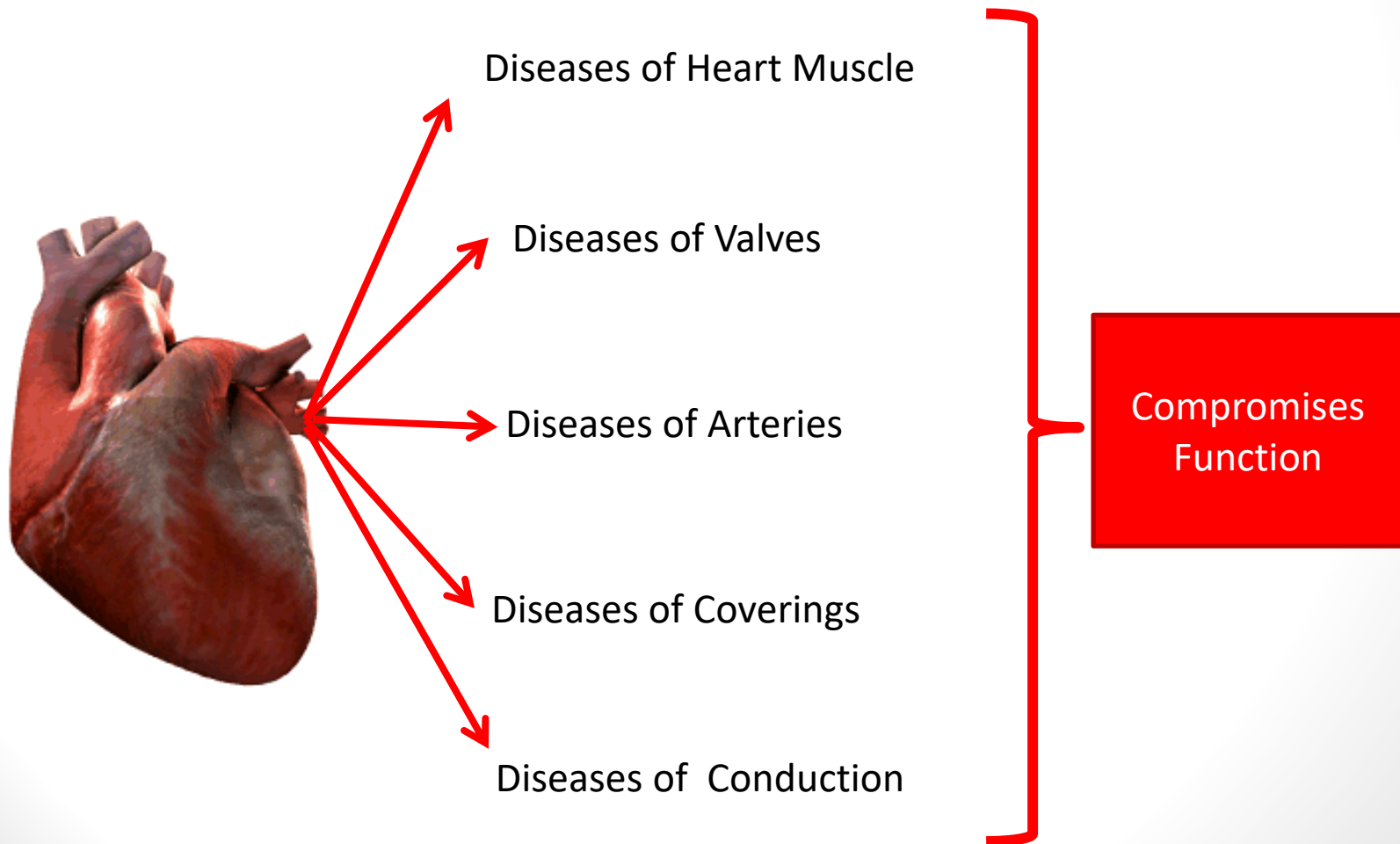




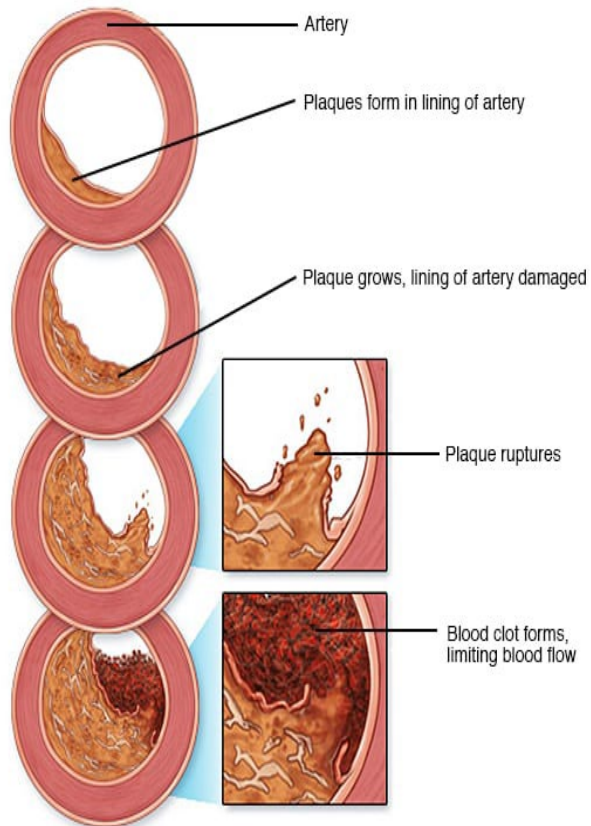
Diseases¹ of the Heart

Sharon Myers RN

So What Could Possibly Go Wrong With Your Heart?

