Nursing Care of Children and their Families: Alterations in Cardiac Function
Congenital Heart Disease

- Incidence 4-10 per live births
- Extra cardiac defects: TE fistula, renal agenesis and diaphragmatic hernias
- Etiology- prenatal factors
  - Maternal rubella
  - Maternal alcoholism
  - Maternal age >40yrs
  - Maternal IDDM
Congenital Heart Disease (cont.)

- **Genetic Factors**
  - Sibling with heart defect
  - Parent with CHD
  - Chromosomal defect (i.e. Down Syndrome)
  - Born with other congenital anomalies

- **H&P Information**
  - Hx familial heart dz
  - Teratogens
  - Poor wt. gain/feeding
  - Respiratory signs
  - Recent strep infection
  - Exercise intolerance and fatigue
The Normal Heart

Diagram of the heart showing:
- Aorta
- Pulmonary Artery
- Right Atrium
- Left Atrium
- Right Ventricle
- Left Ventricle

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Acyanotic Heart Defects

- Heart conditions that do not cause deoxygenation - “pink puffers”
- ASD
- VSD
- Coarctation of Aorta
ASD

- Defect between the atria, FO fails to close
- Increase pulmonary blood flow; L-R shunt
- S/S
  - Dyspnea, fatigue, poor growth
  - Soft systolic murmur
  - Right ventricular overload
  - CHF
- Tx-surgical closure or patch
Atrial Septal Defect
Ventricular Septal Defect

- Incomplete septal wall between the ventricle; L-R shunt
- Increase pulmonary blood flow
- Increased load on right ventricle
- S/S
  - Tachypnea, dyspnea, CHF
  - Poor growth, reduced fluid intake
  - Palpable thrill, systolic murmur, LL sternal border
Ventricular Septal Defect

- **Treatment**
  - Occasional spontaneous closure
  - Surgical patching if failure to thrive occurs
  - Prophylactic antibiotics - endocarditis

- **Preoperative care**
  - Oxygenation and promote growth and development
Ventricular Septal Defect (VSD)
Coarctation of the Aorta

- Narrowing of the descending aorta
- Restricts blood flow leaving heart
- Progressive disorder that leads to CHF
- May be asymptomatic
Assessment - Coarch

- BP difference 20mm
- Good upper extremity pulses; weak femoral
- H/A, vertigo, epitaxis
- Exercise intolerance
- LVH
- Dyspnea
- CVA r/t Increased BP
Treatment of Coarc

- Balloon cardiac cath
- Surgical resection or patch
- Antibiotic prophylaxis
- Monitor BP pre and post procedure
- Rebound HTN may occur immediately postop
Nursing Care for the Child with a Acyanotic CHD

- Explain purpose of test and procedures
- Avoid exposure to individuals with infections
- Teach parents ways to support nutrition, reduce stress on heart, promote rest
  - Small frequent feedings, soft nipple
  - Monitor I&O; may limit fluid
  - Diuretics
  - Good pulmonary hygiene, change position
- Promote mental development
- Teach S/S Congestive Heart Failure
S/S Congestive Heart Failure

- Impaired Myocardial Function
  - Tachycardia, restlessness, sweating
  - Decreased UOP and BP
  - Fatigue, weakness, anorexia
  - Pale, cool extremities, weak peripheral pulses
  - Gallop rhythm

- Pulmonary Congestion
  - Tachypnea, dyspnea
  - S/S resp distress
  - Cough hoarseness

- Systemic Venous Congestion
  - Weight gain
  - Hepatomegaly
  - Peripheral edema; periorbital
  - Ascites, neck vein distention
Cyanotic Heart Defects

- Causes deoxygenation of blood, mucous membranes pale to blue (“Blue Bloaters”)
- Tetrology of Fallot
- Transposition of the Great Vessels (TOGV)
- Hypoplastic Left Heart Syndrome
Tetrology of Fallot

- **4 Structural Defects**
  - Pulmonic stenosis, RVH, VSD, and overriding aorta; sometimes ASD
  - Blood bypasses lungs and enters the L side of heart (R-L shunt)
  - Cyanosis occurs lead to acidosis

- **TET Spells**
  - Transient periods of increased R-L shunting
  - Hypoxia, pallor, tachypnea
Tetraology of Fallot

