Child and Adolescent Nursing (4172601)

Nursing Care of the Child with Cardiovascular Disease

By

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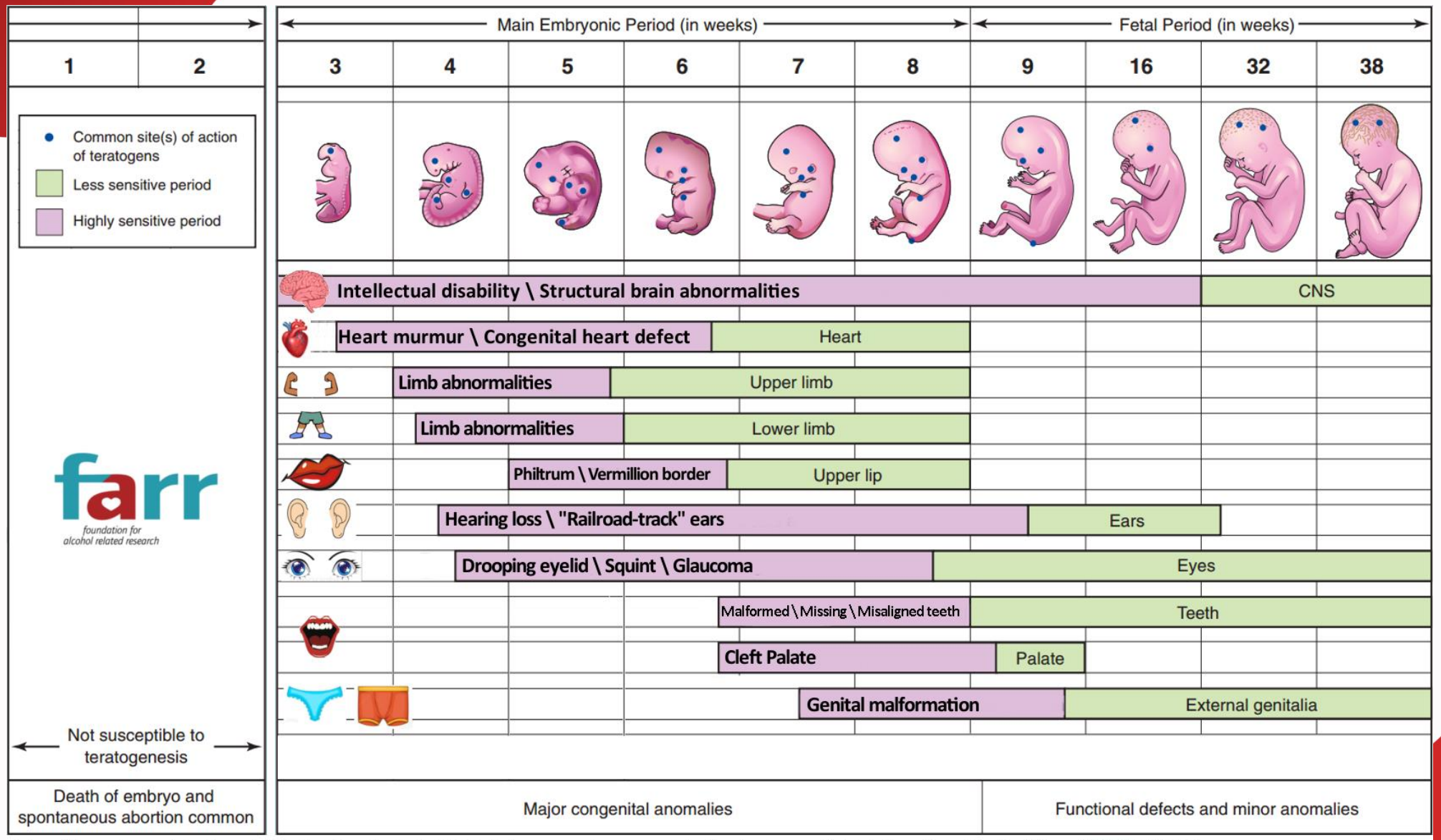
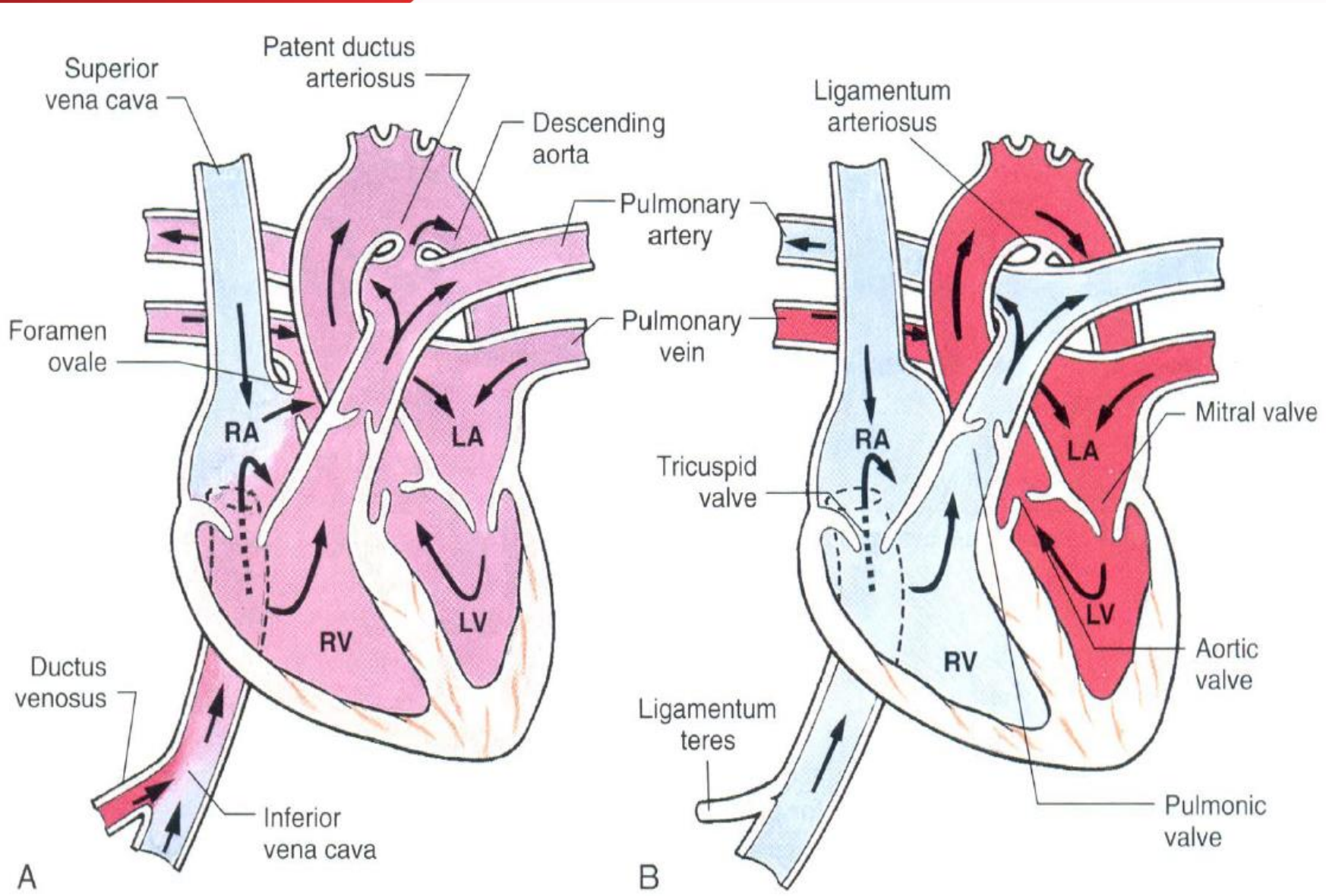
Learning Topics

