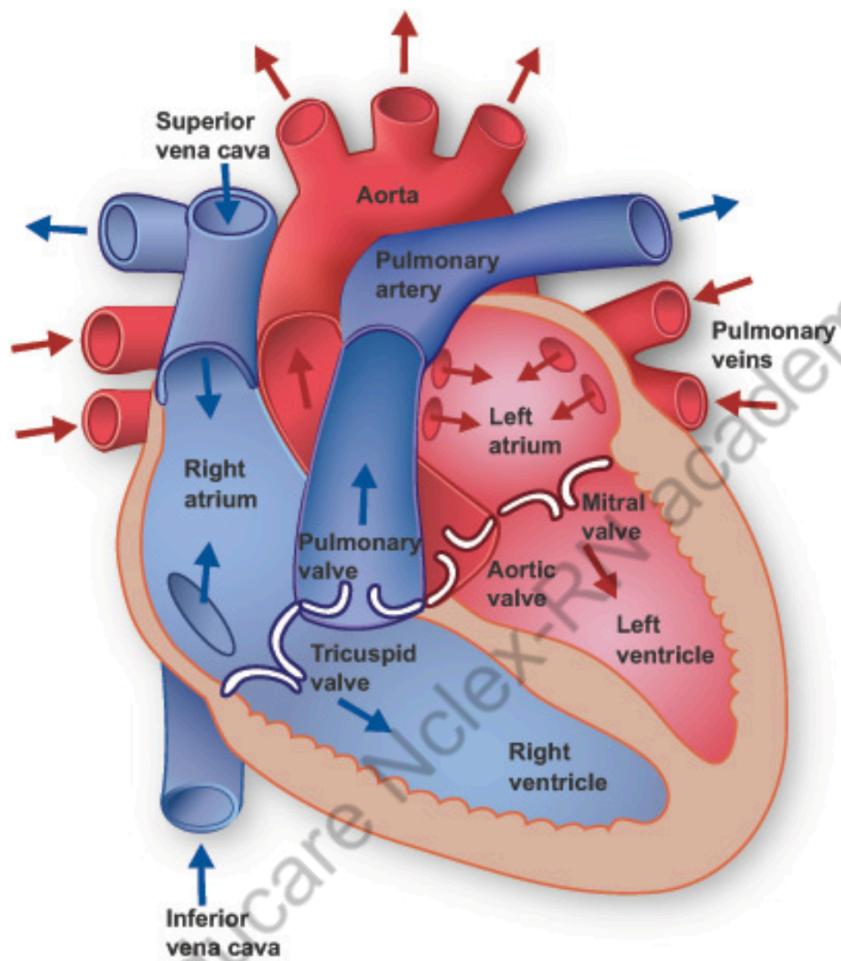


Cardiac System



Hypertension

Hypertension is a chronic high blood pressure, which if not treated can cause damage to organs from all that high pounding pressure.

- Brain: CVA
- Heart: MI & HF
- Kidney: CKD
- Blood vessels: Artherosclerosis
- Eyes: Blindness

Causes of Hypertension

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SODA

S: Stress, Smoking, Sedentary lifestyle

O: Obesity, Oral Contraceptives

D: Diet high in Sodium.

A: African men and old age.

Education

DRESS

D DIET LOW SCC (Sodium, Calories, Cholesterol)

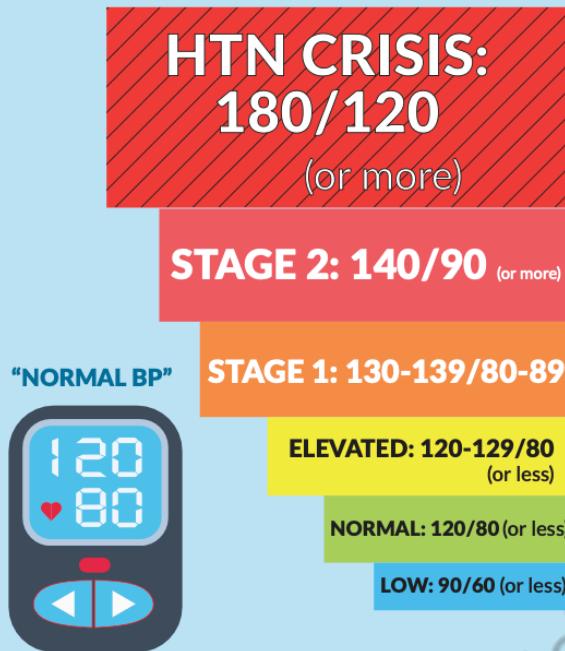
R REDUCE ALCOHOL & CAFFEINE

E EXERCISE: WALKING (30 min. x 5 days/wk)

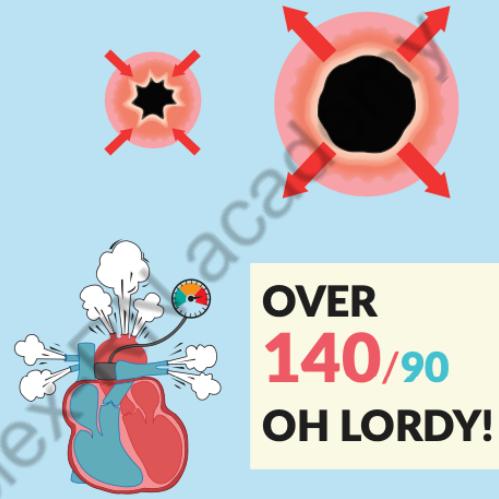
S STOP SMOKING & ALCOHOL

S STRESS REDUCTION

Numbers to know:



120/80
Systolic/Diastolic
"San/Diego"
Squeeze/Decompress



Angina

A typical blockage of the coronary arteries caused by atherosclerosis.

Types: Stable

Unstable

Stable Angina: Stress induced chest pain

Relieved by rest and meds
Pain lasting for 5-15 minutes.

Unstable Angina: Unsafe angina/ Unpredictable

Unrelieved with rest and meds
More tissue damage.

Treatment for Stable angina

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Goal: To decrease O₂ demand, to increase O₂ supply.

- ✓ Eg: Sublingual Nitroglycerin (NTG) Pain is relieved in 3 minutes.
 - ✓ Take 1 dose every 5 minutes, maximum 3 doses.
 - ✓ Sublingual Only.
 - ✓ Keep in dark, dry and cool place.
 - ✓ Headache is expected.
 - ✓ Renew every 6 months after opening.

Avoid to take with Erectile dysfunction drugs
(.....) because it cause severe hypotension due to vasodilations.

Test Tip: patch fall off (Over 1 hour ago)

Take nitro (pill/ spray) new patch can take 30-60 minutes.

Myocardial Infarction (MI)

- ✓ Myocardial Infarction the heart muscles DIE “necrosis” from lack of oxygen.
 - ✓ Occurs due to blockage of the coronary arteries.
 - ✓ Prolonged decrease blood flow to the heart.

Signs and Symptoms

Nclex tip: Sudden, Crushing and Radiating.

Pain: Jaw, back, mild shoulder pain, heartburn (Epigastric).

