A red heart shape is centered against a black background. A silver stethoscope is wrapped twice around the heart, its headpiece at the top and its diaphragm at the bottom.

Chapter 23

Nursing Care of Patients with

Valvular, Inflammatory, and

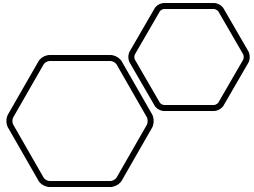
Infectious or Venous Disorders

Audra Xenakis, DNP, RN

Health & Illness III

Objectives

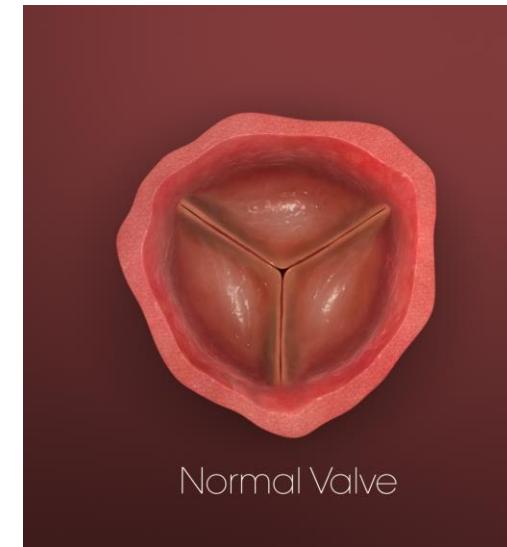
- Explain pathophysiology, etiology, signs and symptoms, diagnostic tests, therapeutic measures, and nursing care for:
 - Valvular disorders
 - Infective endocarditis
 - Pericarditis
 - Myocarditis
 - Cardiomyopathy
 - Thrombophlebitis
- Compare and contrast commissurotomy, annuloplasty, and valve replacement
- Identify postoperative complication following cardiac valve replacements

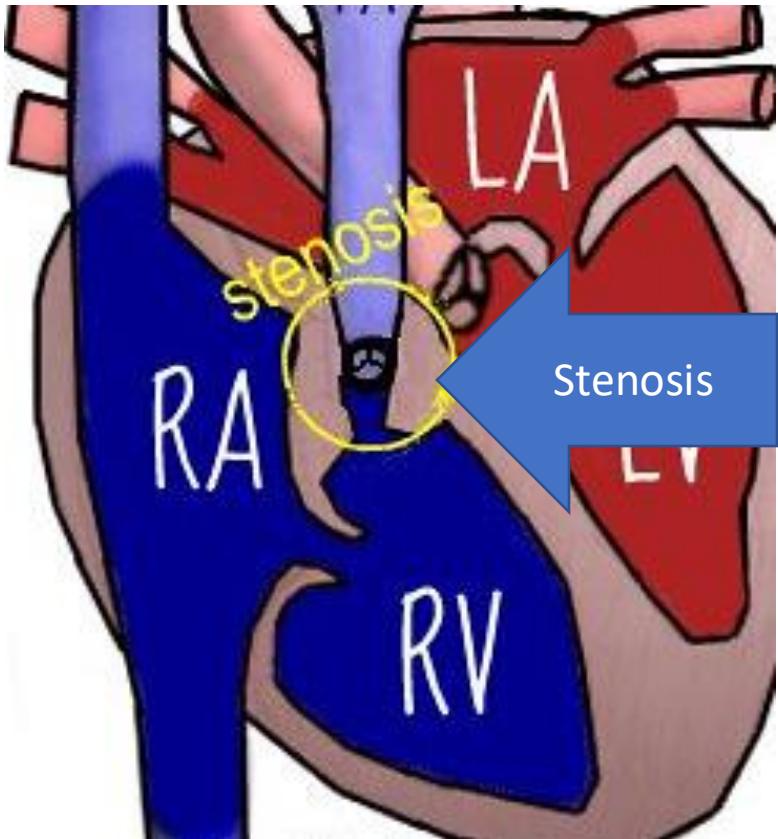


Valvular Disorders

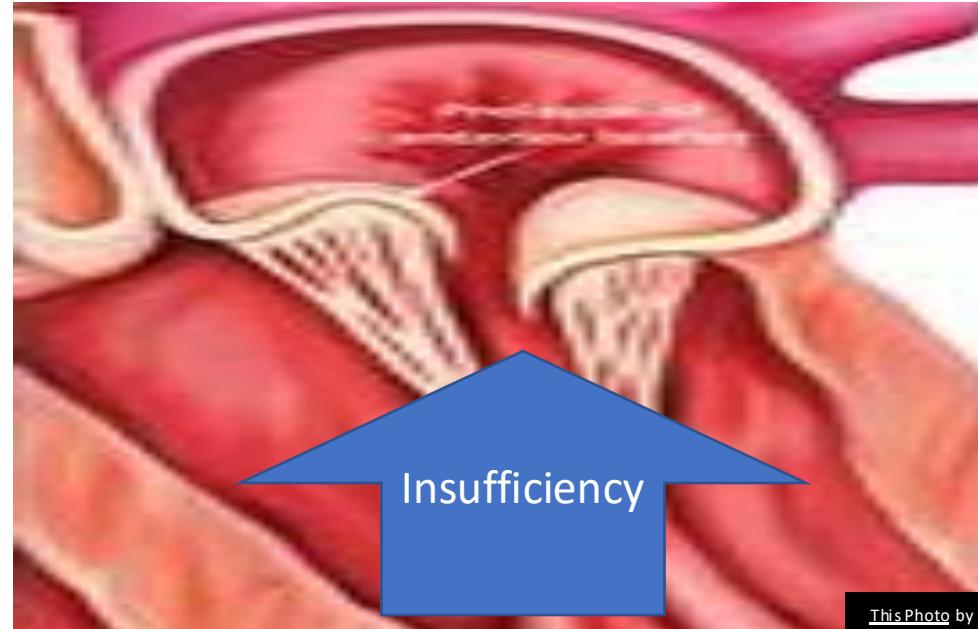
2 major types

- **Stenosis**- Valve does not open completely
- **Insufficiency** -Valve does not close completely





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Valvular Disorders

Rheumatic Fever Disease & Cardiac Valves

Group A beta hemolytic streptococci respiratory infection, strep throat

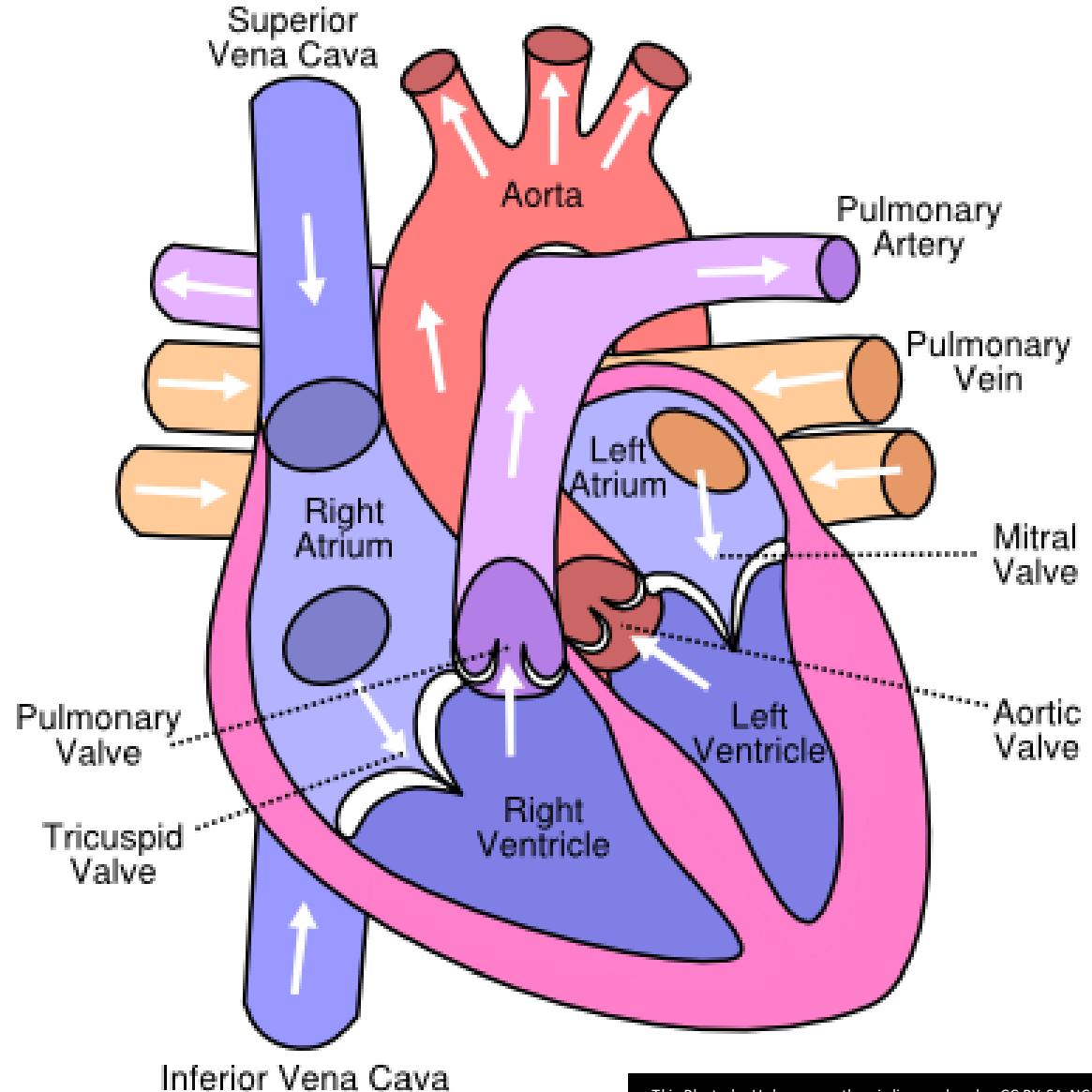
- Occurs typically ages 5-15 years
- Affects aortic and mitral valves
 - Bacteria causes
 - Valves stick together; scarring
 - Leads to stretching or thickening of valves
 - Causing stenosis
- **Prevention:**
 - Treating streptococci infections promptly with penicillin

