

Ventricular Arrhythmias

Pathophysiology	Clinical manifestations
Result from disorders of impulse formation, impulse conductions, or both	<ul style="list-style-type: none"> - Irregular heart rate and rhythm - chest, the neck should back jaw, or arm pain - Cold. clammy skin - Diaphoresis - Decreased peripheral pulses - Dyspnea - Pallors - Nausea & vomiting - Palpitations - Weakness and fatigue
Risk factors	Diagnostic tests
<ul style="list-style-type: none"> - Age-related <ul style="list-style-type: none"> - Stiff muscles, less stretchy arterial walls, decreased stroke volume, and cardiac output - Cardiomyopathy - Conductions defects - Heart failure - MI - Valve disease - Acid-base imbalance - Alcohol - Caffeine and tobacco - Draining - Electrolyte imbalances - Sepsis - Hypoxia 	<ul style="list-style-type: none"> - Labs: CBC, electrolytes, troponin - EKG
Nursing interventions	Complications
Initial <ul style="list-style-type: none"> - If unresponsive assess circulation, airway, and breathing - If responsive monitor airway, breathing, and circulation - Apply o2 via nasal cannula or non-rebreather - Take vital signs - 12 lead ECG - Continuous ECG monitoring 	

<ul style="list-style-type: none"> - Identify dysrhythmia - Establish iv access - Obtain baseline labs 	
Treatment	Teaching

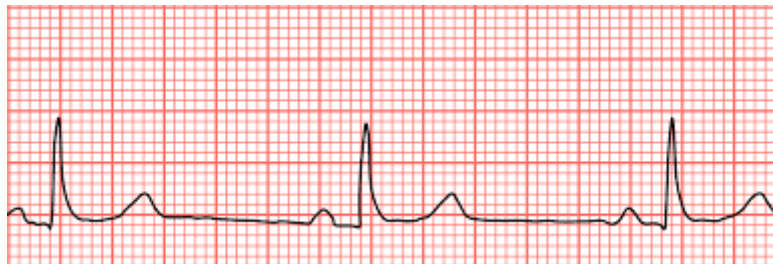
Types of Ventricular rhythms

1. Normal sinus rhythm



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- Rhythm: regular
- Rate: 60-100
- P-wave: normal- upright
- Pr-interval: normal
- QRS: normal

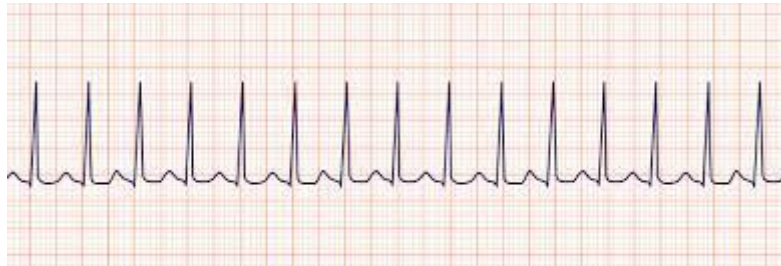
2. Sinus bradycardia



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- Ecg characteristics
 - Rhythm: regular
 - Rate: <60
 - P-wave: normal
 - Pr-interval: normal
 - QRS: normal
- Clinical associations: Common disease states with bradycardia is hypothyroidism, increased ICP, and MI
- Clinical significance: symptomatic bradycardia symptoms are
 - Pale cool skin
 - Hypotension
 - Weakness
 - Angina
 - Dizziness or syncope

