Ventricular Septal Defect

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The normal heart

Systemic blood flow = Qs

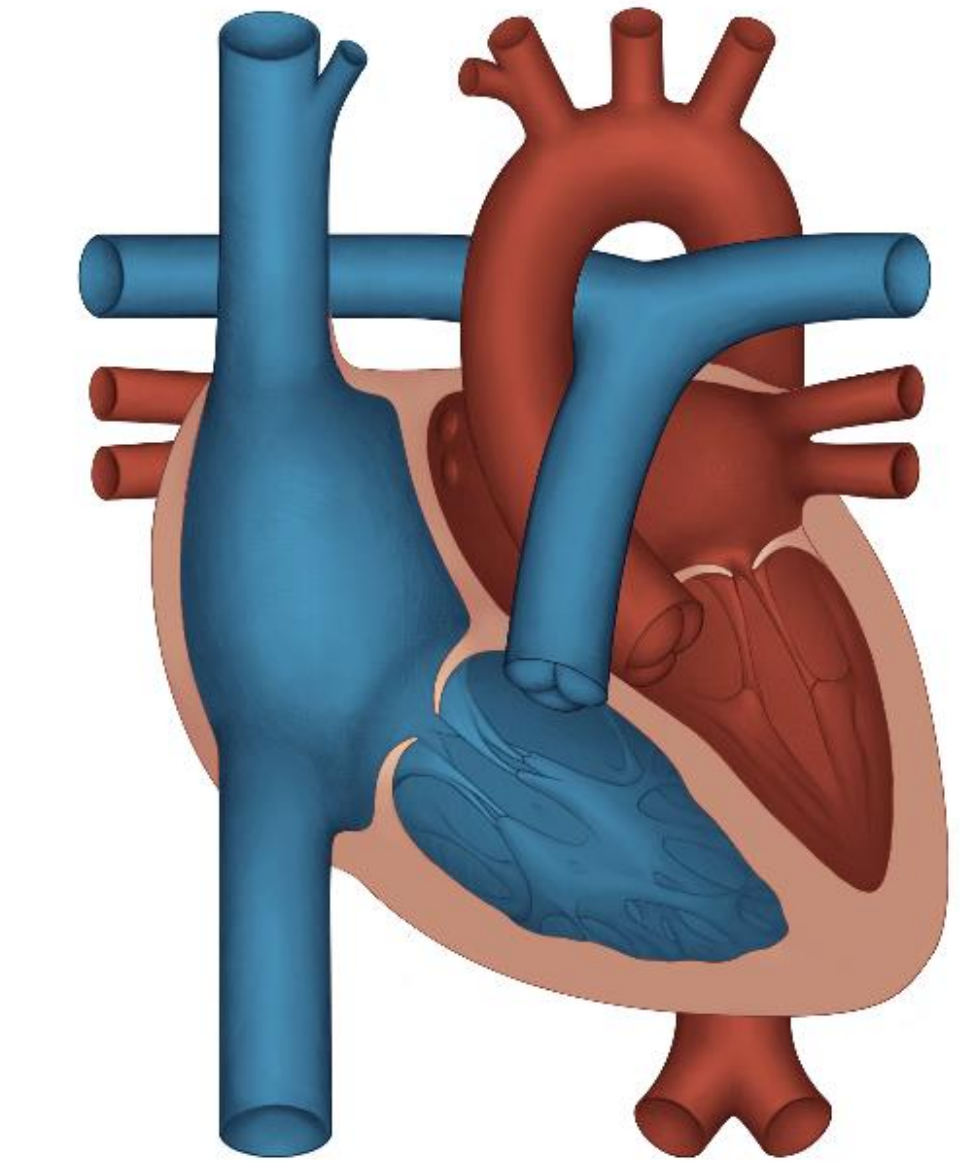
Pulmonary blood flow = Qp

Effective pulmonary blood flow = Qep

Qp/Qs

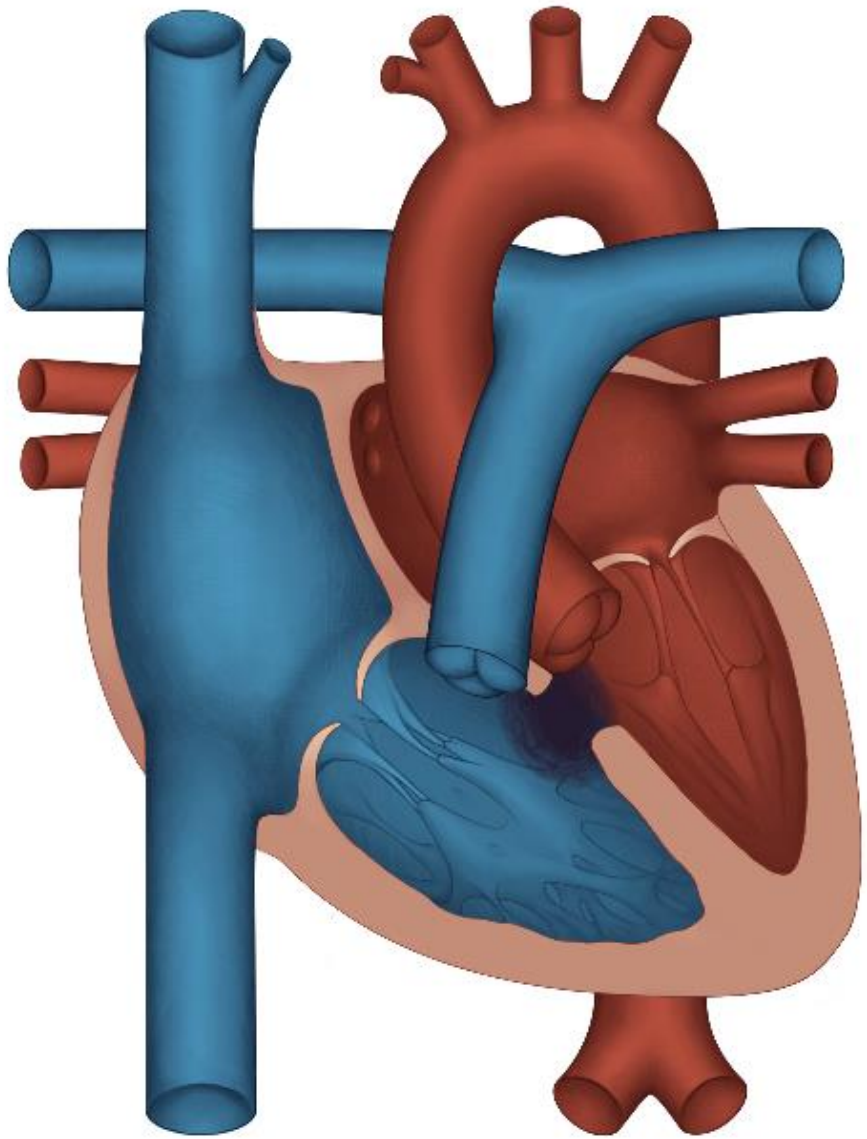
