NCLEX® Essentials

MED SURG

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Cardiovascular Disorders

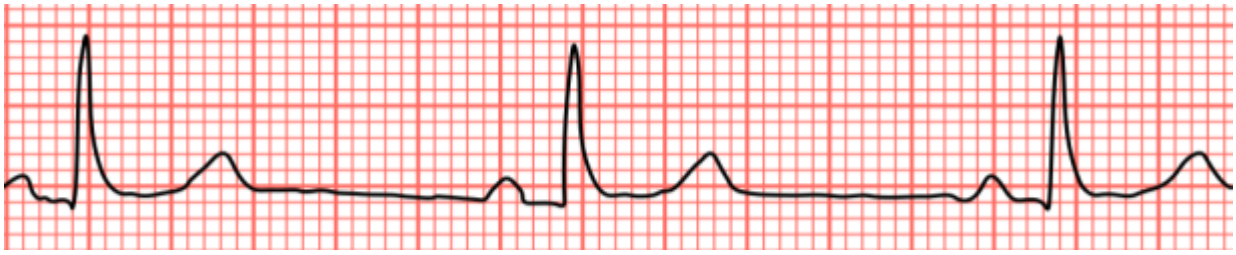
Cardiac Dysrhythmias

	Route			Rate	Rhythm		
Rhythm	**P Wave**	**PR Interval**	**QRS**	**Rate**	**Regularity**	**Life Threatening**	**Causes**
Normal Sinus	Normal	0.12-0.20	<0.12	60-100	Regular	No	Normal Finding
Sinus Bradycardia	Normal	0.12-0.20	<0.12	<60	Regular	Dependant on Cause	Sleep, inactivity, athletic, vagal tone, drugs, MI, K+, respiratory arrest
Sinus Tachycardia	Normal	0.12-0.20	<0.12	>100, usually 100-150	Regular	No	Caffeine, exercise, fever, anxiety, heart failure, drugs, pain, hypoxia, hypotension, volume depletion
Atrial Pause	Looks like SR but drops a complex			Normal or slow	Irregular	Depends on length and frequency	Elderly, digoxin toxicity, MI, rheumatic fever
Atrial Flutter	Saw tooth	None	<0.12	Atrial rate 250-400	Regular or Irregular	Dependant on ventricular rate	Valvular heart disease, MI, CHF, pericarditis
Atrial Fibrillation	Wavy unidentifiable	None	<0.12	Atrial rate >400	Irregular	Dependant on ventricular rate	Heart disease, pulmonary disease, emotional stress, excessive alcohol or caffeine
Junctional Rhythm	INVERTED before or after QRS or absent	<0.12	<0.12	40-60	Regular	Dependant on ventricular rate	Electrical impulse not arriving from SA node, AV node fires at inherent rate
Accelerated Junctional Rhythm	INVERTED before or after QRS or absent	<0.12	<0.12	60-100	Regular	Dependant on ventricular rate	Digoxin toxicity, damage to AV node
Junctional Tachycardia	INVERTED before or after QRS or absent	<0.12	<0.12	>100	Regular	Dependant on ventricular rate	Same as SVT
Supraventricular	Pointed or hidden in T	Immeasurable	<0.12	150-250	Regular	Dependant on rate and	Caffeine, CHF, fatigue, hypoxia,

Tachycardia						patient ability to tolerate	mitral valve disease, altered pacemaker in heart
Idioventricular Rhythm	None	None	>0.11 wide and bizarre	20-40	Regular	Yes	Digoxin toxicity, acute MI
Ventricular Tachycardia	None	None	>0.11 wide and bizarre	150-250	Regular	Yes, may have pulse	MI, ischemia, digoxin toxicity, hypoxia, acidosis, ↓K+, ↓BP
Ventricular Fibrillation	None	None	None	None	Irregular, vary in size, shape and height	Yes, no pulse	Follow PVC, VT, most common cause of sudden death
Asystole	Possible	None	None	None	No QRS	Yes	Follows VT/VFib, acidosis, hypoxia, ↓K+, hypothermia, drug overdose
1° AV Block	Normal	>0.20	<0.12	Varies	Regular or irregular	Usually Not	First sign of increasing AV block
2° AV Block Type I	Normal	Varies: progressively prolonged	<0.12	Varies	Regularly irregular: QRS dropped after progressively prolonged PRI	Usually Not	Acute inferior MI, digoxin toxicity, vagal stimulation, conduction system disease
2° AV Block Type II	Normal	Consistent normal or prolonged	Normal or wide	Usually slow	Regular or irregular; occasionally dropped QRS	Dependant on overall ventricular rate, may progress to 3° AV Block	BBB, anterior MI, lesions of conduction system
3° AV Block	Normal	No relationship between PR & QRS	Wide	Slow	Regular	Yes: pacemaker needed	Atria and ventricles beat independently, digoxin or K+ toxicity, acute MI, ischemic heart disease
Premature Atrial	Yes, PAC P wave	May differ	<0.12	Rate of underlyi	PAC complexes	No	Coffee, tea, alcohol, CHF, emotions,