- Assessment of
- Pathophysiology of
- Nursing care for

Cardiovascular disease in Children



Adapted from: Moore, K. L., Persaud, T. V. N., & Torchia, M. G. (2016). Before we are born: essentials of embryology and birth defects (9th ed.). http://doi.org/9780323313407



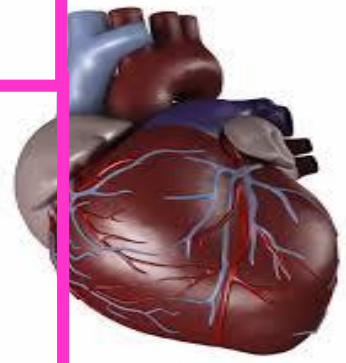
Wong's essentials of pediatric nursing **(p. 824), by M. L. Schroeder, A. Delaney, and A. L. Baker, 2011, St. Louis, MO: Elsevier.**

Classification of CHD

Acyanotic congenital heart disease

Pulmonary blood flow;
- Atrial septal defect
- Ventricular septal defect
- Patent ductus arteriosus

Outflow obstruction;
- Pulmonary Stenosis
- Aortic Stenosis
- Coarctation of aorta



Cyanotic congenital heart disease

Pulmonary blood flow;
- Tetralogy of fallot
- Tricuspid atresia

Mix blood flow;
- Transposition of great vessels
- Truncus arteriosus
- Hypoplastic left heart syndrome

Incidence

- ✓ 8-10/1000 live births approximately 2000/year
- ✓ Incidence is more in :a-Premature, b-abortions, c-still births
- ✓ Incidence increased for siblings.

Etiology

✓ Chromosomal abnormality (5-10%).

-Trisomy 21 (50%) > A-V canal,VSD,ASD, others.
-Trisomy 18 (80%)> VSD,ASD,others.
-Trisomy 13 (40%)> VSD,ASD,PDA,others.
-Turner syndrome (xo)>Bicuspid aortic valve and co-ao
-others.

-Maternal infections >Rubella: PDA,PS
-Maternal diseases > PKU-VSD,ASD, DM: left septal hypertrophy
-Drugs>fetal hydntoin syndrome- VSD, Valproate effect-co ao left heart hypoplasia
-Fetal alcohol syndrome> VSD,ASD,CO-AO.
-Advance maternal age.

Assessment of Cardiovascular disease in Children

Chief Concern: Fatigue, Cyanosis, frequent upper respiratory infections, feeding difficulty, poor weight gain, growth failure, history of dyspnea on exertion, shortness of breathing, orthopnea, lower limbs swelling, palpitation, convulsion.
-All may be manifest of congestive heart failure-

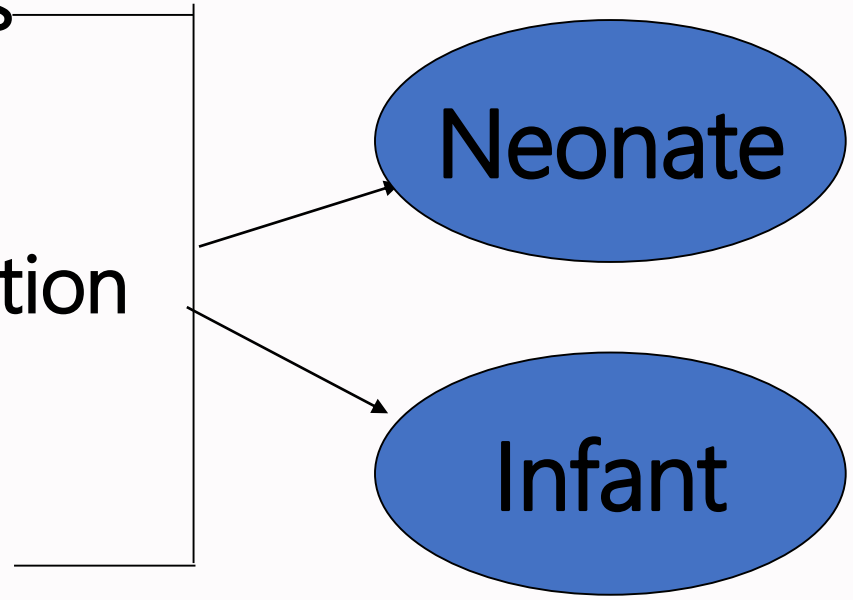
Past medical history: Infection during pregnancy, difficulty with resuscitation at birth

Family medical history: Other members with heart disorders

History Taking

- Age of the patient.
- Ask for

-Feeding difficulties
-Vomiting
-Lethargy
-Increased perspiration
-Rapid respiration
-Hypoactivity
-F.T.T



- All may be manifestation of congestive heart failure.

