• Angina
  □ Definition
    • discomfort that occurs when oxygen demand exceeds oxygen demand

• Angina
  □ Classifications
    • stable
    • unstable
    • Prinzmetal's
- **Angina**
  - **Classifications**
    - Class I: strenuous activity
    - Class II: more prolonged or rigorous
    - Class III: daily activity
    - Class IV: angina @ rest

- **Etiology**
  - smoking
  - hypertension
  - obesity
  - hyperlipidemia

- **Angina**
  - Etiology
    - diabetes
    - sedentary life style
    - cocaine use
    - low serum folate
• Angina
  □ Diagnostics
    ▪ ECG
      ▪ T wave inversion
      ▪ ST segment depression
    □ Lab
      ▪ ABGs
      ▪ H & H
      ▪ Enzymes (troponin & CK - MB)
    ▪ Echocardiogram
  ▪ Clinical symptoms

• Angina
  □ Clinical Presentation
    ▪ pain (30 seconds to 30 minutes)
    ▪ associated symptoms

• Treatment
  □ modify risk factors
  □ correct aggravating factors
Treatment
- oxygen
- aspirin
- nitrates
- β - adrenergic blocking agents
- calcium channel blockers
- heparin
- glycoprotein IIb / IIIa inhibitors

Myocardial Infarction
- necrosis resulting from insufficient supply of oxygenated blood to an area of the heart
- complete necrosis occurs within 4 - 6 hours of total occlusion

Myocardial Infarction
- Types
  - Non - Q wave (ST segment elevation, depression or no change and T wave inversion on indicative leads)
  - Q wave (significant Q wave in presence of acute changes)
Myocardial Infarction

Epidemiology
- > 500,000 MI / year
- Males (40 – 65); equality after 65 years of age
- Women experience more lethal and severe 1st MI

Etiology
- Atherosclerosis
- Coronary artery spasm
- Coronary embolism
- Coronary artery dissection
- MI with normal coronary arteries

Clinical Presentation
- Pain (lasts > 30 minutes)
- Associated symptoms
- No pain in about 20% of patient experiencing MI
Myocardial Infarction

- Diagnostics
  - 12-lead ECG (18-lead)
  - Enzymes
  - Echocardiography
  - Clinical symptoms

Inferior II, III, aVF
Anterior V₂₋₆
Lateral I, aVL, V₅₋₆
Posterior V₁ or V₇₋₉

Anterolateral I, aVL, V₂₋₆
Inferolateral II, II, aVF, I, aVL, V₅₋₆
Right ventricular V₃R, V₄R
Myocardial Infarction

Treatment
- bed rest (1st 24 hours)
- NPO until stable, low cholesterol, low Na
- patient education

Oxygen
- Nitroglycerin
- Analgesia (MS)
- Aspirin

thrombolytic therapy
- tPA (TNK)
- rPA
Myocardial Infarction

Treatment

- β-adrenergic blocking agents
- ACE inhibitors
- glycoprotein IIb/IIIa

Treatment

- interventional cardiology
- coronary artery bypass grafting (CABG)

Nursing Care

Post-procedure

- Lead Monitoring
  - RCA use leads II, III, aVF
  - LAD use V₁ - V₄
  - Left Circumflex use I, aVL, V₅ or V₆
Potential Complications

- Groin complications
  - bleeding
  - hematoma
  - pseudoaneurysm
  - retroperitoneal bleeding

Potential Complications

- Reocclusion (early or late)
  - chest pain
  - ECG: ST segment changes
  - shortness of breath, diaphoresis, nausea

Patient Education

- signs of restenosis
- medications
- risk factor modification
- activity progression
Patient Education

**Activity**
- clarify with MD when to remove groin dressing
- no lifting > 15 - 20 pounds
- no vigorous exercise, no sitting for prolonged times, no sports, no squatting for 1 week

**Groin Care**
- if lump develops at puncture site; hold pressure for 20 minutes
- if bleeding does not stop, continue to hold pressure and go to the ED

**Call MD for:**
- fever
- chills
- pain in affected leg
- drainage from puncture site
- change in color of affected leg
Patient Education

- Stent Specific
  - Carry stent card with you
  - No MRI for 3 - 8 weeks
  - Warfarin & dipyridamole for 2 - 3 months and aspirin indefinitely
  - Prophylactic antibiotics

Cardiac Surgery

- Indications
  - Left main disease
  - Double vessel disease (proximal LAD)
  - Angina unresponsive to meds