Contractions	shaped different	from underlying rhythm		ng rhythm	come early		fatigue, fever, hypoxia, mitral valve disease
Premature Junctional Contractions	Inverted before or after QRS or absent	<0.12	<0.12	Rate of underlying rhythm	PJC make it irregular	No	Vagal tone, stress, caffeine, alcohol, heart failure, digoxin toxicity, ↓K+
Premature Ventricular Contractions	None	N/A	>0.11 wide and bizarre	Dependant on underlying rhythm	Irregular due to premature beat	Depends on frequency and how close to T wave	Ventricular irritability, hypoxia, ↓K+, Ca, MI, digoxin toxicity, anxiety

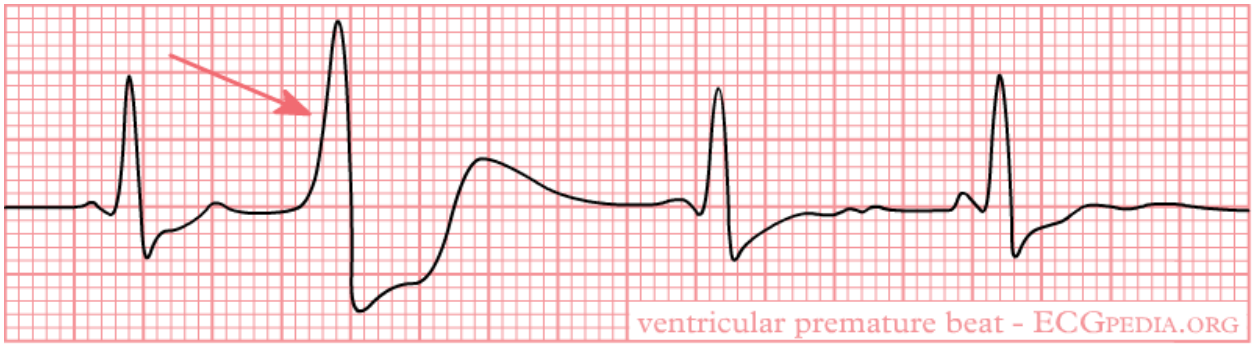
Sinus Bradycardia



Sinus bradycardia is essentially the result of the SA node initiating impulses at a slower rate than normal. Conduction follows the correct path but at a slower rate.

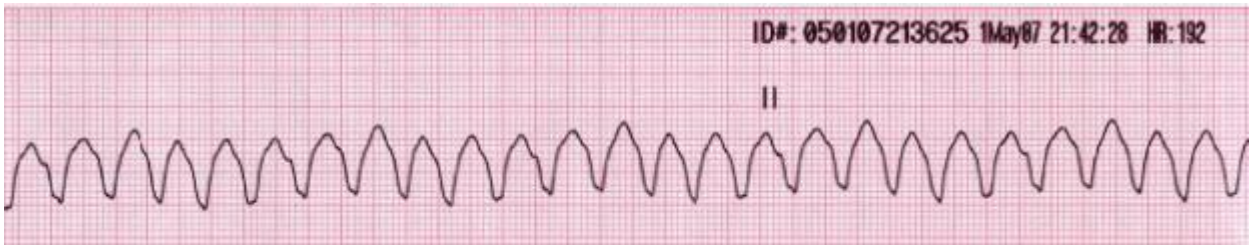
1. Overview
    a. Rhythm is regular
    b. Rate <60
2. NCLEX® Points
    a. Therapeutic Management
        i. Determine cause
        ii. Atropine may be administered to keep the rate >60
        iii. Monitor hemodynamics, insure proper CO
        iv. permanent pacemaker may be required

Premature Ventricular Contractions (PVC's)



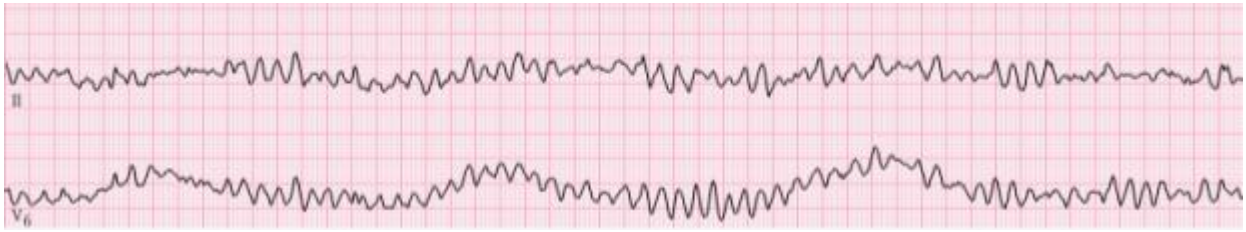
1. Overview
    a. early ventricular beats due to irritable ventricles
    b. may occur in repetitive pattern (bigeminy, trigemeny, quadrigeminy)
2. NCLEX® Points
    a. Therapeutic Management
        i. determine cause
        ii. assess for hypoxia
        iii. assess potassium level
        iv. notify physician if client complains of pain, increased frequency, R on T, multifocal