Rheumatic Heart Disease (RHD)



Rheumatic Fever and Cardiac Valves

- <https://www.youtube.com/watch?v=JSuCM87IpNY>



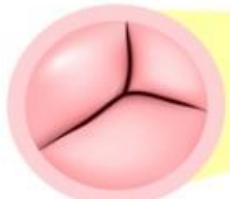
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Heart valve

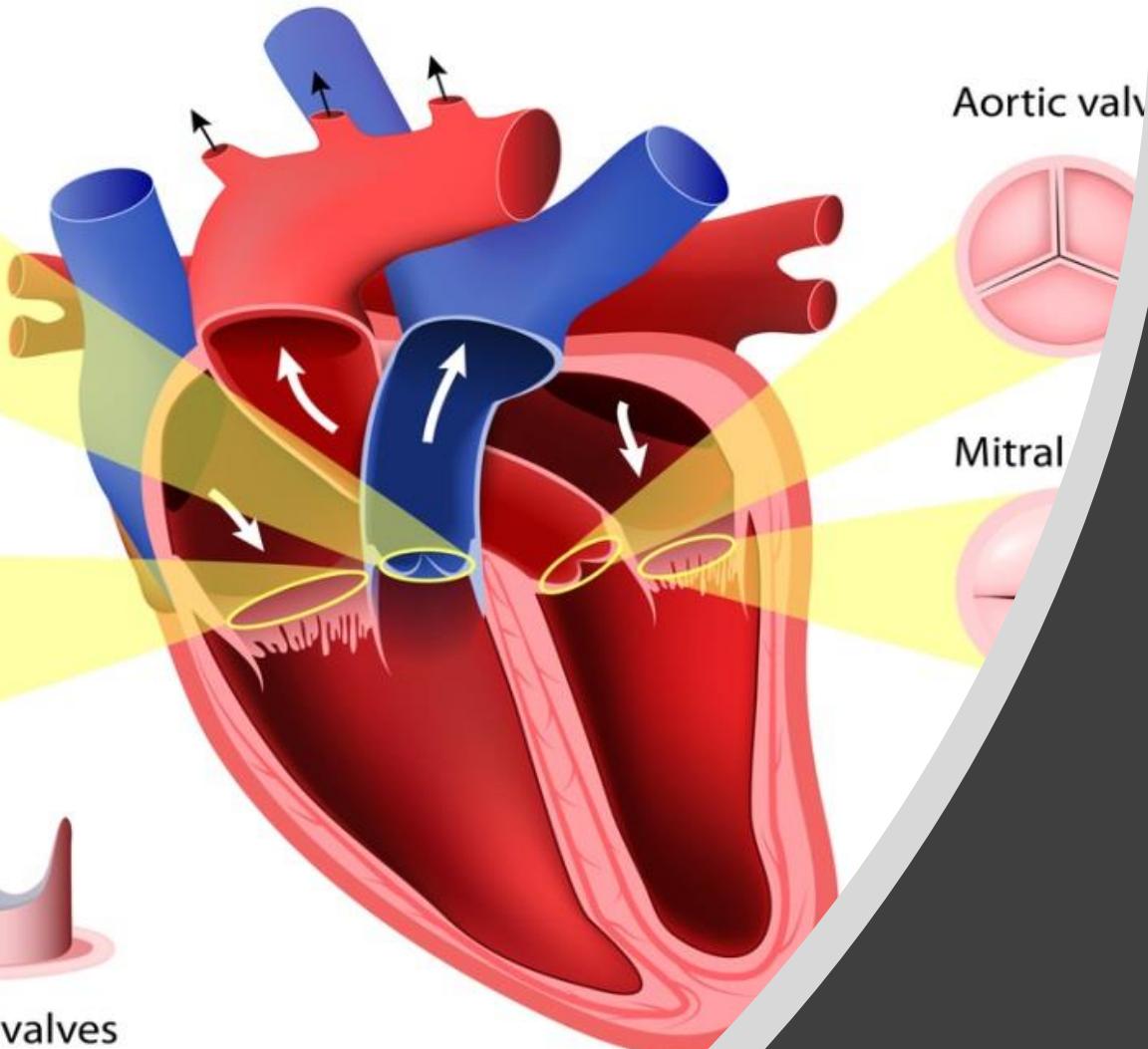
Pulmonary valve



Tricuspid valve



Biological valves



Aortic valve

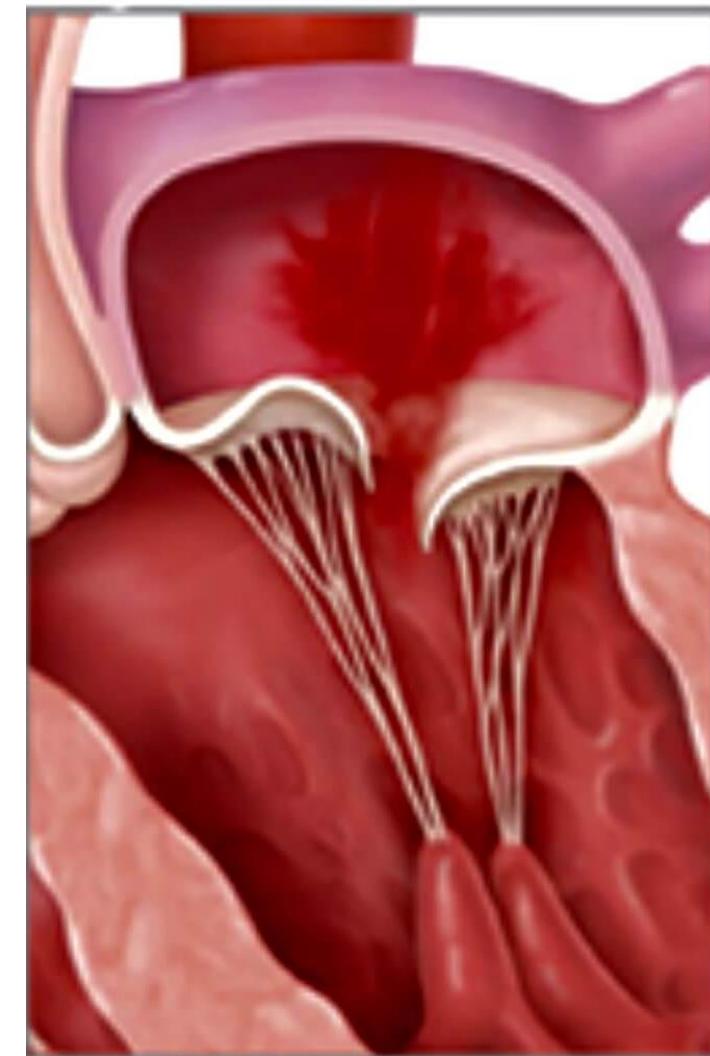


Mitral

Mitral Valve Disorders

Mitral Valve Prolapse

- Valve flaps bulge backward- left atrium
- Blood leaks backward-left atrium
- **Causes:**
- Hereditary
- Infection
- Ischemia heart disease
- Cardiomyopathy
- **Signs and Symptoms**
- Normally none
- Murmur
- Palpitations
- Fatigue



Mitral Valve Prolapse

Complications

- Mitral regurgitation
- Arrhythmias
- Heart failure
- Emboli
- Infective endocarditis

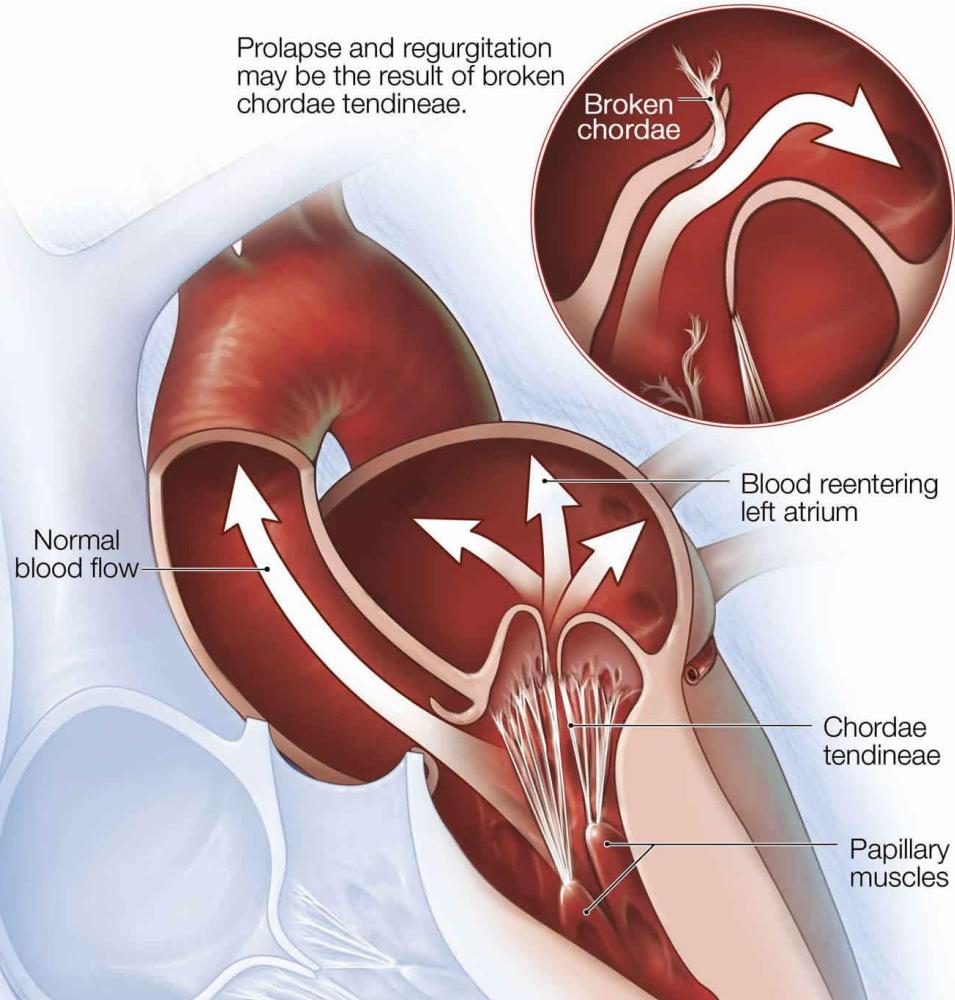
Diagnostic Tests

- Auscultation for murmur or click
- Cardiac Catherization
- Echocardiogram

Treatment

- None-Generally a benign disorder
- Beta Blockers- reduce heart rate
- Antiarrhythmics
- Anticoagulants
- Valve replacement

