Heart and Circulatory System II

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Outline

- Atrioventricular septation: formation of the atrioventricular valves
- Ventricular septation
  - Conotruncal septum
  - Membranous septum
- Development of the great arteries
- Transition from fetal to neonatal circulation
- Congenital heart defects

Formation of Primitive Ventricles

Atrial Septation: Endocardial Cushion Formation

Atrioventricular Valve Formation
Conotruncal septation

- Septation of the truncus arteriosus
  - Aorta
  - Pulmonary artery
- Ventricular septation
  - Conotruncal septum

Formation of the Aorta and Pulmonary Artery

Formation of the Conotruncal Septum

Conotruncal Formation
Ventricular Septum

- Primitive Septum
- Conotruncus
- Endocardial Cushion
- Membranous

Semilunar Valve Formation

Formation of the Aortic Arch

- Part of maxillary a.
- Stapedial a.
- Left dorsal aorta
- 7th intersegmental a.

Formation of the Aortic Arch

Fetal Circulation

- Placenta supplies oxygenated blood via ductus venosus
- Pulmonary blood flow minimal
- Foramen ovale directs blood to left atrium
- Ductus arteriosus allows flow from PA to descending aorta

Neonatal Circulation

- Separation of maternal and fetal circulations
- Increase pulmonary blood flow
- Closure of foramen ovale
- Closure of ductus arteriosus
Transition from Fetal to Neonatal Circulation

- ↑ Pulmonary blood flow
- ↑ Pulmonary venous return
- ↑ Left atrial pressure
- Closure Foramen Ovale
- ↑ Arterial pO₂
- Closure Ductus Arteriosus

Atrial Septal Defects

- Absence of septum primum
- Excessive recession of septum primum

Ventricular Septal Defects

Tetralogy of Fallot

- Pulmonary stenosis
- Overriding aorta
- Hypertrophy
- Interventricular septal defect

Transposition of the Great Arteries

- Aorta
- Patent ductus arteriosus
- Pulmonary artery

Transposition of Great Vessels

Persistent Truncus Arteriosus

- Superior vena cava
- Aorta
- Pulmonary artery
- Persistent truncus arteriosus

Interventricular septal defect
Chromosome 22q11 Microdeletion

- Conotruncal malformations
- Malalignment and deficiency of conal septum
- DiGeorge and VCF
- Neural crest migration
- Chromosome 22q11 microdeletions