Ventricular Tachycardia



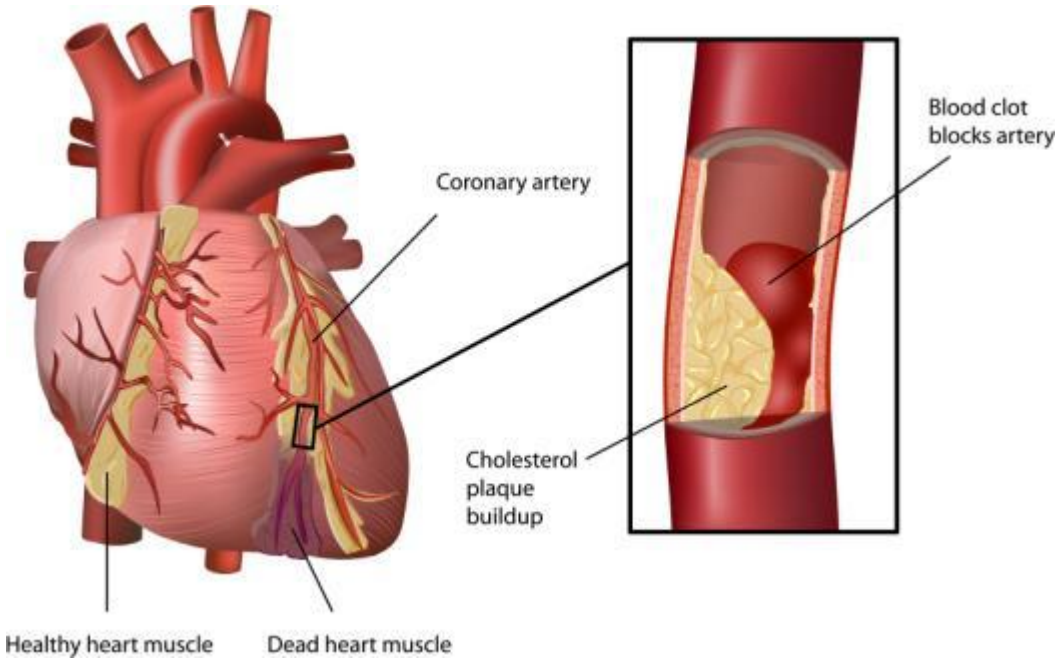
1. Overview
    a. irritable ventricles leas to repetitive firing of the ventricles
    b. may lead to cardiac arrest
2. NCLEX® Points
    a. ASSESS for pulse first
        i. Pulse
            1. Administer O2
            2. Administer antidysrhythimcs
            3. notify physician
            4. cardioversion may be required
        ii. No Pulse
            1. Begin ACLS protocol

Ventricular Fibrillation



1. Overview
    a. ventricles quiver due to multiple irritable foci
    b. no cardiac output
    c. lethal rhythm
2. NCLEX® Points
    a. Therapeutic Interventions
        i. Begin ACLS protocol immediately
        ii. assess pulse and rhythm after 2 minutes of compressions

Myocardial Infarction



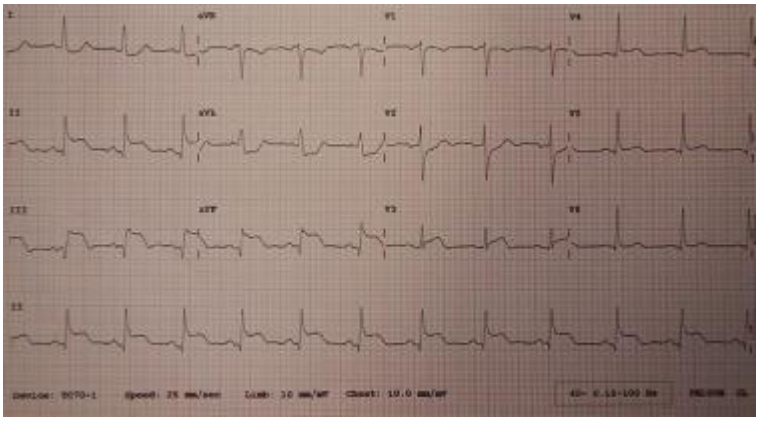
1. Overview
    a. Sudden restriction of blood supply to a portion of the heart.
2. NCLEX® Points
    a. Modifiable risk factors
        i. smoking
        ii. obesity
        iii. stress
        iv. ↑Chol

v. Diabetes
vi. HTN

b. Angina Pectoris: chest pain due to restricted blood flow
   i. Stable angina: predictable with increased activity
   ii. Unstable angina: at rest and with activity
   iii. Prinzmetal angina: caused by vasospasm

c. Nursing Assessment
   i. Chest pain unrelieved by rest
   ii. Crushing chest pain, diaphoresis, mottled skin, nausea, anxiety, SOB, palpitations
   iii. ST elevation on 12-lead
   iv. Elevated Troponins (most sensitive), elevated CK-MB

d. Treatment
   i. MONA
      1. morphine, oxygen, nitroglycerin, aspirin
         a. Morphine - relieve chest pain
         b. Oxygen - increase oxygenation
         c. Nitrates - dilate coronary vessels - increase blood supply
         d. Aspirin - antiplatelet
   ii. Monitor EKG



