

❖ **RESPIRATORY CONDITIONS**

- **Croup Syndrome** - a very common viral syndrome applied to a symptom complex characterized by hoarseness, and barking cough resulting from an inspiratory stridor sound produced when there is obstruction of the larynx and trachea.
 - affects the larynx, trachea and bronchi to varying degrees resulting in 3 conditions:
 - a) Acute Laryngotracheobronchitis
 - b) Acute Epiglottitis
 - c) Acute Laryngitis

A) ACUTE LARYNGOTRACHEOBRONCHITIS (ALTB)

- the most common type of Croup and primarily affects children <5yrs of age.
- inflammation of the mucosa lining the larynx and trachea causing a narrowing of the airway
- Signs and symptoms:
 - brassy cough, gradual onset of low grade fever, child struggles to inhale air past the obstruction and into the lungs producing inspiratory stridor, child may be in mild respiratory distress with mild wheezing.
 - *symptoms of hypoxia and airway obstruction may lead to respiratory acidosis and respiratory failure
 - Organisms responsible for ALTB:
 - Parainfluenza virus types 1,2 & 3
 - Respiratory Syncytial Virus (RSV)
 - Influenza A & B
 - Mycoplasma Pneumoniae
- Nursing Interventions:
 - 1) Vigilant observation and accurate of assessment of the respiratory status.
 - 2) Noninvasive cardiac, respiratory, and blood gas monitoring.
 - 3) **Ensure intubation equipment is immediately accessible to the patient.**
 - 4) Keep the child comfortable.
 - 5) Allow the parent or caregiver to lie next to the child in the mist tent to lessen anxiety.
 - 6) Modify treatment to cool moist mist blowing directly toward the patient from the hose when child will not tolerate mist tent

B) ACUTE EPIGLOTTITIS

- a serious obstructive inflammatory process resulting from a bacterial infection that occurs principally in children between 2 and 5 years of age but can occur from infancy to adulthood.
- requires immediate attention.
- Signs and Symptoms:
 - Abrupt onset, no cough, asymptomatic the night prior to onset, muffled voice with a froglike croaking sound on inspiration, reddened and inflamed sore throat, drooling, agitation, fever, dysphagia
 - *Respiratory obstruction develops quickly and may lead to hypoxia, acidosis, reduce level of consciousness and sudden death
- **The key difference between ALTB and Epiglottitis is the presence of cough in ALTB.
- organisms responsible for epiglottitis: Haemophilus influenza
- Treatment:
 - 1) Intensive observation by experience personnel
 - 2) Endotracheal intubation
 - 3) Tracheostomy
 - 4) Antibiotic Therapy
- *All invasive procedures should be performed in the OR or areas equipped to initiate immediate intubation.
- Nursing Interventions
 - 1) Reassure the child and family to reduce anxiety.
 - 2) Avoid assessment of the oral cavity with a tongue blade.
 - 3) Allow the child to remain in the caregiver's lap and in the position that is most comfortable.

C) ACUTE LARYNGITIS

- Most common in older children and adolescents; usually caused by viruses and the condition is almost always self limited without extended duration or sequelae
- Signs and Symptoms:
 - Hoarseness, coryza, sore throat, nasal congestion, fever, body malaise, headache
- Treatment is supportive of the symptoms presented
- Nursing Intervention:
 - 1) Assist the patient to expectorate secretions adequately
 - 2) Avoid the spread of infection
 - 3) Maintain patent airway
- **Infectious Mononucleosis ("Kissing Disease")** - an acute common self-limiting infectious disease among young people <25yrs of age; disease course is usually mild but occasionally can be severe accompanied by serious complications.
 - Signs and Symptoms: vary greatly in type, severity and duration
 - Malaise, sore throat, fever with lymphadenopathy, splenomegaly, skin rash over trunk, enlarged and reddened tonsils, enlarged spleen and possible jaundice