SOB: ‘Dyspnea’ ‘Labored breathing’

Nausea: Vomiting ‘Abdominal Pain’

Sweating: ‘Diaphoresis’

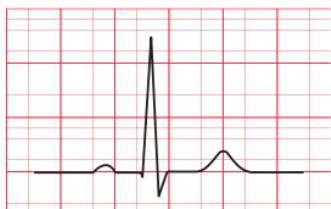
Pale cool skin: Dusky

Anxiety.

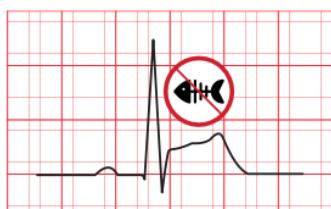
Diagnostics:

EKG: STEMI VS NSTEMI

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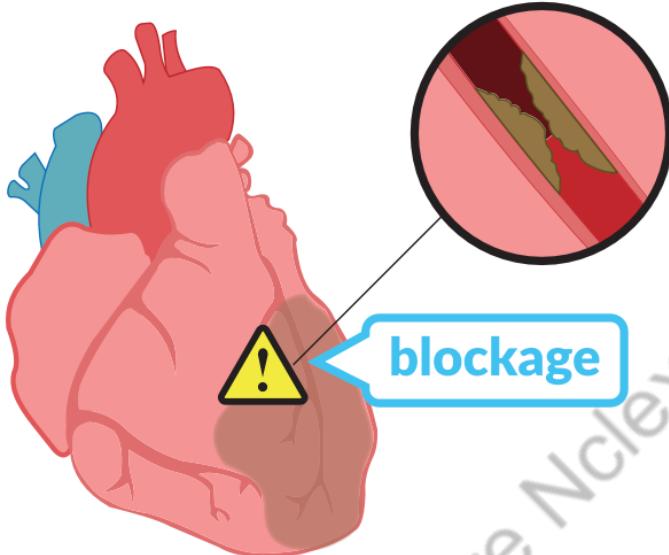
Normal



ST elevation



ST Depression



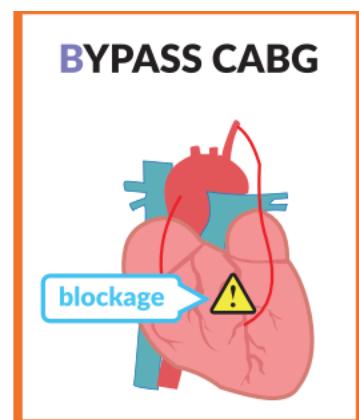
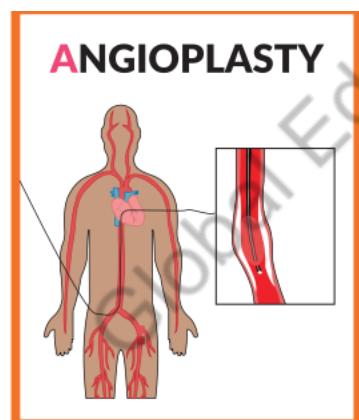
2nd-LABS

T-Troponin (Over 0.5 ng/mL)

T-Trauma (**ONLY** indicator of MI)

Other labs: Crp, Ckmb,

Myoglobin, CRP (inflammation)



Before: NPO: 6-12 hrs

After: BYPASS CABG

NO heavy lifting- lie flat

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No Baths- Shower ok

Infected incision “red, warm, drainage”

Treatment for unstable angina or Myocardial Infarction.

Immediate management

O: Oxygen

A: Aspirin

N: Nitroglycerine

M: Morphine

2. Cardiac Catheterization : Coronary Angiography “90 minutes door to balloon”.

Pre-procedure: Check consent/ NPO/Ask Allergy (Iodine)/ Check kidney function (Creatinine should be less than 1.3)/ hold metformin.

Post procedure: Major complication: Bleeding

Watch for puncture site/ Assess 5ps (Pulselessness, Pallor, pain, Paresthesia and Paralysis. Report pain ASAP.

Bed rest: Leg should be straight (6-8 hours), can ambulate after this.

+ Positive Troponin: Heart Attack (MI).

Clot Buster: “Thrombolytics, Fibrinolytics”

- ✓ t-PA: Alteplase, Streptokinase (Dissolves clot only).
- ✓ Preferably within 1-6 hours.
- ✓ Once the clot dissolve : Rapid rise of serum cardiac marker (Troponin).
- ✓ Bleed risk: 8- hour duration.

Bleed risk (Patient Education)

No Peptic ulcer or active bleed.

No Rugs/ Dim halls

No razors, hard brushing, constipation.

No Herbs start with “G” Gingko, Garlic and Ginseng.

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AFTERCARE

Anticoagulants (Clot Prevention).

Antiplatelets (Less potent)

ASA& Clopidogrel

Platelet less than 50K : risky (Normal: 150-400k)

No need to check INR/ PTT

Anticoagulants (Most potent)

Warfarin : INR (2.5-3.5/ Antidote: Vot: K)

Heparin (Enoxaparin): aPTT (46-100/ Antidot: protamine Sulfate).

Why avoid NSAIDs in MI???

Statin Drugs

Ex: Lovastatin, Rosuvastatin, Atorvastatin, Fluvastatin

Drugs that restrict lipoprotein production.

Hepatotoxic/ Nephrotoxic

Stop use: Rhabdomyolysis

Urine test: Tea color urine, it indicates Kidney problem.

Heart failure

The heart fails to maintain adequate cardiac output due to impaired pumping ability.

HF: Heart failure

HF: Heavy fluids (backs up in lungs/ body)

Weight gain: water gain

Signs and Symptoms

Right sided heart failure:

- ✓ Peripheral edema
- ✓ Weight gain
- ✓ JVD

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- ✓ **Abdominal growth: Ascites/ Hepatomegaly/ Splenomegaly**

Left sided heart failure

- ✓ **Pulmonary edema**
- ✓ **Crackles in lungs**
- ✓ **Pink frothy “blood tinged” sputum**
- ✓ **Orthopnea: Difficulty breathing when lying flat.**

Diagnostic tests:

Labs: BNP (B-type natriuretic peptides)

B: Broken ventricles

Nesiritide (Natrecor): Stop med for 2 hours prior to drawing BNP.

- ✓ **Chest X-ray: shows cardiomegaly.**
- ✓ **ECG.**

Nursing care and interventions

D: Diet low sodium and fluid (2l or 2g or less/ day)

R: Risk for falls

B: BP & BNP

E: Elevate legs (With pillows/ high fowlers)

D: Daily weights (3lbs/ day or 5lbs/ week)

S: Sex (2 flights of stairs with no SOB).

S: Stockings (“Ted hose” decrease blood pooling)

Medical Treatment

A: ACE & ARBS (Lisinopril, losartan)

B: Beta blockers (Atenolol)

C: Calcium CB: (Nifedipine, verapamil, Cardizem).

D: Digoxin (Cardiac Glycoside)

D: Dilators (Nitroglycerin)

D: Diuretics (Furosemide/ Hydrochlorothiazide/ Spironolactone)

Milrinone : Palliative care

Pulmonary Edema

Left ventricle has failed and blood is backing up to the lungs.

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Signs and Symptoms

- ✓ Severe hypoxia
- ✓ Sudden onset
- ✓ Restless
- ✓ Breathless
- ✓ Productive cough- Pink frothy sputum.