Mitral valve prolapse and regurgitation



Mitral Valve Regurgitation

Incomplete closure of mitral valves

Backflow of blood to left atrium

Chronic

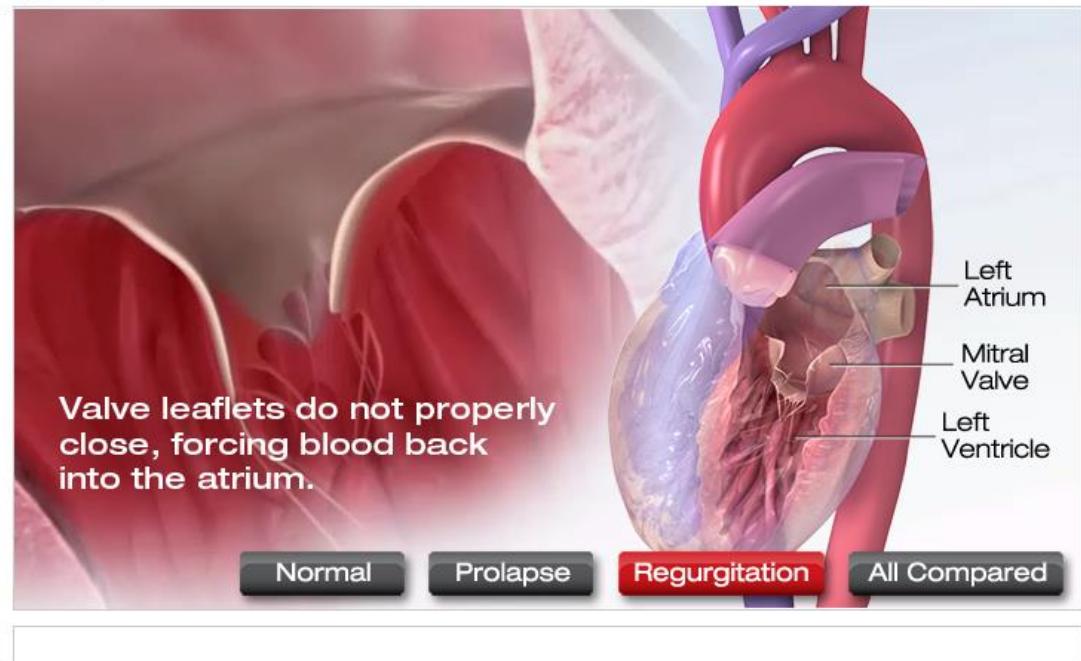
- Increase blood volume in atrium, lungs, and ventricles
- Can lead to failure in both right and left ventricles

Mitral Valve Regurgitation

- <https://watchlearnlive.heart.org/index.php?moduleSelect=prolapse>

Prolapse / Regurgitation

normal mitral valve leaflets meet to prevent blood from flowing back into the left atrium. When the valve is weakened it may prolapse, or balloon back, into the atrium as blood is pumped by the ventricle into the aorta. Many people live with this condition without symptoms. But when a prolapsing valve allows blood to leak back into the atrium, this is called regurgitation. A regurgitating, (or leaky) mitral valve may need to be



Popular Topics



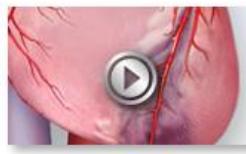
TIA



Cardiac Catheter



Cholesterol



Heart Attack



Stent

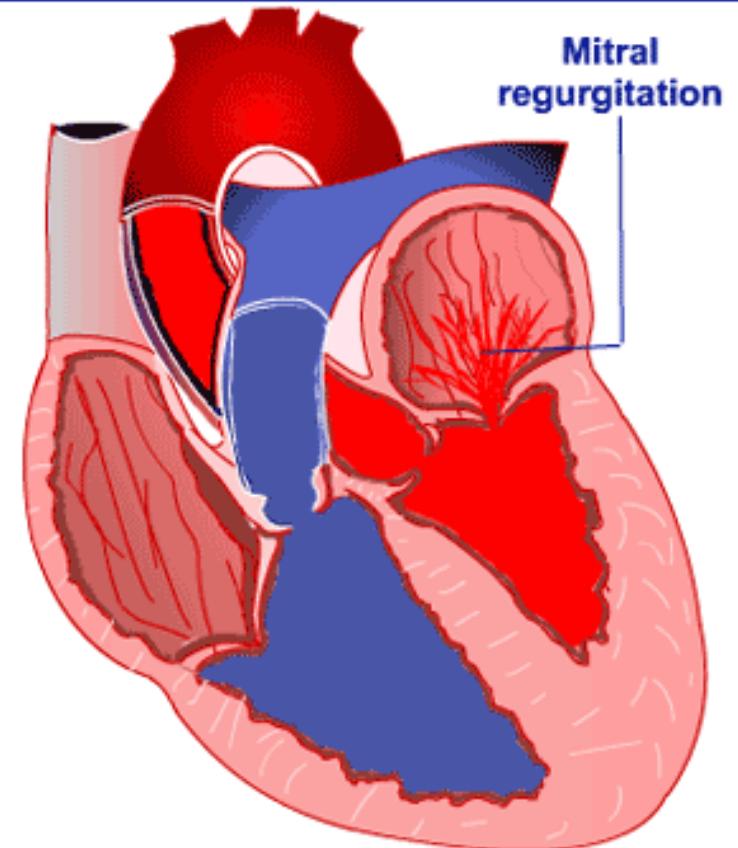
Mitral Valve Regurgitation- Signs and Symptoms & Complications

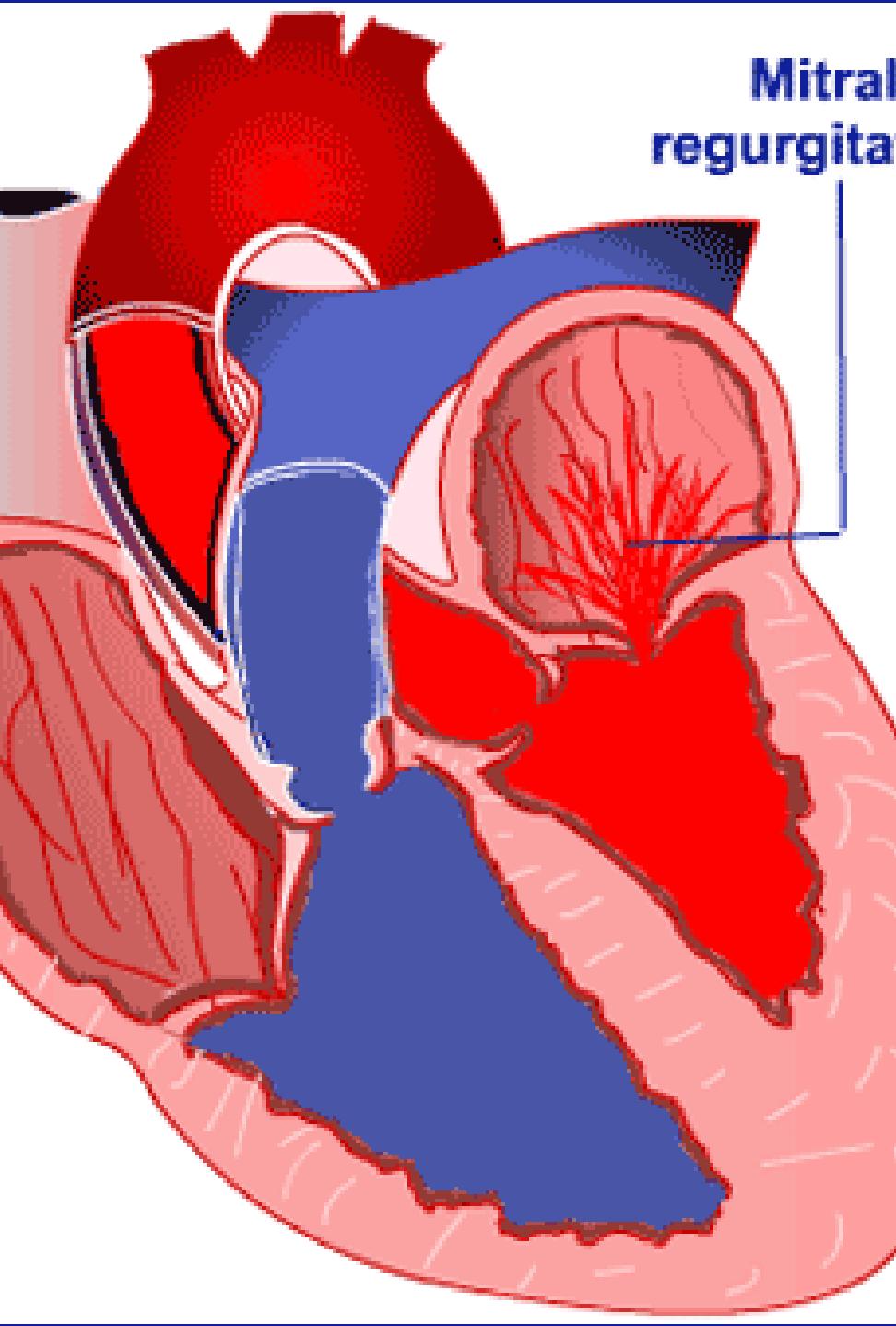
- **Signs and Symptoms**

- None
- Murmur

Late signs:

- Symptoms of heart failure
- Palpitations
- Cough/hemoptysis
- Pulmonary edema



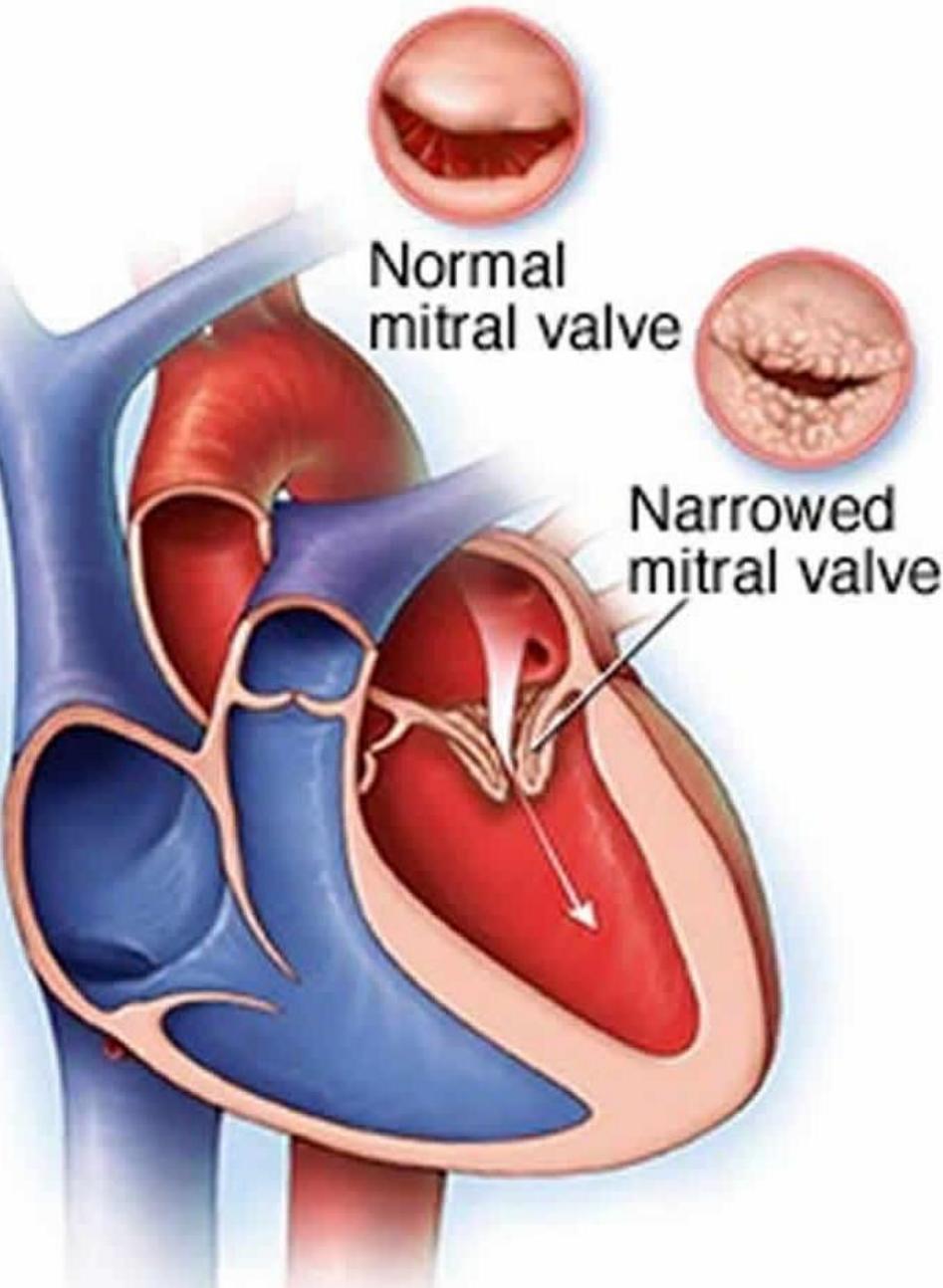


Mitral Valve Regurgitation

Diagnostic Tests & Therapy

- **Diagnostic Tests**
 - Echocardiogram-enlarged atrium
 - ECG-Atrial Changes (flutter or fibrillation)
 - Chest Xray-enlarged heart
 - Cardiac Catheterization-Increased pressures
- **Therapy**
 - Atrial arrhythmias
 - Calcium Channel blockers, beta blockers, digitalis
 - slow heart rate
 - Anticoagulants
 - Decrease blood clots/emboli
 - Surgery
 - Valve replacement

Mitral valve stenosis

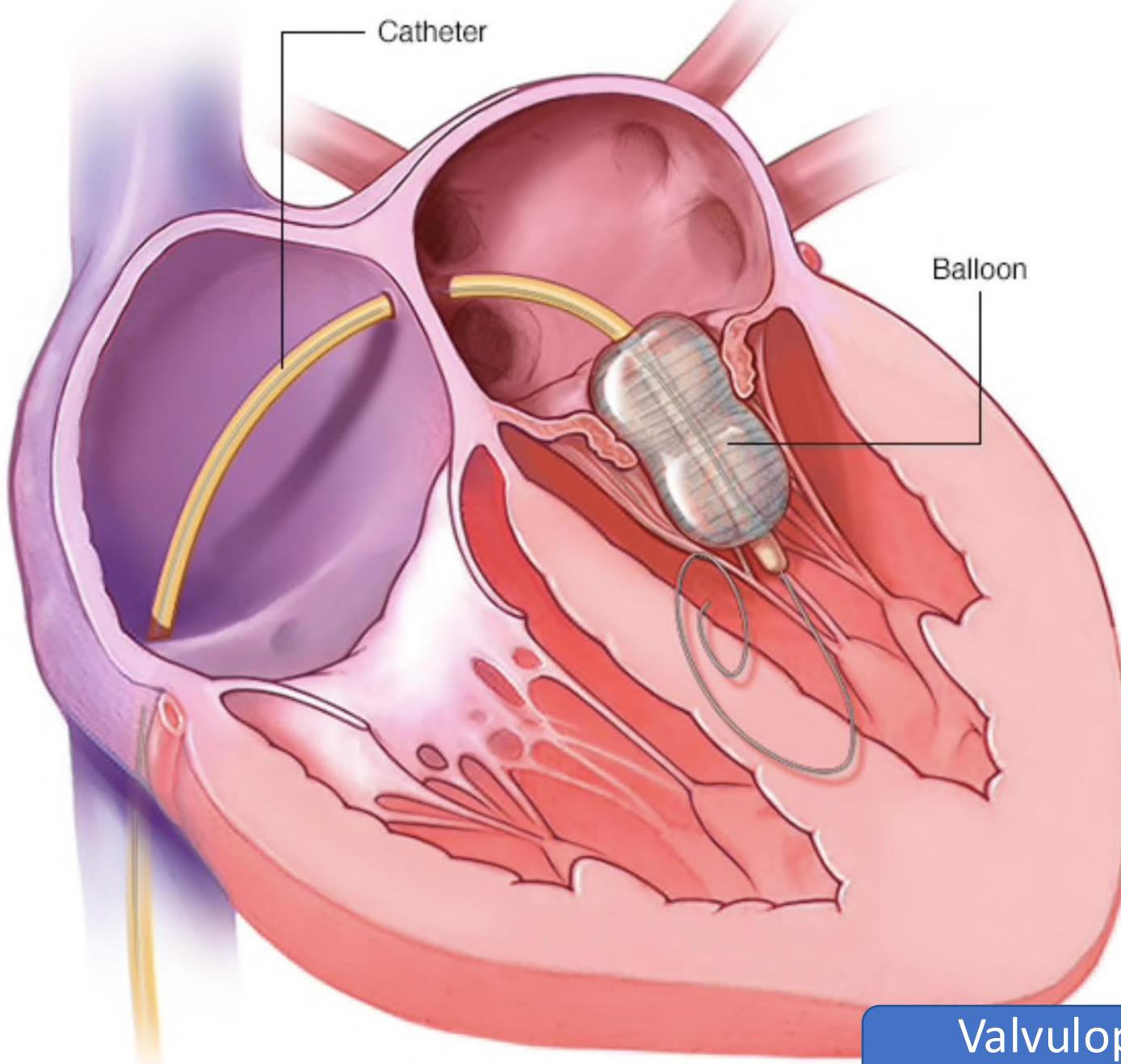


Mitral Stenosis

- Thickening of mitral valves; Shortening of Chordae Tendinea
- **Causes narrowing of valve opening**
- **Reasons:**
 - Rheumatic Fever (**most common cause**)
 - Congenital valve defects, tumors, calcium deposits
- **Can cause:**
 - Left atrium enlarges (hold more blood)
 - Pulmonary pressure increases
 - Right ventricle enlarges-(hold more blood)
 - Right ventricle pressure increases
 - Right ventricle fails-(Extra workload)