Systemic vascular resistance = SVR

Pulmonary vascular resistance = PVR



Heart with a VSD

MyHeartArt



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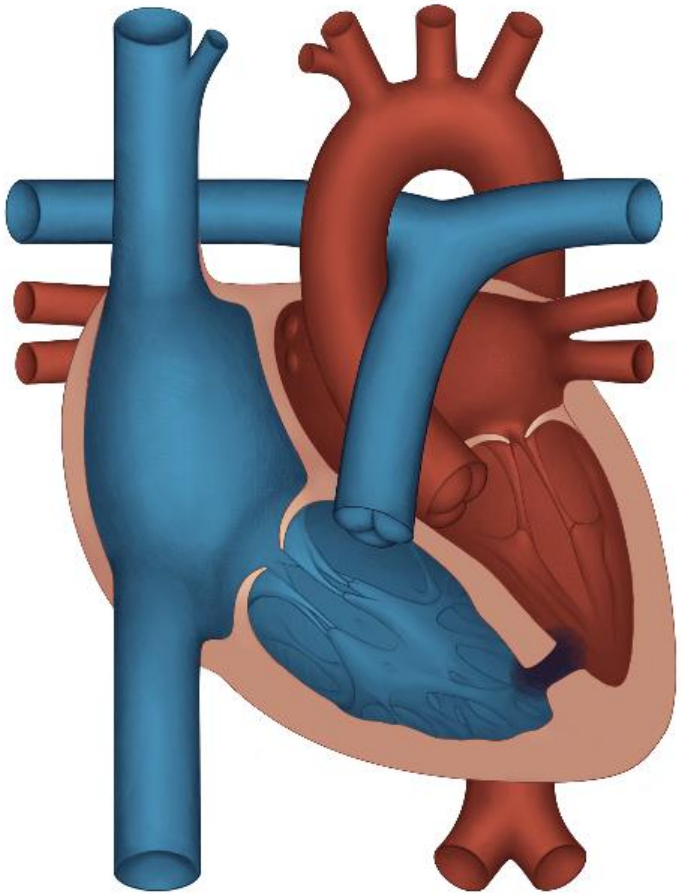
Various types

MyHeartArt