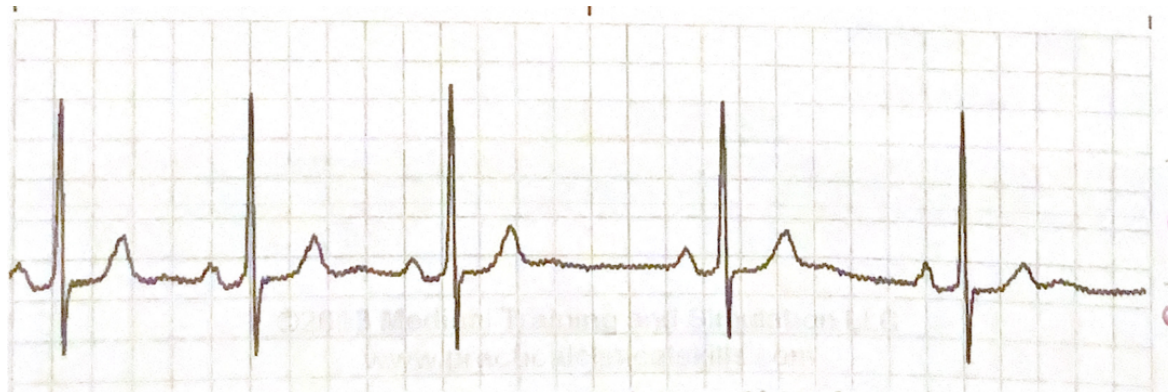
- vi. Confusion or disorientation
- vii. Shortness of breath
- e. Treatment
 - i. If it is due to drugs may have to be held stopped or reduced
 - ii. IV atropine
 - iii. Transcutaneous pacing or a dopamine or epinephrine drip

3. Sinus tachycardia



- a.
- b. ECG characteristics
 - i. Rhythm: 101-180
 - ii. Rate: normal
 - iii. P-wave: normal
 - iv. Pr-interval: normal
 - v. QRS: normal upright
- c. Clinical associations
 - i. Fever, pain, hypotension, hypovolemia, anemia, hypoxia, myocardial ischemia, heart failure, hyperthyroidism, Levophed, atropine, caffeine theophylline, or hydralazine
- d. Treatment
 - i. Effective pain management
 - ii. Vagal maneuvers
 - iii. Beta-blockers, adenosine, calcium channel blockers
 - iv. Unstable pts may need a cardioversion

4. Sinus arrhythmia



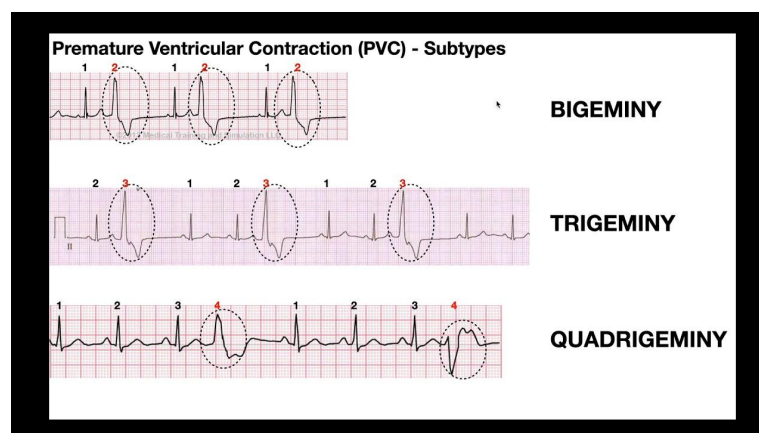
- a.
- b. Rate: 60-100

- c. This is where all the R-R are all going to be different (Sa node is firing irregularly)
 - d. Everything else is pretty much characterized by normal sinus rhythm rates
5. PAC

Premature Atrial Contraction (PAC)



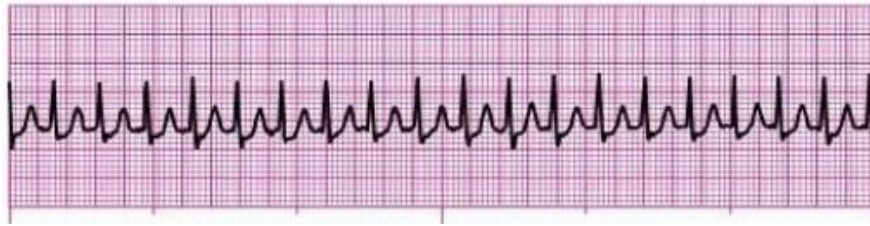
- a.
 - b. This beat comes earlier than the rest of the beats and it comes from the atria
 - i. Bigeminy: PAC is every other beat
 - ii. Trigeminy: PAC is every third beat
 - c. This can be uniform (same form) or multifocal (different forms)
 - d. Clinical associations
 - i. Pac can result from emotional stress or physical fatigue, caffeine, tobacco, or alcohol use. Hypoxia, electrolyte imbalances, hyperthyroidism, COPD, heart disease
 - e. Treatment
 - i. Withdrawal from the source of stimulation may need beta blockers to decrease PACS
6. PVC