D.D

Sepsis

Metabolic disorders

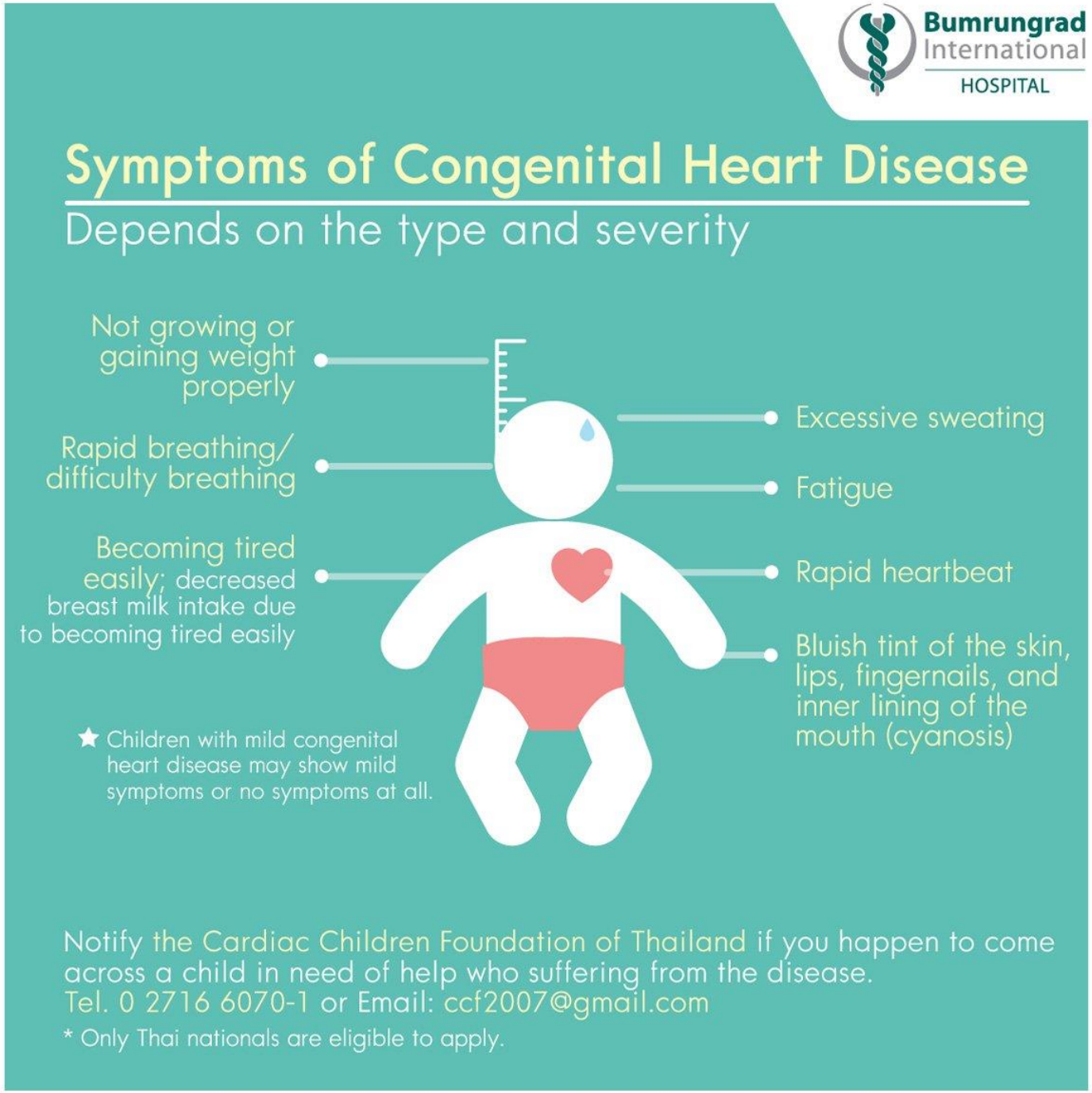
Hypothermia

IVH

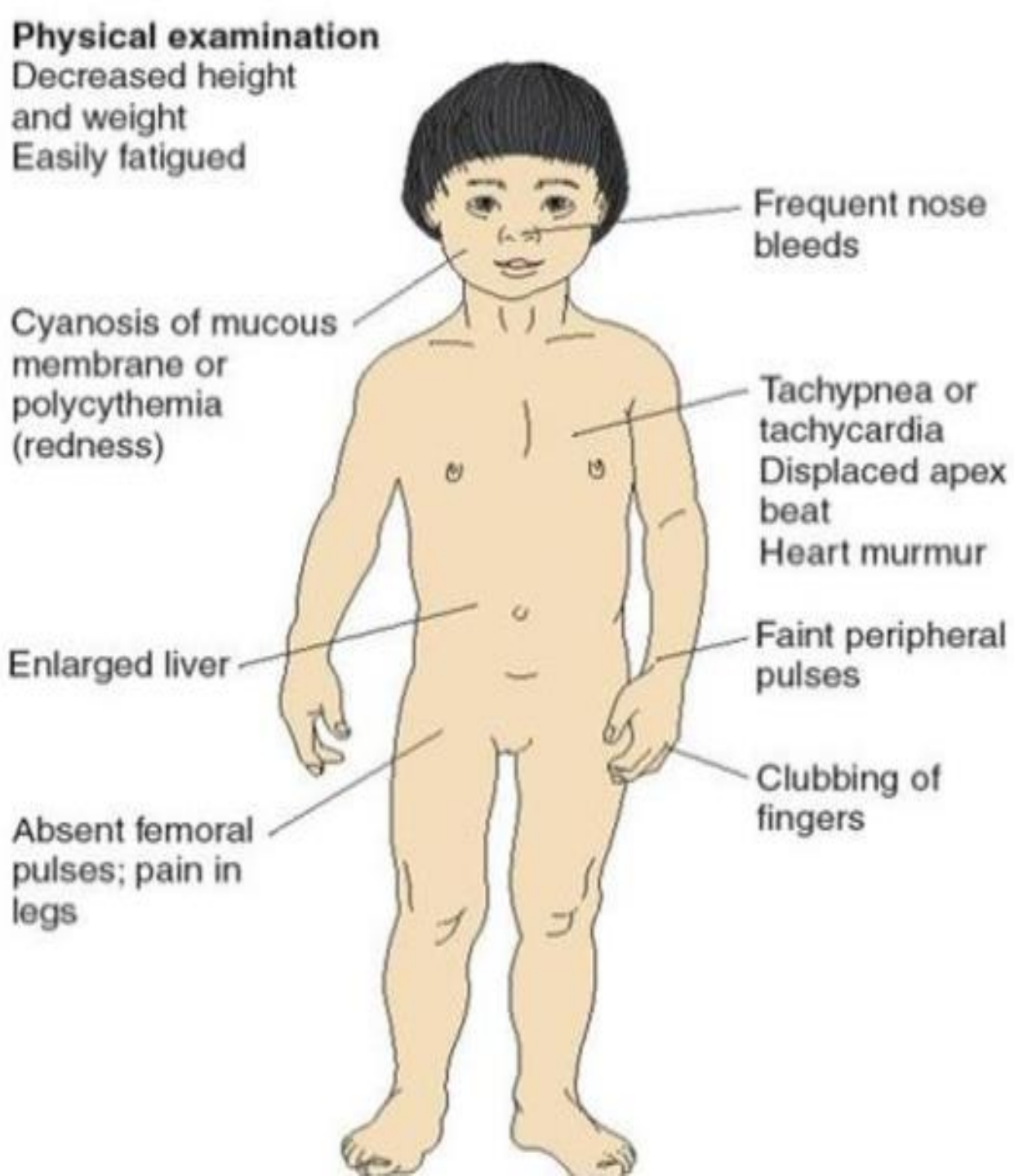
Others

Assessment of Cardiovascular disease in Children

04



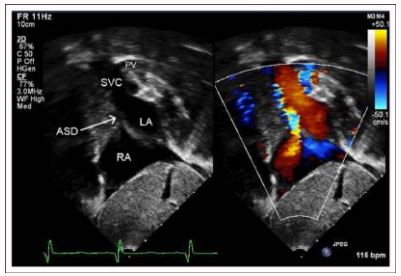
Assessment of Cardiovascular disease in Children

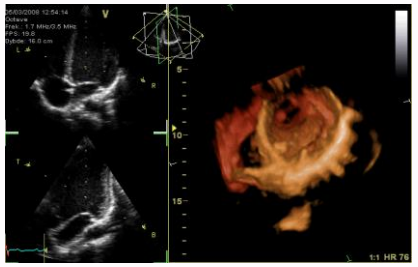


If we suspect C.H.D Investigation…

- **CBC**---- polycythemia, anemia….etc
- **CXR**----heart size and shape
- **ECG**--HR,axis ,rhythm, LVH,RVH,BVH,BBB.
- **Echocardiography**
- **MRI**
- **Cardiac catheterization**








- Atrial Septal Defect
- Ventricular Septal Defect
- Patent Ductus Arteriosus
- Tetralogy Of Fallot
- Transposition of Great Vessels

