Cardiac disease

- Cardiac disease
- Electrolytes - Cardiac
- Calcium
- Magnesium Sulfate
- Sodium
- Potassium

Dysrhythmias

- Sinus Tach - HR > 100 bpm, SA node, Regular rhythm
- PAT - Single ECG complex, occurs early
- Sinus Brady HR < 60 bpm, Rhythm regular
- Atrial Tach HR reg > 160-250, SA Node
- Atrial Flutter - HR Irregular > 250-400 bpm ventricular rate 75-150
- Atrial Fibr - Rapid, Irregular HR
- Ventricular Tach - 60-80 bpm atrial 110-250 bpm Ventricular
  HR Regular usually run of 3 > PUC's
- Ventricular Fibr. - HR > 300 bpm, Irregular
  (Always check this rhythm)
1A. Cardiac –
genral presenting problems

I. Specific
  a. Fatigue
  b. SOB
  c. Syncope
  d. Cough
  e. Palpitations
  f. Dizziness
  g. Anorexia
  h. Difficulty sleeping

II. Specific
  a. Chest-pain
  b. Dyspnea
  c. Orthopnea
  d. Paroxysmal nocturnal dyspnea
  e. Palpitations
  f. Edema
  g. Cyanosis

2B. Lab – Blood

I. Non-specific
  a. CK norm 50-325 mu/ml
  b. LDH
  c. SGOT

II. Specific
  a. CKMB
  b. Tropinin (replaces LDH)

III. Related to Future Problems
  a. Lipid profile
  b. C-reactive protein

3C. Diagnostic Tests

1. EKG – DX
   a. MI
   b. Ischemia
   c.
   d.
   e.

2. Stress Test
   a.
   b.

3. Nuclear Scan
3C. Diagnostic Tests (Cont.)

4. Cardiac Cath – Definitive DX
   a. Right side –
   b. Left side –
   c. Purpose
   d. Nursing care – post procedure
      1.) Assessment:
      2.) Nursing Diagnosis – Cardiovascular dysfunction
      3.) Goals:
      4.) Interventions:

4. Cardiac Cath – Definitive DX (Cont.)
4.) Interventions (Cont.)
   A. Cardiac monitoring
      1. Swartz-Ganz
         a. Placed in pulmonary artery
         b. Proximal port
         c. Distal port
         d. Nursing care
            1.
            2.
            3.
            4.
            5.
            6.

A. Cardiac monitoring (Cont.)

II. CVP Line
   a. checks right aorta pressure
   b. Blood volume information
   c. Normal reading 4-10 cm h20
3C. Diagnostic Tests (Cont.)

5. Evaluation of Interventions – Cardiac Pt.
   a. No edema, IVD, weight stable
   b. Cap refill < 3 sec
   c.

Acute Coronary Syndrome

A. MI/S.
   I. Signs and Symptoms
      a. Impending doom
      b. SUB
      c. Substernal chest pain, jaw, left side, back
      d. Women – atypical pain
      e. Heart sounds – s1, s4
   II. Tests
      a. EKG
      b. Coronary angiography
      c. Thallium 201
      d. Labs

Acute Coronary Syndrome (Cont.)

III. Treatment – Medical MI
   a. Thrombolytic Therapy
   b. Nitro
   c. M.S.
   d. ASA
   e. Other

IV. Nursing – MI
   a. Antiarrhythmics as ordered
      1. Lidocaine – IVInf.
      2. Procainamide (prostacyclone) IV, A fib, A flutter, PAT
      3. Pacemaker therapy
         a. Internal
         b. External

9/14/2008
Acute Coronary Syndrome (Cont.)
B. Angina — decrease O² demand, increase O² supply
1. Med. Treatments
   a. Nitrates
   b. Beta-adrenergic blockers
   c. Antiplatelets
   d. Antilipemics
2. Nursing care

Coronary Bypass Surgery (LABG)
1. Treatment goal — New blood supply to diseased heart
2. Nursing — pre-op
   a. Demonstrate post-op activities
   b. Explain tubes, etc.
3. Nursing post-op
   a. Administer anticoagulants
   b. Monitor ventilator
   c. Etc.
4. Potential Complications
   a. Thrombus
   b. Pulmonary embolism
   c. Etc.
5. Teaching
   a. Avoid lifting
   b. Etc.

Heart Failure — H.F (pump failure)
A. Left sided – Ventricular damage, blood backs up into lungs
1. Assessment
   a. Dyspnea, orthopnea, fatigue, cough
   b. Tachycardia, PMI, displaced laterally
   c. Possible S¹ H.S.
2. Diagnostics
   a. Chest X-ray
   b. Echocardiogram
   c. S¹ Heart sound
Heart Failure - H.F (Cont.)