- a.
- b. Essentially the same thing as a PAC but the “beat” comes from the ventricle instead of the atria
- c. ECG characteristics
 - i. Rate and rhythm: underlying rhythm can be any rate or irregular rhythm, PVCs occur at variable rates
 - ii. P wave: not usually visible hidden in the PVC
 - iii. Pr interval: not measurable
 - iv. Qrs complex: wide and disoriented

- d. Clinical significance
 - i. Occurs when there are three or more consecutive PVC's
 - ii. Often associated with caffeine, alcohol, nicotine, aminophylline, epinephrine, isoproterenol, electrolyte imbalances, hypoxia, fever, exercise, and emotional stress
- e. Treatment
 - i. Therapy for hypoxia, electrolyte replacement

7. SVT



- a.
- b. ECG characteristics
 - i. Rhythm: regular
 - ii. Rate: 151-220
 - iii. P-wave: abnormal shape and could be hidden in the t-wave
 - iv. Pr-interval: normal or shortened
 - v. QRS: normal
- c. Clinical associations
 - i. In a normal heart, this is associated with overexertion, emotional stress, deep inspiration, and stimulants. This is also associated with rheumatic heart disease, digitalis toxicity, and CAD
- d. Clinical significance
 - i. prolonged episode will cause decreased CO due to reduced stroke volume
 - ii. Manifestations: hypotension, palpitations, dyspnea and angina
- e. Treatment
 - i. Vagal stimulation and drug therapy
 - ii. IV adenosine is the drug of choice short half-life (10 seconds) beta blockers and calcium channel blockers are options
 - iii. Synchronized cardioversion is done when the pt is unstable

8. Atrial flutter



- a.
- b. ECG characteristics
 - i. Rhythm: irregular
 - ii. Rate: <100

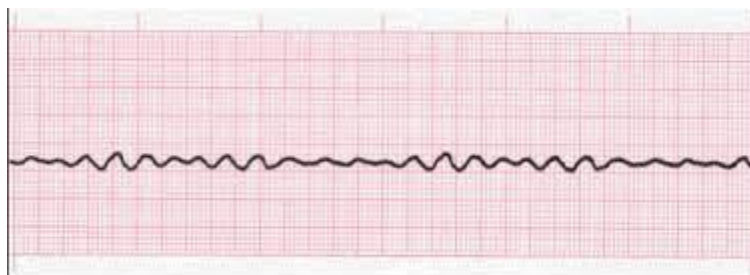
- iii. P-wave: gonna see a saw tooth pattern
 - iv. Pr-interval: not measurable
 - v. QRS: normal
 - vi. Qt: not measurable
- c. Clinical associations
 - i. It is associated with CAD, hypertension, mitral valve disorder, p.e, chronic lung disease, cor pulmonale, cardiomyopathy, and hyperthyroidism
 - ii. Use of drugs digoxin, quinidine, and epinephrine
- d. Clinical significance
 - i. High ventricular rates and loss of atrial kick that is associated with this decreased CO,
 - ii. Have an increased risk for stroke, warfarin causes a decrease in clots
- e. Treatment
 - i. Calcium channel blockers and beta blockers
 - ii. Cardioversion

9. Atrial fibrillation



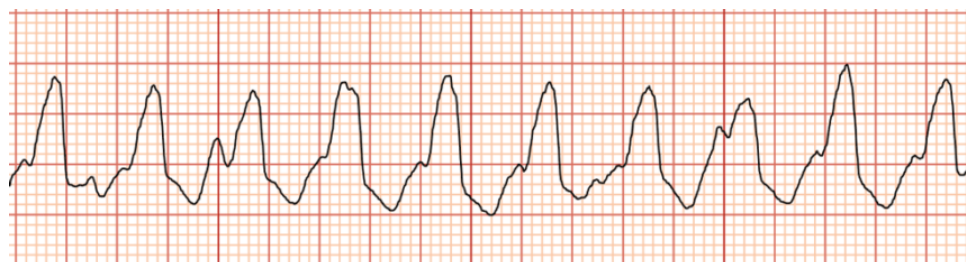
- a.
- b. ECG characteristics
 - i. Rhythm: irregular
 - ii. Rate: <100
 - iii. P-wave: fibrillatory waves
 - iv. Pr-interval: not measurable
 - v. QRS: normal
 - vi. Qt: not measurable
- c. Clinical associations
 - i. Occurs in pts with underlying heart disease, CAD, valvular heart disease, cardiomyopathy and hypertensive heart disease, HF, and pericarditis
 - ii. Develops acutely with: alcohol intoxication, caffeine, electrolyte problems, stress, and heart surgery
- d. Clinical significance
 - i. Decrease the ventricular response
 - ii. Thrombi may form in the atria
- e. Treatment
 - i. Drugs: calcium channel blockers amiodarone and digoxin