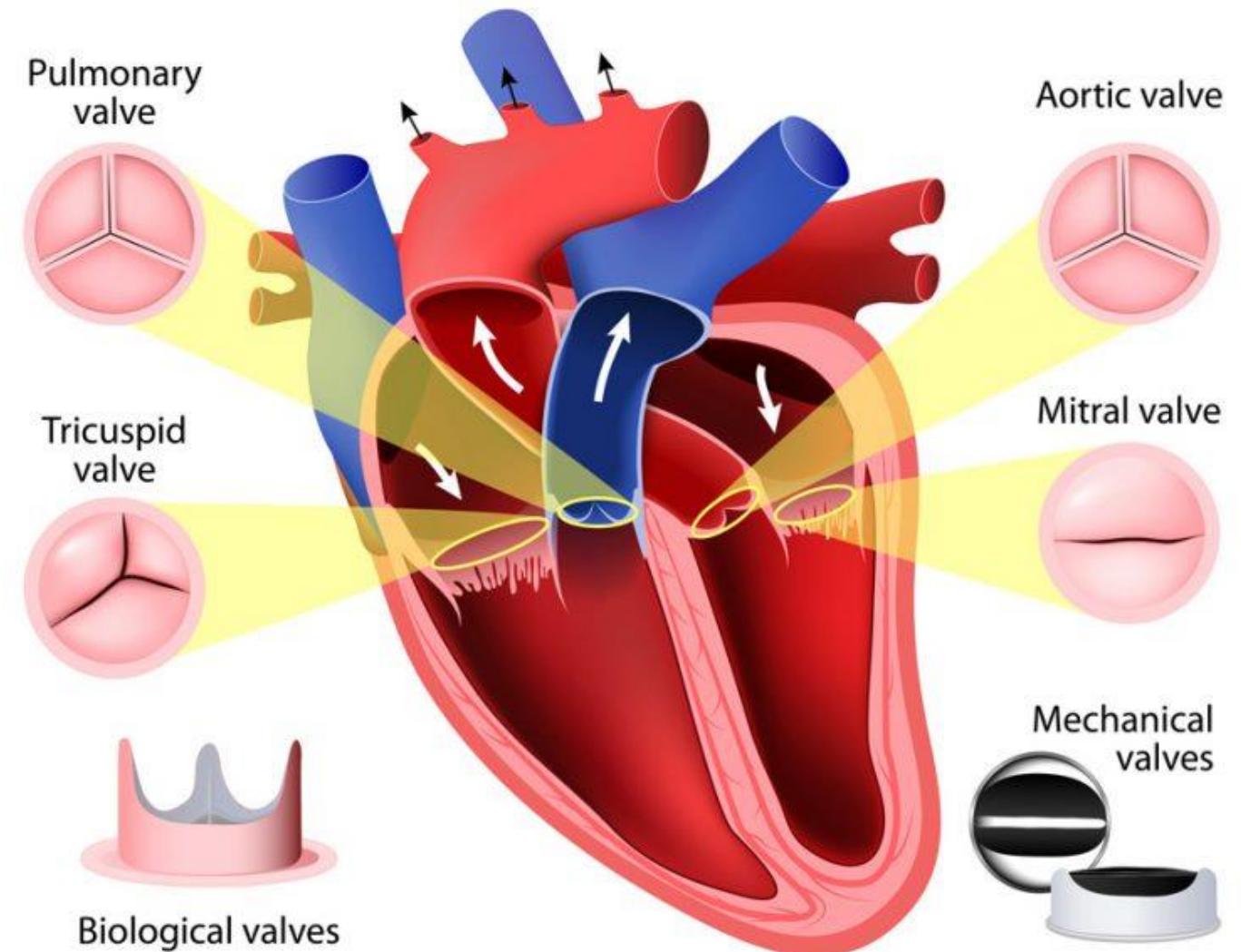
Mitral Stenosis-Signs and Symptoms

Symptoms	Complications	Diagnostic test	Treatments
<ul style="list-style-type: none">• None• Click or murmur• Chest pain• Exertional dyspnea• Hemoptysis• Edema	<ul style="list-style-type: none">• Emboli• Heart failure• Pulmonary edema	<ul style="list-style-type: none">• Gold Standard:• Transthoracic Echocardiogram	<ul style="list-style-type: none">• None• Anticoagulants• Antiarrhythmics• Valvuloplasty• Valve replacement



Valvuloplasty

Aortic Valve Disorders

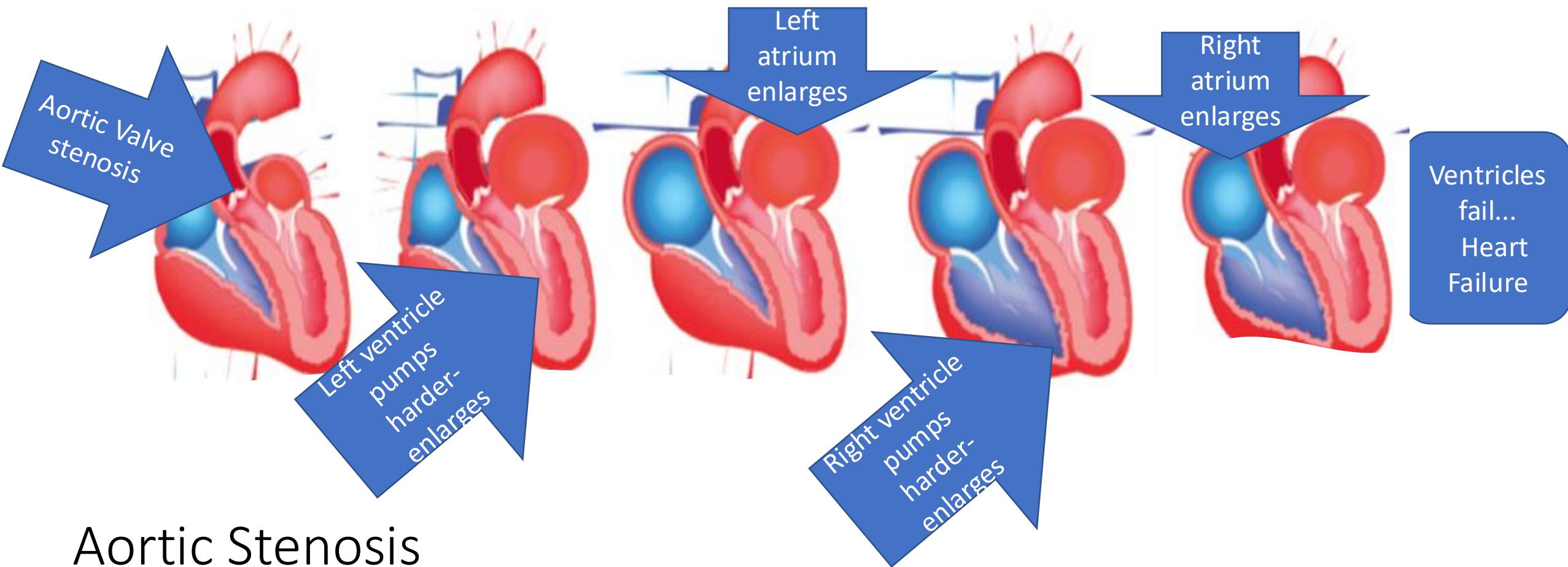


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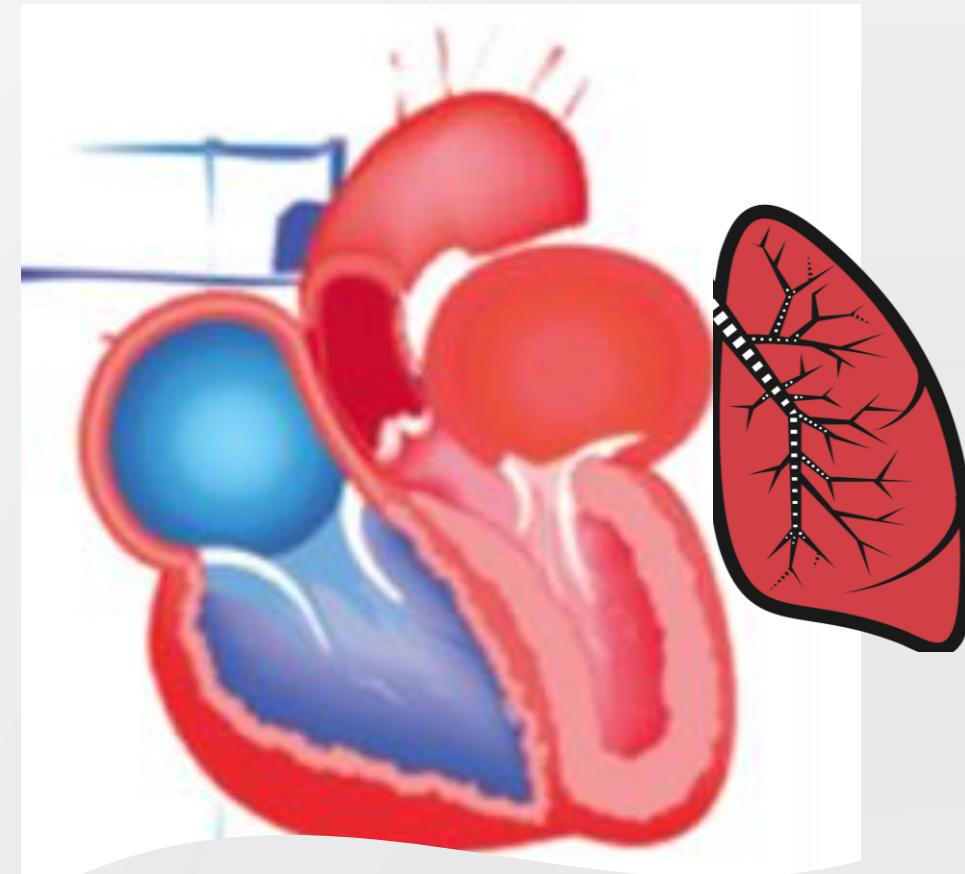
Aortic Stenosis

- **What is it?**
 - Obstruction to aortic valve
- Reasons:
 - Valve may be thick, scarred, calcification, fusing of flaps