8. Right sided - weak right ventricle, Systemic venous congestion
   1. Causes
      a. Left side failure
      b. Right side infarction
      c. COPD
   2. Assessment
      a. Anorexia, nausea, weight gain
      b. Dependent pitting edema
      c. CVP- Elevated
      d. Hepatomegaly
   3. Medical Prg.-Heart Failure
      a. Drug therapy
      b. Diet
      c. Eliminate or Fix Cause

Heart Failure - H.F (Cont.)

4. Nursing Goal
5. Nursing Care
6. Teaching
   a. Diet
   b. Weight gain (1-2kg, 2 days)
   c. Pedal Edema
   d. Rest
   e. Medicine
Acute Coronary Syndrome (Cont.)

8. Angina – decrease O₂ demand. Increase O₂ supply
   1. Med. Treatments
      a. Nitrates
      b. Beta- adrenergic blockers
      c. Antiplatelets
      d. Antilipemics
   2. Nursing care

Heart Failure – H.F (pump failure)

A. Left sided – Ventricular damage, blood backs up into lungs
   1. Assessment
      a. Dyspnea, orthopnea, fatigue, cough
      b. Tachycardia, PMI, displaced laterally
      c. Possible S₃ H.S.
   2. Diagnostics
      a. Chest X-ray
      b. Echocardiogram
      c. S₃ Heart sound

Coronary Bypass Surgery (LABG)

1. Treatment goal – New blood supply to diseased heart
2. Nursing – pre-op
   a. Demonstrate post-op activities
   b. Explain tubes, etc
3. Nursing – post-op
   a. Administer anticoagulants
   b. Monitor ventilator
   c. Etc.
4. Potential Complications
   a. Thrombus
   b. Pulmonary Embolism
   c. Etc.
5. Teaching
   a. Avoid lifting
   b. 
   c. etc.
Heart Failure – H.F (Cont.)
B. Right sided – weak right ventricle, Systematic venous congestion
1. Causes
   a. Left side failure
   b. Right side infarction
   c. COPD
2. Assessment
   a. Anorexia, nausea, weight gain
   b. Dependent pitting edema
   c. CVP- Elevated
   d. Hepatomegaly
3. Medical Mgt. – Heart Failure
   a. Drug therapy
   b. Diet
   c. Eliminate or Fix Cause

Heart Failure – H.F (Cont.)
4. Nursing Goal-
5. Nursing Care-
6. Teaching
   a. Diet
   b. Weight gain (1-2kg, 2 days)
   c. Pedal Edema
   d. Rest
   e. Medicine

Nursing Care
1. Monitor Rep Status
   a) Check Lung Sounds
   b) ABG’s
   c) O₂, Raise HOB
2. Physical + Emotional
   a) Lack of anxiety
   b) Mentation changes
   c) Limit activity
III. Increase CO
   a) Digoxin
   b) Monitor EKG
   c) Vasodilation
   d) V.S.

IV. Reduce or eliminate edema
   a) Diuretics; Lasix; Bumex
   b) I/O
   c) Peripheral pulses
   d) Monitor electrolyte levels
   e) Monitor CVP, Swan-ganz lines
   f) Skin care meticulous

PULMONARY EDEMA
A. General Information
   1. Medical emergency, intravascular fluid moves into
      alveoli, bronchi, bronchioles. Leads to suffocation and
death.
   2. Caused by Left side heart failure; rapid infusion of IV
      fluids

B. Medical Management
   1. O$_2$
   2. Drugs:
      - M.S. for vasodilation and decreased anxiety, 5 mg IV slowly
      - Digoxin - Improve Cardiac Output
      - Diuretics (Lasix)
      - Aminophylline to relieve broncho spasm, increase CO
      - Vasodilators (Nitro, isosorbid) reduces amount of blood
        returning to the heart

PULMONARY EDEMA (Cont.)
C. Assessment
   1. Dyspnea
   2. Cough, blood-tinged sputum
   3. Tachycardia, pallor, wheezes, crackles, diaphoresis
   4. Fear, Anxiety, restlessness
   5. SOB
   6. Decrease PO$_2$, increased PCO$_2$, elevated CVP
**Nursing Interventions**
1. Assist with intubation and monitor ventilator
2. O₂, mask at high concentrations (40-60%)
3. Semi-Fowlers position
4. Meds
5. Hemodynamic monitoring
6. Pt Teaching, meds, activity
7. Monitor for pedal edema, restlessness