Atrial Septal Defect: ASD

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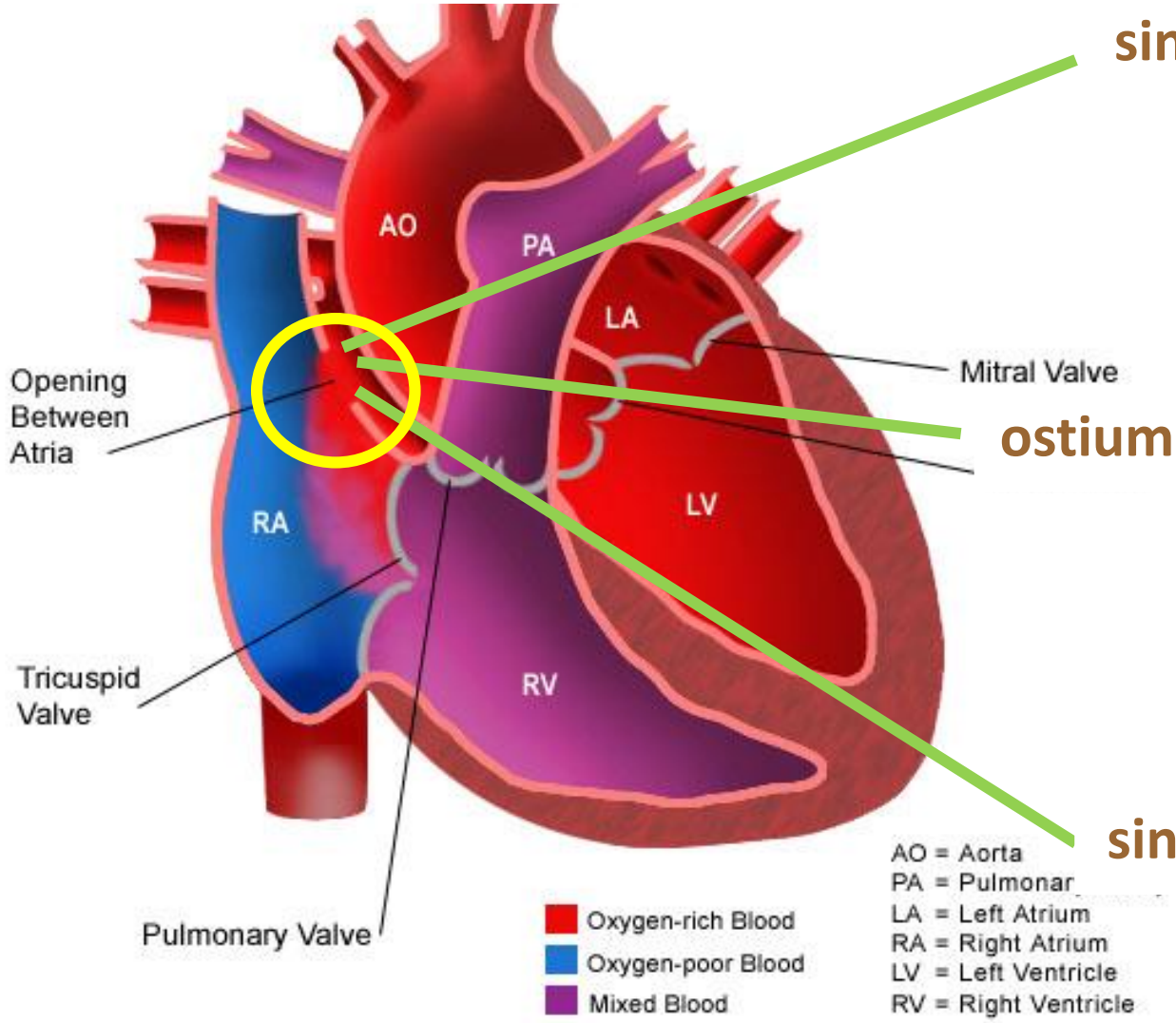


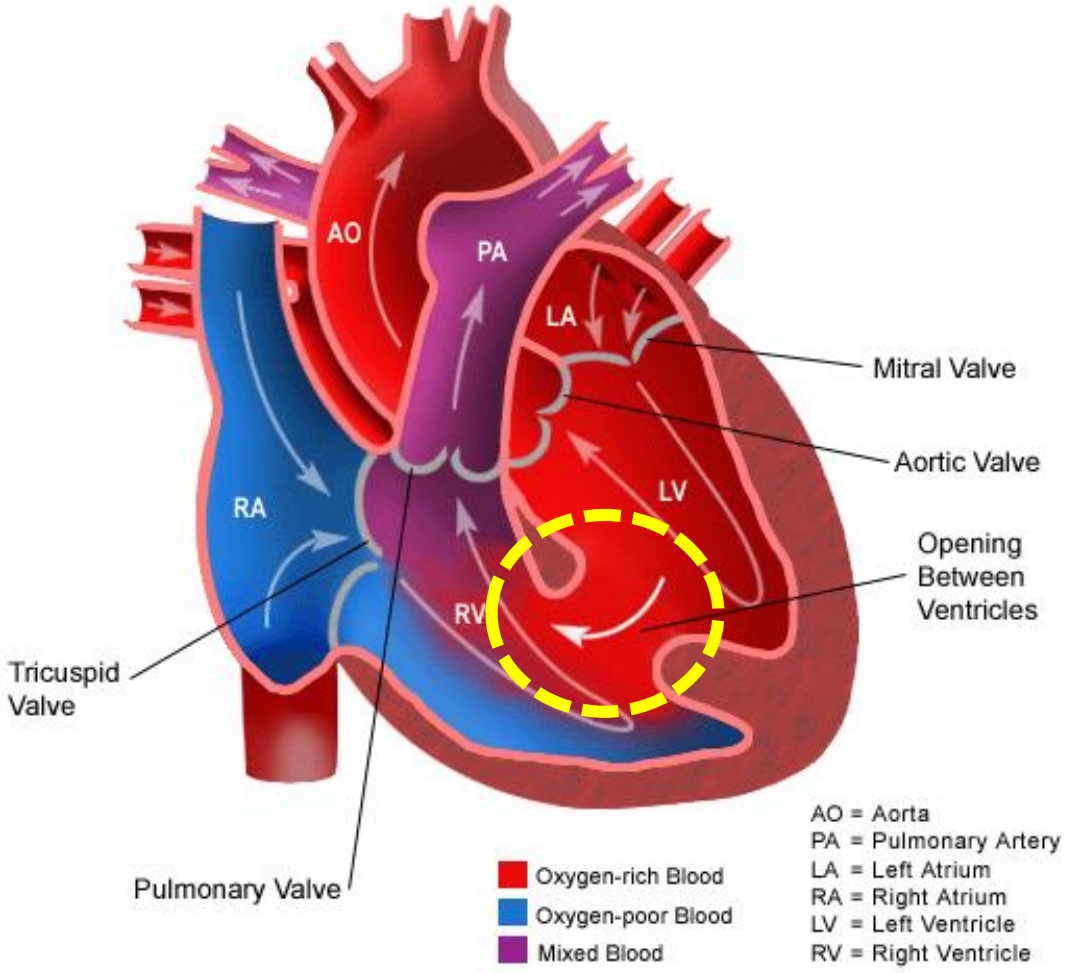
sinus venosus defect

ostium secundum defect

sinus venosus defect

http://www.urmc.rochester.edu/Encyclopedia/Content.aspx?ContentTypeID=90&ContentID=P01766

Ventricular Septal Defect: VSD



Perimembranous VSD

Muscular VSD

Subpulmonary VSD

Inlet VSD/ A-V canal

(atrioventricular canal)