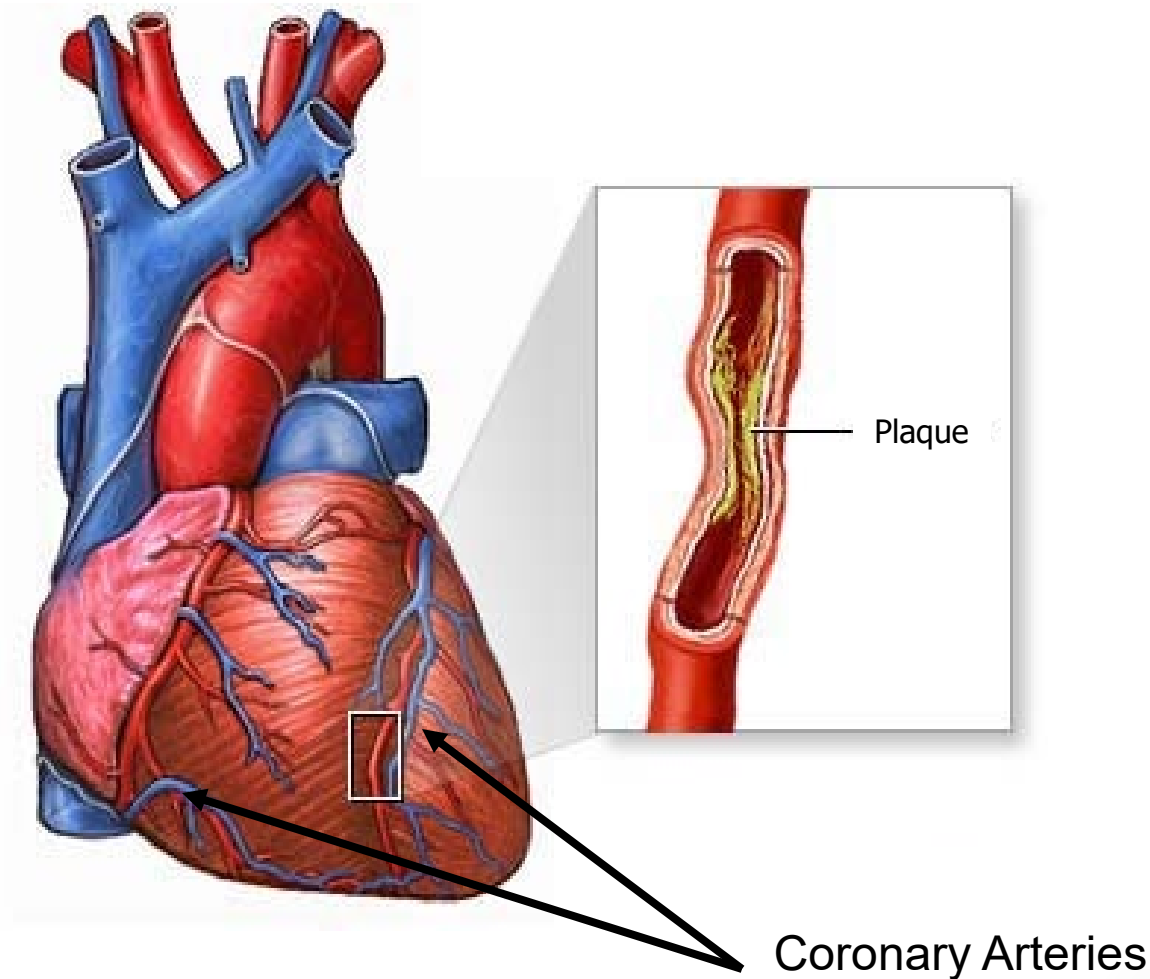


1. Diseases of Arteries

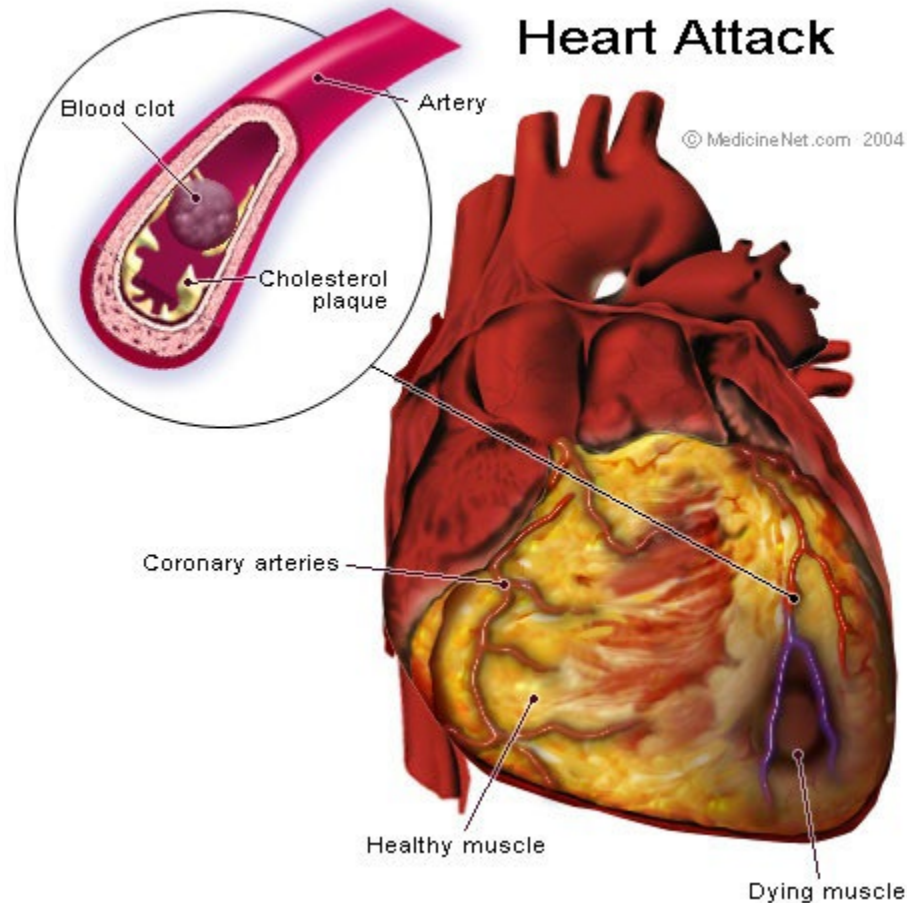


- ♥ Atherosclerosis is a disease that affects the arteries
- ♥ Deposits of fat (principally cholesterol) in the inner lining of arteries
- ♥ It is associated with **spasm** of the vessel, **bleeding** into the vessel and **clotting** on the inner surface of the vessel

The Deposits Of Fat (Plaques) Also Occur In The Arteries Of The Heart

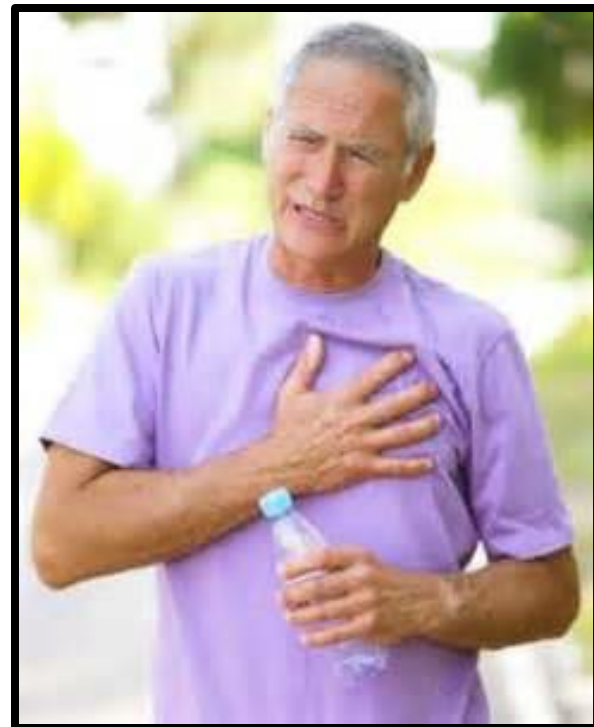


Heart Attack (Myocardial Infarction)

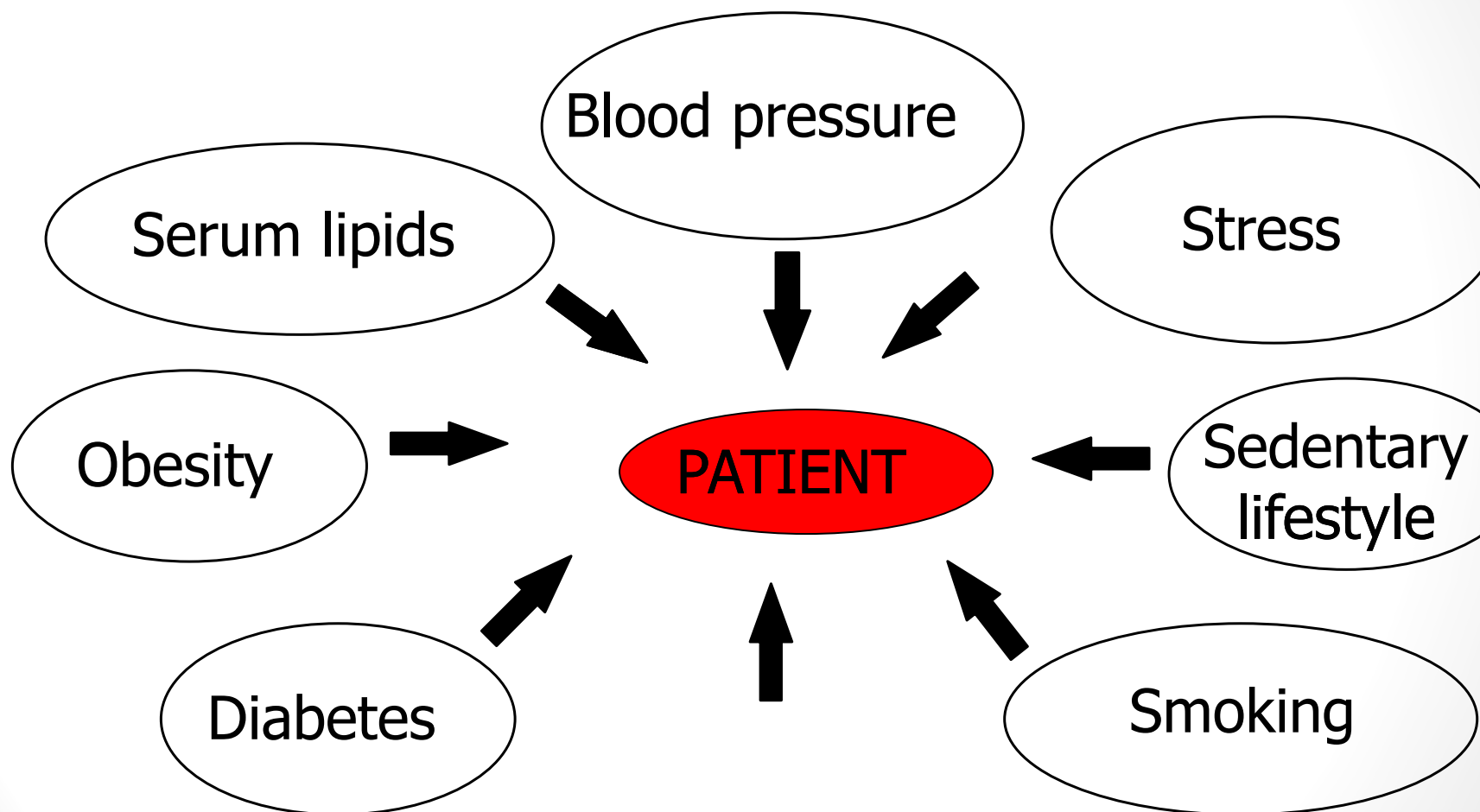


Warning Signs/Symptoms

- ♥ Chest discomfort
- ♥ Discomfort in other areas of upper body
- ♥ Shortness of breath
- ♥ Lightheadedness
- ♥ Nausea/vomiting
- ♥ Back or jaw pain
- ♥ Left arm pain



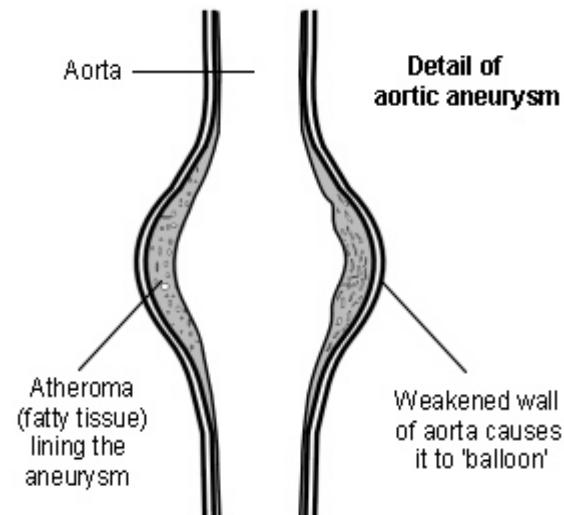
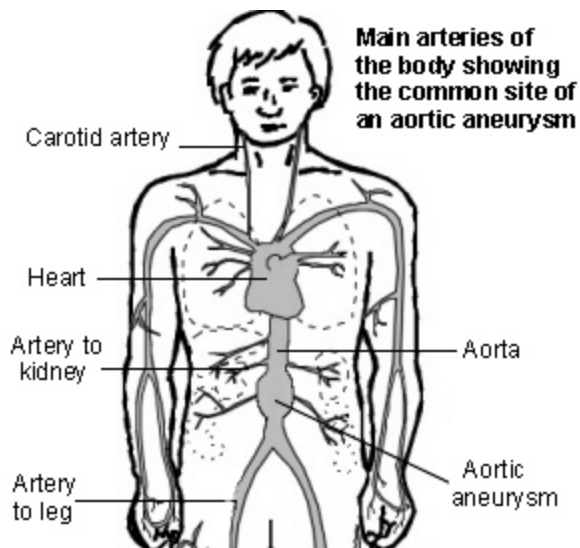
Risk Factors for Coronary Artery Disease