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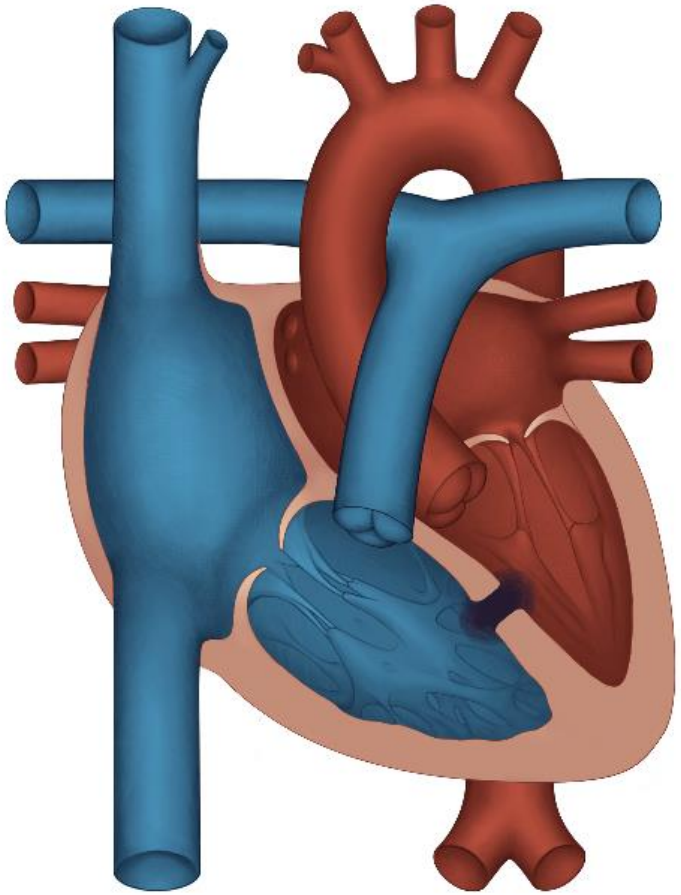
MyHeartArt



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Types of Isolated VSDs

- Perimembranous
- Muscular
- Inlet
- Outlet/supracristal/subarterial/doubly committed/subpulmonic