ST Elevation MI

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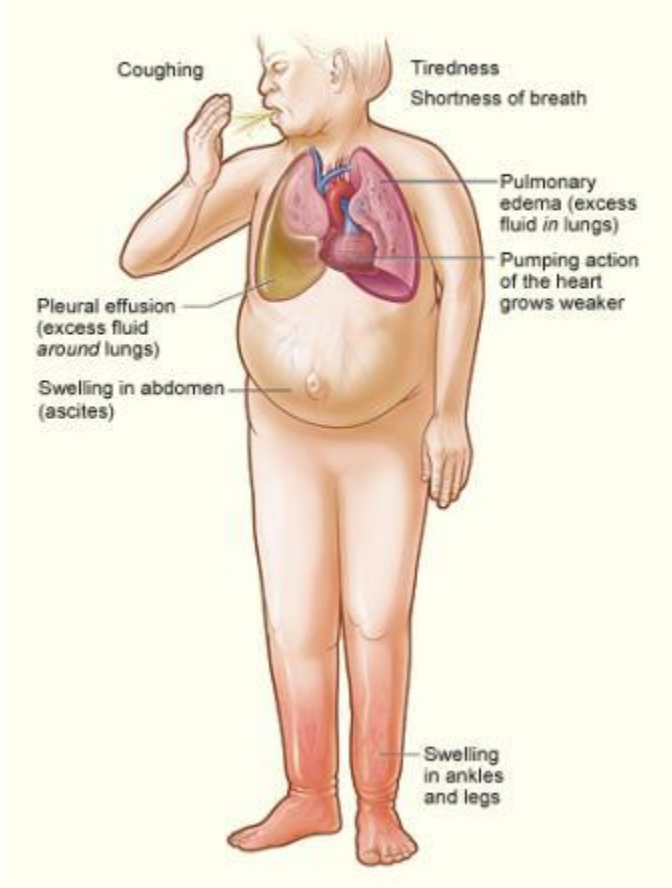
   iii. Rest - decrease O2 demands of heart

Heart Failure



1. Overview
    a. Heart is unable to pump enough blood to the body. Any condition that affects the hearts ability to pump can lead to Heart Failure (MI, valve disorders, HTN, pulmonary HTN).
    b. Initially presents as Right or Left side as it progresses both sides are affected.
    c. Left Side
        i. Left ventricle is unable to pump blood into the systemic circulation causing a "back-up" into the pulmonary circulation.
    d. Right Side
        i. Right ventricle is unable to pump blood into the pulmonary circulation causing a "back-up" in venous circulation.
2. NCLEX® Points
    a. Nursing Care
        i. raise head of bed
        ii. administer O2
        iii. Assess lung sounds
        iv. Encourage rest
        v. Monitor daily weights

vi. Instruct on low sodium diet

b. Medical Management

i. Diuretics

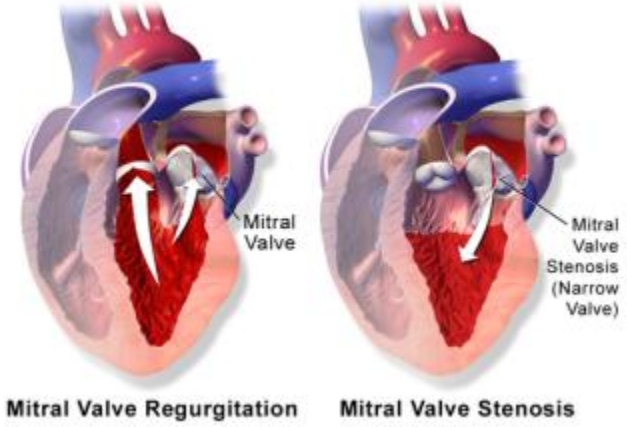
ii. Digoxin - improve contractility (CO) (assess apical pulse for 1 full minute)

iii. ACE Inhibitors - decrease afterload (increase CO)

Right-Sided Failure	Left-Sided Failure
Systemic circulation	Pulmonary circulation
Dependent edema	Dyspnea
JVD	Crackles in lungs
Abdominal distention	Tachypnea

Valve Disorders

1. Overview
   a. Valves do not open (stenosis) or close (regurgitation) completely
   b. blood flow is jeopardized
2. NCELX® Points
   a. Types
      i. Mitral Stenosis
         1. mitral valve does not open completely during diastole
      ii. Mitral regurgitation
         1. Mitral valve does not close completely before systole



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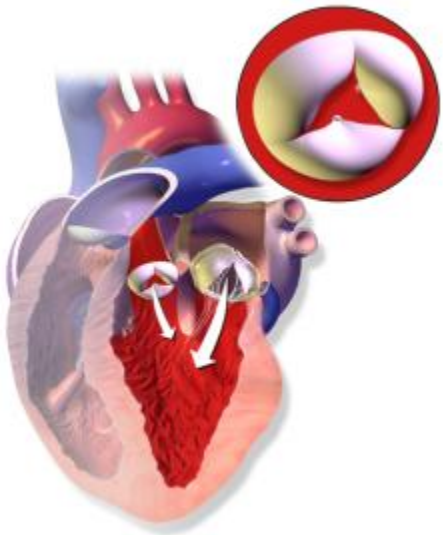
iii. Aortic Stenosis