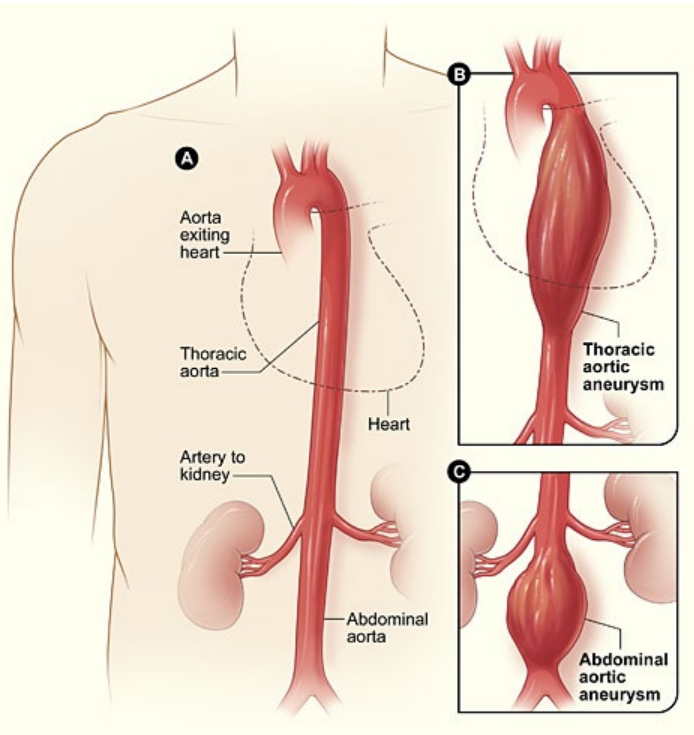
Age, Gender, Family history

1. Diseases of Arteries- Aneurysm

An aneurysm occurs where a section of a blood vessel (artery) balloons out. The wall of an aneurysm is weaker than a normal artery wall. The pressure of the blood inside the artery causes the weaker section of wall to balloon.



1. Diseases of Arteries- Aneurysms



Occur in two main places:

- Abdominal- occur in the part of the aorta that passes through the middle to lower abdomen
- Thoracic- occur in the aorta as it passes through the chest cavity

1. Diseases of Arteries- Aneurysms

Aneurysms increase the risk for:

- Atherosclerotic plaque formation-This will cause further weakening of the artery wall.
- Stroke-A blood clot may form at the site and dislodge
- Pain-Increase in the size of the aneurysm can cause it to press on other organs
- Aneurysm rupture- Because the artery wall thins at this spot, it is fragile and may burst under stress.

*The rupture of an aortic aneurysm is a catastrophic, life-threatening event.

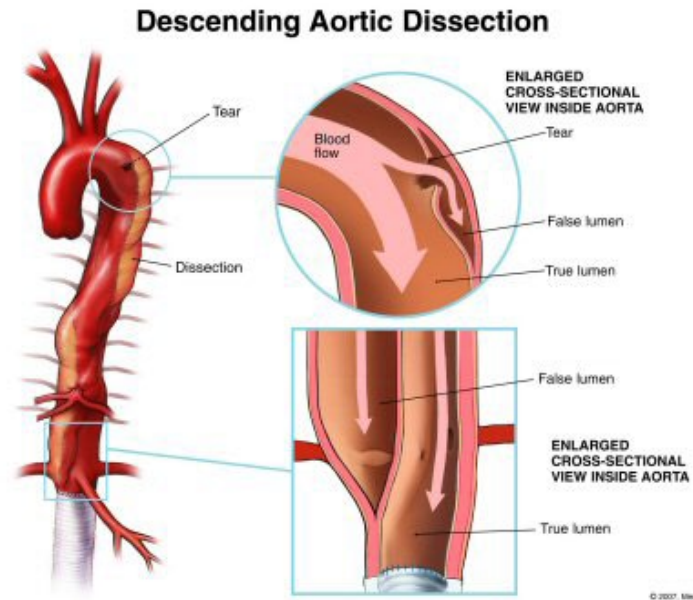
1. Diseases of the Arteries- Aortic Aneurysms

Causes:

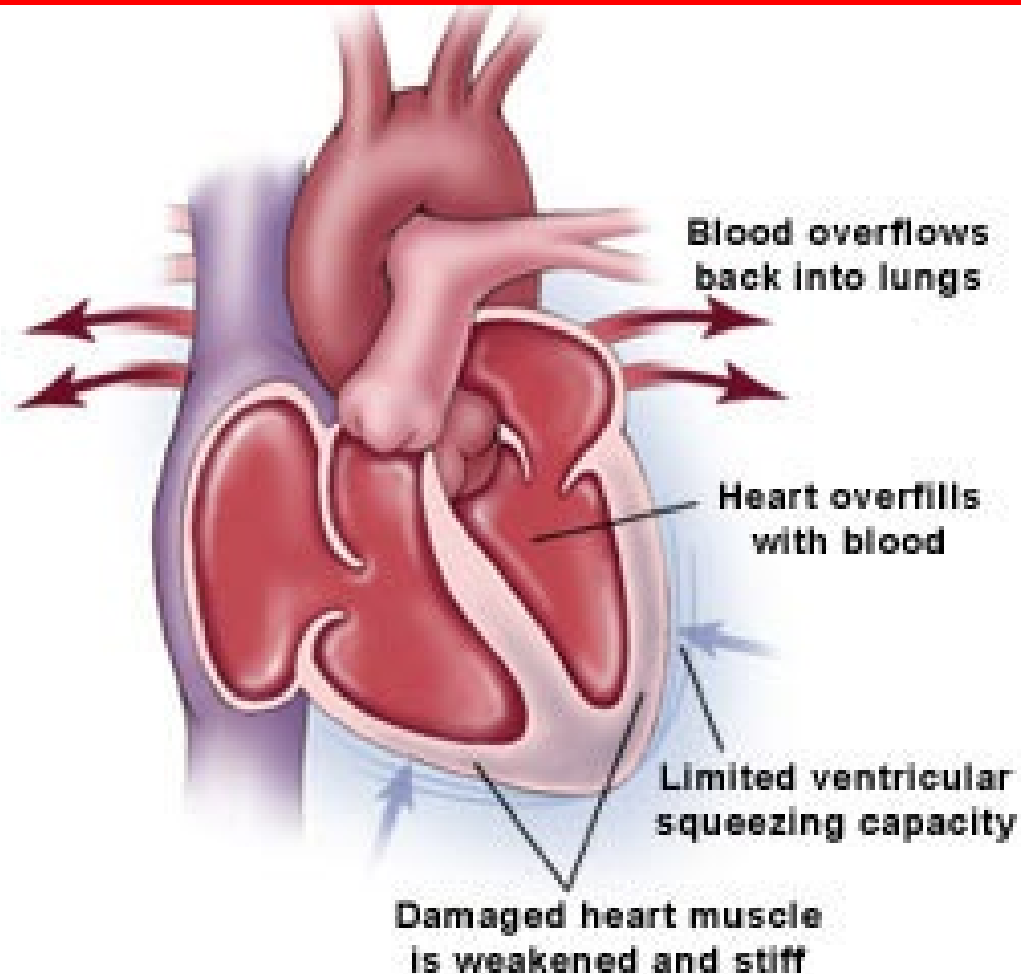
- Atherosclerosis-hardening of the arteries, which weakens arterial walls.
- Hypertension (high blood pressure)
Local injury to the artery.
- Congenital abnormality
- Aging
- Syphilis used to be a common cause of thoracic aneurysms, but it is no longer as common.

1. Diseases of Arteries- Dissecting Aneurysm

Instead of causing a bulge in a thinned artery wall, aortic aneurysms occasionally occur between layers of the artery itself. This is called a "dissecting aneurysm." Blood starts to flow in the separated artery layers cutting off blood flow in the artery. This condition can rapidly lead to rupture of the artery.



2. Diseases of Heart Muscle



2. Diseases of Heart Muscle- Heart Failure

- Heart failure means that the heart's ability to pump blood or fill with blood is diminished.
- Approximately 6 million Americans have heart failure.
- Although some types of heart failure can be treated by surgery, most forms of congestive heart failure are life-long.
- Heart Failure can be managed with lifestyle adjustments (diet, exercise, fluid restriction), and with medication

2. Diseases of Heart Muscle- Heart Failure

Left-sided Heart Failure - the left ventricle typically pumps out inadequate amounts of oxygenated blood to the rest of the body, and fluid backs up into the lungs.

Right-sided Heart Failure - the resistance to blood flow through the lungs exceeds the right ventricle's ability to pump blood into the lungs. Consequently, blood backs up into the liver and other organs. The most common cause of right heart failure is actually left heart failure.