10. Ventricular fibrillation

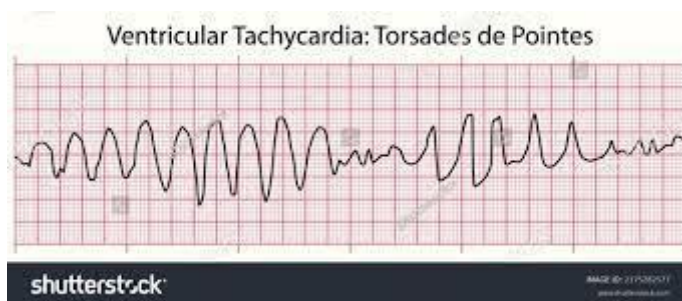


- a.
- b. Ecg characteristics
 - i. Rate and rhythm are not measurable and irregular
 - ii. P wave: absent
 - iii. Pr interval: not measurable
 - iv. Qrs complex: not measurable
- c. Clinical associations
 - i. MI, myocardial ischemia, cardiac catheterization, electric shock, hyperkalemia, hypoxemia, acidosis, and drug toxicity
- d. Clinical significance
 - i. If not treated quickly pt will not make it
- e. Treatment
 - i. CPR and ACLS with the use of defibrillation
 - ii. Give epi and amioderone
- f.

11. Ventricular tachycardia



a.



b.

- c. Ecg characteristics
 - i. Rate and rhythm: 150-250 beats for min and irregular to regular
 - ii. P wave: not usually visible
 - iii. Pr interval: not mesurbale
 - iv. Qrs complex: wide and distorted

- d. Clinical associations
 - i. MI, CAD, significant electrolyte imbalances, cardiomyopathy, long QT syndrome, drug toxicity, and central nervous system disorders
- e. Clinical significance
 - i. Causes a severe decrease in cardiac output decreased ventricular diastolic filling times and loss of atrial contraction
- f. Treatment
 - i. Preipitaing causes must be identified and treated
 - ii. Monooprophic treatment
 - 1. Stable: iv procainamide, lidocaine, or amiodarone
 - iii. Polymorphic treatment
 - 1. Stable IV magnesium, isoproterenol, phenytoin, and external pacing
 - iv. If PT is unstable
 - 1. Without pulse start Cardiopulmonary resuscitation and rapid defibrillation

12. Asystole



- a.
- b. Ecg characteristics
 - i. Pulses electrical activity
- c. Clinical associations
 - i. Heart disease and severe cardiac conduction system problem
- d. Clinical significance
 - i. Pt with asystole has end-stage heart disease or has prolonged arrest and cannot be resuscitated
- e. Treatment
 - i. CPR and ACLS measures with drug therapy and epinephrine

Coronary Artery Disease (CAD)