- Principal causing agent:
Epstein-Barr (EB)Virus - incubation period following exposure is 4-6 wks
- Treatment:
 - 1) Mild analgesics
 - 2) Force fluids and humidified air should be sufficient
- Nursing Interventions:
 - 1) For pts with enlarged spleen, avoid activities in which the child may receive a blow to the abdomen
 - 2) Diet counseling to meet growth and energy needs
 - 3) Advise patient and family that regular activities may resume when the acute phase of the illness has ended
 - 4) Health teaching: directed on how to avoid secondary infections and transfer of infections to other family members

❖ CARDIOVASCULAR CONDITIONS

Definition of Terms:

- ***Cardiac catheterization** - Catheters are inserted into the heart via a large peripheral vein and advanced into the heart to measure pressures and oxygen levels in heart chambers and visualize heart structures and blood flow patterns.
 - ***Pulse Oximetry** - device used to evaluate the degree of oxygen saturation in the blood using a small infrared light probe.
 - ***Electrocardiogram** - Detects normal electrical events and abnormal cardiac rhythms in the heart.
 - ***Echocardiogram** - Two-dimensional Doppler evaluation to detect evidence of valve leakage, cardiac anatomy, size, and function.
- o **Congestive Heart Failure (CHF)** is the inability or failure of the cardiovascular system to provide adequate cardiac output to meet the metabolic demand of the body.
 - usually occurs secondary to congenital heart defects in which there are structural abnormalities leading to increased pressure or volume load to the ventricles.
 - The cause of congestive heart failure (CHF) can be classified as follows:
 - a) **Volume overload;** b) **Pressure overload;** c) **Decreased contractility;** and d) **High cardiac output demands**
 - The **signs and symptoms** of CHF can be placed in three categories:
 1. Impaired myocardial function – **Tachycardia**, Diaphoresis, Poor perfusion,
 2. Pulmonary congestion – **Tachypnea**, Mild cyanosis, Dyspnea, Costal retractions, Orthopnea, Wheezing, Cough, Hoarseness
 Gasping and grunting respirations
 3. Systemic venous congestion – Hepatomegaly, Edema, Weight gain, Ascites, Pleural effusions, Distended neck and peripheral veins

Test Results

Diagnosis is confirmed by child's clinical presentation: Dyspnea, Retractions, Tachypnea, Activity intolerance
 Chest radiograph demonstrates cardiomegaly and increased pulmonary vascular markings.

Treatment

- 1)Two groups of drugs are used to enhance myocardial integrity:
 - Digitalis glycosides to improve contractility
 - Angiotensin inhibitors to reduce the afterload on the heart
- 2) Diuretic therapy is used to eliminate excess water and salt.

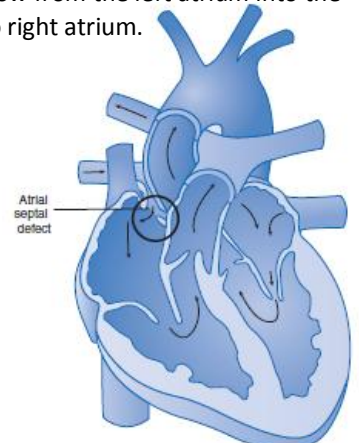
Nursing Interventions

- 1) Administer diuretic therapy and **digoxin** as prescribed.
- 2) Assessment: heart rate, blood pressure, peripheral perfusion, excretion of urine, imbalanced nutrition,
- 3) Evaluate for excessive fluid volume.
- 5) Auscultate apical pulse.
- 6)Assess for vomiting that may be evidence of digoxin toxicity.
- 7)Teach the caregiver the correct method to administer digoxin.

- o **Atrial septal defect (ASD)** is an abnormal opening between the atria that allows blood to flow from the left atrium into the right atrium. Left atrium pressure is slightly higher, which allows blood to flow from the left to right atrium.
 - This abnormal blood flow causes:
 - (a) Increase of oxygenated blood into the right atrium;
 - (b) Right atrium and right ventricle enlargement

- Signs and Symptoms

Patients are sometimes asymptomatic,
 A murmur characteristic of ASD is heard on auscultation,
 Increased pulmonary blood flow may lead to pulmonary vascular obstruction or emboli.