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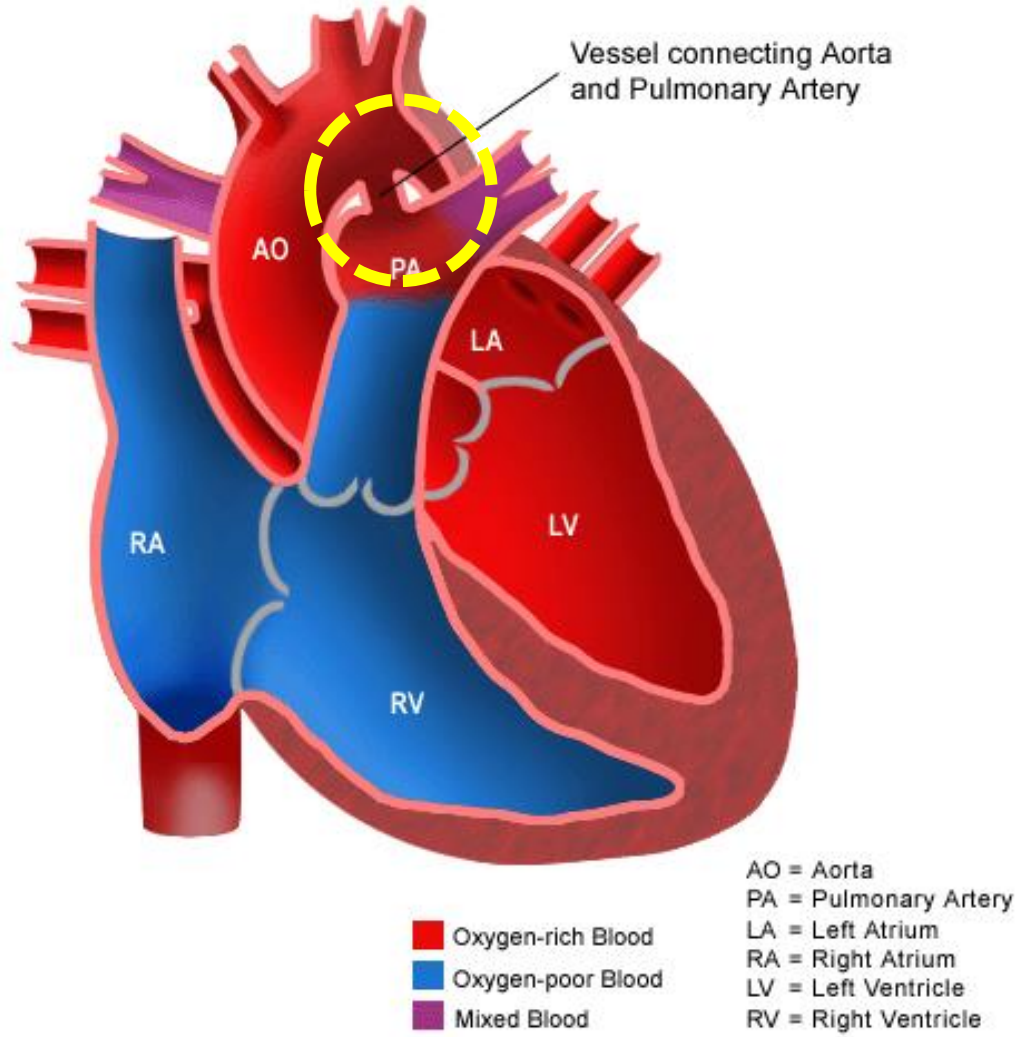
patent ductus arteriosus: PDA



- The ductus arteriosus is normally closed to blood within 24 hours after birth.
- Close tightly within the first week after birth.

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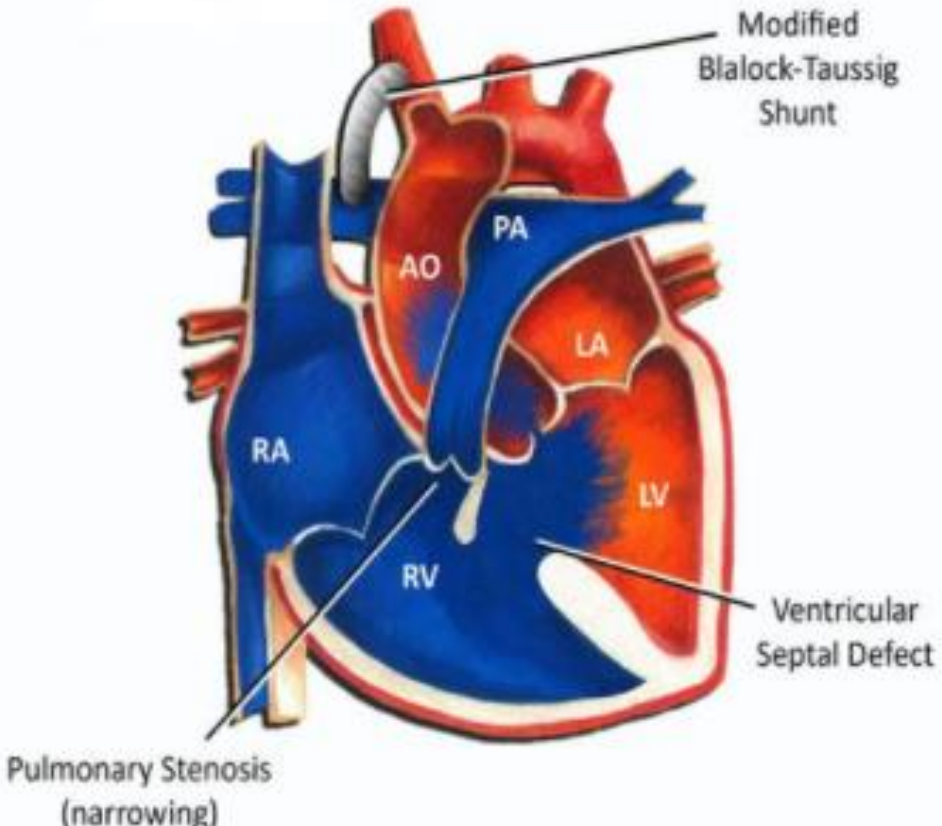
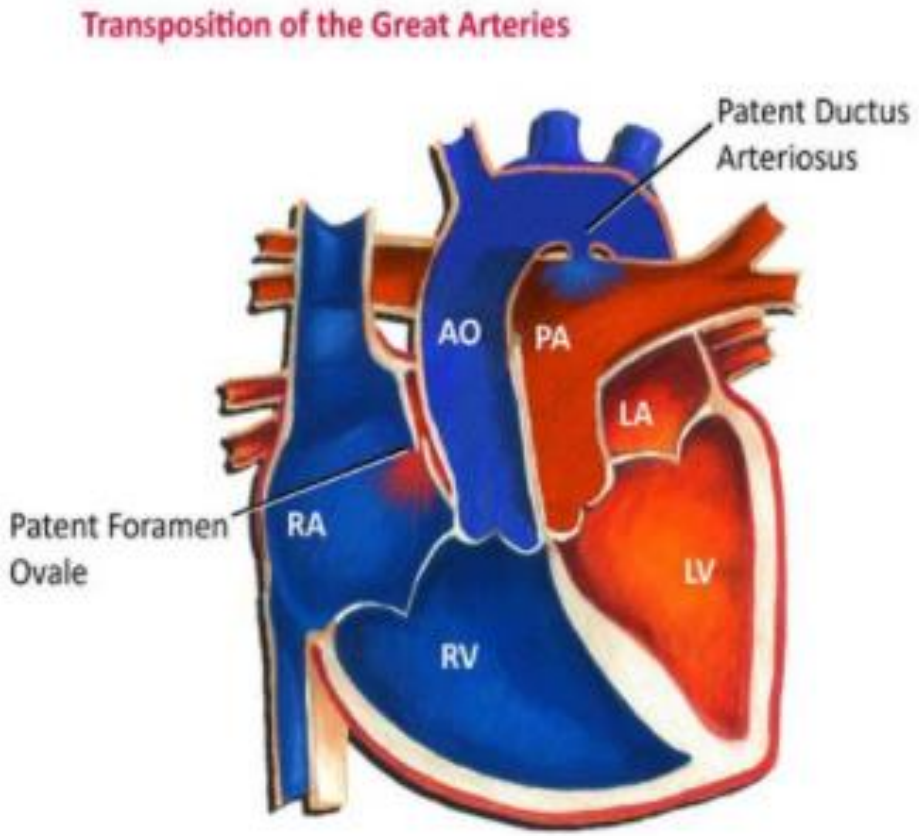
TOF