Pathophysiology	Clinical manifestations
<p>Characterized by atherosclerosis (lipid deposits in the artery) this takes many years to develop this is also known as “hardening of the arteries”</p> <p>Stages</p> <ol style="list-style-type: none"> 1. Chronic endothelial injury 2. Fatty streak 3. Fibrous plaque resulting from smooth muscle cell proliferation 4. Complicated lesion 	<ul style="list-style-type: none"> - None at the early stages of the disease - Critical to identify those who are at risk <p><i>Chronic symptoms</i></p> <ul style="list-style-type: none"> - Angina - <i>Chronic stable angina</i> refers to chest pain that occurs intermittently over a long period of time with a similar pattern of onset, duration, and intensity of symptoms. <ul style="list-style-type: none"> - It is often provoked by physical exertion, stress, or emotional upset. - EKG changes – may or may not see change (ST segment depression OR T wave inversion) - describe a pressure, heaviness, or discomfort in the chest. Discomfort is often described as a squeezing, heavy, tight, or suffocating sensation. May show dyspnea, fatigue, nausea. - The pain of chronic stable angina usually lasts for only a few minutes and commonly subsides when the precipitating factor is resolved (e.g., resting, calming down, using sublingual nitroglycerin) - Other types (table 33-9) <ul style="list-style-type: none"> - <i>Silent ischemia</i> refers to ischemia that occurs in the <i>absence of any subjective symptoms</i>. Patients with diabetes have an increased prevalence of silent ischemia. - ANGINA IS WARNING SIGN OF HEART ATTACK

	<ul style="list-style-type: none"> - <i>Prinzmetal's</i> - Coronary vasospasm <ul style="list-style-type: none"> - Occurs primarily at rest - Triggered by smoking and increased levels of some substances (e.g., histamine, epinephrine, cocaine) - May occur in the presence or absence of CAD - <i>Microvascular</i> – Myocardial ischemia secondary to microvascular disease affecting the small, distal branches of coronary arteries <ul style="list-style-type: none"> - Triggered by activities of daily living (e.g., shopping, work) vs. physical exercise (exertion) - These patients usually have positive stress test results and have an inconsistent response to nitrates. - Nitro does not work for this - No ecg changes - <i>Unstable</i> – Rupture of unstable plaque, exposing thrombogenic surface <ul style="list-style-type: none"> - New-onset angina – very sudden - Chronic stable angina that increases in frequency, duration, or severity - Occurs at rest or with minimal exertion - Lasts more than 10 min
Risk factors	Diagnostic tests
<i>Modifiable</i>	<ul style="list-style-type: none"> - Chest x-ray: determines the

<ul style="list-style-type: none"> - Hyperlipidemia - Hypertension - Tobacco use - alcohol use - Physical inactivity - Obesity <p><i>Contributing</i></p> <ul style="list-style-type: none"> - Diabetes - Metabolic syndrome - Psychological - Homocysteine - Substance abuse <p><i>Nonmodifiable</i></p> <ul style="list-style-type: none"> - Increasing age - Middle tagged men (over age 45) - Women over 55 until 75 years old - Race <ul style="list-style-type: none"> - White men have the highest incidence - African americans have a early age of onset - Native americans die from heart disease later than expected - Hispanic have significant lower rate of CAD - Family hx 	<p>enlargement, cardiac classifications, and pulmonary congestion</p> <ul style="list-style-type: none"> - EKG - Stress test - Labs: biomarkers, isoenzymes, lipids, CRP (inflammatory marker), homosystemien, bnp (rules out respiratory causes) or CHF peptide and NT-Pro-BMP - PET scan: - Angiography: visualizes the coronary arteries - Chest x-ray - Arteriogram: looks at the arteries and electrical flow of the heart - Coronary heart cath: look at abnormalitis in the heart muscle
Nursing interventions	Complications
<ul style="list-style-type: none"> - Important to teach UAP to communicate chest pain or shortness of breath or pulse/BP out of range - Good I&O tracking - Low sodium diet - 	
Treatment	Teaching
<p><i>Medications</i></p> <ul style="list-style-type: none"> - Nitroglycerin (nitrate): sublingual under tongue, take at the start of chest pain Q5 min max of 3 doses- go to ER if chest pain does not resolve <ul style="list-style-type: none"> - Watch out for hypotension, dizziness, confusion, high fall 	<ul style="list-style-type: none"> - Low saturated fat diet, high fiber - Smoking cessation - Flu and covid vaccines - Addressing psychological aspects - Increase activity moderate activity 30 mins x 5 days a week - Heart caths are at risk for bleeding

