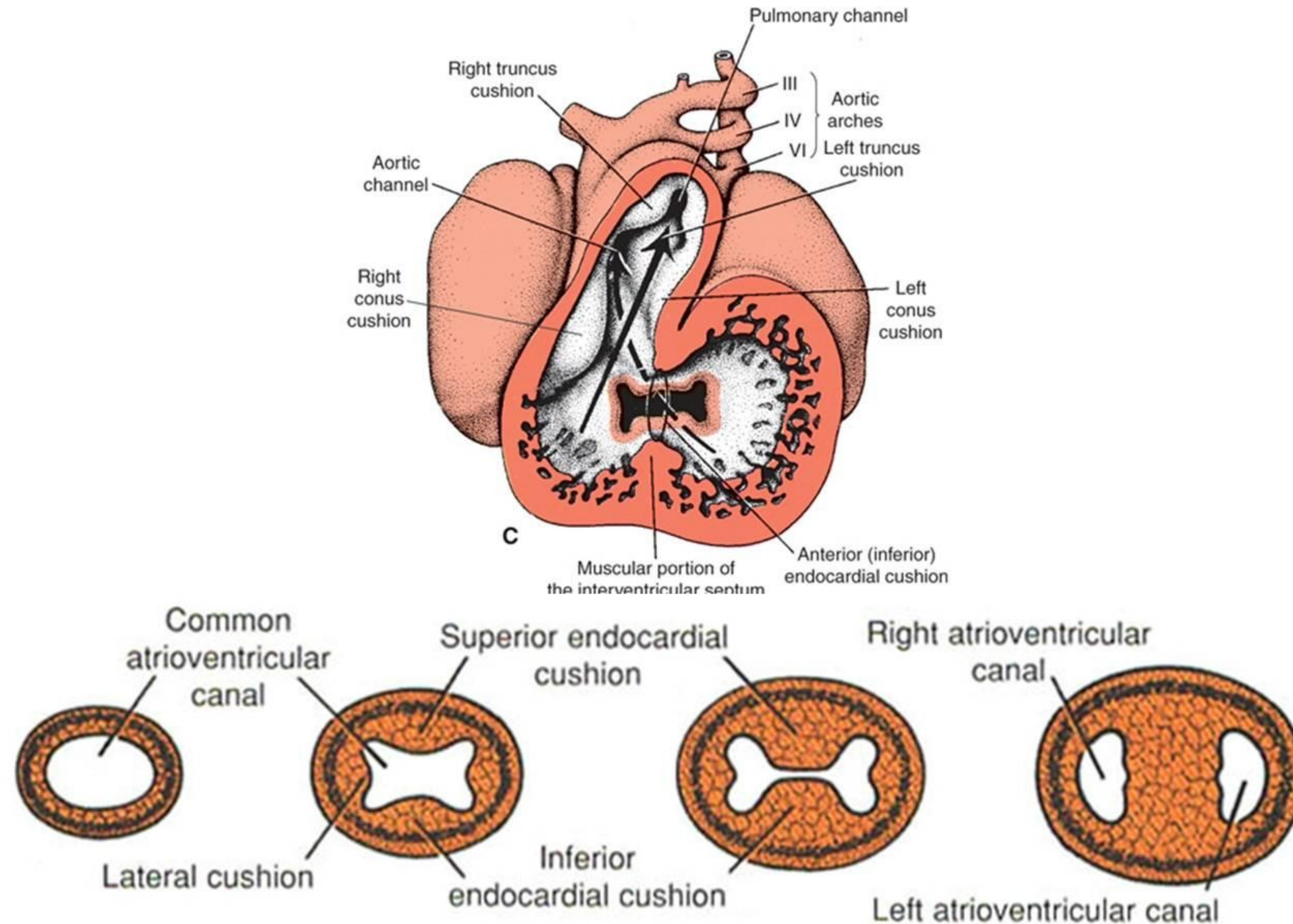
Formation of the cardiac septa

- 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