2. Diseases of Heart Muscle- Heart Failure

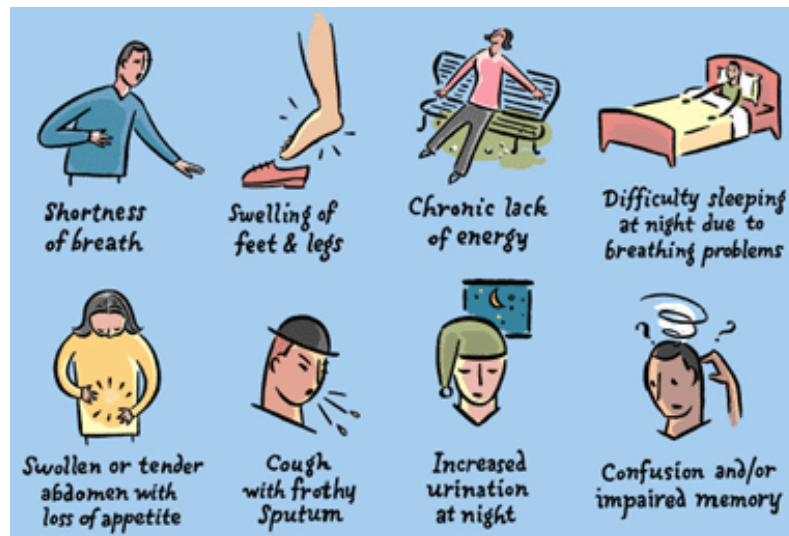
Systolic Heart Failure - the heart's pumping/squeezing function is decreased

Diastolic Heart Failure - the heart's relaxation function is limited and is unable to fill up with an adequate amount of blood

2. Diseases of Heart Muscle- Heart Failure

Symptoms of heart failure often develop slowly because the body can compensate for early effects of the disease

Symptoms : Shortness of breath (dyspnea), coughing, swelling, weight gain, and fatigue



Causes of Heart Failure

- Heart attacks- most common cause of heart failure
- Heart Valve disease or malfunction
- Hypertension
- Heart Arrhythmias- atrial fibrillation, SVT etc.
- Cancer therapies such as radiation and chemotherapy
- Certain treatments for AIDS- damage myocardium
- Viral or bacterial infections
- Peripartum- during pregnancy
- Drug and Alcohol abuse
- Obesity
- Diabetes
- Diabetes medications- Rosiglitazone (Avandia) and Pioglitazone (Actos)
- Sleep Apnea
- Idiopathic- meaning the cause is unknown

Assessing for Heart Failure

Heart failure is determined by measuring a patient's ejection fraction (the percentage of blood that the heart pumps each heart beat) to determine tell how well the heart is working.

Tests the physician may use:

Echocardiography

Left ventriculogram;

Nuclear imaging;

Computed tomography (CT) scan; and

Magnetic resonance imaging (MRI).

2. Other Diseases of the Heart Muscle- Myocarditis

- Inflammation of the heart muscle which can reduce the heart's ability to pump blood.
- Most commonly caused by **an infection in the body** from viruses:

Common cold

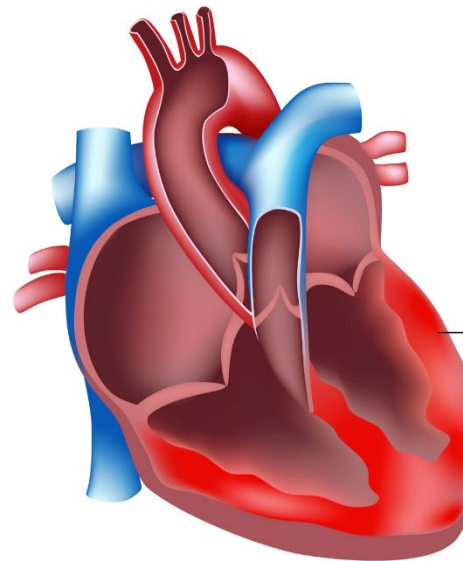
Influenza

COVID-19

Bacteria

Fungus

Parasites

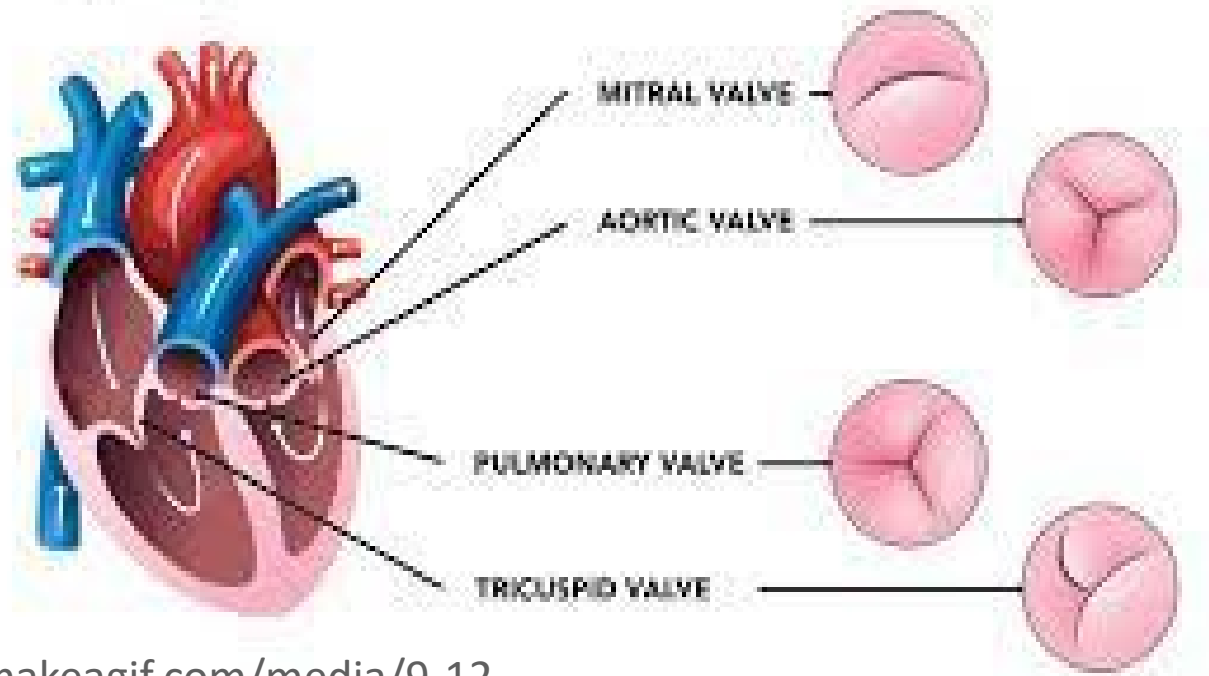


Myocarditis

Inflammation of
heart muscle

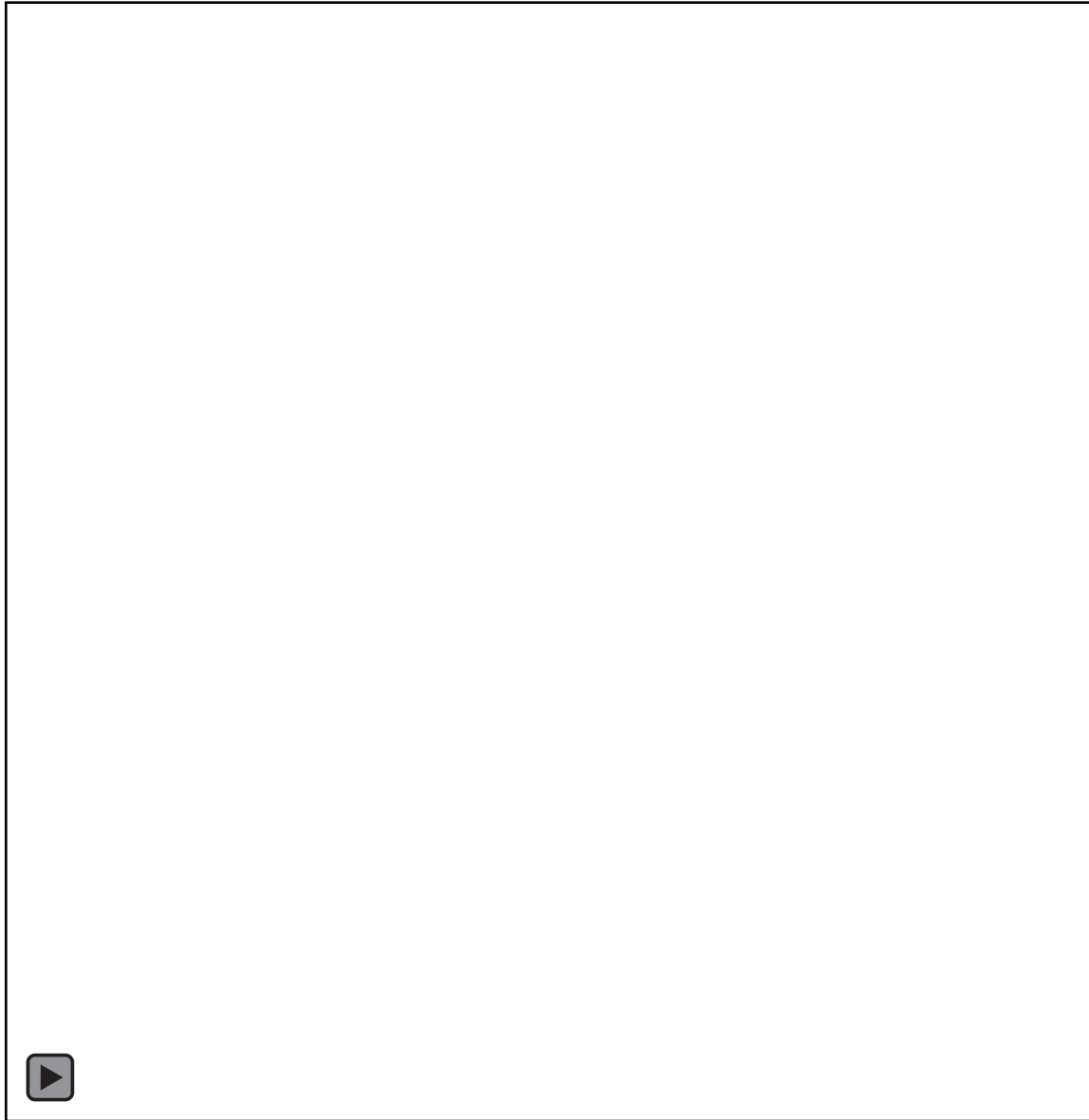
3. Diseases of Valves

THE HEART'S VALVES



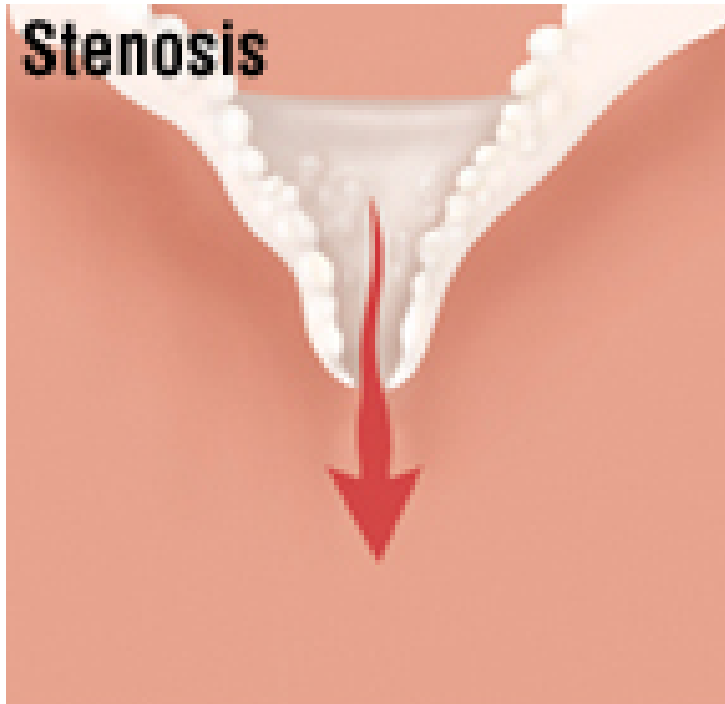
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UCSF video clip



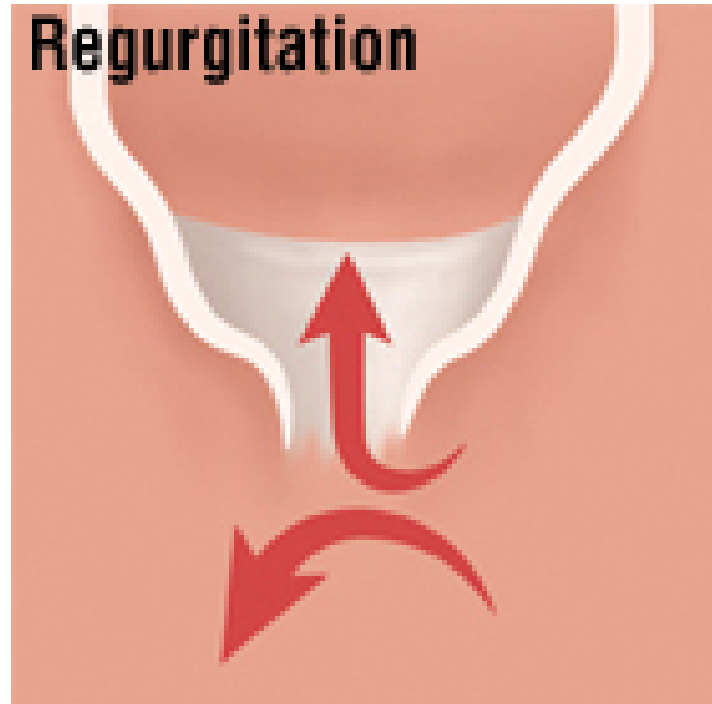
3. Diseases of Valves

Stenosis



Valve doesn't open all the way, not enough blood passes through

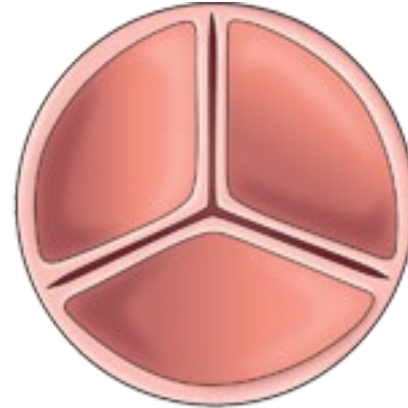
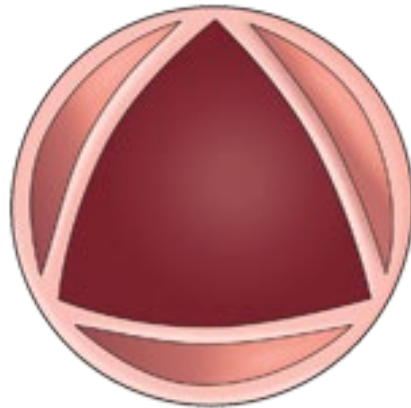
Regurgitation



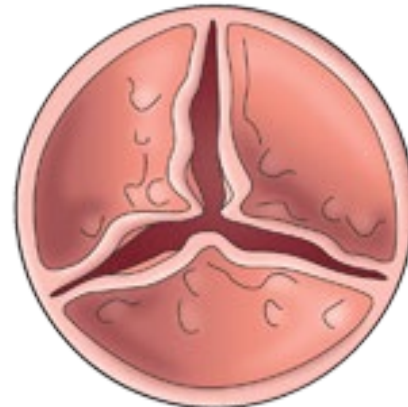
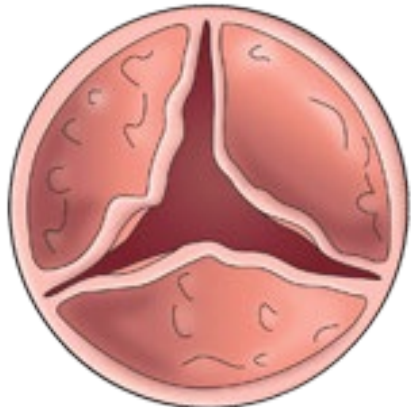
Valve doesn't close all the way so blood leaks backwards