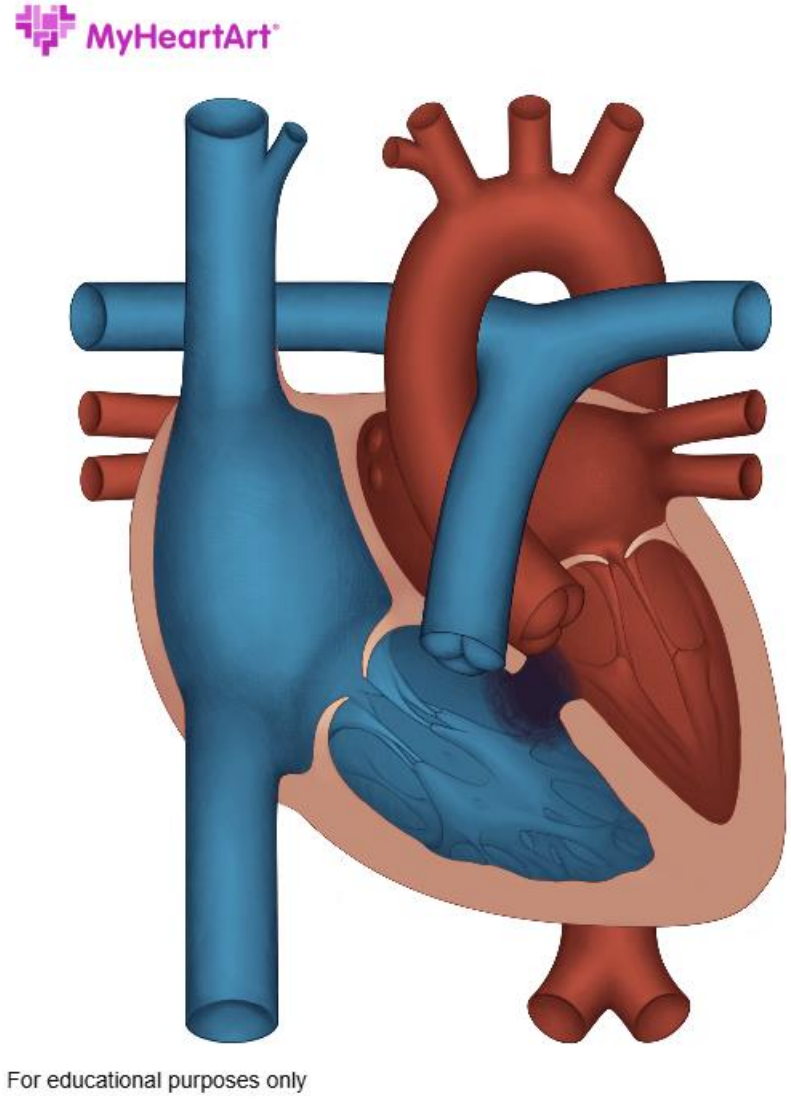
Heart with a VSD

Systemic blood flow = Qs

Pulmonary blood flow = Qp

Effective pulmonary blood flow = Qp

Qp/Qs



Size of hole

Balance between resistances

Systemic vascular resistance = SVR

Pulmonary vascular resistance = PVR

Effect of left to right shunting

- Increased pulmonary blood flow
  - Pulmonary edema/congestion
  - Lung stiffness and airway resistance
  - Increased pulmonary artery pressure
    - Reactive
    - Fixed
- Decreased systemic blood flow

Compensatory factors

- Salt and water retention
- Vasoconstriction
- Renin-angiotensin-aldosterone
- Sympathetic / parasympathetic system

Congestive heart failure

Modifiers

- Size of shunt
- Presence of atrial communication
- Other shunts, e.g. PDA
- Pulmonary valve stenosis
- Coarctation
- Altitude

History – the story you want to hear

- My baby was doing well but now…..
- Increased work of breathing
  - Diaphoresis with feeds – sweating over the forehead
  - Head bobbing
- Always hungry and not failure to thrive
- Cold clammy skin

The story you don’t want to hear

- My child was well at birth
- Then the baby had poor growth
- Over time things got better and baby grew well
- And now…….