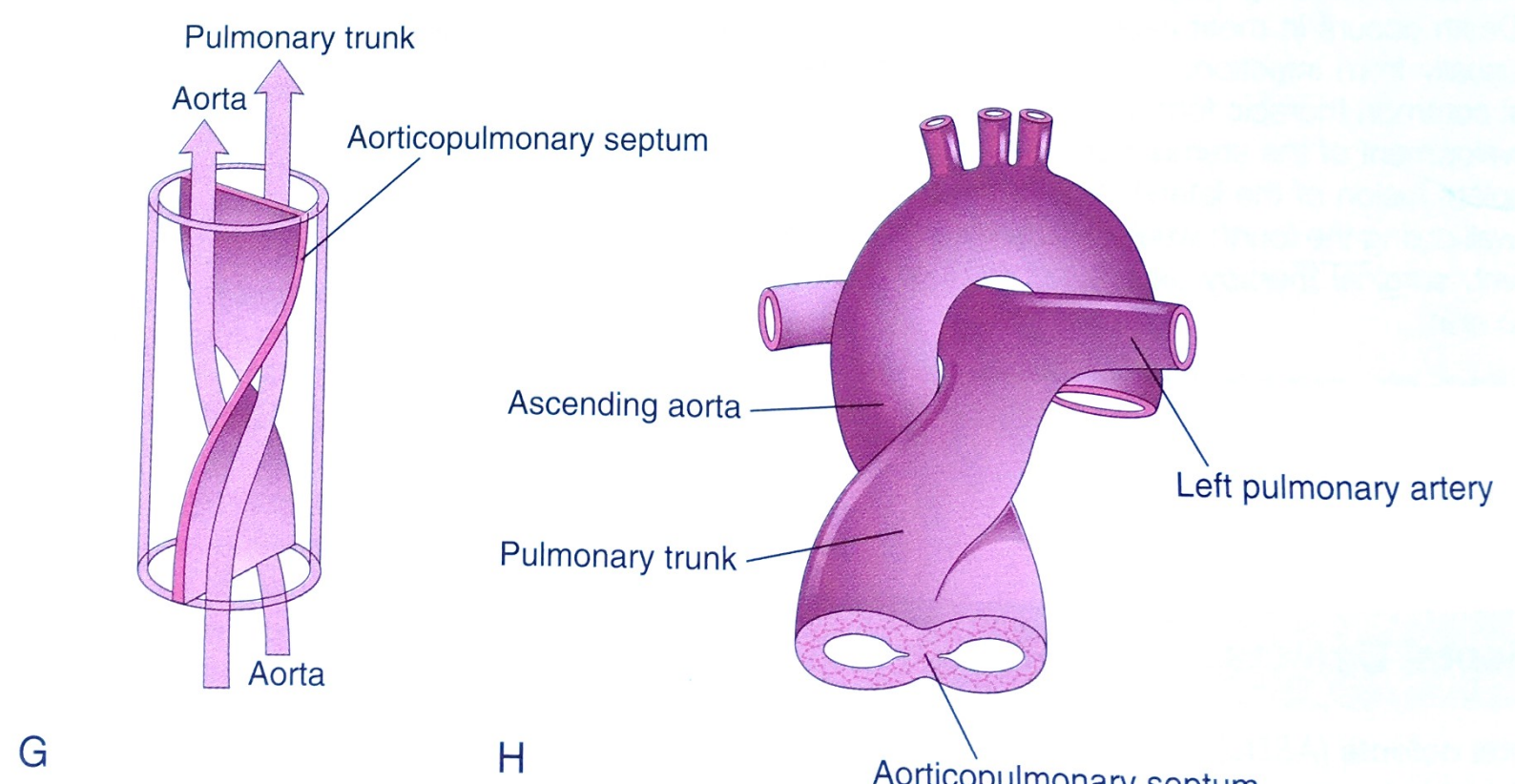
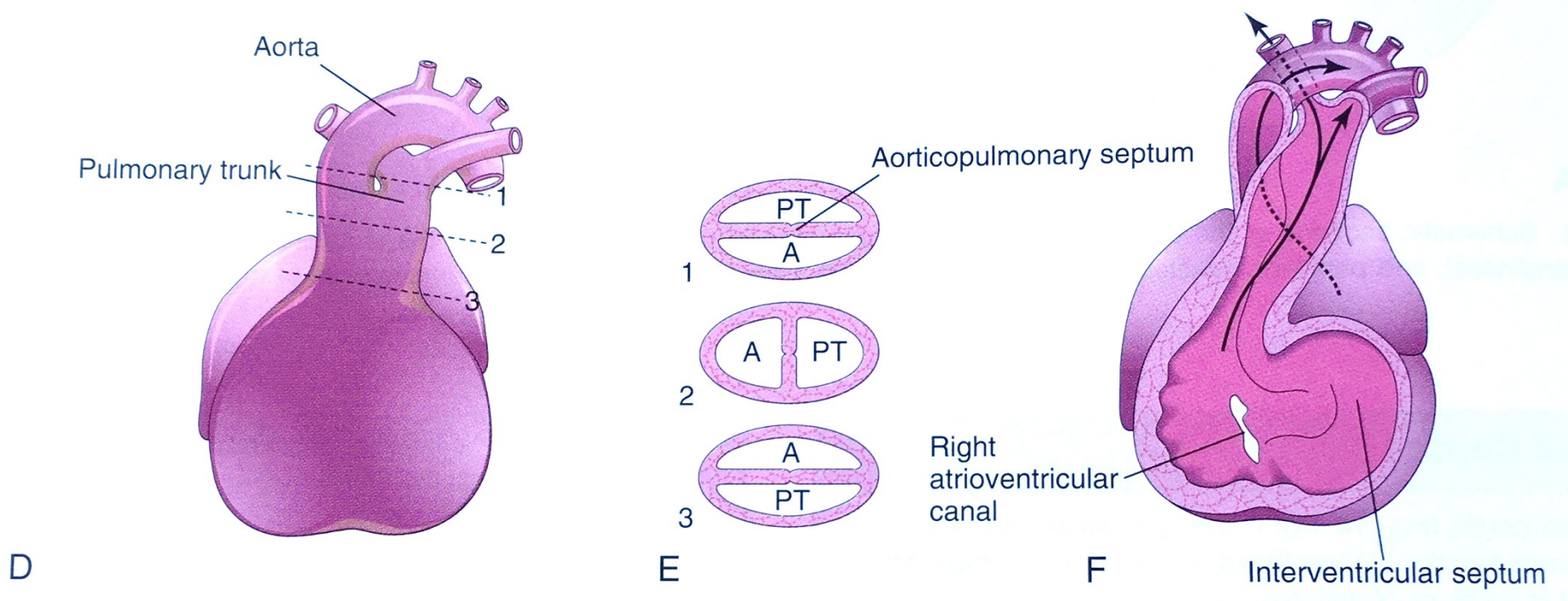
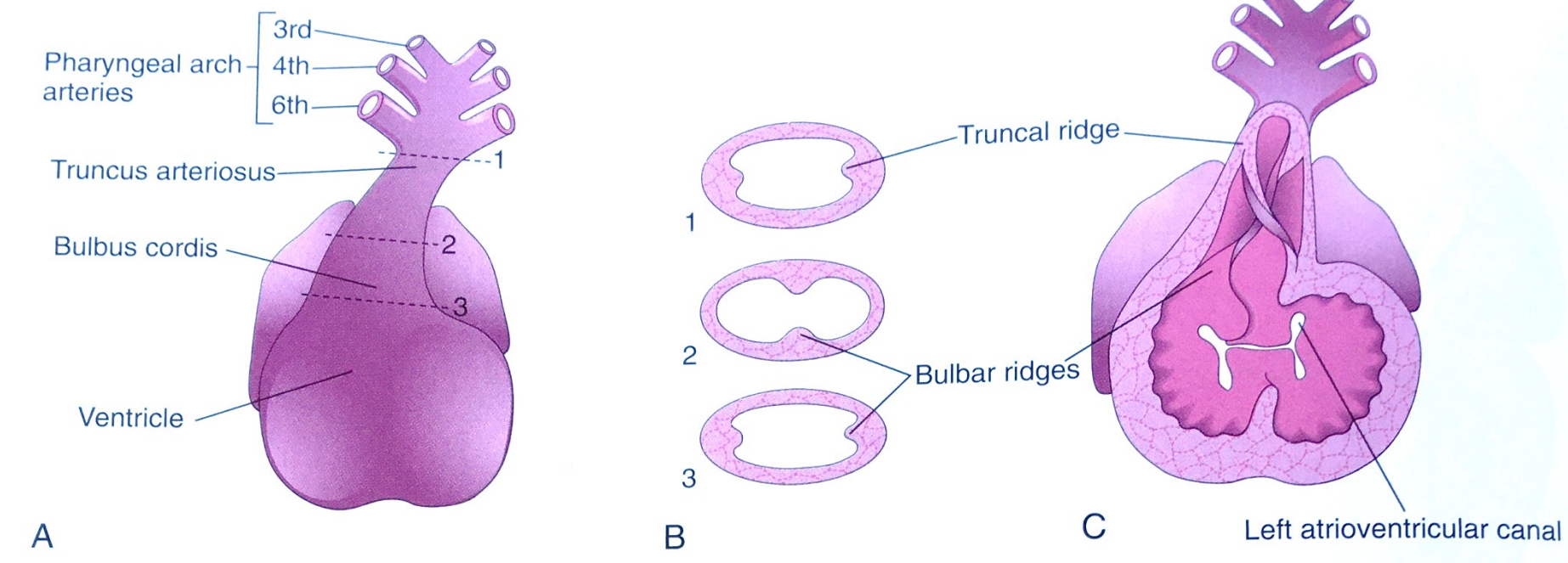