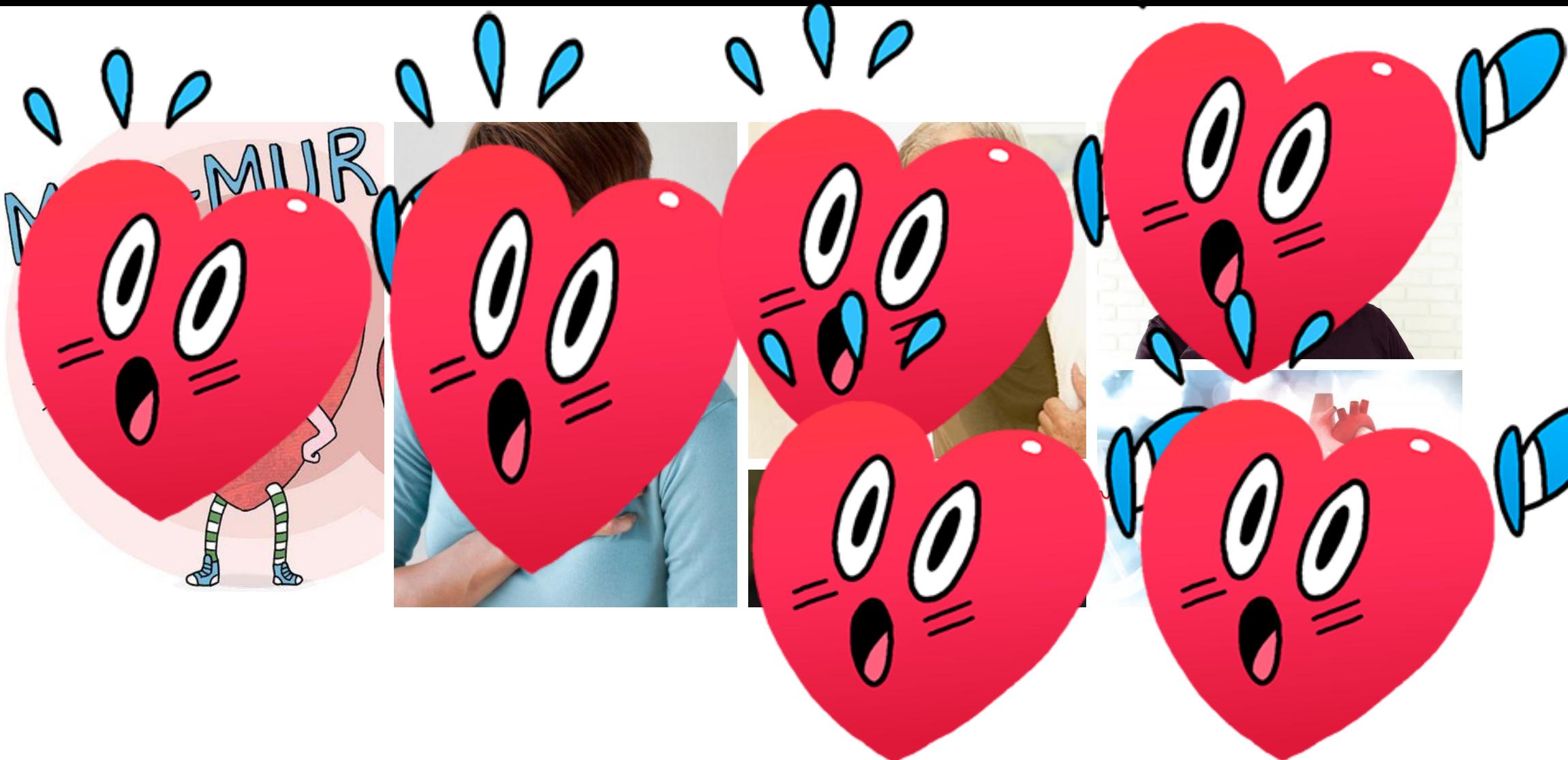




Aortic Stenosis

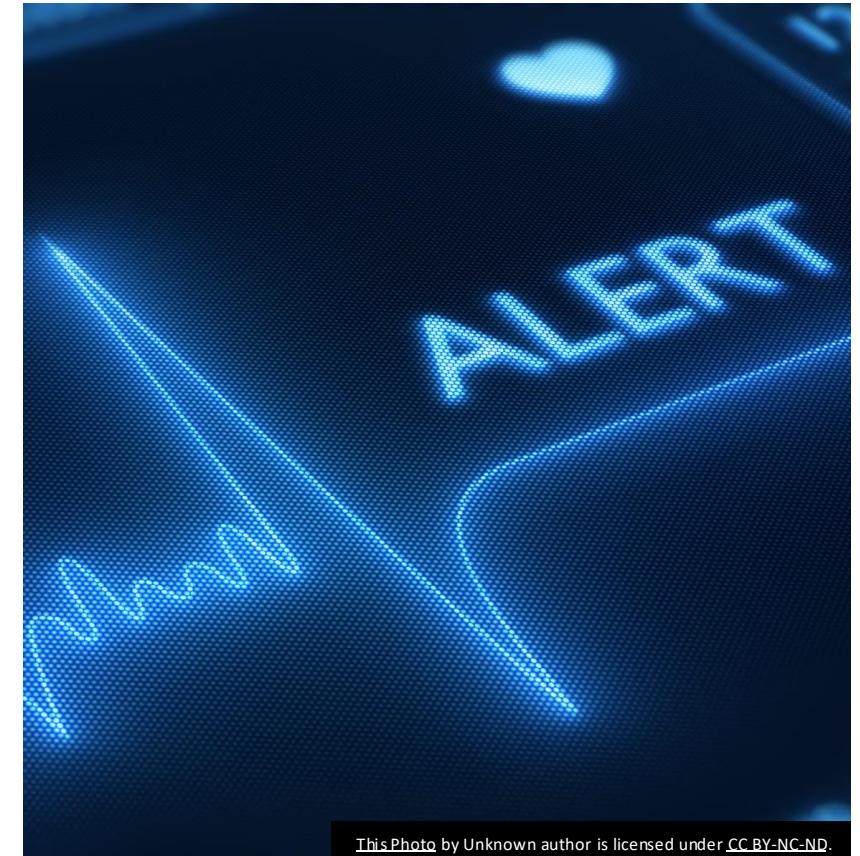


Aortic Stenosis-Signs and Symptoms



Aortic Stenosis- Diagnosis & Therapy

- **Diagnosis**
 - ECG-Enlarged heart
 - Echocardiogram-thickening left ventricle wall; impaired valve
 - Cardiac catheterization-increased left ventricle pressure; decreased cardiac output
- **Therapy**
 - **Aortic valve replacement**



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Aortic Regurgitation

- **What is it?**

- Aortic doesn't close fully
- Backflow of blood to left ventricle
- Left ventricle enlarges
- Left ventricle fails

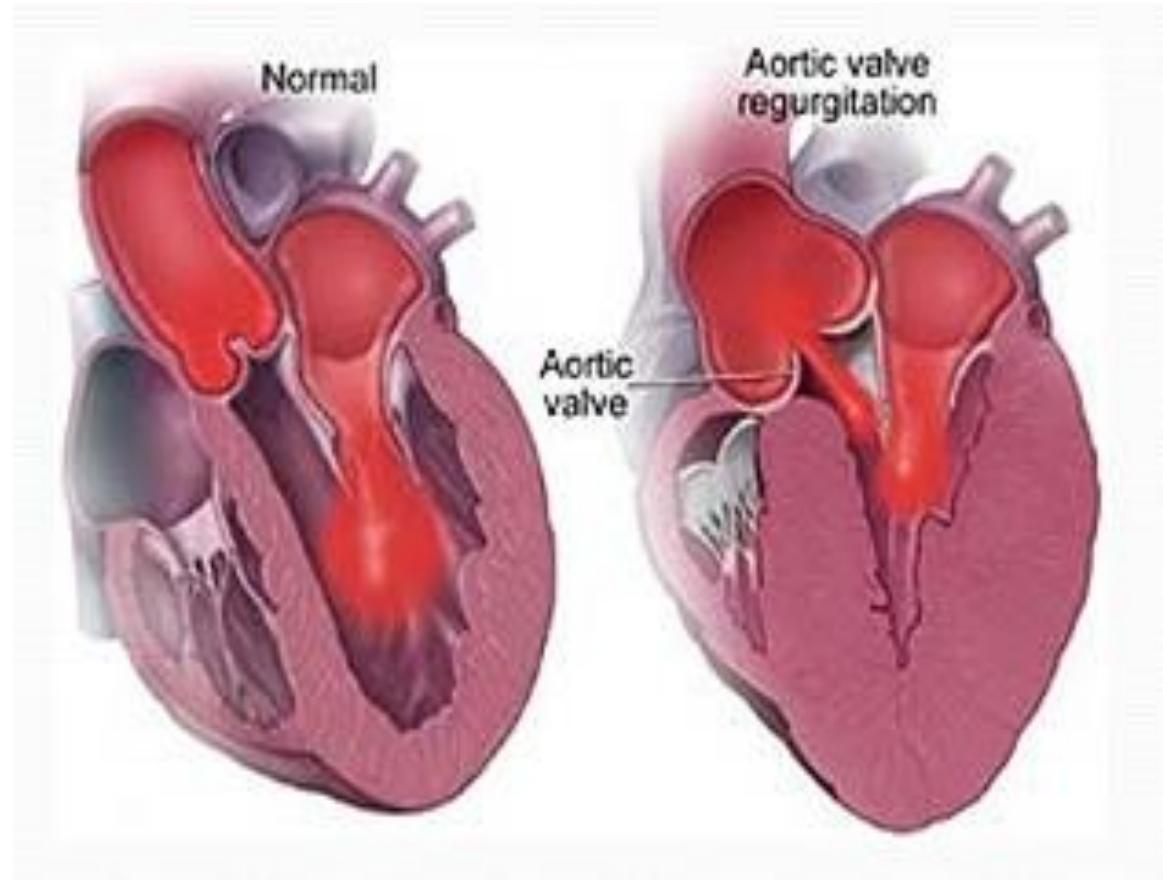
- **Signs and Symptoms**

- **Early**

- May not be apparent for years
- Feeling of forceful heartbeat-lying down
- Dyspnea
- Murmur

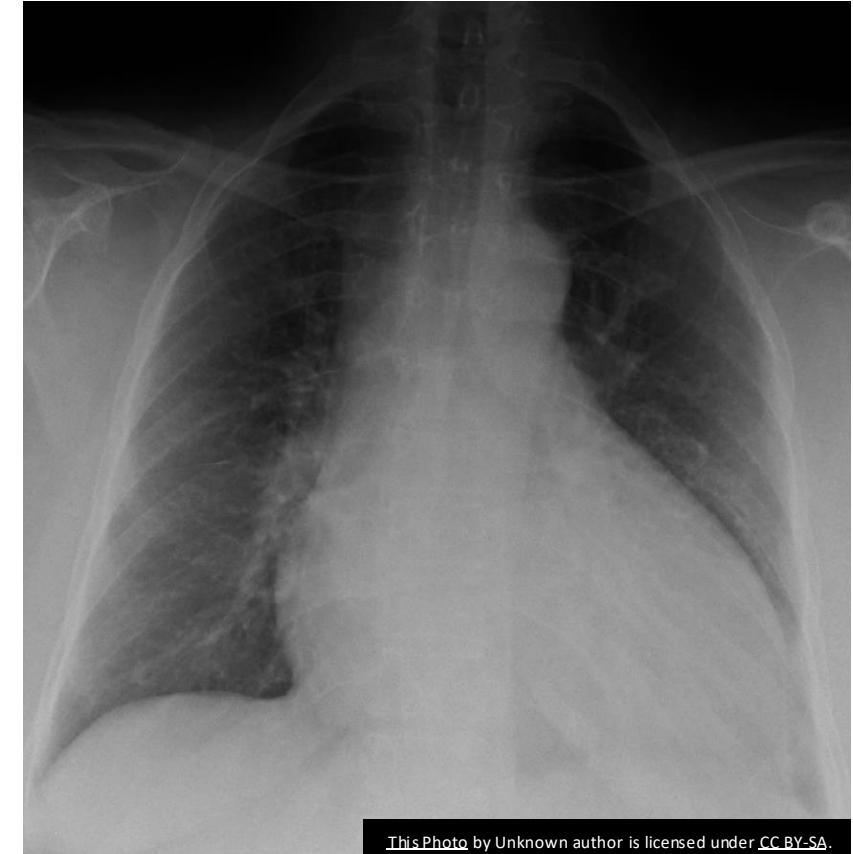
- **Late**

- Chest pain
- Diaphoresis-bradycardia...decreased oxygen to heart
- Heart failure