Test Results

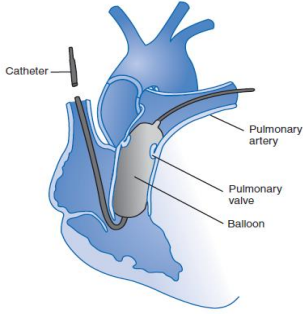
Cardiac catheterization: Reveals septal defect and any structural changes or defects.

Pulse oximetry (SpO2): Oxygen level may be within normal range.

Electrocardiogram: Detects normal electrical events and abnormal cardiac rhythms in the heart. Atrial septal defect is noted with right ventricular hypertrophy.

Echocardiogram: Septal defect and ventricular hypertrophy are evident.

Treatment:

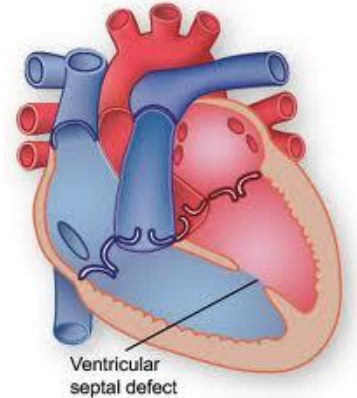


- 1) Treatment of choice is surgical patch closure.
- 2) Open heart repair with cardiopulmonary bypass.
- 3) ASD may require mitral valve replacement.

○ **Ventricular Septal Defect (VSD)** an abnormal opening causing complications between the right and left ventricles. The defect may vary in size from a pinhole to the actual absence of the septum.

Signs and Symptoms:

- Blood flows from the left ventricle into the pulmonary artery.
- Increased pulmonary blood flow and increased pulmonary resistance.
- In severe cases, patient may develop **Eisenmenger syndrome**.



Test Results

Cardiac catheterization: ventricular defects and cardiomegaly will be evident
 Pulse Oximetry: Oxygen saturation will be decreased
 Electrocardiogram: detects abnormal cardiac rhythms and signs of cardiomegaly
 Echocardiogram: Septal defect, cardiomegaly and altered cardiac function noted.

Treatment:

- 1) Palliative approach includes pulmonary artery banding (band around the pulmonary artery).
- 2) Complete surgical repair is the treatment of choice:
 - (a) Pursestring technique for small defects and;
 - (b) Dacron patch for larger openings

○ **Patent Ductus Arteriosus (PDA)** - occurs when the artery connecting the aorta and the pulmonary artery in fetal circulation fails to close during the first few weeks of life. The continued patency allows blood from the aorta to flow back to the pulmonary artery resulting in a **left-to-right shunt**. This altered circulation causes:

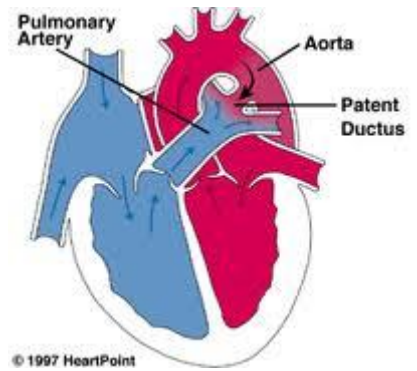
- 1) Increased workload on the left side of the heart;
- 2) Pulmonary congestion and resistance
- 3) Right ventricular hypertrophy

Signs and Symptoms

- Patient may be asymptomatic.
- Characteristics of CHF.

Test Results

Cardiac catheterization: Patent ductus and right ventricular hypertrophy evident.
 Pulse oximetry (SpO₂): Oxygen saturation decreased.
 Electrocardiogram: Signs of ventricular hypertrophy noted.
 Echocardiogram: Septal defects and ventricular hypertrophy noted.



Treatment

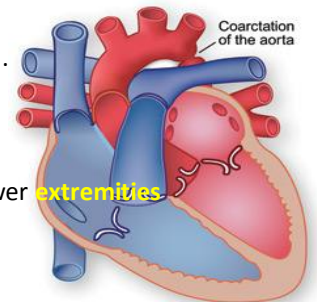
- The palliative approach includes:
- (1) Administration of indomethacin (prostaglandin inhibitor)
 - (2) Application of coils to occlude the PDA
 - (3) Surgical treatment includes ligation and clipping of the patent vessel.