Septum in the common atrium



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

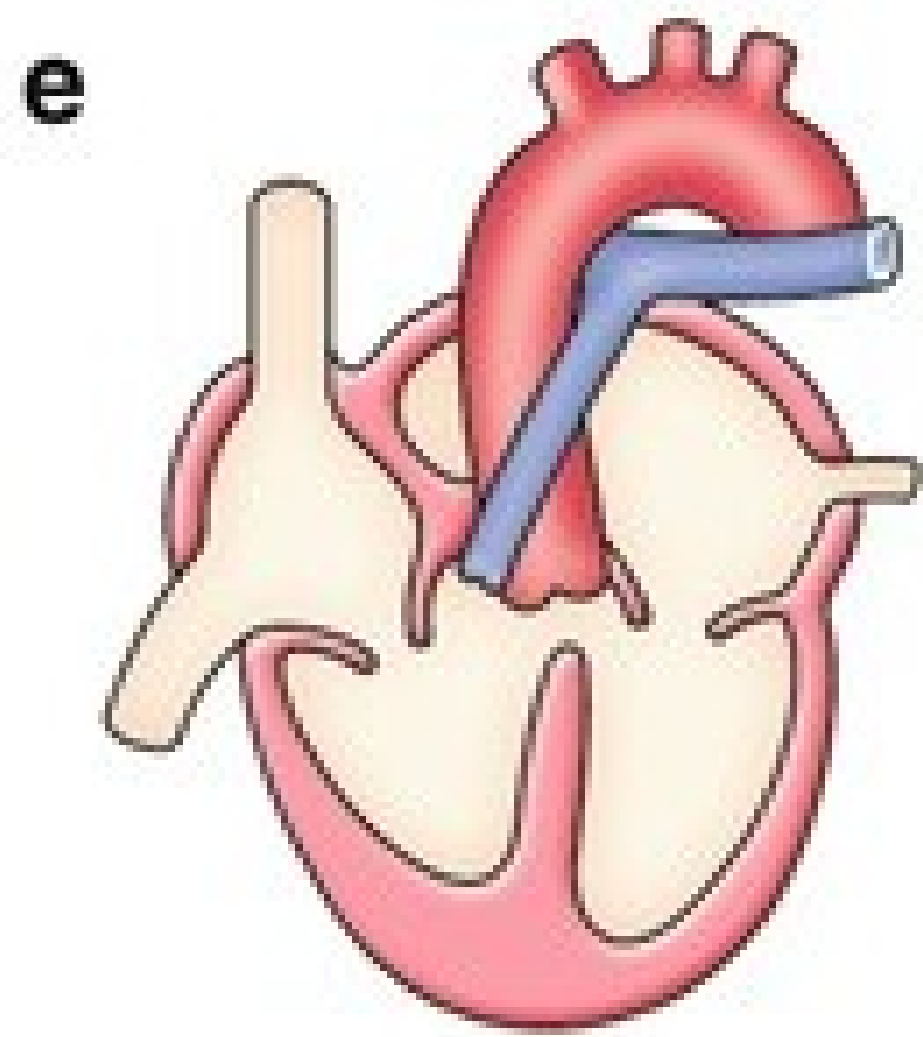