Aortic Valve Stenosis

**normal
aortic
valve**



**aortic
valve
stenosis**

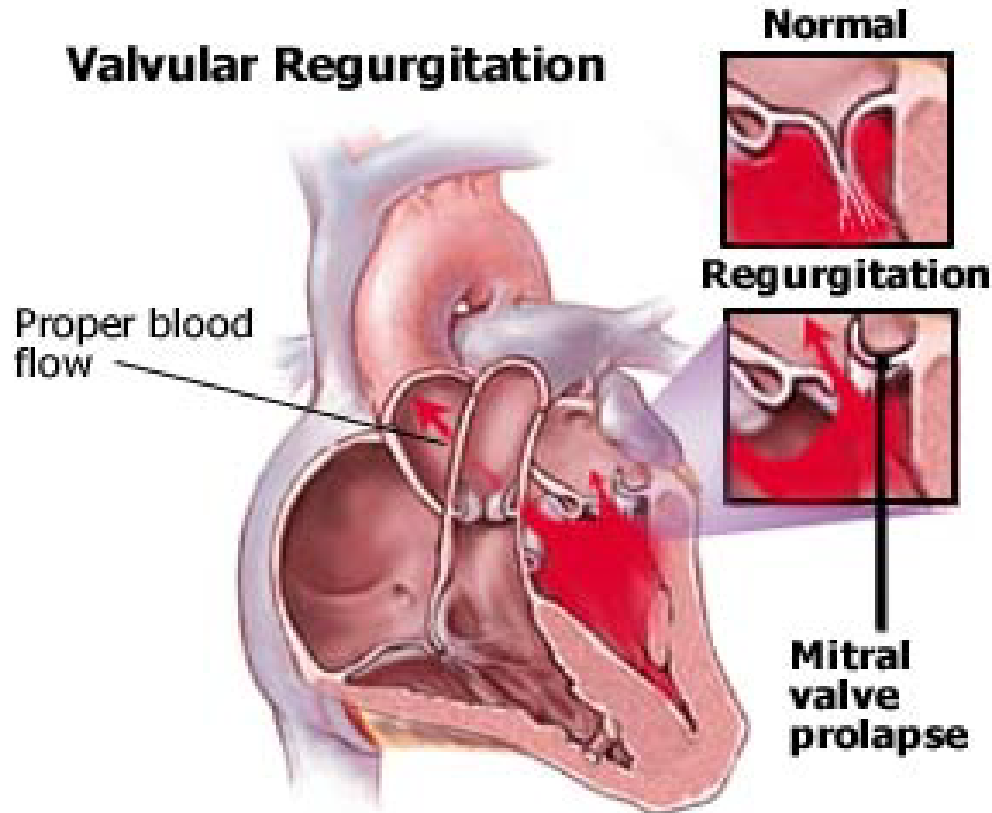


© Allina Health System

open

closed

Valvular Regurgitation

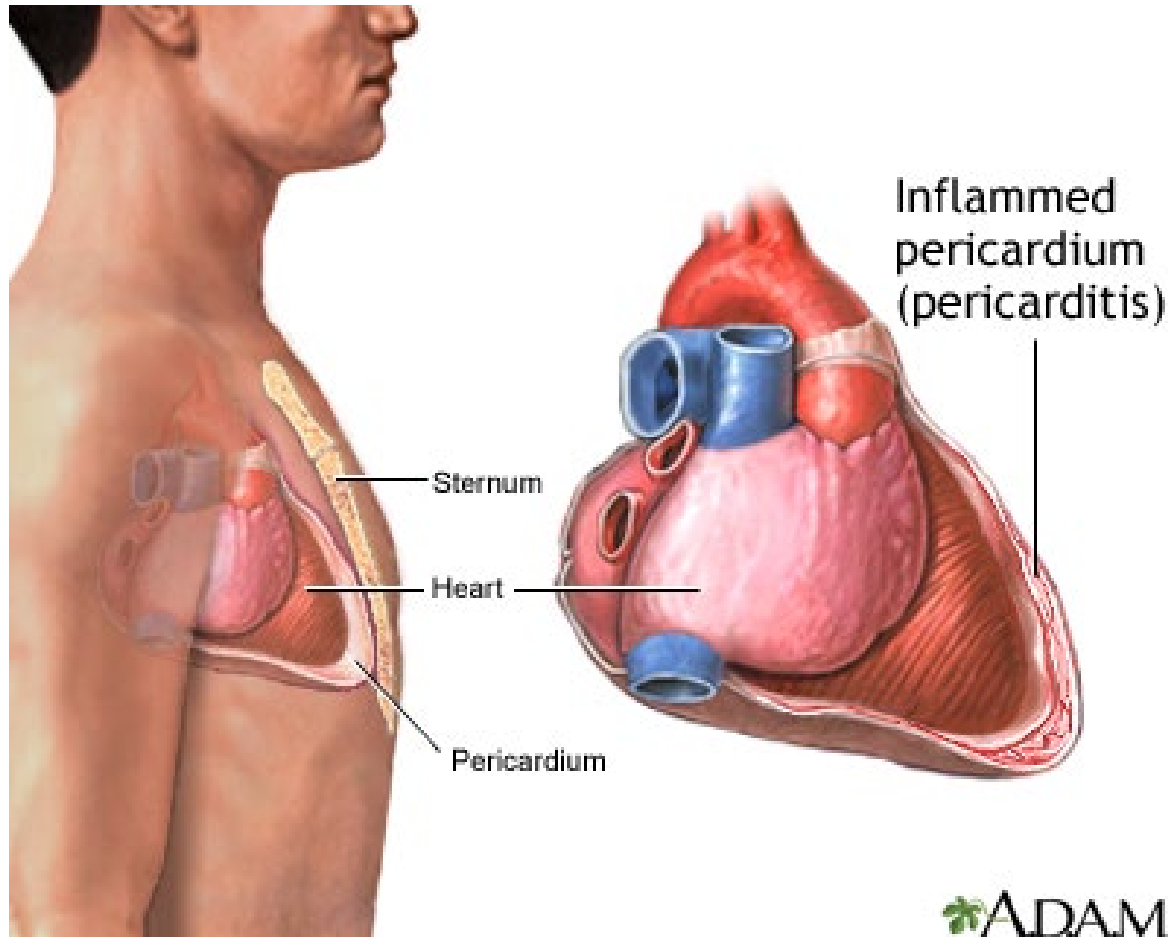


Valvular regurgitation occurs when blood leaks in the wrong direction. In this illustration, a condition called mitral valve prolapse (in which the valve's leaflets cannot close properly) is causing the regurgitation during the contraction phase.

Treatments for Valve Diseases

- Surgical Valve Replacement – Mechanical or Tissue
- Valvuloplasty (Balloon)
- TAVR or TAVI (Transcatheter Aortic Valve Replacement/implant)
- Mitral Clip

4. Diseases of the Coverings of the Heart



Pericarditis

Pericarditis is often the result of an infection:

- Viral infections that cause a chest cold or pneumonia, such as echovirus or coxsackie virus (common in children) and influenza
- Infections with bacteria (less common)
- Some fungal infections (rare)
- Covid

Symptoms of Pericarditis

- Chest pain is almost always present.
- May be felt in the neck, shoulder, back, or abdomen
- Often increases with deep breathing and lying flat, and may increase with coughing and swallowing
- Can feel sharp and stabbing
- Is often relieved by sitting up and leaning or bending forward
- You may have fever, chills, or sweating if the condition is caused by an infection.

Causes of Pericarditis

The condition may be seen with diseases such as:

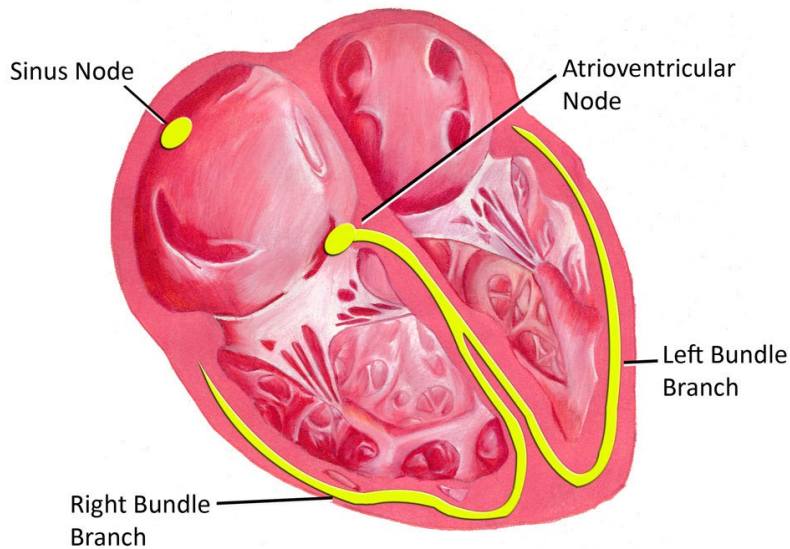
- Cancer (including leukemia),
- Disorders in which the immune system attacks healthy body tissue by mistake
- Underactive thyroid gland
- Kidney failure
- Rheumatic Heart Disease
- Heart attack
- Heart surgery or trauma to the chest, esophagus, or heart
- Medicines (procainamide, hydralazine, phenytoin, isoniazid, and some drugs used to treat cancer or suppress the immune system)
- Swelling or inflammation of the heart muscle
- Radiation therapy to the chest

Treating Pericarditis

- Nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen
- Colchicine
- Antibiotics will be used for bacterial infections;
- Antifungal medicines will be used for fungal pericarditis
- Other medicines that may be used are:
 - Prednisone (in some patients)
 - Diuretics "Water pills" to remove excess fluid
- Pericardiocentesis (removing fluid from heart wall using an echocardiography-guided needle.
- Cutting a small hole (window) in the pericardium to allow the infected fluid to drain
- Surgery called pericardiectomy may be needed if the pericarditis is long-lasting, comes back after treatment, or causes scarring or tightening of the tissue around the heart.