1. aortic valve does not open completely during systole

iv. Aortic Regurgitation

1. aortic valve does not close completely prior to diastole



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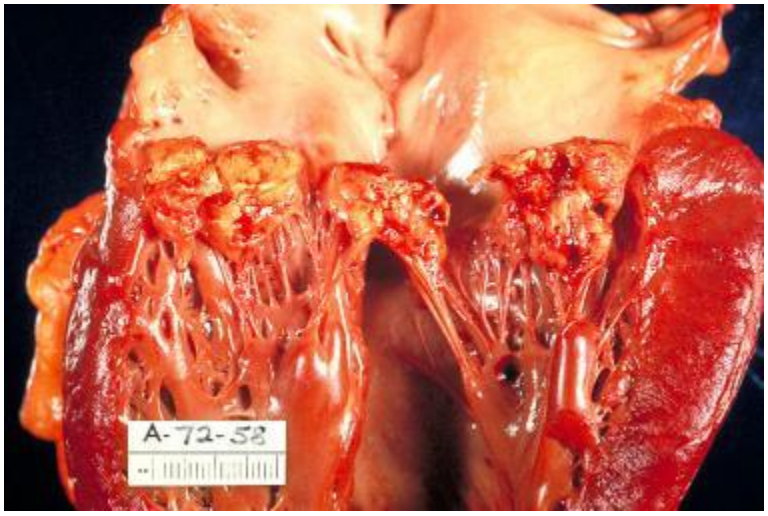
b. Therapeutic Management
    i. Balloon valvuloplasty
    ii. Valve replacement
        1. Mechanical: lifetime anticoagulant therapy indicated
        2. Biological: valve from other species
        3. post op
            a. monitor hemodynamics
            b. monitor for signs of bleeding
            c. maintain good oral hygiene with soft bristle tooth brush
            d. prophylactic antibiotics required prior to invasive procedures
            e. instruct client on anticoagulant therapy
            f. avoid dental procedures for 6 months

Endocarditis

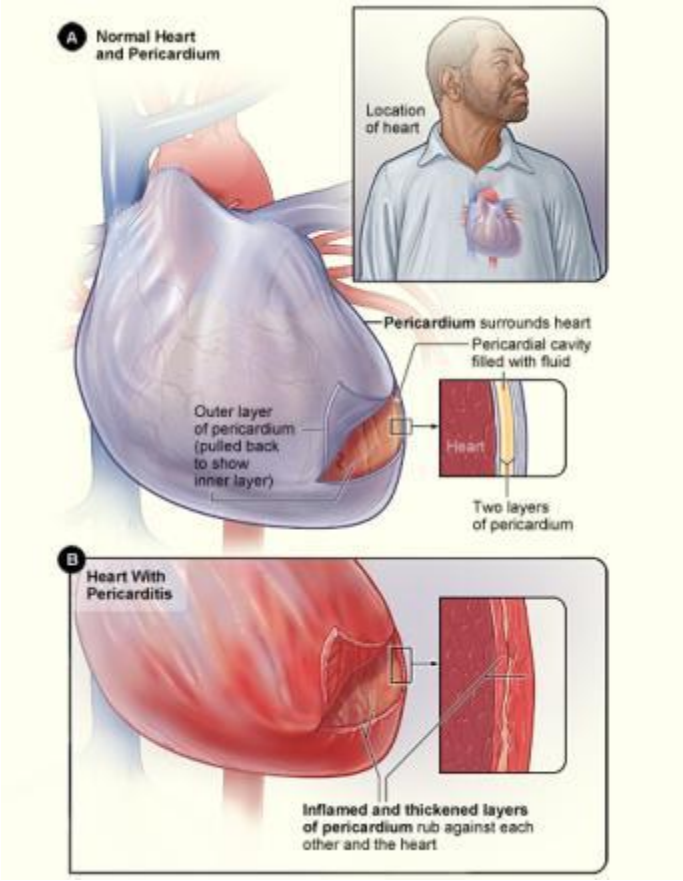


Mitral valve vegetation caused by bacterial endocarditis

1. Overview
    a. inflammation of the inner lining of the heart and valves
    b. common causes include IV drug use and valve replacement
    c. **Vegetations** form which are masses of platelets, fibrin, microorganisms, and inflammatory cells
        i. vegetations can become embolic
    d. infecting organism enters via:
        i. oral cavity (higher risk with recent dental procedure)
        ii. invasive procedures
        iii. infections
2. NCLEX® Points
    a. Assessment
        i. spiking fever
        ii. signs of heart failure
        iii. elevated WBC
        iv. heart murmurs
        v. Embolic complications from vegetations
            1. Splinter hemorrhages in nail beds
            2. Janeway lesions on fingers, toes, nose
            3. Clubbing of fingers
    b. Therapeutic Management
        i. Antiembolic stockings
        ii. IV antibiotic therapy
        iii. Oral hygiene with soft bristled tooth brush twice a day and rinse
        iv. Teach client to monitor for signs of infection
        v. Monitor for signs of emboli

vi. Instruct dental provider of condition (prophylactic antibiotics needed)