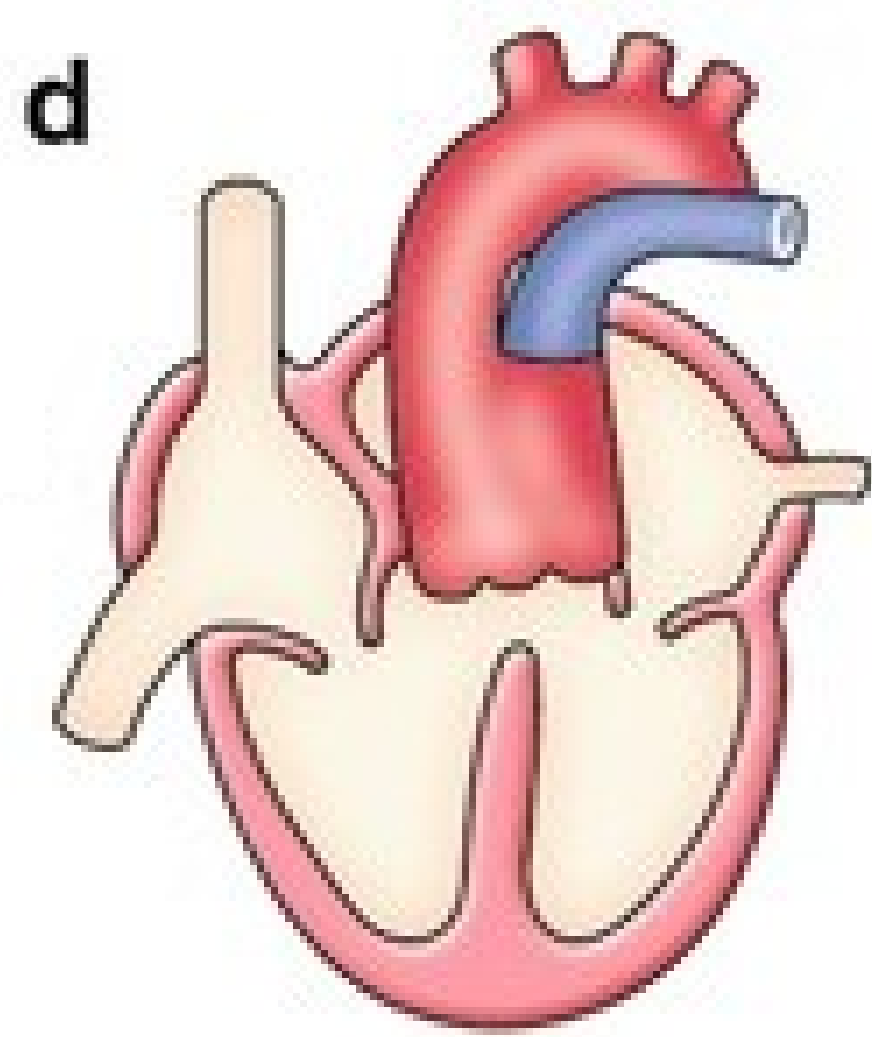
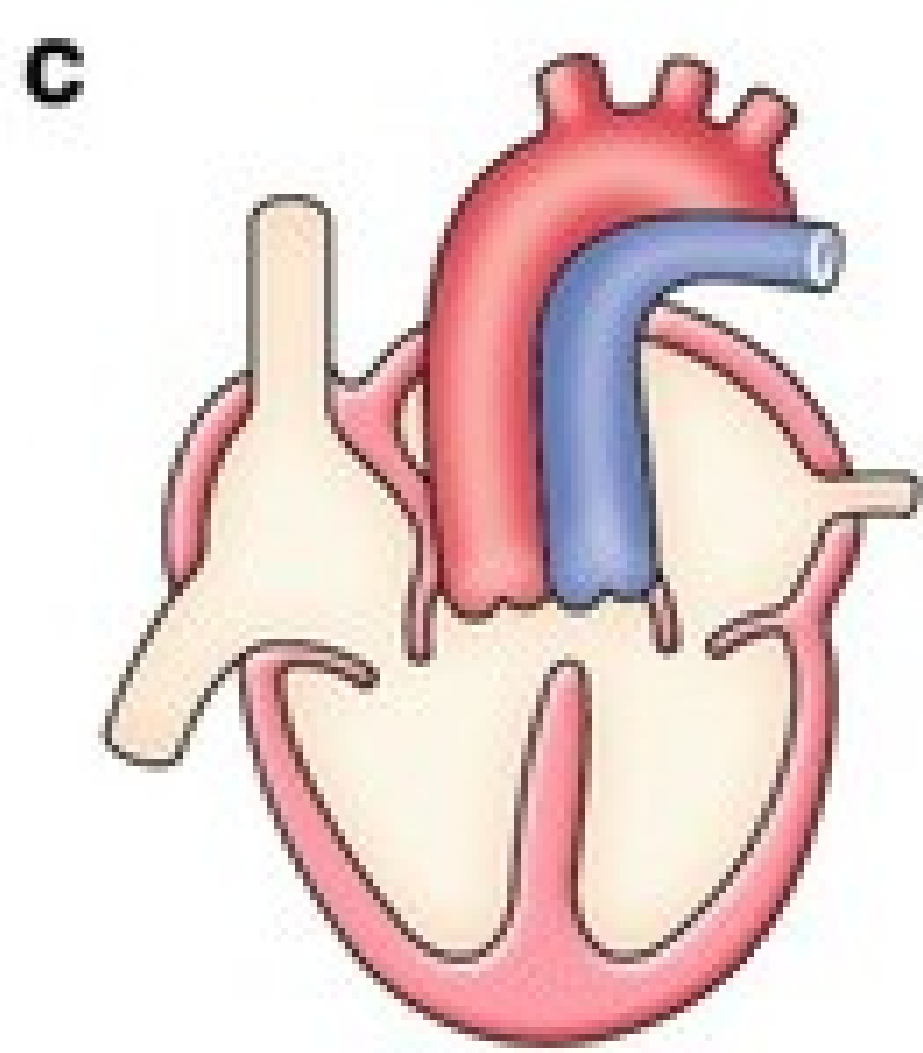
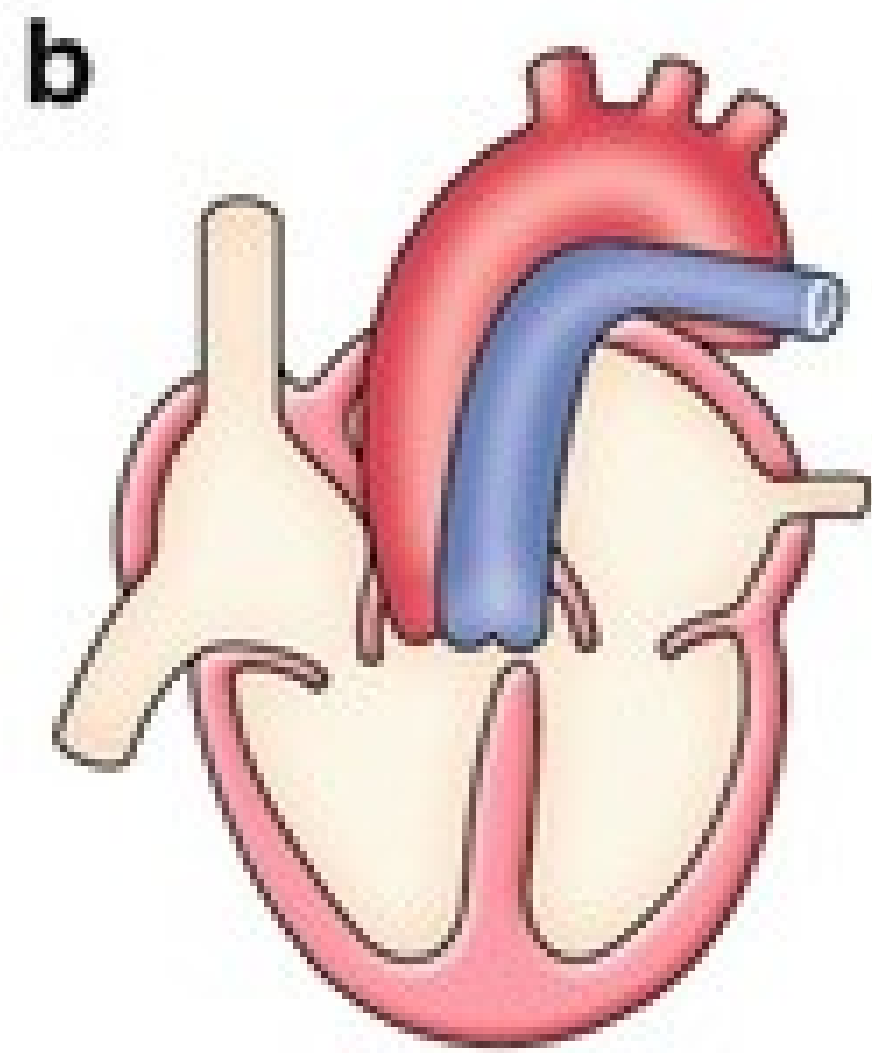
3. Dextroposition of the aorta

4. Right ventricle hypertrophy (as a result of the pulmonary stenosis)

Aortic stenosis and aortic atresia

Unequal division of TA

Pulmonary atresia, pulmonary stenosis



Lymphatic system development