Treatment

Furosemide: Lasix

- ✓ Administer Slowly (40 mg IV push/ 1-2 minutes)
- Side effect: Hypotension and Ototoxicity
- ✓ Nitroglycerin IV
- ✓ Digoxin
- ✓ Morphine
- ✓ Synthetic BNP: Nesiritide (Natrecor)

Nursing Interventions

Position: Upright/ legs down

Check lung sound, avoid fluid volume excess.

Vascular Disorders

Peripheral Arterial Disease (PAD): Involves thickening of artery walls, which results in a progressive narrowing of the arteries of the upper and the lower extremities.

- ✓ Higher in women
- ✓ Non-hispanic African Americans

Risk factors: Tobacco use, Diabetes, Hyperlipidemia, Hypertension, Obesity, Sedentary lifestyle and stress.

- ✓ **Clinical Manifestations:** Classic symptom of lower extremity PAD is **intermittent claudication** which is ischemic muscle pain that is caused by exercise, resolve within 10 minutes or less with rest.
- ✓ **Paresthesia, numbness or tingling :** In the toe or feet may result from nerve tissue ischemia. True peripheral neuropathy occurs more often in patients with Diabetes.
- ✓ Skin becomes thin, shiny , taut and hair loss occurs on the lower legs.
- ✓ **Elevation pallor:** Blanching of the foot develops in response to leg elevation.
- ✓ **Reactive Hyperemia:** Redness of the foot develops when the limb is in dependent position.

Complications

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- ✓ Prolonged ischemia leads to atrophy of the skin and underlying muscles.
- ✓ Arterial ulcers and gangrene

Diagnostic studies

- ✓ Doppler ultrasonography
- ✓ Ankle brachial index (Normal 1.00 to 1.40)

Collaborative care

- ✓ Risk factor modification
- ✓ Tobacco cessation
- ✓ Diabetes is a major risk factor for PAD and increase the risk of amputation in these patients.
- ✓ Hypertension: is a well known risk factor for PAD progression, as well as other CVD events (Eg. Stroke, MI and HF)

Types of arterial disorders

Thromboangiitis Obliterans (Buerger's Disease): Is a nonatherosclerotic, segmental, recurrent inflammatory disorder of the small and medium –sized arteries and veins of the upper and lower extremities.

- ✓ Mostly in young men less than 45 years of age with a long history of tobacco or marijuana use.
- ✓ As the disease progresses, rest pain and ischemic ulcerations develop, colour and temperature changes of the limbs.
- ✓ There are no laboratory or diagnostic tests specific to Burger's disease. Diagnosis is made based on age of onset; history; exclusion of autoimmune disease.

Raynaud's Disease

- ✓ Vasospastic disorder of small cutaneous arteries, most often involving the fingers and toes.
- ✓ More common in girls.
- ✓ Vasospasm induced color changes of fingers, toes, ears and nose (White, blue and red).
- ✓ Exposure to cold, emotional upset, tobacco use and caffeine often bring on symptoms.
- ✓ Coldness and numbness in the vasoconstrictive phase followed by throbbing, aching pain, tingling and swelling.

Nursing management

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- ✓ Tell patient to wear loose, warm clothing as protection from the cold, including gloves when handling cold objects.
- ✓ Stop using all tobacco products, avoid caffeine and all other drugs that have vasoconstrictive effects (Eg: Cocaine, amphetamines, ergotamine, pseudoephedrine).
- ✓ Teach patient about stress management.
- ✓ When conservative management is ineffective, drug therapy is considered.
- ✓ Sustained release calcium channel blockers (Eg. Nifedipine (Procardia) are the first line drug therapy.

Venous Disorders

Phlebitis: Is inflammation of the walls of small cannulated veins of the hand or arm.

Sign and symptoms: Pain, tenderness, warmth, erythema and swelling.

Apply warmth, moist heat and administer oral NSAIDs (Eg. Diclofenac).

Venous Thrombosis

Venous thrombosis involves the formation of a thrombus in association with inflammation of the vein.

Classification

Superficial vein thrombosis

DVT

Causes/ Risks

Virchow's triad:

- ✓ Venous stasis
- ✓ **Damage of the endothelium (Inner lining of the vein).**
- ✓ Hypercoagulability of the blood.

Prolonged bed rest increase the risk of DVT.

Chemotherapy cause hypercoagulation.

Female age above 35/ smoker/ never give oral contraceptives : increase the risk of MI and Dvt.

Clinical Manifestations

Edema, Increased pigmentation, eczema, unilateral leg edema, pain and erythema.

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Treatment

- ✓ Collaborative care
- ✓ VTE prophylaxis is a core measure of high quality health care in hospitalized surgical patients.
- ✓ Early and aggressive mobilization.
- ✓ Ambulatory patients: out of bed every 4-6 hours/ day.
- ✓ Antiembolism stockings: Worn during day and removed at night.
- ✓ SCDs (Sequential Compression devices): are inflatable garments wrapped around the legs. They apply external pressure to the lower extremities by means of an electric pump.
- ✓ SCDs are not worn when the patient has an active VTE because of the risk of PE.
- ✓ Teach patient to change position every 2 hour while awake.

Anticoagulants: Antidote.....?

Warfarin (Coumadin): Long term anticoagulation

Begin to take effect in 48-72 hours and take several days to reach at the peak.

Level monitored: INR

Therapeutic value: 2-3

Herbs like Ginseng reduce the effectiveness.

Do not give antiplatelets or NSAIDs with Warfarin.

Heparin(UH): Antidote...?

Frequent monitoring of clotting status as measured by activated partial thromboplastin time (aPTT)

Normal value: 25-35 sec

Therapeutic value: 46-70 sec

Side effect of Heparin: HIT (Severe sudden reduction in the platelet count)

HIT is diagnosed by measuring the presences of heparin antibodies in the blood.

Treatment require: Immediately stopping heparin therapy.

LMWH: Longer half life and fewer bleeding complications than UH.

Less likely to cause HIT and Osteoporosis.

Eg. Enoxaparin(Lovenox), Dalteparin(Fragmin), Nadroparin(Fraxiparine).

Pacemaker

Used to increase the heart rate with symptomatic bradycardia (HR less than 60)

Indications

Dizziness

Feeling of impending doom

Fatigue and Drowsiness

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Nursing intervention

Monitor signs of infection: 24-48 hours.

Risk of electronic dislodgement.

Immobilize the arm: No shampooing first 2-3 days.

No lifting above shoulder

Check pulse daily.

ID card

Avoid contact sports like wrestling, boxing.

Cardiac Tamponade (Pericardial tamponade)

Blood, fluid and exudates have leaked into pericardial sac.

Causes: Motor vehicle collision, Stab wound (gun shoot), MI, Pericarditis, trauma to the heart.

Clinical manifestations: Cardiac output decrease, CVP increase, BP decrease, Heart sound: Muffled distant heart sound, Neck vein: Distended.

Pressure in all chambers is all the same.

Pulse paradoxus: when systolic pressure fall greater than 10 mm of hg.
Very difficult to determine manually/ easy way to detect on monitor.

Narrowed pulse pressure: Differences between systolic and diastolic blood pressure.