○ **Coarctation of the Aorta** - a narrowing located near the insertion of the ductus arteriosus.

- This alteration results in:
- (a) Increased pressure in the head and neck area;
 - (b) Decreased pressure distal to the obstruction in the body and lower extremities

Sign and Symptoms:

- High blood pressure and bounding pulses in the upper extremities.
- Lower extremities cool with decreased pulses and blood pressure.
- Symptoms of CHF. Hypertension.
- Older children experience headaches, fainting, and epistaxis.

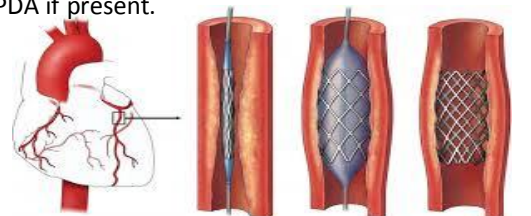


Test Results

Cardiac catheterization: Reveals location of aortic narrowing and VSD or PDA if present.
 Pulse oximetry (SpO₂): May be normal or decreased if CHF is present.
 Electrocardiogram: Signs of right and left ventricular hypertrophy noted.

Treatment

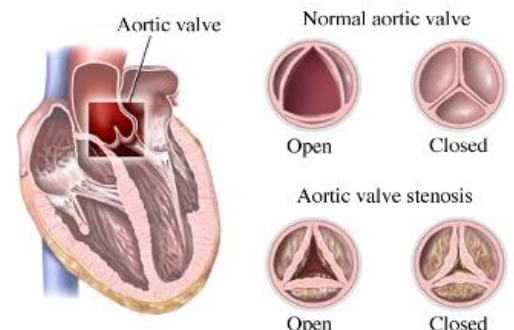
- 1) Balloon angioplasty →
- 2) Resection of the coarcted portion with end-to-end anastomosis of the aorta
- 3) Enlargement of the constricted section by a graft prosthetic



○ **Aortic Stenosis (AS)** a narrowing or a stricture of the aortic valve that results in:

- 1) Resistance to blood flow in the left ventricle;
- 2) Decreased cardiac output
- 3) Left ventricular hypertrophy
- 4) Pulmonary venous & pulmonary arterial hypertension

The hallmark result of AS is hypertrophy of the left ventricular wall, which leads to increased end-diastolic pressure and pulmonary hypertension.



Signs and Symptoms:

-Faint pulses, Hypotension, Tachycardia, Poor feeding, Exercise intolerance, Chest pain, Dizziness and Characteristic murmur

Treatment: 1) Balloon Angioplasty; 2) Excision of a membrane
3) Cutting of fibromuscular ring

- **Tetralogy of Fallot (TOF) or "TET"** - a congenital heart defect which is classically understood to involve four anatomical abnormalities of the heart (although only three of them are always present). It is the most common cyanotic heart defect, and the most common cause of blue baby syndrome.

The classic form of tetralogy of Fallot (TOF) has four defects:

- (1) Ventricular septal defect; (2) Pulmonic stenosis; (3) Overriding aorta; (3) Right ventricular hypertrophy

Signs and Symptoms

- Cyanosis, Hypoxia, Anoxic spells when infant's oxygen supply exceeds blood supply

Test Results

Cardiac catheterization: Reveals the four defects. (only three of them are always present in most cases)

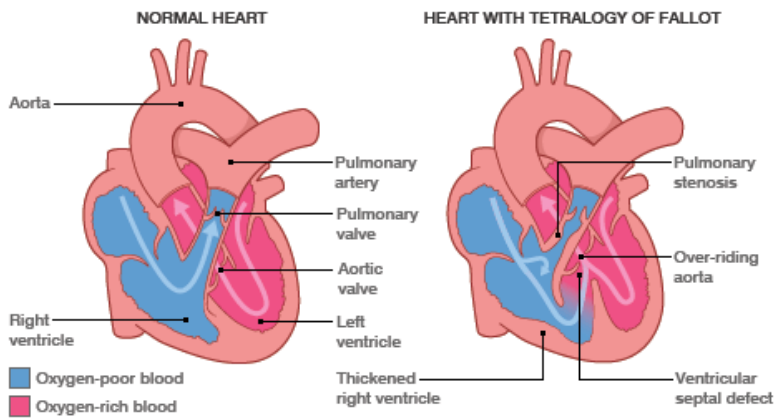
Pulse oximetry (SpO2): Decreased according to degree of deoxygenation.