Modified
Blalock-Taussig
Shunt
PA
AO
LA
RA
LV
RV
Ventricular
Septal Defect
Pulmonary Stenosis
(narrowing)

TGV / TGA


Transposition of the Great Arteries
Patent Ductus
Arteriosus
AO
PA
LA
Patent Foramen
Ovale
RA
LV
RV

cyanotic congenital heart disease

Tetralogy of Fallot: TOF

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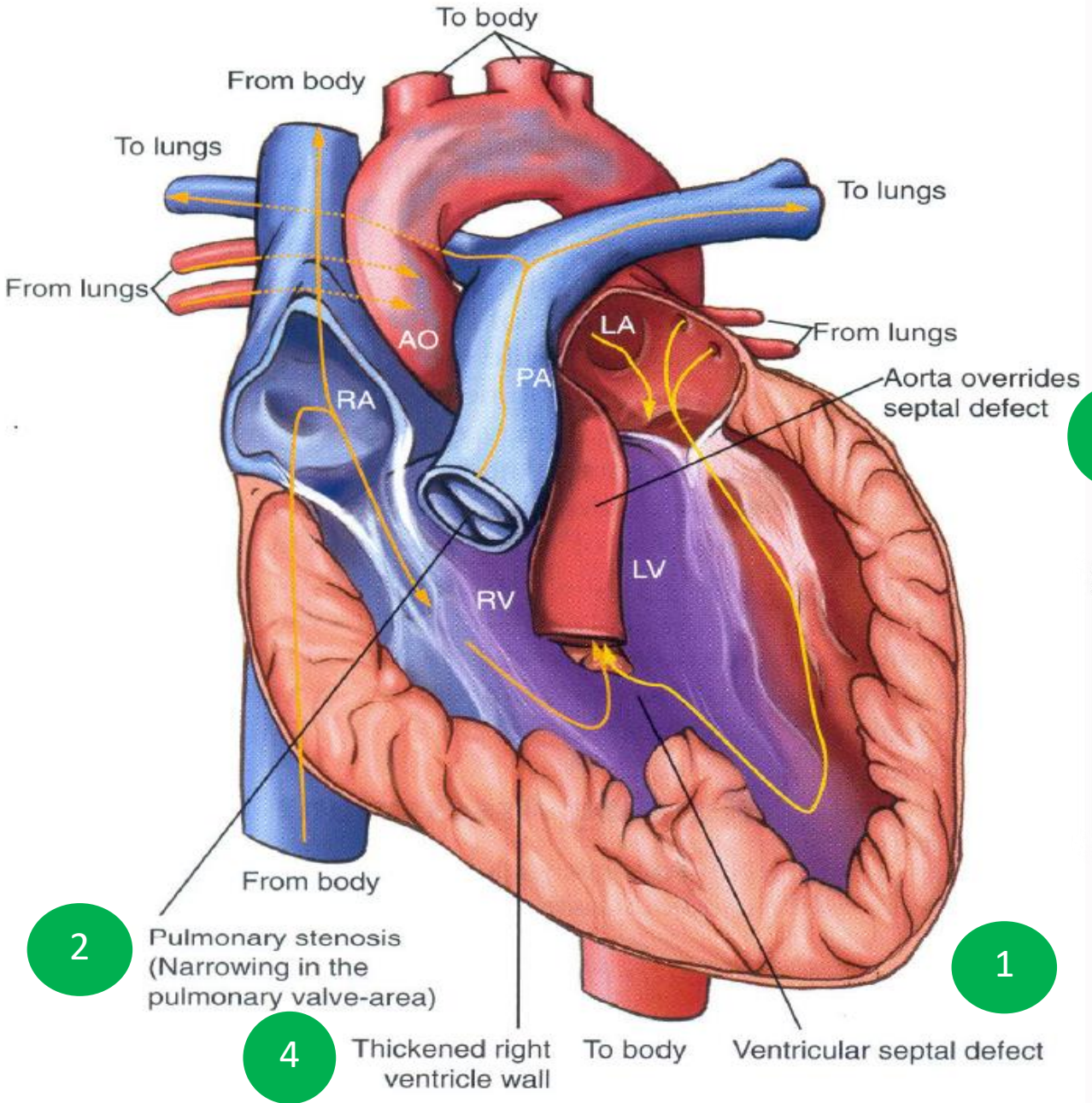