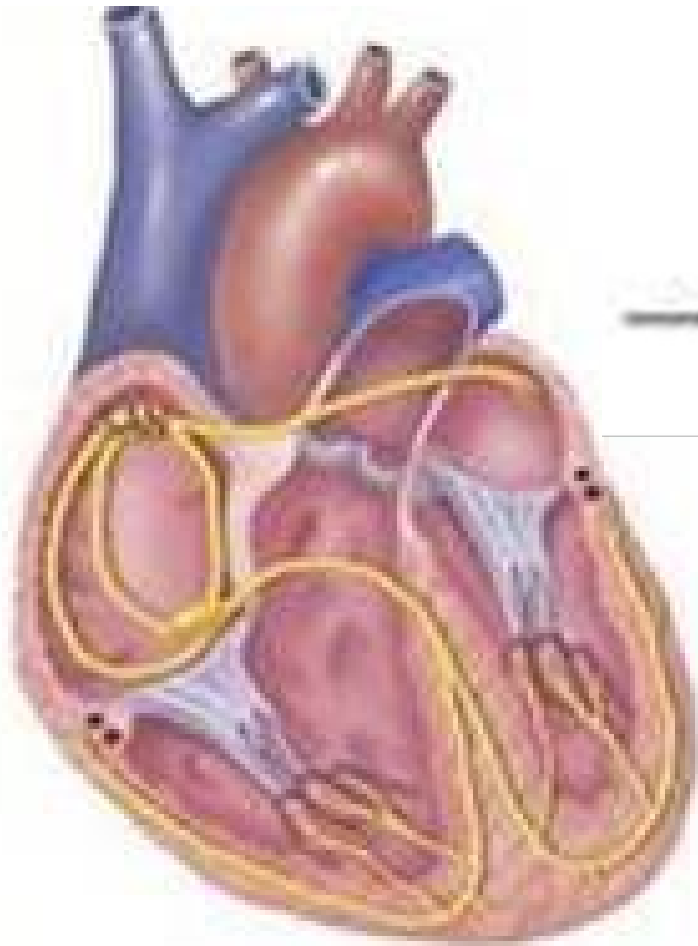
5. Diseases of Conduction in the Heart

Normal Electrical Conduction

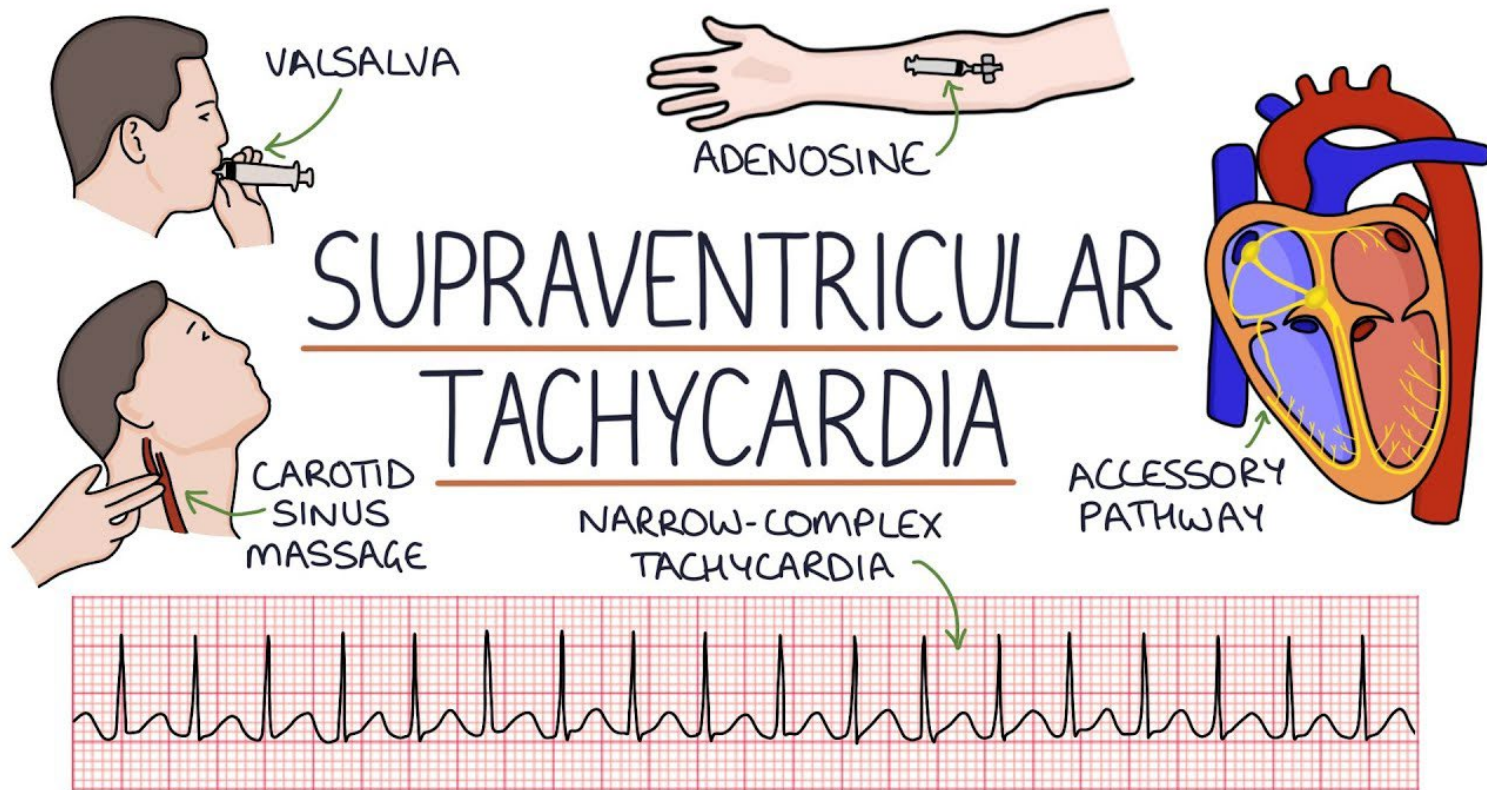


- Fast heart rate
- Slow heart rate
- Irregular heart rate
- Skipped beats

Normal Conduction

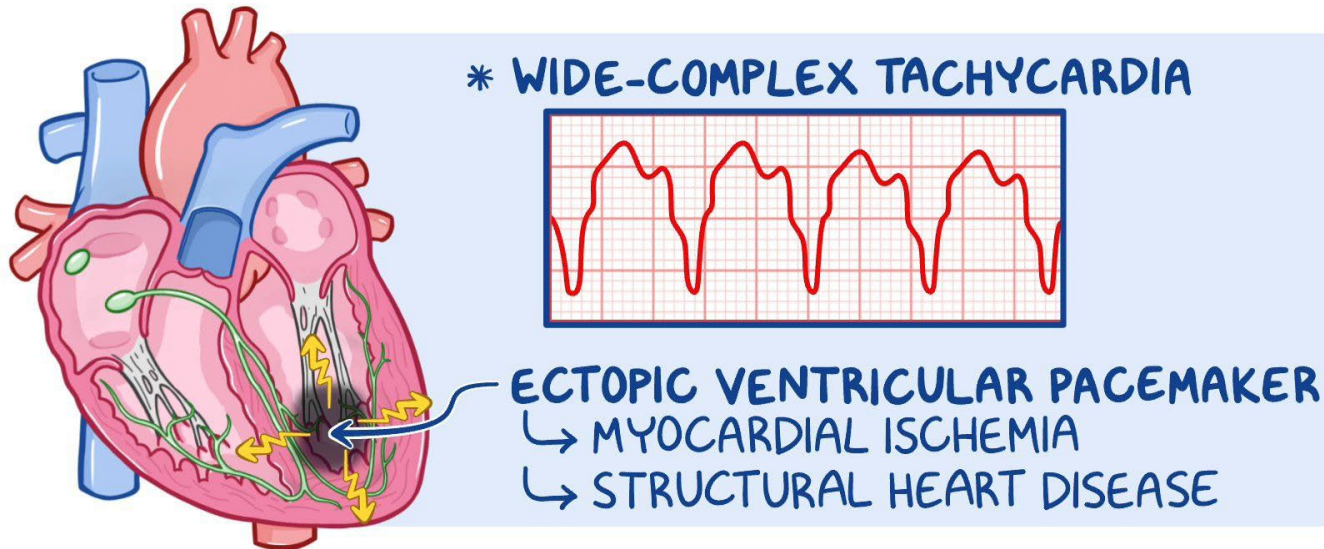


Supraventricular Tachycardia (SVT) - fast heart beat

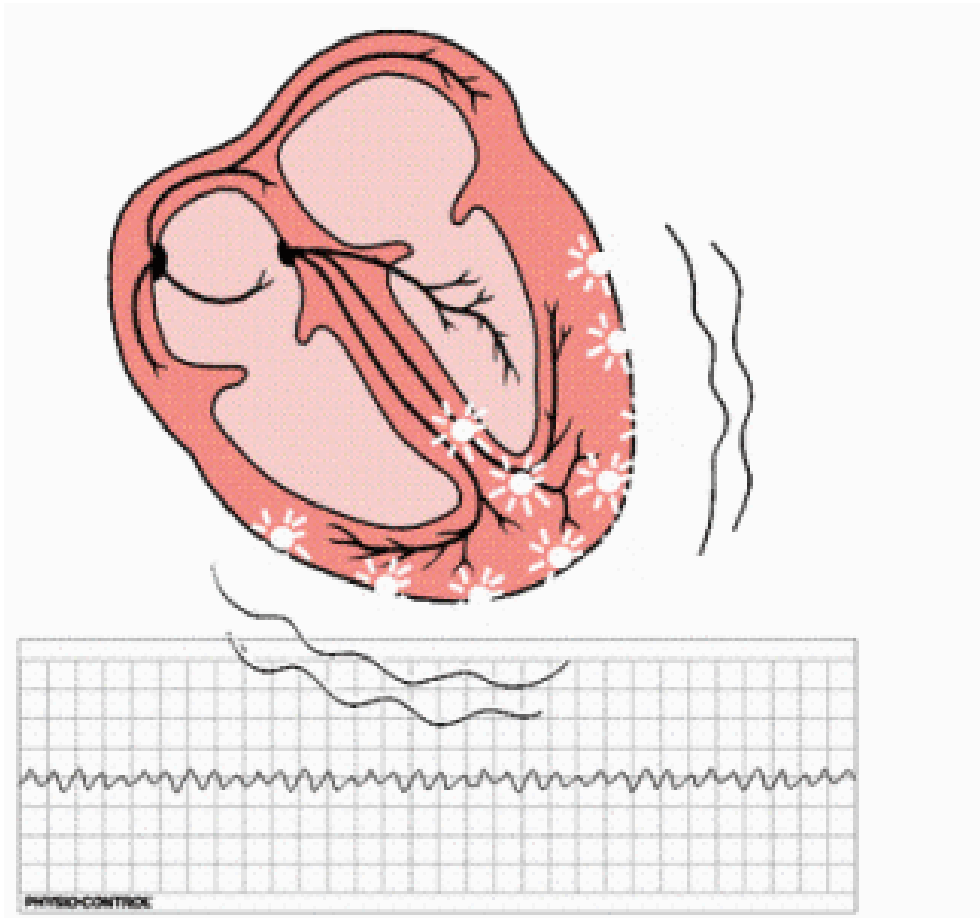


Ventricular Tachycardia- fast heart beat

VENTRICULAR TACHYCARDIA, VT, or V-TACH



Ventricular Fibrillation- Quivering heart



Bradycardia- slow heart beat

Sinus Bradycardia ECG

Sinus bradycardia occurs on an ECG when there is a normal upright P wave in lead II (sinus P wave) preceding every QRS complex with a ventricular rate of less than 60 beats per minute.