Natural history

- Age dependent

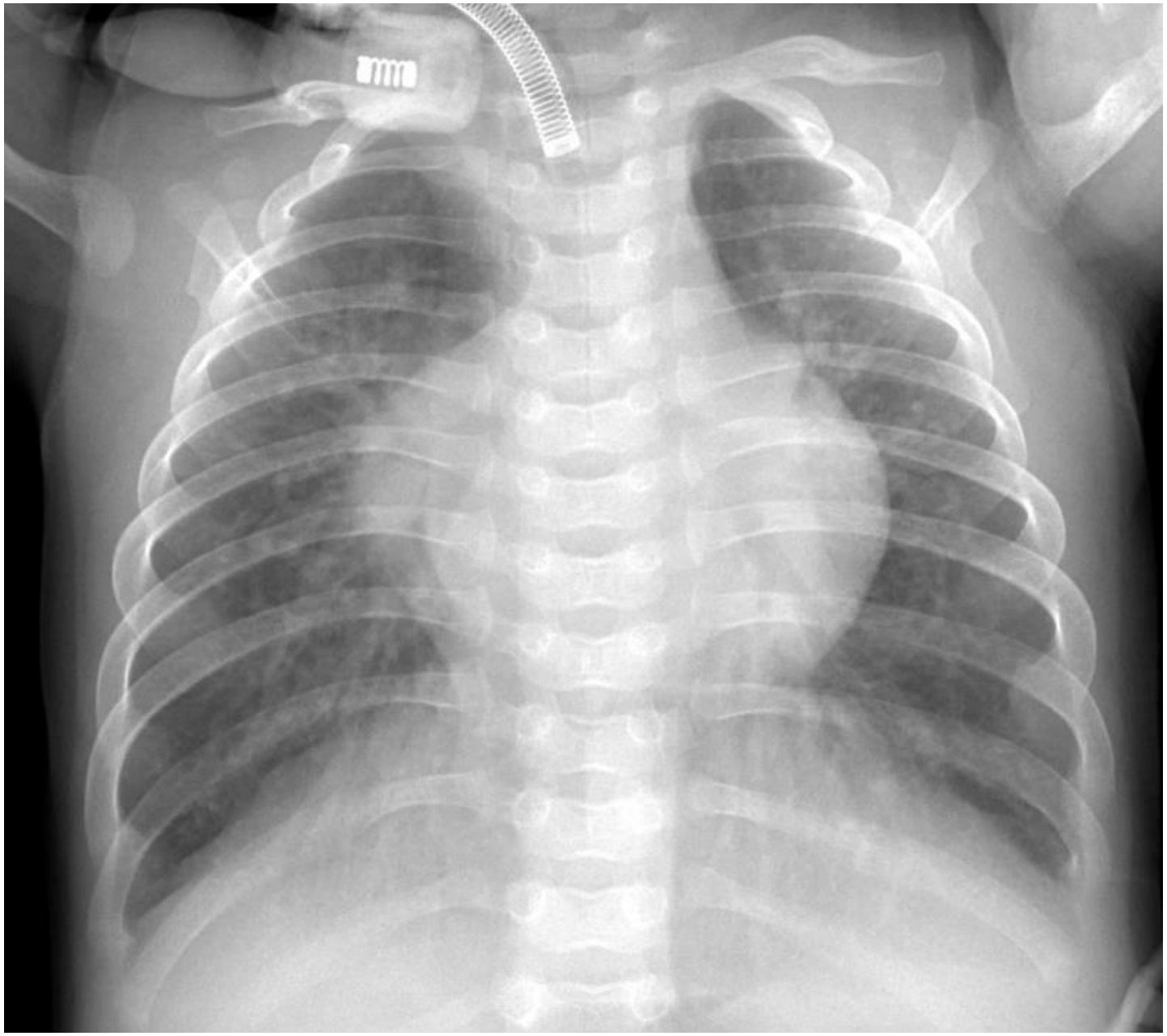
- Determined by normal and abnormal changes in PVR

Physical Examination

- Vitals (oxygen saturation is a must)
- Respiratory
- Cardiac
- Abdomen

Investigations

- EKG
- Chest x-ray
- Echocardiogram
- Cardiac Catheterization
- Cross-sectional imaging



Management

Congestive heart failure

Failure to thrive

- Diuretics
- Nutrition
- Digoxin, inotropes
- Afterload reduction/oral beta blocker therapy
- Permissive hypoxia and hypercarbia
- Intercurrent infections

Close the hole!

Which investigations and when?