Boot shaped heart in pt. with TOF

hypoxic spells / anoxic spells

transposition of great Vessels: TGV

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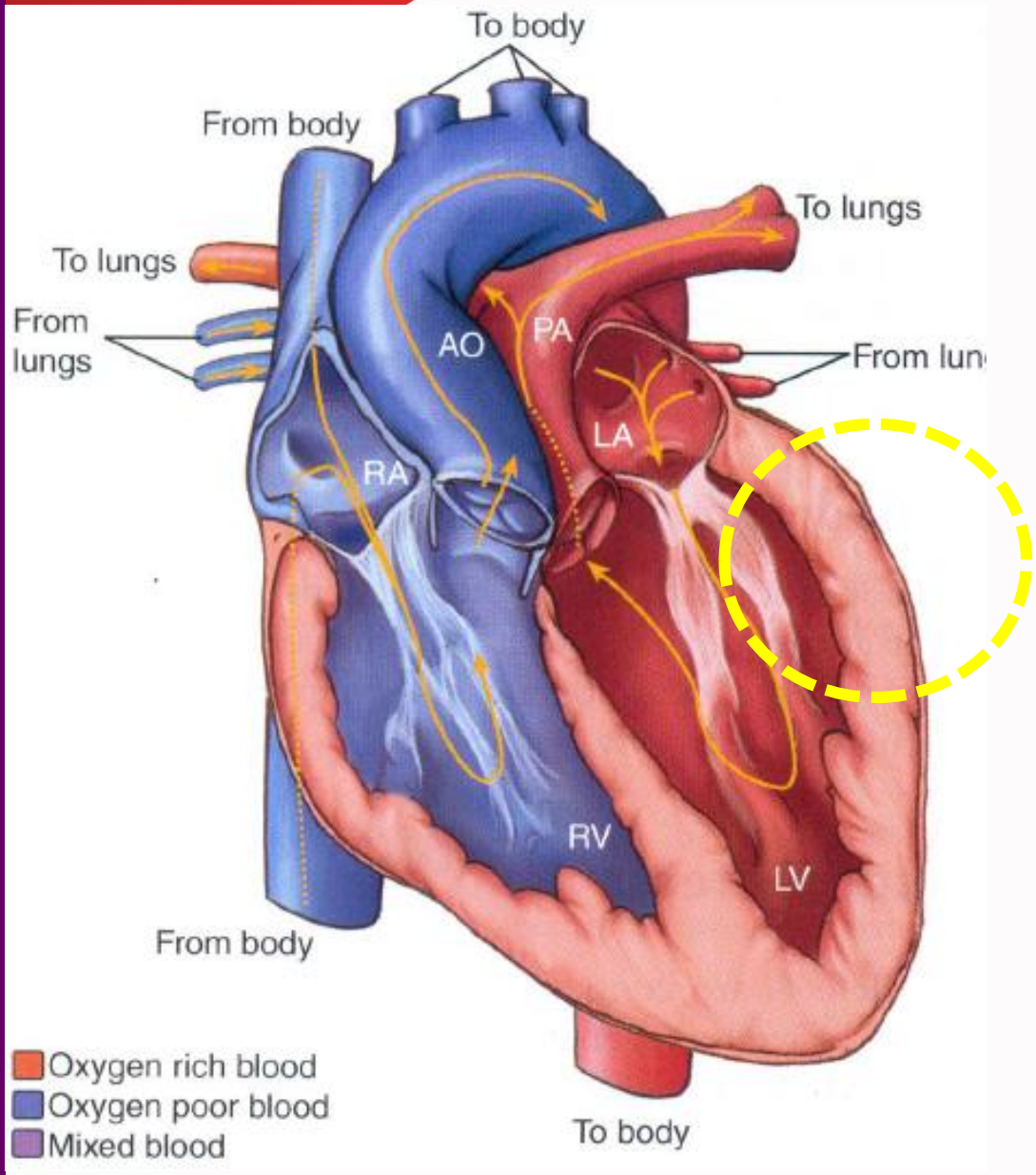
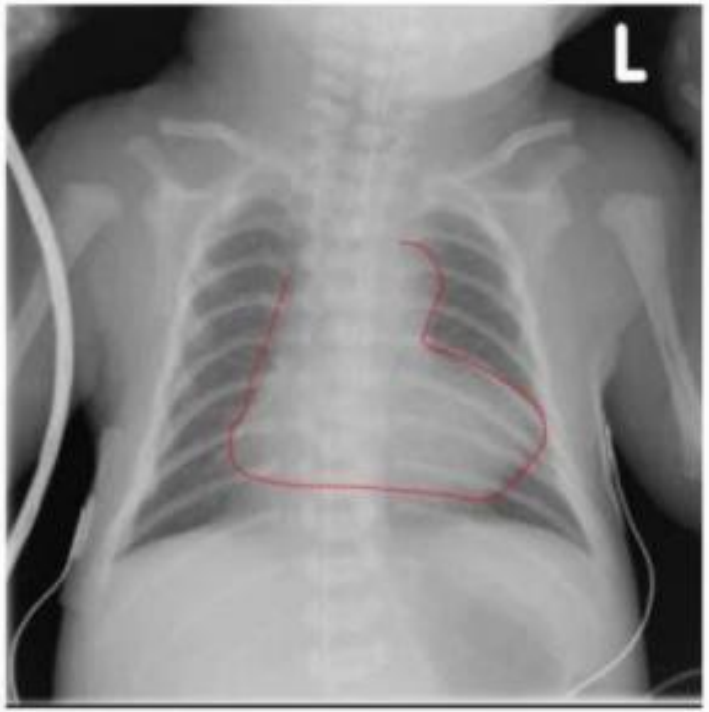


HEART

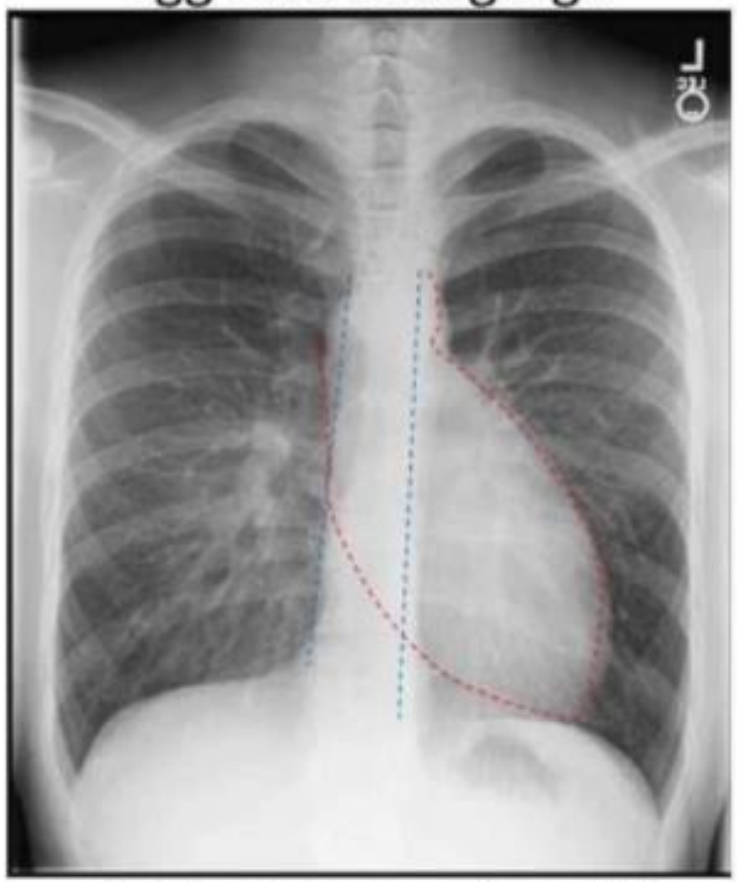
Boot-shaped heart



Newborn with
Tetralogy of Fallot

https://pediatricimaging.wikispaces.com/file/view/tet.jpg/53373286/558x615/tet.jpg

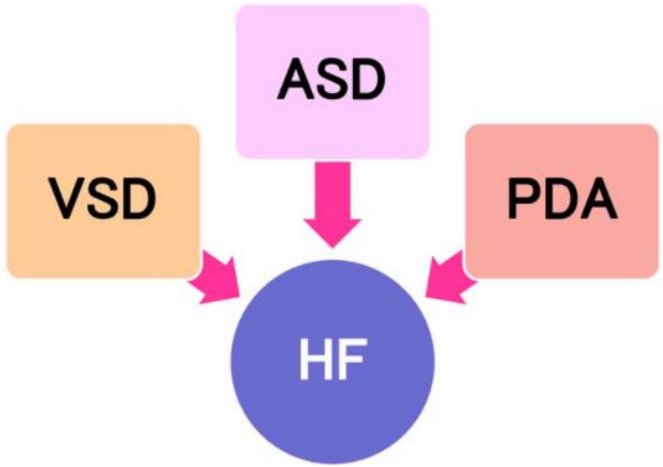
Egg on a string sign



Child with transposition of the great arteries.

https://upload.wikimedia.org/wikipedia/commons/thumb/f/fd/Transposition-of-great-vessels.jpg/200px-Transposition-of-great-vessels.jpg

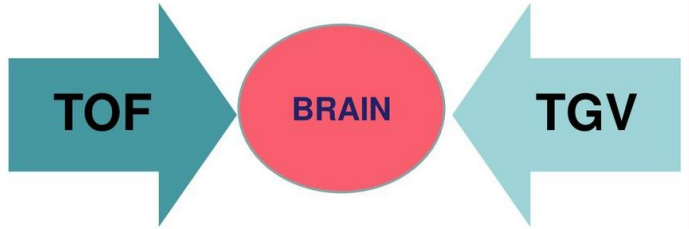
Acyanotic heart diseases.