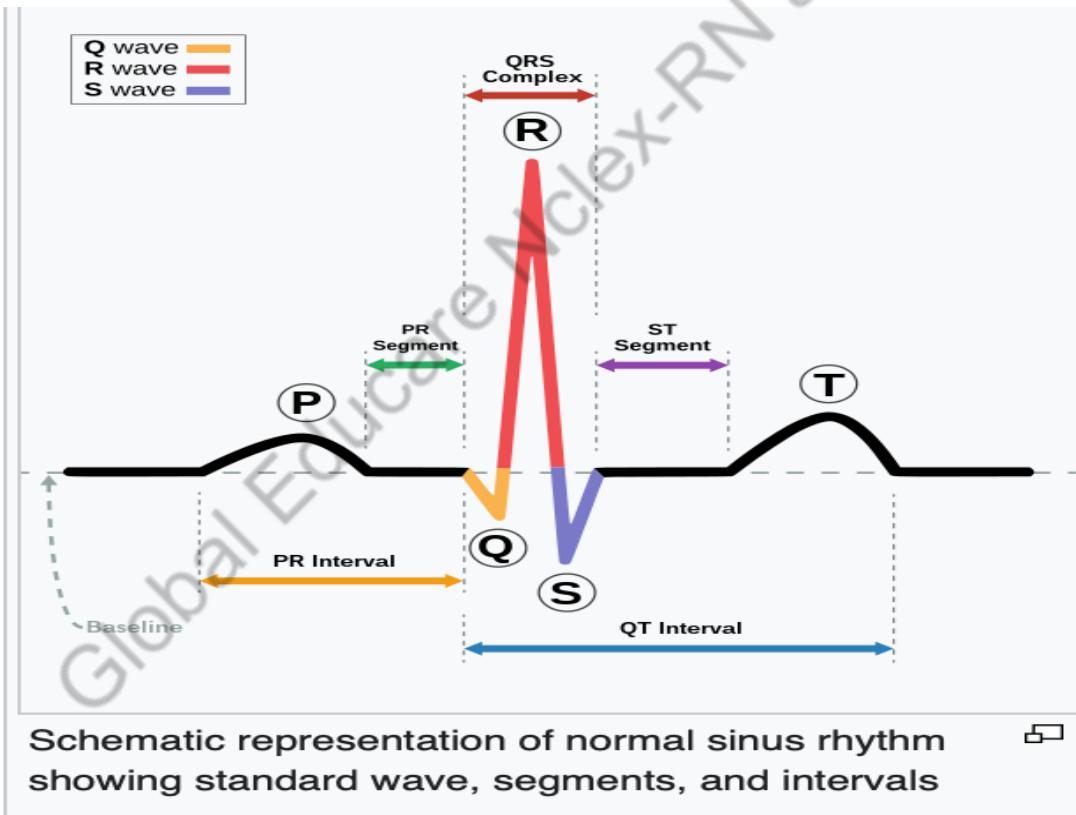
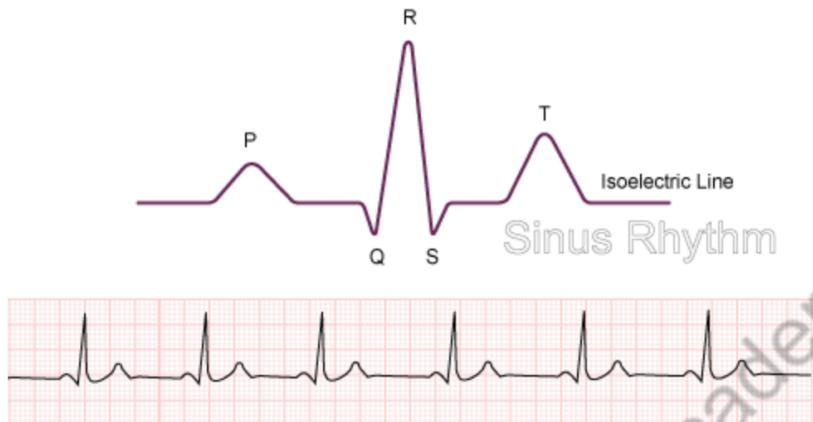
Treatment: Pericardiocentesis.

Cradiac Arrythmias

Normal sinus rhythm: Rhythm that starts in the SA node at a rate of 60-100 times per minute and follows the normal conduction pathways.

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Image: P,QRS & T Wave



Defibrillation

Is the treatment for immediately life threatening arrhythmias with which the patient does not have the pulse.

Treatment:

VF

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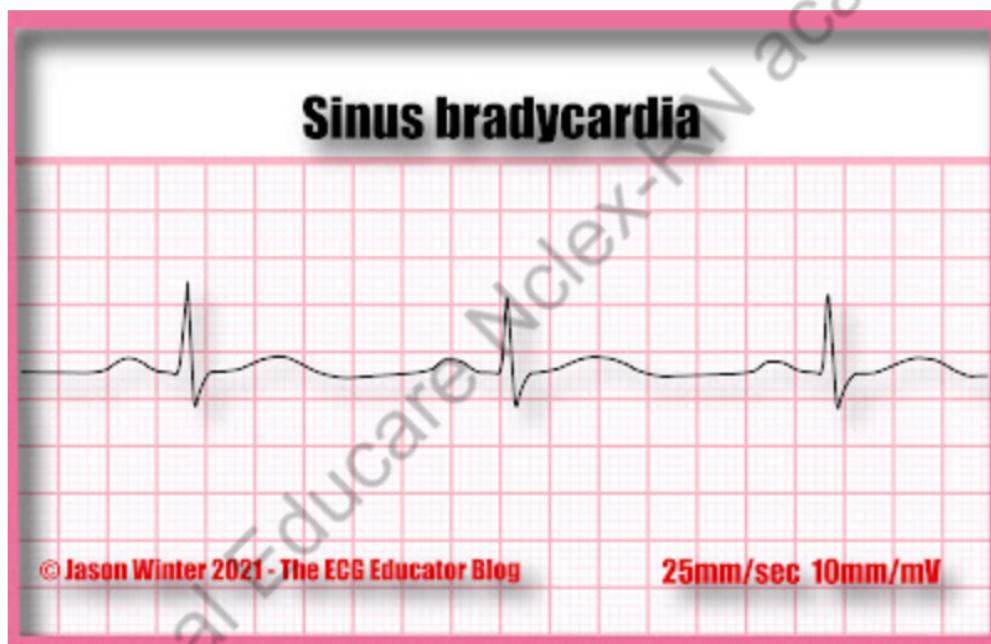
Pulseless VT

Cardioversion

Is any process that aims to convert an arrhythmia back to sinus rhythm.
Used in less urgent cases eg. AF to try to revert the rhythm back to sinus.

Sinus Bradycardia

In sinus Bradycardia, HR is less than 60 beats/minute and the rhythm is regular.
It may be a normal sinus rhythm in aerobically trained athletes and in some people during sleep.
It also occurs in response to carotid sinus massage, valsalva maneuver, hypothermia, increased intraocular pressure, vagal stimulation and administration of certain drugs (eg. Beta adrenergic blockers, calcium channel blockers).



ECG strip showing sinus bradycardia

Treatment:

Atropine

Symptomatic bradycardia: Permanent pacemaker.

Sinus Tachycardia

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Sinus Tachycardia: The sinus rate is 101 and 200 beats/minute. Clinical Associations is associated with physiologic and psychologic stressors such as exercise, fever, pain, hypotension, hypovolemia, anemia, hypoxia, hypoglycemia, myocardial, myocardial ischemian, heart failure (HF), hyperthyroidism, anxiety, and fear.