Pericarditis



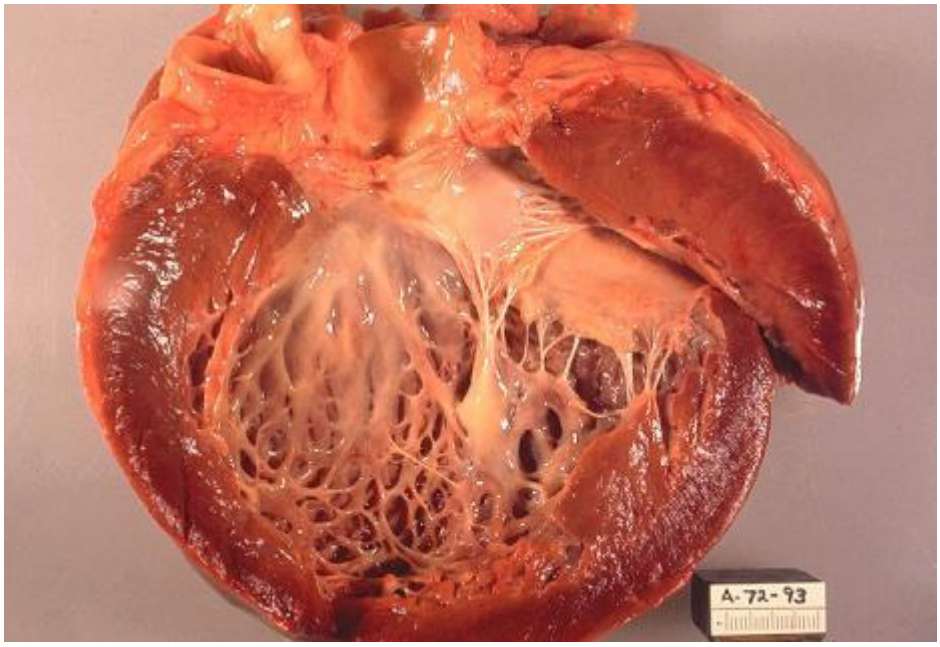
1. Overview
    a. inflammation of the pericardium
    b. compression of the heart occurs as the pericardial sac inflames
    c. heart failure or cardiac tamponade can occur
2. NCLEX® Points
    a. Assessment
        i. Pain
            1. chest radiating to left side of neck, shoulder, or back
            2. aggravated by inspiration, coughing, and swallowing
            3. worse in supine position, relieved by leaning forward
        ii. ST elevation
        iii. Signs of heart failure
    b. Therapeutic Management
        i. assess and treat pain
        ii. administer O2 and place client in high Fowler's
        iii. Assess for cardiac tamponade

1. pulsus paradoxus (abnormally large decrease in systolic blood pressure and pulse wave amplitude during inspiration)
2. JVD with clear lungs
3. narrow pulse pressure (difference between SBP and DBP)
4. Decreased CO
5. Muffled heart sounds
6. For more information on Cardiac Tamponade visit: http://goo.gl/umTsKA

Hypertension

1. Overview
    a. SBP >140 or >90 DBP based on average of three separate readings
    b. Classified in stages
        i. Visit Mayo Clinic for more information on stages: http://goo.gl/icZSxe
2. NCLEX Points
    a. Assessment
        i. past cardiovascular, cerebrovascular, renal, or thyroid disease, diabetes, smoking, alcohol use.
        ii. family history
        iii. referred to as silent killer as asymptomatic until end organ damage occurs
    b. Therapeutic Management
        i. record I&O
        ii. assess for cardiovascular changes
        iii. weight reduction and lifestyle changes
        iv. assess renal and neuro status
        v. Medication therapy
            1. ACE Inhibitors
            2. Beta Blockers
            3. Calcium Channel Blockers
            4. Diuretics
        vi. Lifestyle modifications
            1. Sodium restriction
            2. DASH diet
            3. smoking cessation
        vii. Orthostatic hypotension: rapid drop in SBP of 10-20mmHg in upright position
            1. raise slowly
            2. avoid bathes and strenuous activity after taking medications
        viii. Instruct pt to take medications even if asymptomatic