L→R Shunt

- ↑ Fatigue
- Murmur
- ↑ Risk Endocarditis
- CHF
- Growth Retardation

Cyanotic heart diseases



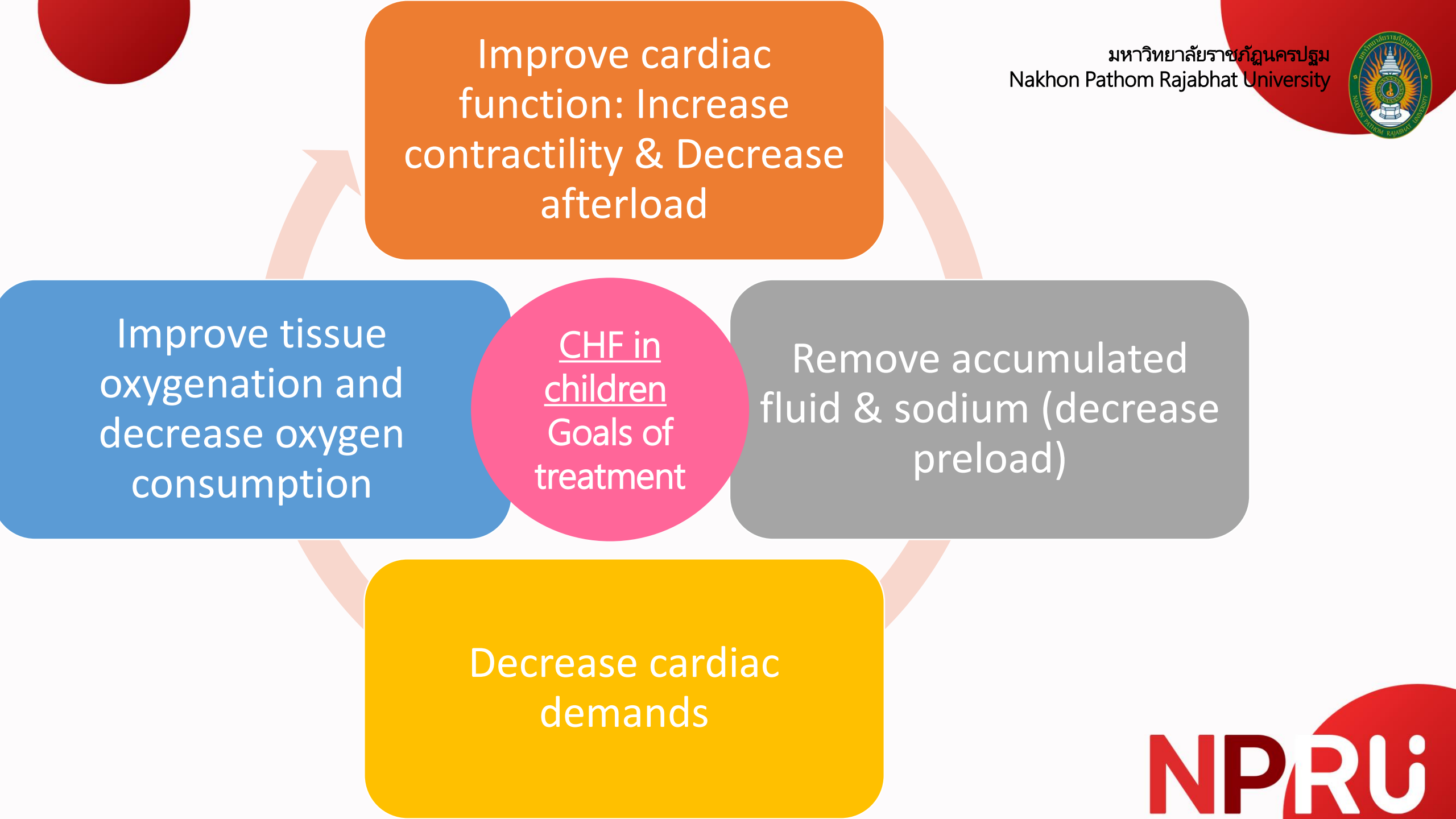
R→L Shunt

- Squatting
- Cyanosis
- Clubbing
- Syncope

CHF in Children

- Generally caused by abnormalities
- May be right- or left-sided; most of the time a mixture of both
- Impaired myocardial function
- Pulmonary congestion
- Systemic venous congestion

- Impaired myocardial function: Tachycardia, fatigue, weakness, restlessness, pale, cool extremities, decreased blood pressure, decreased urinary output
- Pulmonary congestion: Tachypnea, dyspnea, respiratory distress, exercise intolerance, cyanosis
- Systemic venous congestion: Peripheral and periorbital edema, weight gain, ascites, hepatomegaly, neck vein distention


Improve cardiac function: Increase contractility & Decrease afterload
Remove accumulated fluid & sodium (decrease preload)
Decrease cardiac demands
Improve tissue oxygenation and decrease oxygen consumption
CHF in children
Goals of treatment

CHD: Nursing care management

- Assist in measures to improve cardiac function
  - Digoxin administration
    - When to withhold
    - Heart rate 90-110 for infants and young children
    - 70 for older children
    - Watch for signs of toxicity (normal dig level 0.8-2.0)
- Monitor afterload reduction
- Decrease cardiac demands
- Reduce respiratory distress
- Maintain nutritional status
- Assist in measures to promote fluid loss
- Support child and family

Hypoxemia

Hypoxemia: decreased O2 tension in arterial blood

Hypoxia: decreased tissue oxygenation

Cyanosis: blue discoloration when hemoglobin is not bound to oxygen

Clinical manifestations

- Polycythemia
- Hypercyanotic spells (blue spells, tet spells)
- Persistent cyanosis =neuro complications & clubbing of fingers

Hypoxemia

Therapeutic management

- Prostaglandin infusion
- Keeps fetal shunts OPEN

Management of hyper-cyanotic spells

- Knee-chest position
- Avoid agitating patient
- Oxygen
- Hydration
- Comfort/calm
- Morphine

Nursing care management

- Deal with body image concerns
- Deal with family/parental concerns
- Prevent dehydration
- Prevent pulmonary infection
- Prevent air embolism
- Shunting of blood from right to left can cause air embolism to travel straight to brain

Nursing care of child and family with CHD

- Starts as soon as diagnosis is suspected
- Help family adjust to disorder
- Educate family about disorder
- Help families manage the illness at home
- Prepare child and family for invasive procedures
- May need to tour ICU
- **Provide postoperative care:** Observe vital signs, Maintain respiratory status, Monitor fluids , Provide rest and progressive activity, Provide comfort and emotional support
- Plan for discharge and home care


Thank
You!

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