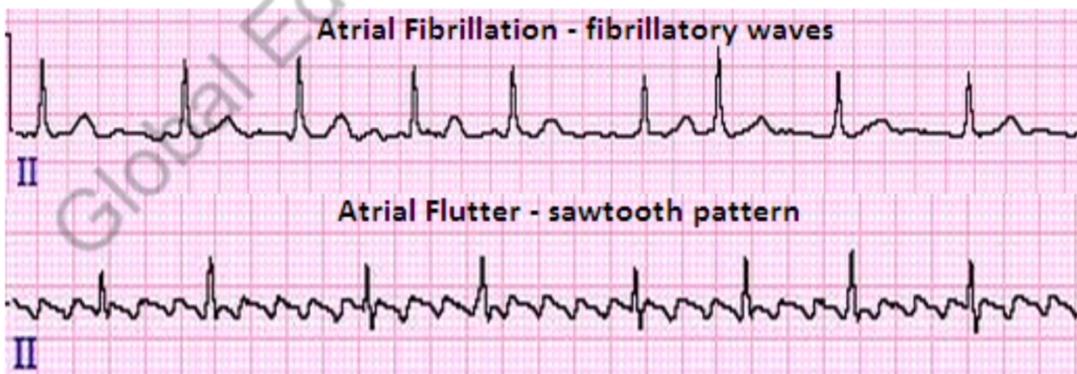


Treatment:

In clinically stable patients, **vagal maneuvers can be attempted. In addition, β IV-adrenergic blockers (e.g., metoprolol [Lopressor]), adenosine (Adenocard), or calcium channel blockers (e.g., diltiazem [Cardizem]) can be given to reduce HR and decrease myocardial oxygen consumption.** In clinically unstable patients, synchronized cardioversion is used.

ATRIAL FLUTTER

Atrial flutter rarely occurs in a healthy heart. It is associated with CAD, hypertension, mitral valve disorders, pulmonary embolus, chronic lung disease, cardiomyopathy.



TREATMENT

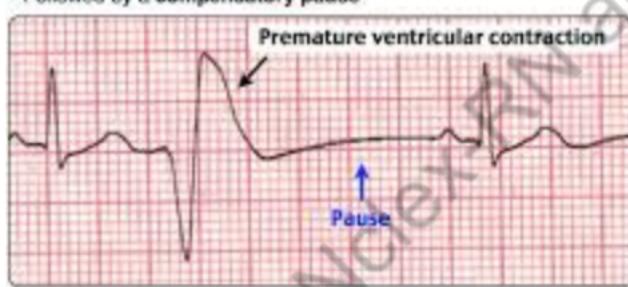
- **Warfarin (Coumadin) is given to prevent stroke in patients who have atrial flutter**
- Drugs used to control ventricular rate include **calcium blockers and β -adrenergic blockers.**

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ATRIAL FIBRILLATION

- The goals of treatment include a decrease in ventricular response (to less than 100 beats/minute).
- Ventricular rate control is a priority for patients with atrial fibrillation.
- Calcium channel blockers (e.g., diltiazem), β -adrenergic blockers (e.g., metoprolol), dronedarone, and digoxin (Lanoxin).
- If a patient is in atrial fibrillation for longer than 48 hours, anticoagulation therapy with warfarin is needed for 3 to 4 weeks before the cardioversion and for several weeks after successful cardioversion.

Premature Ventricular Contractions



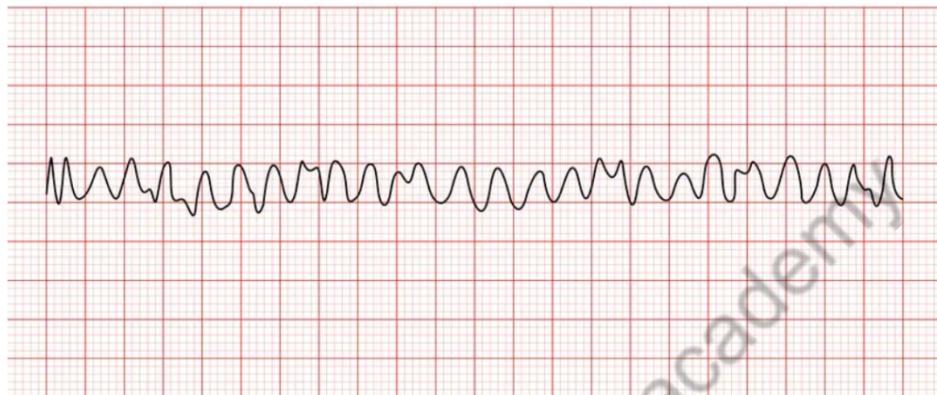
(E.g., oxygen therapy for hypoxia, electrolyte replacement). Assessment of the patient's hemodynamic status is important to determine if treatment with drug therapy is needed.

Drug therapy includes β -adrenergic blockers, procainamide (Pronestyl), or amiodarone.

VF (Ventricular Fibrillation)

Treatment consists of immediate initiation of CPR and advanced cardiac life support (ACLS) with the use of defibrillation and definitive drug therapy (e.g., epinephrine, vasopressin [pitressin]). There should be no delay in using a defibrillation once available.

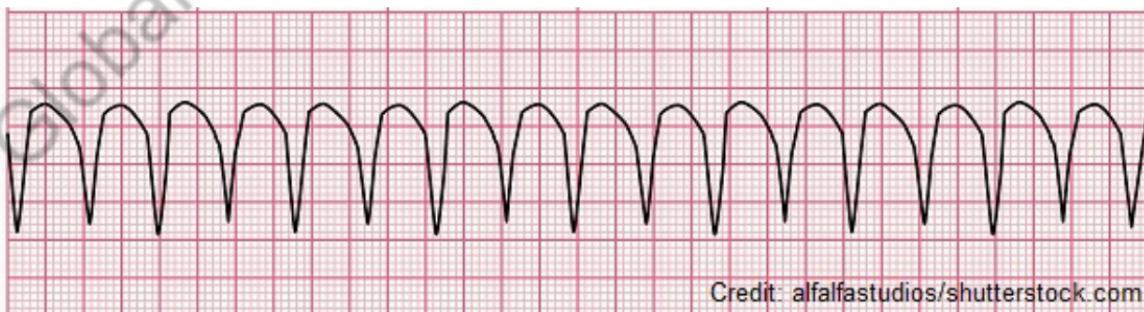
Ventricular Fibrillation (VF)



VT (Ventricular tachycardia)

Cardioversion is used if drug therapy is ineffective.

VT without a pulse is a life-threatening situation. It is treated in the same manner as VF. Cardiopulmonary resuscitation (CPR) and rapid defibrillation are the first lines of treatment, followed by the administration of vasopressors (e.g., epinephrine) and antidysrhythmics (e.g., amiodarone) if de Ventricular Fibrillation.