Electrocardiogram: Signs of right ventricular hypertrophy noted.

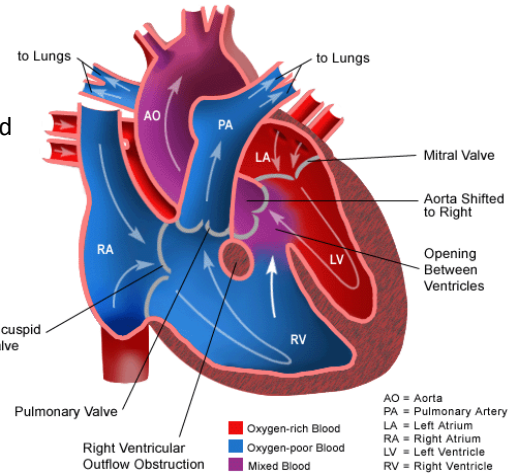
Echocardiogram: The 3-4of the defects are revealed.

Treatment

- 1) Blalock-Taussig procedure to increase pulmonary blood flow
- 2) Complete repair by: (a) Closing the VSD; (b) Resectioning the infundibular stenosis; and (c) Enlarging the right ventricular outflow tract

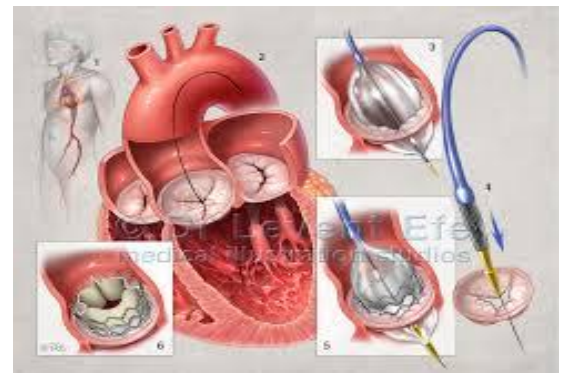


Tetralogy of Fallot (TOF or "Tet")



****Blalock Taussig** is a surgical procedure used to increase pulmonary blood flow for palliation in duct dependent cyanotic heart defects like pulmonary atresia, which are common causes of blue baby syndrome. In modern surgery, this procedure is temporarily used to direct blood flow to the lungs and relieve cyanosis while the infant is waiting for corrective or palliative surgery.

One branch of the subclavian artery or carotid artery is separated and connected with the pulmonary artery. The lung receives more blood with low oxygenation from the body.



- **Transposition of great arteries (TGA)** - the pulmonary artery rises from the left ventricle and the aorta exists from the right ventricle. There is no communication between the systemic and pulmonary circulation.

Life is sustained due to defects associated with the TGA.

The common defects are patent ductus arteriosus and ventricular septal defects.

Signs and Symptoms:

Severely cyanotic
Characteristics of CHF

Test Results

Cardiac catheterization: Reveals vessel transposition and septal defects and cardiomegaly.

Pulse oximetry (SpO2): Oxygen saturation levels are low

Electrocardiogram: May be normal for newborn and later show signs of ventricular hypertrophy

Echocardiogram: Will reveal vessel transposition and septal defects.

Treatment

- 1) Intravenous prostaglandin E to increase blood mixing so that oxygen saturation is $\geq 75\%$.
- 2) Atrial septostomy (Rashkind procedure) performed during catheterization to increase mixing and maintain cardiac output.
- 3) Arterial switch procedure to connect the main artery to the proximal aorta and the ascending aorta to the proximal pulmonary artery.
- 4) Coronary arteries are switched from the proximal aorta to the proximal pulmonary artery, which creates a new aorta.