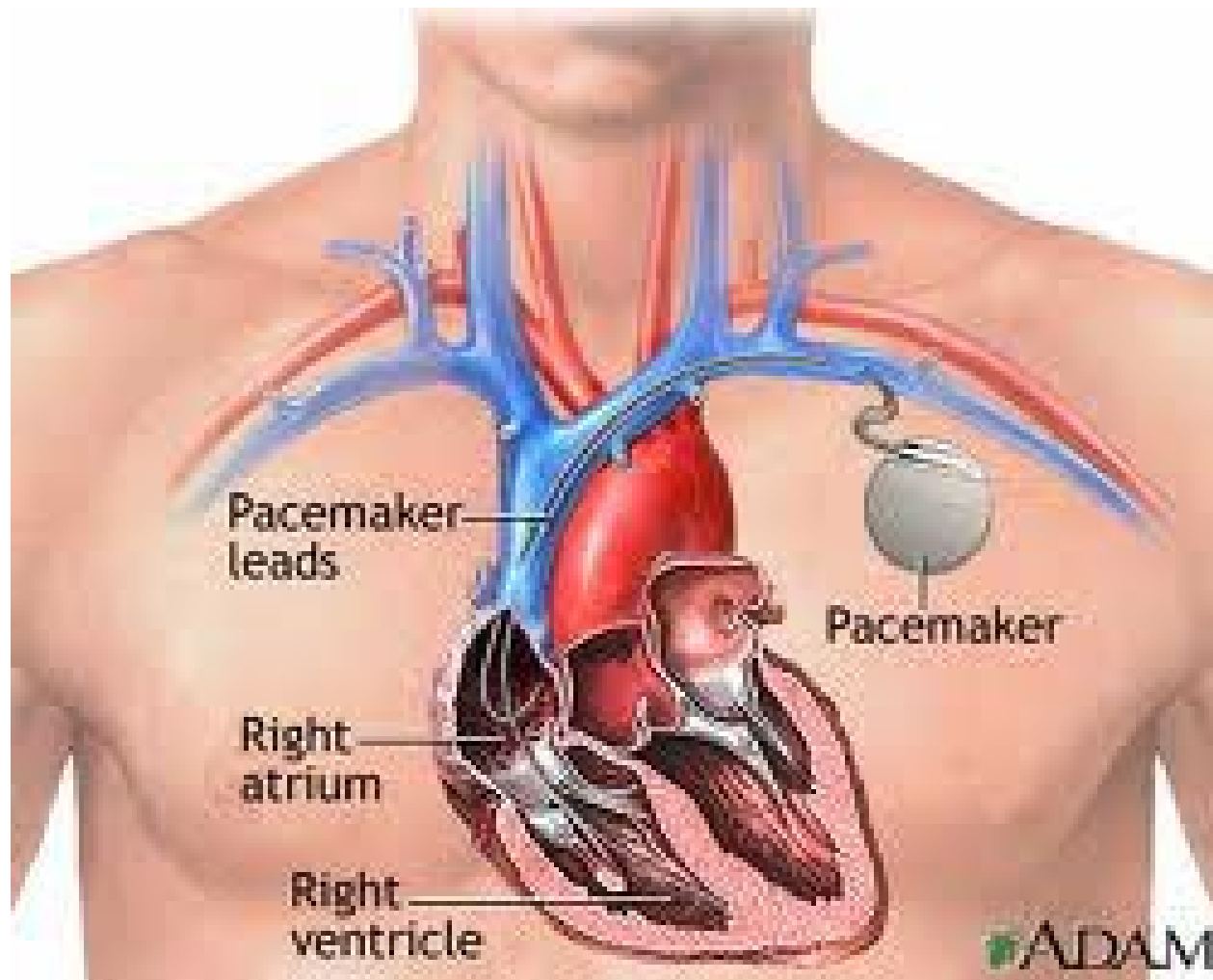


Causes of sinus bradycardia include:

1. AV blocking medications (beta-blockers, non-dihydropyridine calcium channel blockers, digoxin)
2. Heightened vagal tone (i.e. well trained athletes)
3. Sick sinus syndrome
4. Hypothyroidism
5. Hypothermia
6. Obstructive sleep apnea
7. Hypoglycemia

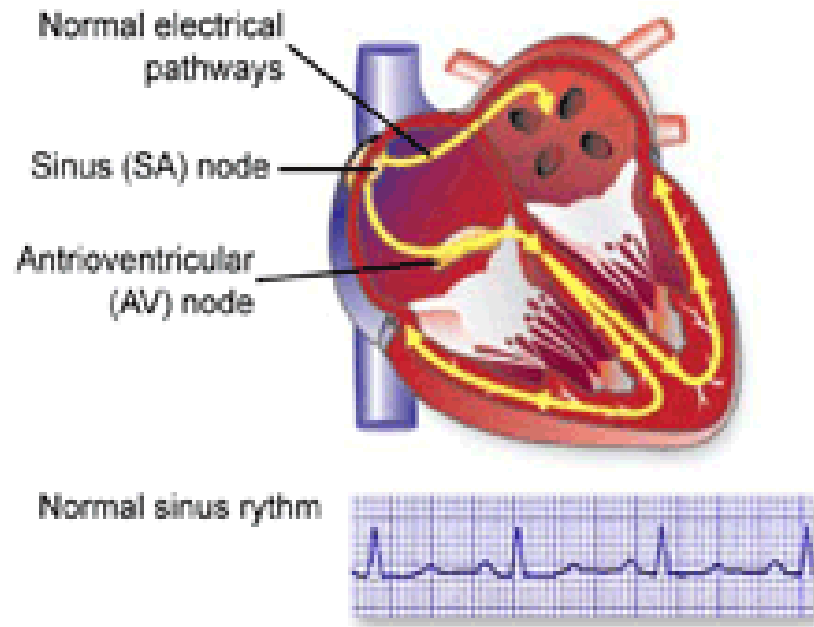
LearnTheHeart.com

Artificial Pacemaker

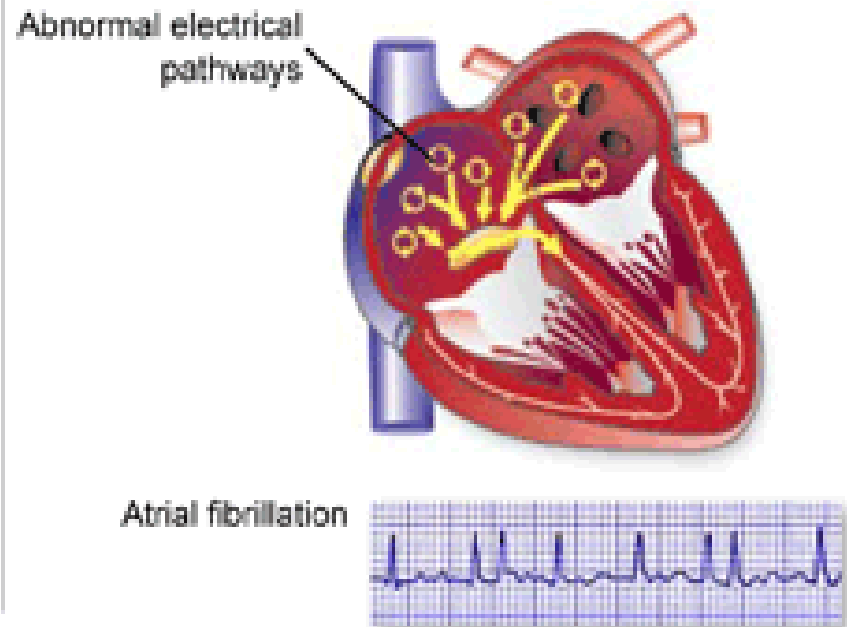


Atrial Fibrillation- irregular heart rate

Normal Heart

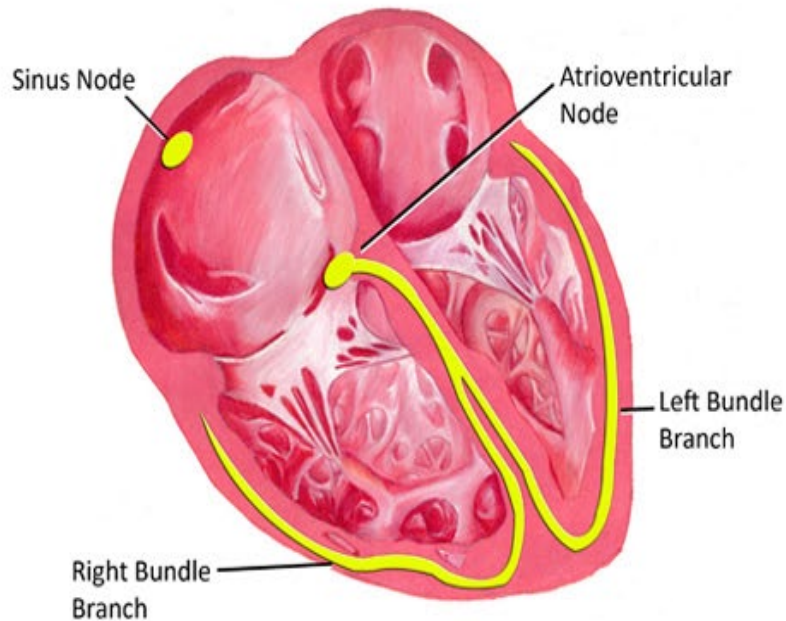


Heart in Atrial Fibrillation

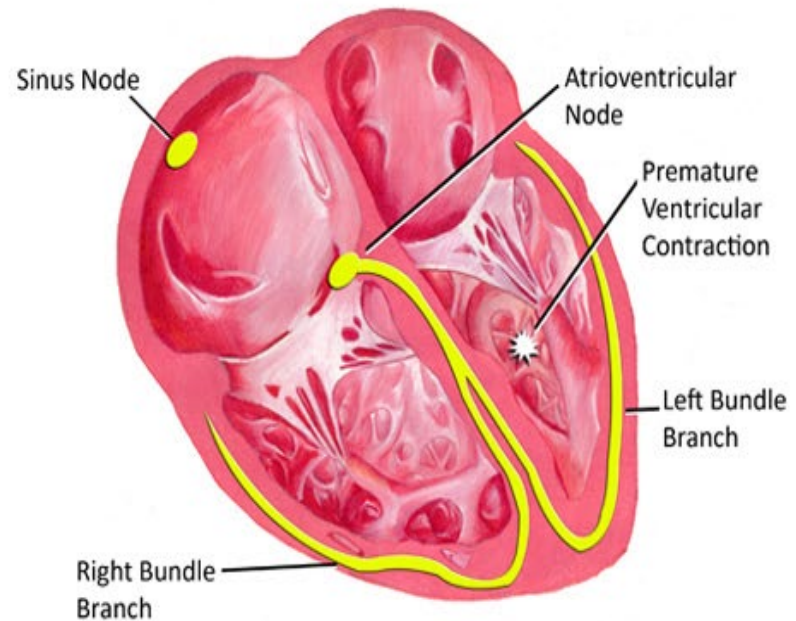


Skipped Heart Beats- PVC

Normal Electrical Conduction



Premature Ventricular Contraction



Thank You