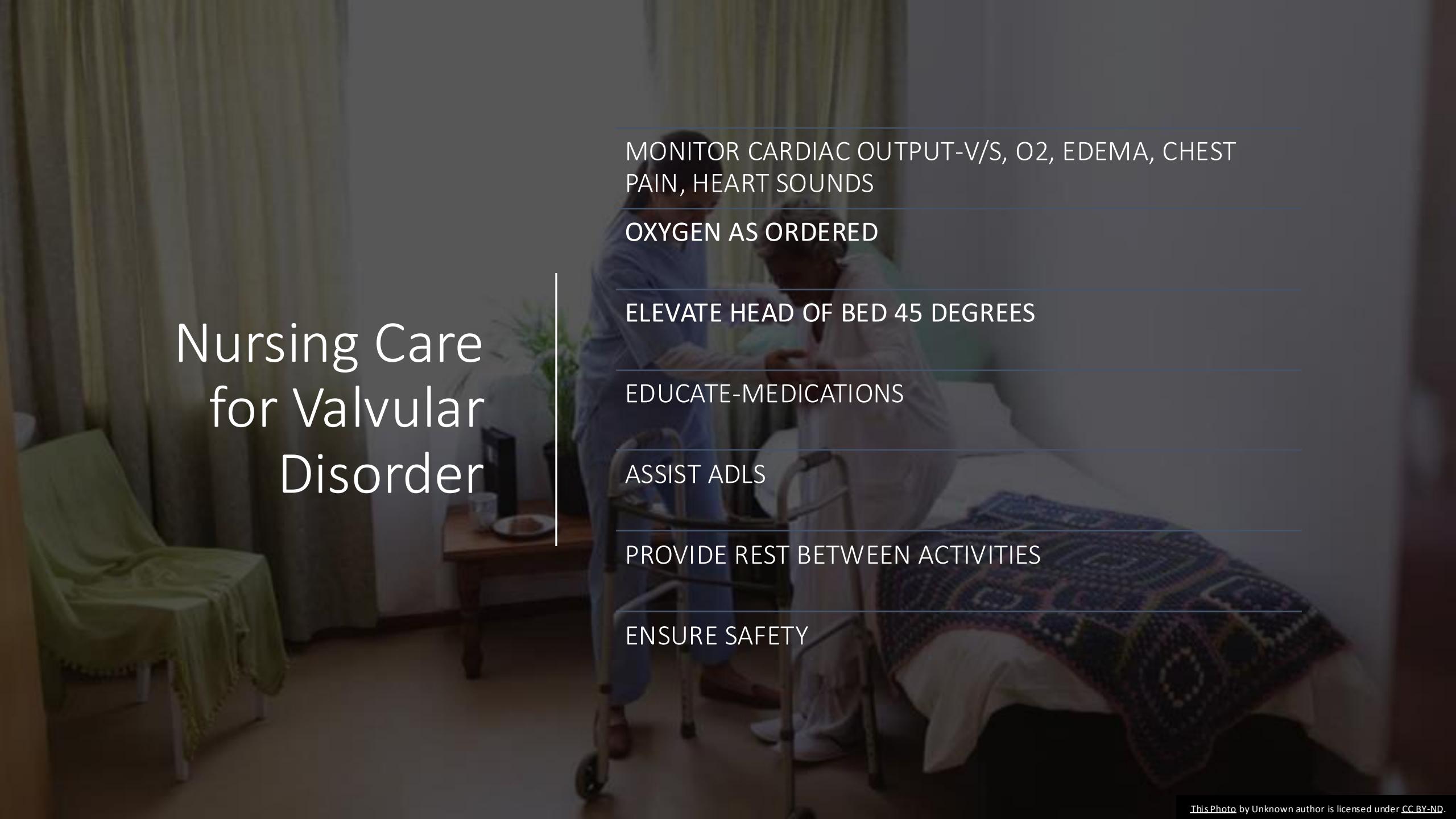
Aortic Regurgitation- Diagnostic Tests and Therapy

- **Diagnostic Tests**
 - Reveals Left ventricle enlargement:
 - Chest xray
 - Echocardiogram
 - Cardiac catheterization-regurgitation in left ventricle
- **Therapy**
 - Surgery-valve replacement
 - Reduce systolic blood pressure
 - Vasodilators
 - Diuretics



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Nursing Care for Valvular Disorder



MONITOR CARDIAC OUTPUT-V/S, O₂, EDEMA, CHEST PAIN, HEART SOUNDS

OXYGEN AS ORDERED

ELEVATE HEAD OF BED 45 DEGREES

EDUCATE-MEDICATIONS

ASSIST ADLS

PROVIDE REST BETWEEN ACTIVITIES

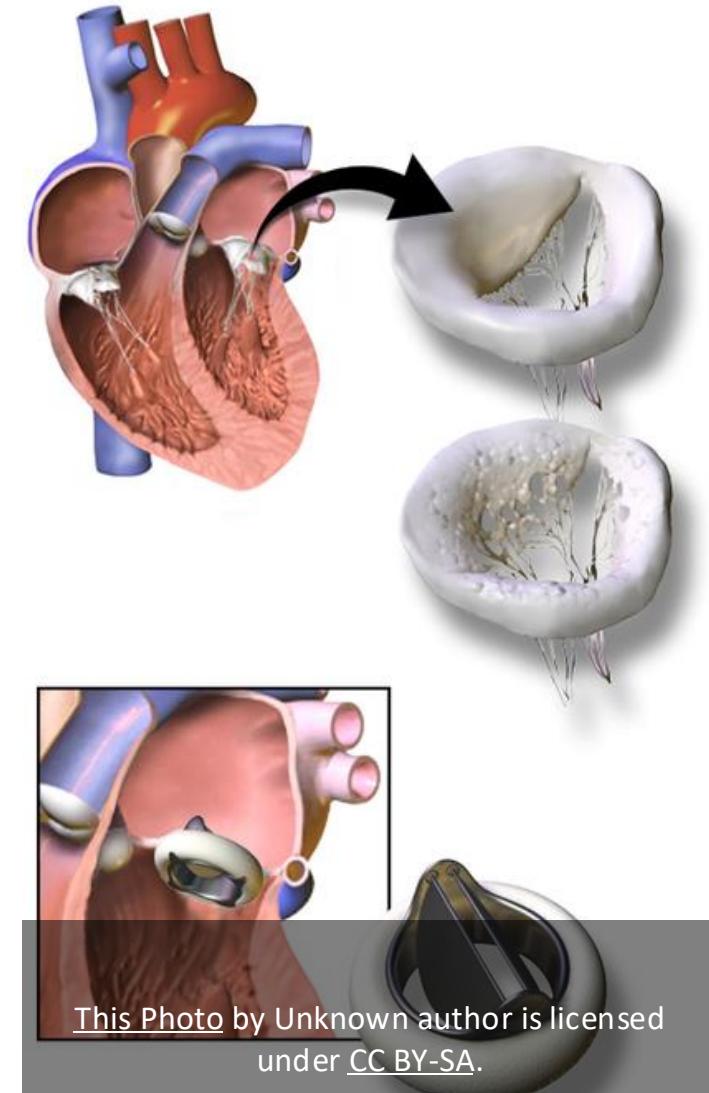
ENSURE SAFETY

Patient Education

- Most valve disorders are benign!
- Medications
 - Prevention of complications
 - **Do not stop blood thinners!**
- Report early symptoms of worsening
- Prophylactic antibiotics
 - Prevent infective endocarditis



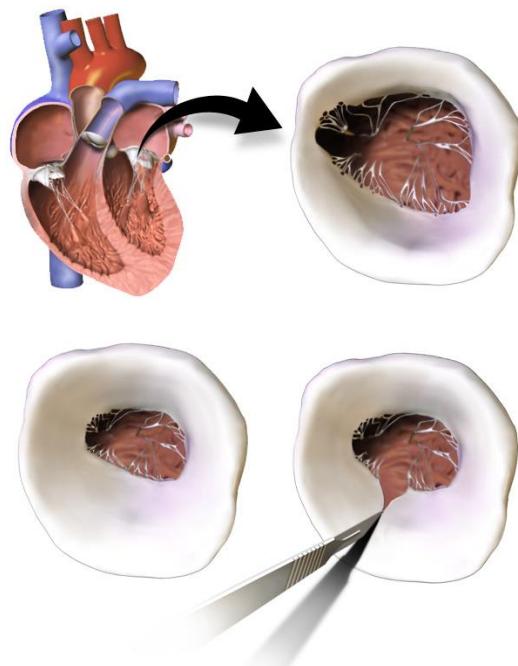
Surgical Valve Interventions



What's the difference?