**Endocarditis**
A. General Information
   1. Inflammation of endocardium, platelets and fibrin deposit on mitral and/or aortic valves, cause stenosis or insufficiency
   2. Bacteria, S. Aureous most common
   3. Risk factors: Rheumatic heart disease, open heart surgery, dental extractions, invasive monitoring
B. Medical Management
   1. Antibiotics, antipyretics

C. Assessment
   1. Fever, Malaise, dyspnea
   2. Petechiae, murmurs, cough if extensive valvular damage
   3. Elevated WBC
   4. Lab tests, blood cultures
D. Nursing Care
   1. Administer Meds
   2. Control Temperature
   3. Assess for complications
   4. Client teaching and discharge plan
      - Risk for recurrences dental procedures, urinary cath or scope procedures
      - Antibiotic therapy
      - Avoid infectious people
Pericarditis

A. General Information
   1. Inflammation of the pericardium
   2. Causes: bacterial or viral infection, fungal growth, trauma, M.I., radiation therapy, meds: procainamide, hydralazine, doxorubicin (Adriamycin)

B. Medical Management
   1. Diagnosis and control cause
   2. Drug therapy
      a) Analgesics
      b) Corticosteroids, ASA, Anti-inflammatory meds
      c) Antibiotics

C. Assessment
   1. Chest pain, deep inspiration relieved by sitting up, cough, hemoptysis
   2. Tachycardia, pleural friction rub, accentuated S3, JVD
   3. Elevated WBC

D. Diagnostics
   1. CXR - Heart effusion
   2. ECG - ST elevation

E. Nursing Care
   1. Bedrest, HOB elevated
   2. Hemodynamic monitoring
   3. Meds
   4. Teaching: recurrence, chest pain increases with inspirations or position change.

Cardiac Tamponade – Emergency

A. General Information
   1. Fluid/Blood in pericardium prevents ventricular filling
   2. Causes: chest-trauma, malignant pericardial effusion, complications of cardiac surgery

B. Med Management
   1. Pericardiocentesis

C. Assessment
   1. Chest-pain
   2. Hypotension, JVD, tachycardia, muffled, or distant heart sounds, pericardial friction rub
   3. Elevated CVP
   4. Elevated CVP
D. Nursing care
   1. O₂
   2. CVP monitoring
   3. IV
   4. Assist with pericardiocentesis
      a. ECG monitor/VS
      b. Collect fluid, send to lab

Valve surgery
- required by patients with stenosis or cardiac insufficiency
   1. Valves
      a. Mechanical
      b. Prosthetic
   2. Symptoms – Aortic Insufficiency
      a. Palpitations
      b. Dizziness
      c. Dizziness
      d. Angina
      e. Murmurs
      f. CXR and ECG = Left vent. Hypertrophy

Valve surgery (Cont.)
3. Aortic Sterosis – may be asymptomatic
4. Mitral Sterosis – surgery required
   a. Fatigue, dyspnea
   b. Hemoptysis
   c. Arrhythmia
   d. Pulmonary hypertension
   e. Right ventricular hypertrophy
5. Mitral Insufficiency – surgery
   a. If symptoms interfere with ADL’s
Valve surgery (Cont.)

- Nursing Care - After valve replacement or balloon valvuloplasty
  1. Monitor for severe hypotension, decreased C.O., shock
  2. VS q 15 mins until stable, report distant heart sounds, new murmurs
  3. Monitor ECG, check for bradycardia, Ventricular tachycardia
  4. Frequently check peripheral pulses, cap, re-fill, lung sounds
  5. May have chest-tube, be on vent
  6. Meds
  7. Labs
**PEDIATRIC CARDIAC FUNCTION**

1. Heart rate is sensitive to oxygen level.
2. Cardiac output is dependent on the heart rate until child is 5 yrs old.
3. Child has an increased risk of heart failure
   a) Immature heart is sensitive to volume or pressure overload.
   b) Muscle fibers are less developed.

**SURGICAL PROCEDURES**

1. Palliative: surgery designed to improve the overall condition of the child; does not correct the disorder, many palliative surgeries may create additional defects that allow for better exchange of blood between the chambers.
2. Correction: surgery designed to resolve the cardiac problem

**I. CONGENITAL CARDIAC HEALTH PROBLEMS**
I. CONGENITAL CARDIAC HEALTH PROBLEMS

A. Acyanotic heart defects: heart conditions that do not cause deoxygenation or low oxygen levels; the skin and mucous membrane color is usually normal pink

1. Atrial septal defect
   a) Description
   1. Defect between the atria
   2. Seepal wall defect allowing blood to flow from left atrium to right atrium, called a left to right shunt.