Cardiac Surgery

- Indications
  - CAD with EF < 35%
  - Emergent conditions
Cardiac Surgery

Types of Procedures
- traditional (CABG)
- valve surgery
- MIDCAB
- post access procedure

Preoperative Management
- review history
- preop labs
- medications
- postop education
- surgical preparation

Postoperative Management
- Airway management
- Breathing management
- Hemodynamic status
- Monitor drainage
Cardiac Surgery
  - Postoperative Management
    - monitor fluid & electrolytes
    - postoperative meds
    - monitor for complications
    - cardiac pacing

Cardiac Surgery
  - Complications
    - dysrhythmias
    - cardiac tamponade
    - MI
    - cardiac failure
    - persistent bleeding
    - hypovolemia

Congestive Heart Failure
  - Definition
    - congestion in pulmonary or systemic circulation
    - heart's inability to pump adequate amounts of blood
**Etiology**
- myocardial infarction
- cardiomyopathy
- valvular heart disease
- volume overload
- cardiac depressants
- hyperthyroidism

**Congestive Heart Failure**
  - Clinical Presentation
    - dyspnea
    - orthopnea
    - paroxysmal nocturnal dyspnea
  - nocturnal angina
  - Cheyne – Stokes respirations
  - fatigue & lethargy
**Right Ventricular Failure**
- Clinical Presentation
  - jugular venous distension
  - peripheral edema
  - cyanosis
  - congestive hepatomegaly
  - ascites
  - hepatojugular reflex

**Left Ventricular Failure**
- Clinical Presentation
  - pulmonary crackles
  - tachypnea
  - 
  - cardiac murmurs (AS, AR, MR)
  - paradoxic splitting $S_2$

**Diagnostics**
- Lab: CBC, BUN, creatinine, liver enzymes; TSH
- Imaging: chest x-ray; 2D echocardiography; cardiac catheterization
**Goals of Treatment**

- **Systolic Dysfunction**
  - diuretics
  - ACE inhibitors
  - β - blockers
  - digitalis

- **Diastolic Dysfunction**
  - HTN
  - calcium channel blockers
  - ACE inhibitors
  - β - blockers
  - diuretics
**Goals of Treatment**

- **Diastolic Dysfunction (AS)**
  - diuretics
  - NO, ACE inhibitors, nitrates, and digitalis (except in rate control)
  - aortic valve replacement

- **Diastolic Dysfunction (AR & MR)**
  - ACE inhibitors with diuretics
  - hydralazine with nitrates is ACEI not tolerated

- **Diastolic Dysfunction (restrictive cardiomyopathy)**
  - β - blockers &/or calcium channel blockers
  - restore IV volume
  - septal myotomy
Goals of Treatment
- Diastolic Dysfunction (Mitral Stenosis)
  - diuretics
  - β-blockers, digitalis &/or verapamil to control HR
  - repair or replace mitral valve
  - balloon valvuloplasty

Dilated (Congestive)

Introduction
- ↑ preload & afterload
- stimulation of renin – angiotensin – aldosterone system
- heart dilates
- refractory heart failure

Clinical Presentation
- right & left heart failure

Diagnosis
- Chest x-ray
  - Cardiomegaly
  - Pulmonary congestion
Dilated (Congestive)
- Diagnosis
  - Electrocardiography
  - Biventricular hypertrophy
  - Atrial fibrillation
- Echocardiography
  - Diminished wall motion
  - Reduced EF
- Cardiac catheterization
  - Elevated PAOP, PAP
  - Diminished CO & EF
  - Mitral valve abnormality

Management - manage CHF
- \( O_2 \) to achieve 90% \( SaO_2 \)
- ACE inhibitor
- vasodilator
- diuretics
- inotrope (digitalis)

Management - \( \downarrow O_2 \) demand
- activity restriction
- sodium restrictions
- anxiolytics as needed
Dilated (Congestive)
- Management - complications
  - dysrhythmias
  - systemic emboli

Hypertrophic (IHSS)
- Introduction
  - hypertrophy of heart muscle
  - rigid, noncompliant ventricle
  - ↓ preload & CO
  - ↓ coronary & cerebral blood flow

Hypertrophic (IHSS)
- Clinical Presentation
  - Chest pain
  - Syncope
  - Palpitations
  - Exertional dyspnea
  - Fatigue
  - murmurs