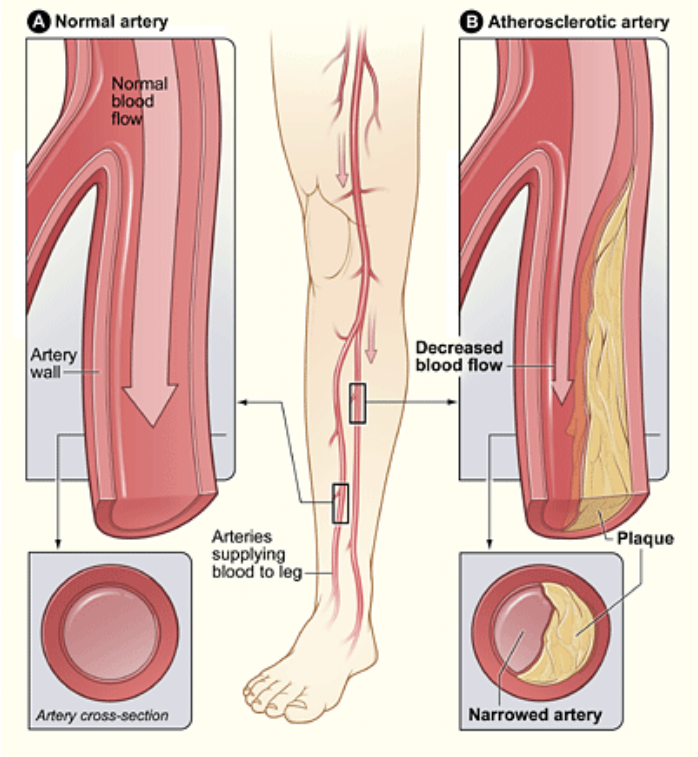
Cardiomyopathy



Thickened, dilated left ventricle

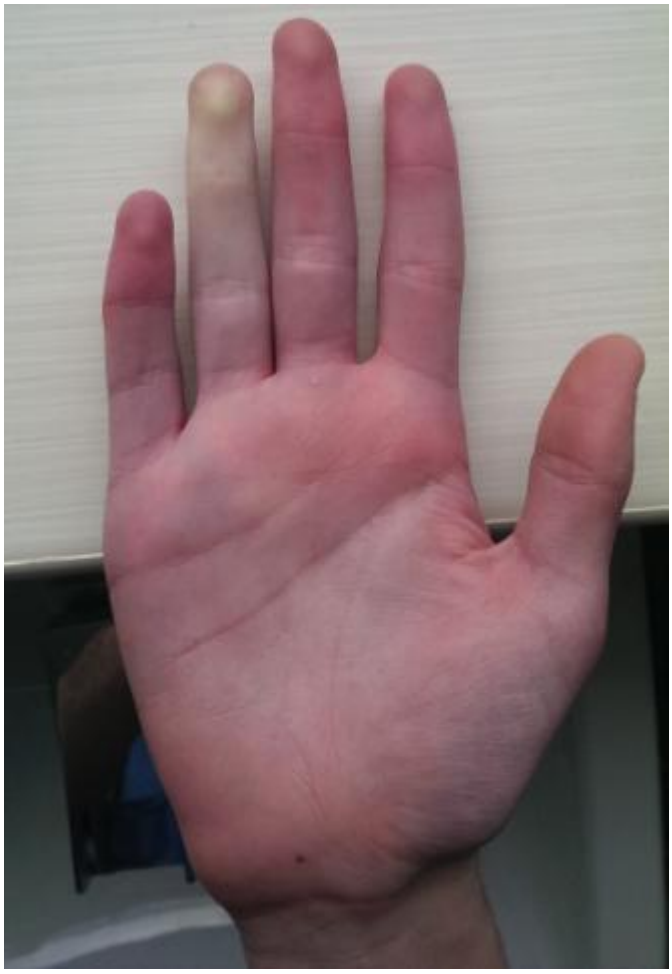
1. Overview
    a. Abnormality of heart muscle leading to functional changes
    b. Three types
        i. Dilated: all 4 chambers enlarged, ↓ contractility, ↓CO
        ii. Hypertrophic: progressive thickening of ventricular muscle, ↓CO
        iii. Restrictive: rigid ventricular walls do not stretch during filling, leads to right HF, ↓SV, ↓CO
2. NCLEX® Points
    a. Assessment
        i. fatigue (dyspnea)
        ii. dysrhythmias
        iii. extra heart sounds (s3 and s4)
    b. Therapeutic Management
        i. monitor for signs of HF
        ii. Encourage rest and minimize stress
        iii. Ventricular assistive devices

Peripheral Arterial Disease



1. Overview
    a. Chronic arterial occlusion leads to decreased oxygen supply to lower extremities
    b. Atherosclerosis most common cause
2. NCLEX® Points
    a. Assessment
        i. Intermittent claudication (muscle pain following predictable amount of activity relieved by rest)
        ii. Rest pain which awakens the client from sleep
        iii. loss of hair on lower extremities
        iv. Cool, pale, numb extremities
    b. Therapeutic Management
        i. assess pulses
        ii. smoking cessation
        iii. encourage exercise to the point of claudication then rest
        iv. Angioplasty
        v. Endarterectomy
        vi. Bypass grafting

Raynaud's Disease



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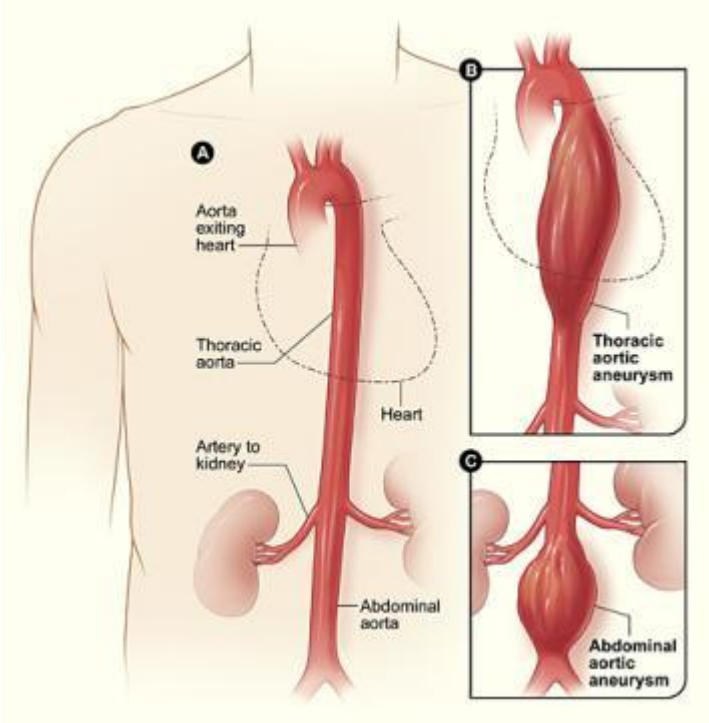
1. Overview
    a. Vasospasm of small arteries and arterioles of hands (less commonly feet, cheeks, ears)
    b. Occur when exposed to cold or stress
2. NCLEX® Points
    a. Assessment
        i. Triphasic color changes (pallor, cyanosis, rubor)
        ii. numbness, tingling, swelling
    b. Therapeutic Management
        i. identify and avoid precipitating factors
        ii. smoking cessation
        iii. wear warm clothing
        iv. medications
            1. analgesics
            2. vasodilators
            3. calcium channel blockers (vasospasm prevention)

Buerger's Disease (thromboangiitis obliterans)