1. Ventricular Septal Defect
2. Pulmonary Stenosis
3. Hypertrophy of Rt. Ventricle
4. Overriding Aorta

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Assessment/Treatment of TET

- **Assessment**
  - clubbing of digits
  - Polycythemia, metabolic acidosis
  - Poor growth, exercise intolerance
  - Systolic murmur, RVH

- **Treatment**
  - Prostaglandin E – open DA
  - Corrective sx: patch VSD and relieving Pulmonary Stenosis
TET Spells

- Hypoxia, pallor and tachypnea
- Precipitated by crying, defecation, and feeding
- Child assumes squatting position to decrease blood return to lower extremities
- Place child in knee chest position
- Administer MSO4, propranolol, O2
Transposition of the Great Vessels

- Aorta arises from the right ventricle and PA arises from left ventricle
  - Blood travels from LV to PA-lungs and then back to the LA
- Other functional anomalies exist; R-L shunting occurs
- Two closed circulation pathways- FO must remain open to mix blood for survival
Transposition of the Great Vessels
Assessment/Treatment

**Assessment**
- Progressive cyanosis, hypoxia, acidosis
- S/S CHF
- Tachypnea
- Poor feeding, growth
- Dx: ECHO

**Treatment**
- Prost E to keep open ductus arteriosus
- Palliative surgical interventions
- Corrective surgery
- Prophylactic antibiotics
- Promote nutrition and oxygenation
Hypoplastic Left Heart Syndrome

- Abnormally small or absent left ventricle at birth
- Absent or stenotic LV and Aortic Arch
- Major resistance to aortic flow
- RVH
- Inability of the heart to supply the O2 needs of the body
- Prognosis poor
Hypoplastic Left Heart Syndrome
Assessment/Treatment

**Assessment**
- Tachypnea, chest retractions, dyspnea
- Cyanosis, decreased pulses
- Poor peripheral perfusion
- CHF
- Increased right ventricular impulse

**Treatment**
- Prostaglandin E
- Palliative surgery
  - Norwood procedure
  - 3 surgeries
- May need transplant
- Survival past five yrs in low
Nursing Care of the Child with Cyanotic Heart Disease

- Monitor H/H and electrolytes
- Keep child calm, administer O2 and sedatives as needed
- Offer small frequent feedings
- Avoid infections
- Monitor s/s CHF
- Weigh child daily
- Strict I&O
- Administer diuretics, digoxin
- Palpate liver
- Observe for thrombus formation
- Anxiety and anticipatory grieving
Rheumatic Fever

- Systematic inflammatory disease that involves the heart and joints; CNS and connective tissue involvement
- 2-6 weeks after a group A strep infection
- May be an autoimmune reaction; not culturable
- Lasts up to 3 months and is self limiting
- Long term consequence rheumatic heart disease with valvular damage
Phases

- **Acute Phase**
  - 2-3 weeks
  - Inflammation of connective tissue in the heart, joints and skin

- **Proliferative Phase**
  - Aschoff bodies develop in heart valves
  - Cardiac valve leaflets develop and lead to valvular stenosis and regurge
Jones Criteria

- **Major**
  - Inflammation of multiple joints - knees, elbows, wrists
  - Carditis - new murmur, pericardial friction rub, ECG changes, Tachycardia
  - Erythema marginatum
  - Chorea
  - Subcutaneous nodules on skin over flexor joints

- **Minor**
  - Fever, spiking temp
  - Arthralgia
  - Elevated ESR, C reactive protein, and decreased RBC count
  - ECG changes
Nursing Care of the Child with Rheumatic Fever

- Bed rest until ESR returns to normal
- Anti-inflammatory agents- aspirin and prednisone
- Monitor cardiac function
- Penicillin-erythromycin if allergic
- Plan activities to promote rest and decrease stress on heart
- Patient and family education on cause of disease, self limiting and diversional activities
Kawasaki’s Disease

- Vasculitis and lymphadenopathy
- Nursing Management
  - Promote comfort
  - Small frequent feedings
  - Cool baths, fever management
  - Passive ROM to extremities
  - Encourage fluids, gentle oral care
  - Monitor for conjunctivitis