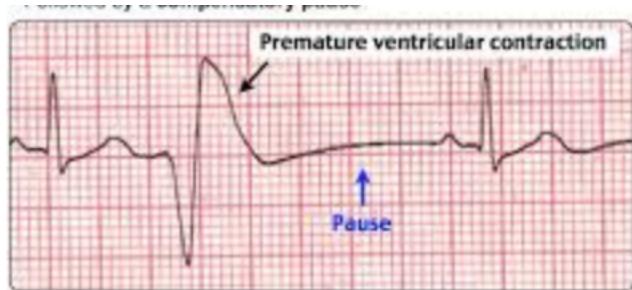
Credit: alfalfastudios/shutterstock.com

PVC (Premature ventricular contraction)

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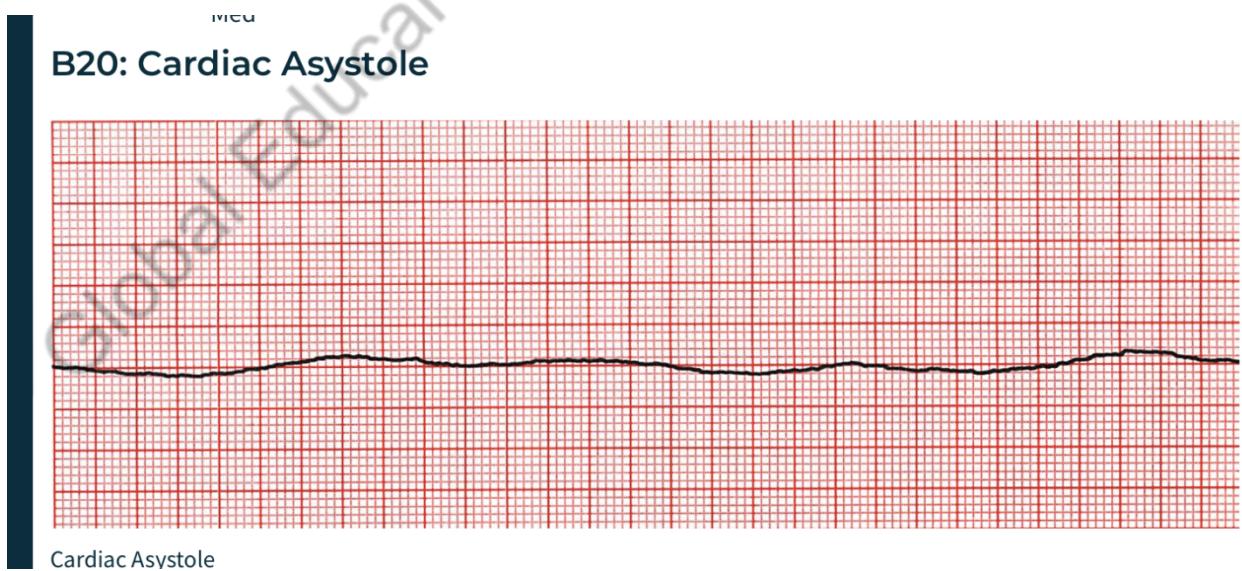
(E.g., oxygen therapy for hypoxia, electrolyte replacement). Assessment of the patient's hemodynamic status is important to determine if treatment with drug therapy is needed.

Drug therapy includes β -adrenergic blockers, procainamide (Pronestyl), or amiodarone.



Asystole

Treatment :Epinephrine and vasopressin, intubation



First degree heart block

"This material is intended for educational purposes only"

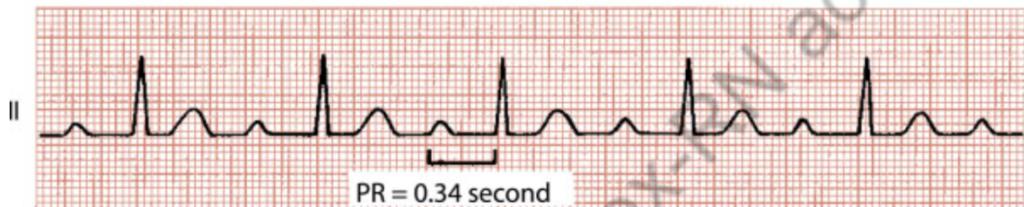
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First-degree AV block is a type of AV block in which every impulse is conducted to the ventricles but the time of AV conduction is prolonged.

TREATMENT

There is no treatment for first-degree AV block. Monitor patients for any new changes in heart rhythm.

First-Degree AV Block



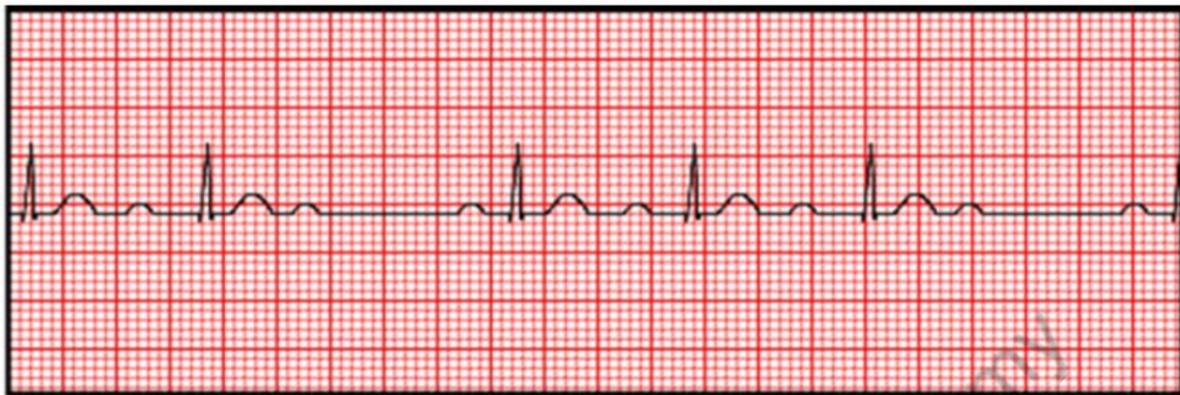
Second degree HB:

It occurs because of a prolonged AV conduction time until an atrial impulse is nonconducted and a QRS complex is blocked (missing).

TREATMENT

If the patient is symptomatic, atropine is used to increase HR, or a temporary pacemaker may be needed, especially if the patient has had an MI. If the patient is asymptomatic, the rhythm is closely observed with a transcutaneous pacemaker on standby.

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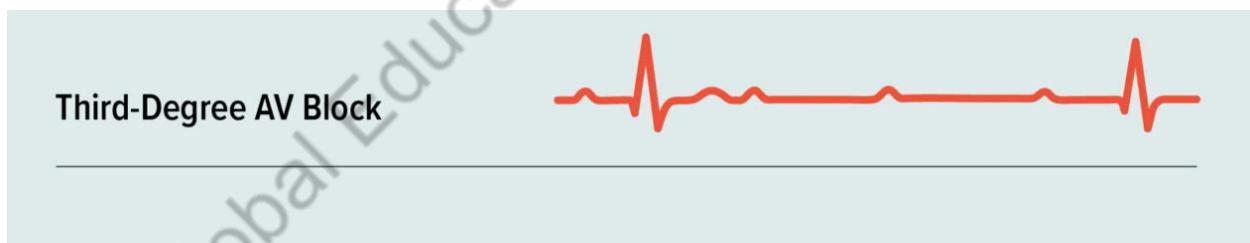


Third degree HB:

Third-Degree AV block, or complete heart block, constitutes one form of AV dissociation in which no impulses from the atria are conducted to the ventricles.