1. Overview
    a. Inflammatory disease of the medium to small arteries and veins of the arms and legs
    b. microthrombi form and lead to vasospasm
2. NCLEX® Points
    a. Assessment
        i. Rest pain
        ii. Intermittent claudication
        iii. pain is most severe at night
        iv. diminished pulses
        v. ulceration in extremities
    b. Therapeutic Management
        i. smoking cessation
        ii. Medication
            1. Calcium channel blockers (prevent vasospasm)
            2. analgesics
        iii. Surgical treatment
            1. bypass grafting
            2. sympathectomy - surgical dissection of nerve fibers

Aortic Aneurysm



1. Overview
    a. dilation/out pouching of the aorta due to weakened medial layer

b. classified by location
    i. thoracic
    ii. abdominal
c. types
    i. dissecting: blood vessels separated by layer of blood
    ii. fusiform: dilation that involves the entire circumference
    iii. saccular: localized out pouching
    iv. false: clot forms outside the vessel wall

2. NCLEX® Points
    a. Assessment
        i. thoracic
            1. pain in back, shoulders, abdomen
            2. dyspnea
        ii. abdominal
            1. pulsating mass in the abdomen
            2. systolic bruit
            3. tenderness on abdominal palpation
            4. hematoma on flank
        iii. Rupture assessment
            1. severe sudden onset of pain
            2. pain radiating to flank and groin
            3. signs of shock
    b. Therapeutic Management
        i. Reduce blood pressure
        ii. diagnose via CT or abdominal ultrasound
        iii. Abdominal aortic aneurysm resection/EVAR (endovascular aneurysm repair)
            1. assess peripheral pulses
            2. monitor renal function (due to blood loss and decreased perfusion)
                a. urine output, renal labs
            3. assess vital signs
            4. assess incision site

Thrombophlebitis

1. Overview
    a. thromubs (clot) formation with associated inflammation
    b. Virchow's Triad
        i. Venous stasis
        ii. Damage to inner lining of vein
        iii. Hypercoagulability of blood
    c. Risk for pulmonary embolism if detachment occurs
2. NCLEX® Points
    a. Assessment

i. Risk factors
    1. history of thrombophlebitis, pelvic surgery, obesity, HF, a-fib, immobility, MI, pregnancy, IV therapy, hypercoagulabiity
ii. Assessment findings
    1. unilateral edema
    2. pain
    3. warm skin
    4. febrile state
    5. Homan's sign - pain on dorsiflexion of foot
iii. Therapeutic management
    1. analgesia
    2. ultrasound to confirm finding
    3. monitor respiratory status
        a. report pink sputum, tachypnea, tachycardia, chest pain (signs of pulmonary embolism)
    4. monitor circumference of affected limb
    5. monitor distal pulses
    6. smoking cessation
    7. avoid long periods of sitting
    8. elevate legs 10-20 min every few hours
    9. monitor PT and INR for patients on Coumadin (warfarin)
    10. monitor PTT for patients on Heparin therapy

NCLEX® Cram - Cardiovascular

1. Heart Rate
    a. normal sinus 60-100bpm
    b. sinus tachycardia >100bpm
    c. sinus bradycardia <60bpm
2. Vascular System
    a. arteries
        i. carry oxygenated blood to tissues
    b. veins
        i. carry deoxygenated blood back to heart
3. Cardiac Markers
    a. Indication of cardiac damage

Troponin	Most sensitive to cardiac damage	12 hours
CK-MB	Sensitive when skeletal damage isn't present	10-24 hours
Myoglobin (Mb)	Low specificity to infarction	2 hours

4. Labs
    a. Potassium
        i. Hypokalemia
            1. ventricular dysrhythmias
            2. ↑ digoxin toxicity
            3. U wave
            4. ST depression
        ii. Hyperkalemia
            1. Peaked T waves
            2. Wide QRS
            3. Ventricular dysrhythmias
    b. ↑ Hematocrit indicates volume depletion
    c. ↓Hematocrit and hemoglobin indicate anemia
    d. Lipids
        i. Total cholesterol ↓200 mg/dL
        ii. LDL ↓130 mg/dL
        iii. HDL 30-70 mg/dL
5. Holter monitoring provides 24 hour EKG monitoring
    a. client should record any moment that they have chest pain
6. Assess for iodine, seafood allergies prior to any dye tests
7. Cardiac Catheterization
    a. used to assess cardiac function (valve and chamber function)
    b. monitor distal pulses

   c. monitor pressure dressing and insertion site for bleeding or hematoma
8. Angioplasty
   a. used to dilate occluded cardiac vessels
   b. encourage fluid intake to flush dye from system
   c. assess distal pulses
9. Cardioversion
   a. synchronized to R wave
      i. if not synchronized shock could cause VF
10. Coronary artery disease
   a. narrowing of coronary arteries due to plaque build up
      i. may lead to MI, HF, HTN, angina
      ii. ST depression occurs with ischemia
   b. client should follow low fat, low cholesterol, high fiber diet
11. Vena Cava Filter
   a. assess cardiac, neuro, and respiratory status post op
   b. avoid hip flexion
   c. assess for bleeding and hematoma at insertion site
   d. assess peripheral pulses
   e. anti embolic stockings
   f. anti coagulant therapy
12. Cardiogenic Shock
   a. heart is unable maintain effective cardiac output
   b. Assessment
      i. low urine output
      ii. ↓BP
      iii. Assess CVP (pressure in superior vena cava representing right atrial pressure preload)
         1. CVP: 2-8 mmHg
         2. reading should be taken at end expiration if ventilated

Zero transducer at the fourth intercostal space along the mid axillary line (location of the right atrium)