<ul style="list-style-type: none"> <ul style="list-style-type: none"> risk, headache - Keep in a dark cool area, replace every few months - ACE inhibitors <ul style="list-style-type: none"> - Ends in -pril - Example lisinopril - Decreases ventricular remodeling and decreased blood pressure - Watch out for dry cough and angioedema - ARBS <ul style="list-style-type: none"> - End in -satan - Used in pts who are intolerance of ACE inhibitors - Losartan - Beta blockers <ul style="list-style-type: none"> - End in -lol - Decreases myocardial contractility and also decreases demand of oxygen - Hold if pt hr is less than 60 - Watch for s/s of hypoglycemia - Calcium channel blockers <ul style="list-style-type: none"> - Given if beta blockers were not tolerable - Systemic vasodilation, decreases hr - Watch out for orthostatic hypotension - Statins <ul style="list-style-type: none"> - Monitor liver enzymes, get baseline liver panel before therapy - Teach pt how to have a low cholesterol diet - Sodium current inhibitors <ul style="list-style-type: none"> - Co-therapy, help with vascular portion decrease blood pressure - Example ranexa - Morphine <ul style="list-style-type: none"> - Vasodilator to reduce preload and myocardial O₂ consumption - Used in an acute setting 	<ul style="list-style-type: none"> - Check the 6 P's
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<ul style="list-style-type: none">- Antiplatelets<ul style="list-style-type: none">- Warfarin, heparin, aspirin<ul style="list-style-type: none">- Aspirin initial 162-325 mg <p><i>Cardiac catheterization</i></p> <ul style="list-style-type: none">- Preoperative<ul style="list-style-type: none">- NPO 6-12 hours before procedure- Look at kidney function in order to determine if they can handle dye- Post procedure<ul style="list-style-type: none">- Watch for bleeding- Frequent vitals- High risk of bleeding lie supine for an extended period of time <p><i>Coronary revascularization</i></p> <ul style="list-style-type: none">- Bloon moves buildup of cholesterol to the side	
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Type	Etiology	Characteristics
Chronic stable angina	Myocardial ischemia (usually from CAD) caused by an O ₂ supply/demand mismatch	<ul style="list-style-type: none"> • Episodic pain lasting a few minutes • Provoked by exertion or stress • Relieved by rest or nitroglycerin
Prinzmetal's angina	Coronary vasospasm	<ul style="list-style-type: none"> • Occurs primarily at rest • Triggered by smoking and increased levels of some substances (e.g., histamine, epinephrine, cocaine) • May occur in presence or absence of CAD • Treatment may include long-acting nitrates and/or calcium channel blockers
Microvascular angina	Myocardial ischemia from microvascular disease affecting the small, distal branches of coronary arteries	<ul style="list-style-type: none"> • More common in women • Triggered by activities of daily living (e.g., shopping, work) vs. physical exercise (exertion) • Treatment may include nitroglycerin
Unstable angina	Rupture of unstable plaque, exposing thrombogenic surface	<ul style="list-style-type: none"> • New-onset angina • Chronic stable angina that increases in frequency, duration, or severity • Occurs at rest or with minimal exertion • Lasts more than 10 min

Chronic Heart Failure

Pathophysiology	Clinical manifestations
<p>Interfering with normal mechanisms regulating CO₂ may cause HF</p> <p>Causes of heart failure are divided into two subgroups primary and precipitating factors</p>	<p><i>Right-sided heart failure (rocks the body with fluid)</i></p> <ul style="list-style-type: none"> - Peripheral edema - Gonna see weight gain, edema, JVD and abdominal growth - Symptoms can be remembered by the word Swelling <p><i>Left-sided heart failure (left things lungs)</i></p> <p>Most common</p> <ul style="list-style-type: none"> - Pulmonary edema - Crackles in the lungs - Frothy pink, blood tinted sputum - Dyspnea and orthopnea (difficulty breathing while lying flat) - Symptoms can be remembered by the work drowning <ul style="list-style-type: none"> - Fatigue after usual daily activities - Dyspnea when lying down - PND when pt is asleep, pt awakens in a panic, feeling of suffocation. Pt will have the feeling of wanting to sit or stand up - A dry nonproductive cough - Tachycardia - Edema - Dusty skin - Angina <p>Can be remembered by FACES</p> <ul style="list-style-type: none"> - Fatigue - Activities limited - Chest congestion - Edema or ankle swelling - Shortness of breath
Risk factors	Diagnostic tests
<ul style="list-style-type: none"> - Black/Hispanic Americans develop HF at an earlier age <p>Primary factors</p> <ul style="list-style-type: none"> - Cardiomyopathy - Congenital heart defects 	<ul style="list-style-type: none"> - Cardiopulmonary exercise stress test - 6-min walk tests - Sleep studies - BNP - Echocardiogram