TREATMENT

The use of drugs such as atropine, dopamine, and epinephrine is a temporary measure to increase HR and support blood pressure (BP) until temporary pacing is started.



Treatment

LAVA

Use Lidocaine and Amiodorone for ventricular problem.

PVC: Lidocaine

Amiodorone

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V Tach: Lidocaine

AF/ Atrial Flutter

Adenosine

Beta blockers

Calcium channel blockers

Digoxin

VF: Defibrillate

Asystole

Epinephrin first given

Atropine

S/E anticholinergics

Drugs

classification	name	indication	Side/adverse effects	Nursing consideration
ACE Inhibitors	– Pril Enalapril Lisinopril ramipril	– Decrease BP – Prevent MI/CVA	– Antioedema – Cough – Elevate – Potassium – Orthostatic – Hypotension – dizziness	– Check K ⁺ and hold the med, if high. – Avoid salt substitutes – Use with caution with renal failure and liver disease and if taking K ⁺ sparing diuretics. – Slow position changes.
ARB	– SARTAN IRBESARTAN VAL SARTAN LO SARTAN OLME SARTAN	– Decrease BP – HR – Prevent MI/CVA	– Orthostatic hypotension – Dizziness	– Check K ⁺ and hold the med, if high. – Avoid salt substitutes

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				<ul style="list-style-type: none"> – Use with caution with renal failure and liver disease and if taking K⁺ sparing diuretics. – Slow position changes.
Beta-blockers	<ul style="list-style-type: none"> – Lol Atenolol Carvedilol Metaprolol Nebivolol propranolol 	<ul style="list-style-type: none"> – Decrease BP and HR – Prevent MI/CVA 	<ul style="list-style-type: none"> – Orthostatic hypotension – Bradycardia – Dizziness 	<ul style="list-style-type: none"> – Hold if HR <60 or BP <100/60 – Slow position changes – Use with caution with Erectile Dysfunction drugs. – Use with caution Asthma/COPD: Bronchconstrictions – Use with caution with Diabetics: Blood sugar masking.
Calcium channel blockers	<ul style="list-style-type: none"> – pine almodipine nifedipine diltiazem verapamil 	<ul style="list-style-type: none"> – Decrease BP and HR – Treat angine 	<ul style="list-style-type: none"> – Orthostatic hypotension – Bradycardia – Dizziness <p>A/E peripheral and pulmonary edema</p>	
Cardiac Glycoside	Digoxin	<ul style="list-style-type: none"> – Decrease BP and HR or afib(does not affect BP) 	<ul style="list-style-type: none"> – Bradycardia – Digoxin – Toxicity <p>Early signs: Nausea/vomiting/diarrhea/anorexia</p> <p>Late signs: Arrhythmias Vision changes</p>	<ul style="list-style-type: none"> – Hold if HR<60 for adults – Hold if HR<70 for child – Hold if HR<90 for infant – Check K⁺ level (Hypokalemia can precipitate dig toxicity) – Memory trick for Digoxin: ATP – Apical pulse – Toxicity – Potassium – Therapeutic levels: 0.5-2

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				<ul style="list-style-type: none"> – Antidote: Immune fab/Digibind
Antiplatelet	Aspirine (ASA) Clopidogrel prasugrel	Prevent blood clots	<ul style="list-style-type: none"> – Bleeding – Ototoxic 	<ul style="list-style-type: none"> – Check ringing in ears – Take with food – Possible allergic reactions with NSAIDs – Don't give to children <18 years(can cause Reye's disease) – Antidote:Activated Charcoal ▪ Assess for bleeding ▪ Hold if platelet count <150,000 or signs of active bleeding ▪ Use with caution with herbs starting with G (Ginger ,Ginseng etc)
Antianginals	Isosorbide Nitroglycerine Minoxidil niboproside	<ul style="list-style-type: none"> – Treat chest Pain and decrease BP – Hypertension causes 	<ul style="list-style-type: none"> – Headache – Hypotension 	<ul style="list-style-type: none"> – Don't give if taking erectile dysfunction drug; may cause severe hypotension – Give 1 sublingual tablet every 5 min and give a max of 3 doses for chest pain. – Store nitro in dark-coloured bottle – Apply patch in AM and take off in PM
Anticoagulant	Apixaban Dalteparin Rivaroxaban	<ul style="list-style-type: none"> – Treat and prevent blood clots for those with 	<ul style="list-style-type: none"> – Bleeding 	<ul style="list-style-type: none"> – Assess for bleeding and don't give if active bleeding: – Hold if platelets <150,000

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Low molecular weight heparin	Enoxaparin Dalteprin Heparin IV Warfarin	afib, valves, MI, DVT, PE Prevent clots for post-op or bed rest prevent blood clots or bridge therapy for PO anticoagulants to prevent blood clots for those with arrhythmias or artificial valves		<ul style="list-style-type: none"> – Hold if significant drop in Hgb and Hct – Monitor aPTT (normal/control=25-35; therapeutic : 1.5-2.5 times normal/control) – Antidote is protamine sulfate – Hold INR >Therapeutic level – Therapeutic level : 2-3c for afib, 3-4 for artificial valves – Don't give increase or decrease amount of green leafy vegetables. – Antidote : vitamin K
Diuretics	K-sparing Diuretics Spironolactone Loop Diuretics Furosemide Bumetanide Torsemide Thiazide- Diuretics Hydrochlorothiazide Chlorthalidone	<ul style="list-style-type: none"> – Treat edema and HTN 	Hypokalemia	<ul style="list-style-type: none"> – Check signs of hypokalemia <p>General instructions</p> <ul style="list-style-type: none"> – Slow position changes – Apply sunscreen while in sun – Assess kidney function tests – Assess lung sounds, generalized edema for pulmonary edema.
Thrombolytic	Alteplase Streptokinase tenecteplase	MI/Ischemic CVA	Bleeding	<ul style="list-style-type: none"> – Watch for signs of bleeding
vasopressor	Dopamine Epinephrine vasopressin	Shock	Arrhythmias	<ul style="list-style-type: none"> – Assess BP and HR – Administer fluid before giving the meds. – Continuous EKG monitoring

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vasodilator	Hydralazine	Decrease BP		Hold if BP <100/60
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Questions

- A client with a history of type 2 diabetes is admitted to the hospital with chest pain. The client is scheduled for a cardiac catheterization. Which medication would need to be withheld for 24 hours before the procedure and for 48 hours after the procedure?
 1. Glipizide
 2. Metformin
 3. Repaglinide
 4. Regular insulin

A client in sinus bradycardia, with a heart rate of 45 beats per minute and blood pressure of 82/60 mm Hg, reports dizziness. Which intervention should the nurse anticipate will be prescribed?