B. Etiology and pathophysiology

1. Opening between the atria
2. Foramen ovale fails to close
3. Increase pulmonary blood flow

C. Assessment

1. Often asymptomatic if small defect
2. Dyspnea
3. Fatigue, poor growth
4. Soft systolic murmur (abnormal heart sound) in pulmonic area
5. Echocardiogram
6. Congestive heart failure
7. Cardiac catheterization: visualization of defect

D. Priority Nursing Diagnoses

1. Altered nutrition: less than body requirements
2. Ineffective family coping: disabling
3. Risk for impaired growth and development
4. Risk for infection

E. Child and Family Education

1. Teach parents ways to support nutrition, reduce stress on heart, promote rest, and support growth and development during preoperative period
2. Teach parents signs of congestive heart failure and infection
3. Prepare parents for surgery by visiting the intensive care unit, explaining equipment and sounds
4. Teach the need for antibiotic prophylaxis to prevent subacute bacterial endocarditis

F. Other Topics

1. Prevention
2. Management
3. Prognosis
4. Follow-up care
B. Ventricular septal defect (VSD)

a) **Description**
   1. Defect between the ventricles

b) **Etiology & Pathophysiology**
   1. Left to right shunting of blood flow is caused by the higher pressure in the left ventricle
   2. The shunting of blood causes an increased load on the right ventricle

c) **Assessment**
   1. Tachypnea, dyspnea
   2. Poor growth, reduced fluid intake
   3. Palpable thrill
   4. Systolic murmur at left lower sternal border
   5. ECG and radiology detect larger septal defects
   6. Signs of congestive heart failure

d) **Child and Family Education**
   1. Teach parents signs of congestive heart failure and infection
   2. Teach the need for antibiotic prophylaxis to prevent subacute bacterial endocarditis

II. CYANOTIC HEART DEFECTS:

Heart conditions that cause the blood to contain less oxygen than required; the skin and mucous membrane color is usually pale to blue
## I. TETRALOGY OF FALLOT

### a) Description
1. Four defects that combine to allow blood flow to bypass the lungs and enter the left side of the heart, called right to left shunt
2. Unoxygenated blood enters the body circulation accounting for the cyanosis

### b) Etiology and Pathophysiology
1. Four defects: pulmonic stenosis, right ventricular hypertrophy, ventricular septal defect, and overriding aorta
2. Deficient oxygen in the tissues leads to acidosis

### c) Assessment
1. TET spells characterized by hypoxia, pallor, and tachypnea; precipitated by crying, defecation, and feeding; older children will assume a squatting position to decrease blood return from the lower extremities; treatment involves placing the child in a knee-chest position, administering morphine or propranolol and oxygen
2. Clubbing of digits
3. Polycythemia (excess number of red blood cells), metabolic acidosis
4. Poor growth, exercise intolerance
5. Systolic murmur in pulmonic area
6. Right ventricular hypertrophy
7. Cardiac catheterization visualizes anomalous structures

### d) Therapeutic management
1. Prostaglandin E1 to maintain open ductus arteriosus
2. Palliative surgery to improve oxygenation includes shunting procedures
3. Corrective surgery includes patching the VSD and relieving the pulmonary stenosis

### e) Child and Family Education
1. Teach the parents to promote nutrition in light of weak suck
2. Discuss activities to promote oxygenation
3. Describe symptoms of respiratory infections
4. Describe treatments and procedures the child will undergo
### III. ACQUIRED CARDIAC HEALTH PROBLEMS

#### Rheumatic fever

1. **Description**
   - Systemic inflammatory disease that involves the heart and joints;
   - CRF and connective tissue involvement may also occur.
   - Occurs secondary to an infection by group A beta-hemolytic streptococcus.

2. **Etiology and pathophysiology**
   - Follows 2 to 6 weeks after a group A beta-hemolytic streptococcal infection.
   - It may be an autoimmune reaction against beta-hemolytic streptococcus.
   - Acute phase lasts 2 to 3 weeks and is characterized by inflammation of connective tissue in the heart, joints, and skin.
   - Proliferative phase affects primarily the heart with Aschoff bodies developing on the heart valves, cardiac valve leafletsacer, and lead to valvular stenosis or regurgitation.
   - Episode of rheumatic fever lasts up to 3 months and is self-limiting.
   - Long-term consequence is rheumatic heart disease, which is often manifested in valvular damage.
   - Difficult to diagnose as similar other diseases; diagnosis is usually based on Jones Criteria, which describes frequent symptoms of rheumatic fever.