<ul style="list-style-type: none"> - HTN - Hyperthyroidism - Myocarditis - Valvular disorders <p>Precipitating factors</p> <ul style="list-style-type: none"> - Anemia - Dysrhythmias - Hyperkalemia - Hypothyroidism - Obstructive sleep apnea - P.E. 	
Nursing interventions	Complications
<p>H: head of bed over 45 degrees O: oxygen P: push furosemide +morphine E: end sodium and fluids</p> <ul style="list-style-type: none"> - High fowler's position - CPAP machine - Continuous ECG and pulse ox monitoring <p><i>Goals for HF pts</i></p> <ol style="list-style-type: none"> 1. Decrease symptoms 2. Decreases peripheral edema 3. Increase in exercise tolerance 4. Adherence to treatment plan 5. No complications related to heart failure 	<ul style="list-style-type: none"> - Pleural effusion - Atrial fibrillation or ventricular dysthymia - Renal failure - Hepatomegaly
Treatment	Teaching
<ul style="list-style-type: none"> - Balloon pump - Cardioversion <p><i>Medication management</i></p> <ul style="list-style-type: none"> - ACE inhibitors <ul style="list-style-type: none"> - Reduced afterload and SVR, inhibits ventricular hypertrophy - End in pril - Possum sparing - Causes low blood pressure - ARBS <ul style="list-style-type: none"> - For pts unable to tolerate ACE inhibitors - Promotes after load reduction and vasodilation - Lowers blood pressure - Spars the potassium - End in sartan - Aldosterone antagonists 	<ul style="list-style-type: none"> - Deit: low sodium less than 2 grams per day and fluid restrictions - Daily weights <ul style="list-style-type: none"> - Call HCP about a weight gain over 3 lbs over 3 days or 3-5 pound gain over 1 week - Increase activity slowly - Avoid extreme heat and cold - Get the annual flu, pneumococcal vaccine - After ADL's plan a rest period - Avoid emotional upsets, shar concerns of depression <p><i>What to report to HCP</i></p> <ul style="list-style-type: none"> - Weight gain over 3 pounds in 2 days or 3-5 pounds in a week - Difficulty breathing

<ul style="list-style-type: none"> - Monitor serum potassium levels and renal function in pts taking this drug - Beta blockers <ul style="list-style-type: none"> - Major side effects including worsening of heart failure, hypotension, fatigue and bradycardia - Ends in -lol - Calcium channel blockers <ul style="list-style-type: none"> - Lowers hr and bp - Ends in -dipine -zem and -amil - Digoxine <ul style="list-style-type: none"> - Monitor renal function and serum potassium levels - Helps create deeper contraction - Dilators <ul style="list-style-type: none"> - Example: nitroglycerine - Lowers bp, decreased resistance - Diuretics <ul style="list-style-type: none"> - Reduces edema, pulmonary venous pressure, and preload - End in -ide think the body is dried - Potassium wasting and sparing <p>Surgical treatment options</p> <ul style="list-style-type: none"> - LVAD works for the heart - Heart transplant 	<ul style="list-style-type: none"> - Waking up breathless at night - Frequent dry hacking cough - Fatigue, weakness - Swelling of the ankles feet or abdomen, swelling of the face or difficulty breathing (ace inhibitor side effects) - Dizziness or fainting
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Acid-base Imbalances

Pathophysiology	Clinical manifestations
Risk factors	Diagnostic tests
Nursing interventions	Complications
Treatment	Teaching

Pulmonary Embolism

Pathophysiology	Clinical manifestations
Obstruction of a pulmonary vessel	
Risk factors	Diagnostic tests
Nursing interventions	Complications
Treatment	Teaching

Sleep Apnea

Pathophysiology	Clinical manifestations
Risk factors	Diagnostic tests
Nursing interventions	Complications
Treatment	Teaching

Tuberculosis

Pathophysiology	Clinical manifestations
Risk factors	Diagnostic tests
Nursing interventions	Complications
Treatment	Teaching