1. Administer digoxin.
 2. Defibrillate the client.
 3. Continue to monitor the client.
 4. Prepare for transcutaneous pacing.
- The nurse in a medical unit is caring for a client with heart failure. The client suddenly develops extreme dyspnea, tachycardia, and lung crackles. The nurse immediately asks another nurse to contact the primary health care provider and prepares to implement which **priority** interventions? **Select all that apply.**
 - 1. Administering oxygen
 - 2. Inserting a Foley catheter
 - 3. Administering furosemide

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- 4. Administering morphine sulfate intravenously
 - 5. Transporting the client to the coronary care unit
 - 6. Placing the client in a low-Fowler's side-lying position
- A client with myocardial infarction suddenly becomes tachycardic, shows signs of air hunger, and begins coughing frothy, pink-tinged sputum. Which finding would the nurse anticipate when auscultating the client's breath sounds?
 1. Stridor
 2. Crackles
 3. Scattered rhonchi
 4. Diminished breath sounds
- A client with myocardial infarction is developing cardiogenic shock. What condition should the nurse carefully assess the client for?
 1. Paradoxical pulse
 2. Ventricular dysrhythmias
 3. Rising diastolic blood pressure
 4. Falling central venous pressure
- A client who had cardiac surgery 24 hours ago has had a urine output averaging 20ml/hr for 2 hours. The client received a single bolus of 500 ml of intravenous fluid. Urine output for the subsequent hour was 25ml. Daily laboratory results indicate that the blood urea nitrogen level is 45 mg/dl (16mmol/l) and the serum creatinine level is 2.2 mg/dl (194 mcmol/l). On the basis of these findings, the nurse would anticipate that the client is at risk for which problem?
 1. Hypovolemia
 2. Acute kidney injury
 3. Glomerulonephritis

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4. Urinary tract infection

- The nurse is reviewing an electrocardiogram rhythm strip. The P waves and QRS complexes are regular. The PR interval is 0.16 seconds, and QRS complexes measure 0.06 seconds. The overall heart rate is 64 beats per minute. Which action should the nurse take?
 1. Check vital signs.
 2. Check laboratory test results.
 3. Monitor for any rhythm change.
 4. Notify the primary health care provider.
- A client is wearing a continuous cardiac monitor, which begins to sound its alarm. The nurse sees no electrocardiographic complexes on the screen. Which is the **priority** nursing action?
 1. Call a code.
 2. Check the client's status.
 3. Call the health care provider.
 4. Document the lack of complexes.
- The nurse is watching the cardiac monitor and notices that a client's rhythm suddenly changes. There are no P waves, the QRS complexes are wide, and the ventricular rate is regular but more than 140 beats per minute. The nurse determines that the client is experiencing which dysrhythmia?
 1. Sinus tachycardia
 2. Ventricular fibrillation
 3. Ventricular tachycardia

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4. Premature ventricular contractions
- The client has frequent bursts of ventricular tachycardia on the cardiac monitor. What should the nurse be **most** concerned about with this dysrhythmia?
 1. It can develop into ventricular fibrillation at any time.
 2. It is almost impossible to convert to a normal rhythm.
 3. It is uncomfortable for the client, giving a sense of impending doom.
 4. It produces a high cardiac output with cerebral and myocardial ischemia.
 - A client is having frequent premature ventricular contractions. The nurse should place **priority** on assessment of which item?
 1. Causative factors, such as caffeine
 2. Sensation of fluttering or palpitations
 3. Blood pressure and oxygen saturation
 4. Precipitating factors, such as infection
 - The client has developed atrial fibrillation, with a ventricular rate of 150 beats per minute. The nurse should assess the client for which associated signs and/or symptoms? **Select all that apply.**
 1. Syncope
 2. Dizziness
 3. Palpitations
 4. Hypertension
 5. Flat neck veins

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- The nurse is watching the cardiac monitor, and a client's rhythm suddenly changes. There are no P waves, instead, there are fibrillatory waves before each QRS complex. How should nurse interpret the client's heart rhythm?
 1. Atrial fibrillation
 2. Sinus tachycardia
 3. Ventricular fibrillation
 4. Ventricular tachycardia
- The nurse is assisting to defibrillate a client in ventricular fibrillation. After placing the pads on the client's chest and before discharging the device, which intervention is a **priority**?
 1. Ensure that the client has been intubated.
 2. Set the defibrillation or the "synchronize" mode.
 3. Administer an amiodarone bolus intravenously.
 4. Confirm that the rhythm is ventricular fibrillation.

The nurse is evaluating a client's response to cardioversion. Which assessment would be the **priority**?

- 1. Blood pressure
 - 2. Airway patency
 - 3. Oxygen flow rate
 - 4. Level of consciousness
- The nurse is caring for a client who has just had implantation of an automatic internal cardioverter-defibrillator. The nurse should assess which item based on **priority**?
 1. Anxiety level of the client and family
 2. Activation status and settings of the device
 3. Presence of a Medic Alert card for the client to carry
 3. Knowledge of restrictions on postdischarge physical activity

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- A client's electrocardiogram strip shows atrial and ventricular rates of 110 beats per minute. The PR interval is 0.14 seconds, the QRS complex measures 0.08 seconds, and the PP and RR intervals are regular. How should the nurse interpret this rhythm?
 1. Sinus tachycardia
 2. Sinus bradycardia
 3. Sinus dysrhythmia
 4. Normal sinus rhythm

The nurse is assessing the neurovascular status of a client who returned to the surgical nursing unit 4 hours ago after undergoing aortoiliac bypass graft. The affected leg is warm, and the nurse notes redness and edema. The pedal pulse is palpable. How should the nurse interpret the client's neurovascular status?

- 1. The neurovascular status is normal because of increased blood flow through the leg.
 - 2. The neurovascular status is moderately impaired, and the surgeon should be called.
 - 3. The neurovascular status is slightly deteriorating and should be monitored for another hour.
 - 4. The neurovascular status shows adequate arterial flow, but venous complications are arising.
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- The nurse is evaluating the condition of a client after pericardiocentesis performed to treat cardiac tamponade. Which observation would indicate that the procedure was **effective**?
 1. Muffled heart sounds
 2. Client reports dyspnea
 3. A rise in blood pressure
 4. Jugular venous distention

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The nurse is caring for a client who had a resection of an abdominal aortic aneurysm yesterday. The client has an intravenous (IV) infusion at a rate of 150 ml/hr, unchanged for the last 10 hours. The client's urine output for the last 3 hours has been 90, 50, and 28 ml (28 ml is most recent). The client's blood urea nitrogen level is 35 mg/dl (12.6 mmol/l), and the serum creatinine level is 1.8 mg/dl (159 μmol/l), measured this morning. Which nursing action is the **priority**?

1. Check the serum albumin level.
 2. Check the urine specific gravity.
 3. Continue monitoring urine output.
 4. Call the primary health care provider (PHCP).
- A client with variant angina is scheduled to receive an oral calcium channel blocker twice daily. Which statement by the client indicates the **need for further teaching**?
 1. "I should notify my cardiologist if my feet or legs start to swell."
 2. "I am supposed to report to my cardiologist if my pulse rate decreases below 60."
 3. "Avoiding grapefruit juice will definitely be a challenge for me, since I usually drink it every morning with breakfast."
 4. "My spouse told me that since I have developed this problem, we are going to stop walking in the mall every morning."

The nurse notes that a client with sinus rhythm has a premature ventricular contraction that falls on the T wave of the preceding beat. The client's rhythm suddenly changes to one with no P waves, no definable QRS complexes, and coarse wavy lines of varying amplitude. How should the nurse interpret this rhythm?

1. Asystole
2. Atrial fibrillation
3. Ventricular fibrillation
4. Ventricular tachycard