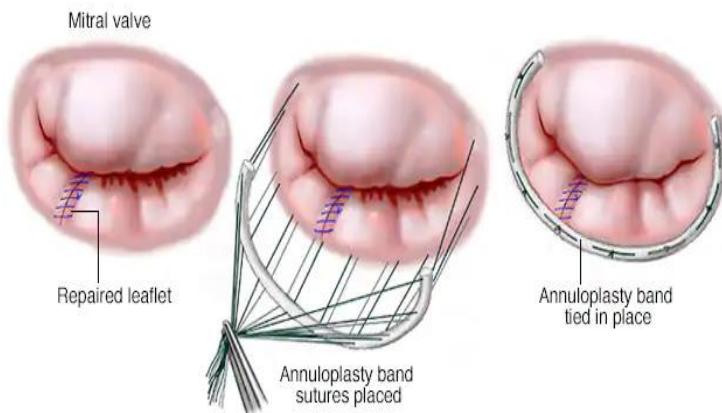
Commissurotomy

- Repairs stenosed valve with **incision**



Annuloplasty

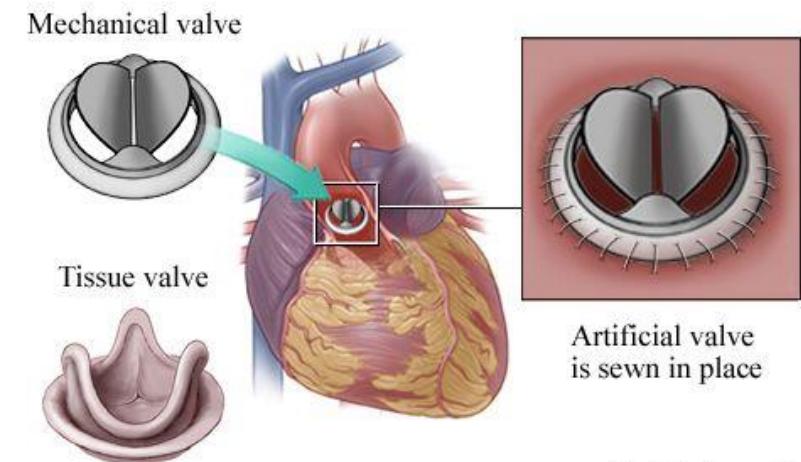
- **Sutures** or prosthetic ring placed



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Valve Replacement

- Valve is **replaced**



© Healthwise, Incorporated

Types of Heart Valve Replacement

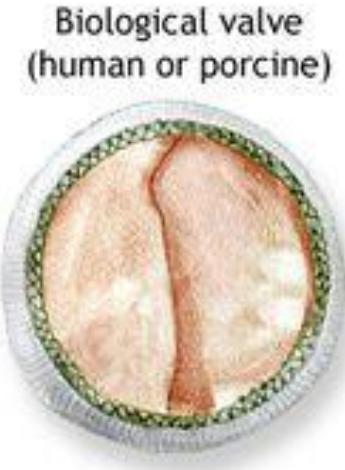
Mechanical

- Last longer than Biological
 - 20-30 years last
- Creates turbulent blood flow
- Requiring lifelong anticoagulants

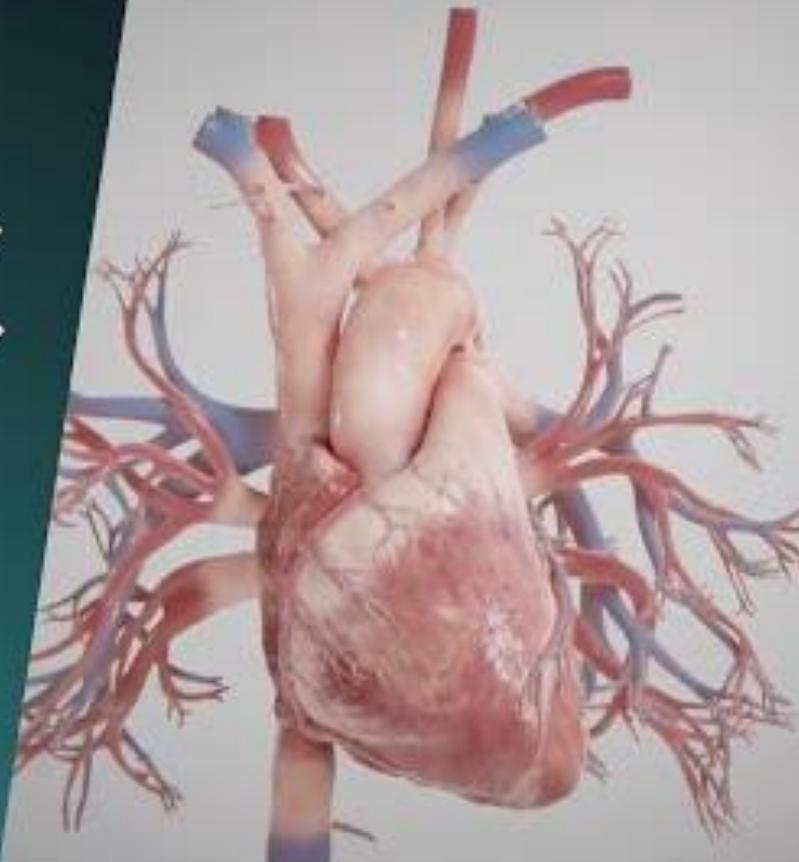


Biological

- Xenografts
 - Porcine (pig)
 - Bovine (cow)
 - Allograft (human)
- Low incidence of thrombus
- Does not require lifelong anticoagulants



AORTIC VALVE REPLACEMENT



https://www.youtube.com/watch?v=mx6c_FYjNAY

Cultural Considerations- Valve Replacements



- **Jewish and Islam religions**
 - May not consume pork products
 - Should be asked prefer bovine, mechanical, or human valves
- **Hindu religion**
 - Cow is sacred
 - Should be asked prefer porcine, mechanical, or human valve

Meet Mr. Schwarzenegger

- Mr. Schwarzenegger is a 74 year old male. He is a former actor, Governor, and bodybuilder. He presented with symptoms of heart failure, palpitations, hemoptysis, heart murmur, and pulmonary edema.
- Subsequently, he had an ECG, chest xray, and cardiac catheterization confirming Mitral Valve Regurgitation.
- He had mitral valve replacement surgery 2 days ago with a mechanical valve. You are now taking care of this patient in the medical/surgical unit.



Mr. Schwarzenegger's Care



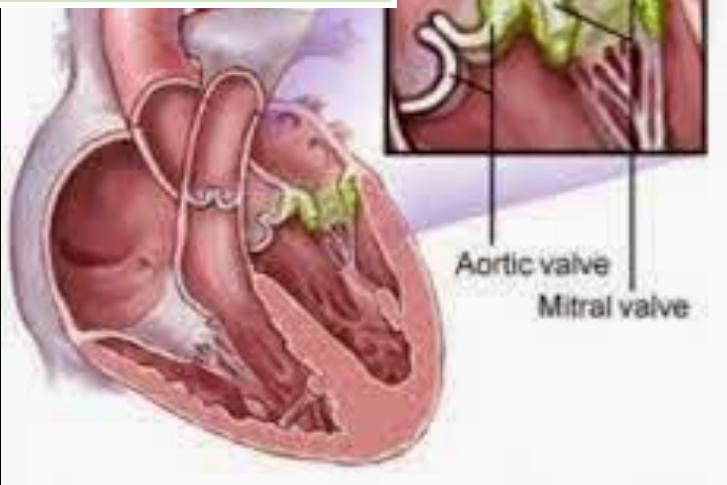
- **Nursing Care:**
- **Assessment**
- **Nursing care:**
- **Patient Education:**
- **Bed position:**
- **At risk for:**
- **Nursing Diagnosis:**
- **Discharge Preparations:**
 - What medications would be important for Mr. Schwarzenegger to take every day and why?
 - He says "My Twin Danny DeVito has Mitral valve prolapse but didn't have to have a valve replacement. Why didn't my little buddy have surgery?" What do you tell him?
 - He states he understood but said "Danny is Jewish and said if he ever had a valve replacement, that he would want to have the kind I got too." Why did Danny say this?

- You took wonderful care of Mr. Schwarzenegger and when you explain he will need cardiac rehabilitation....He responds with....

<https://www.youtube.com/watch?v=WgPePk3kGZk&t=7s>

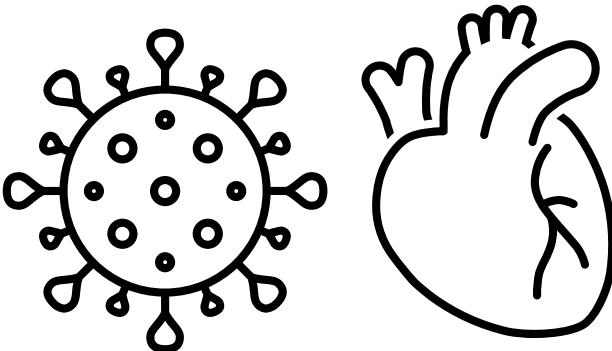


Infective Endocarditis



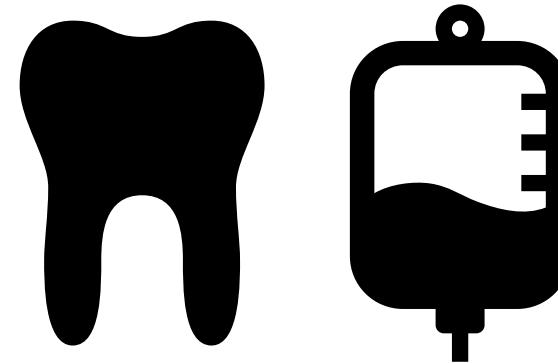
- Infection of the Endocardium
- At risks:
 - Mitral valve prolapse
 - Rheumatic heart disease
 - Congenital defects
 - Valve replacement
 - Compromised immune system
 - IV drug use
 - Gingival gum disease
- Mostly occurs with artificial or damaged valves, pacemakers

Infective Endocarditis



Begins with organism attaching to endocardium

- Platelets and fibrin attack and cover the organism
- Reducing ability to destroy organism
- Damage to valve as organism grows
- Valve damage leads to heart failure



Prevention is key

- Dental surgery contributing factor
- Daily tooth care
- Antibiotic prophylaxis before any dental procedure

Infective Endocarditis

- Signs and symptoms

- **Fever-common sign**
- Chills, Aching muscle and joints
- Fatigue, Cough, Edema
- New or different murmur
- **Petechiae**
- **Janeway lesions**-small, painless red-blue lesions on palms and soles)
- **Osler nodes** (small, painful, nodes on fingers and toes)
- **Roth spots** (hemorrhages in the retina having white center)

FEVER



Osler Node



Janeway Lesion



BACTERIAL ENDOCARDITIS

SIGNS: FROM JANE

Fever

Janeway lesions

Roth spot

Anemia

Osler nodes

Nail bed hemorrhage

Murmur

Emboli

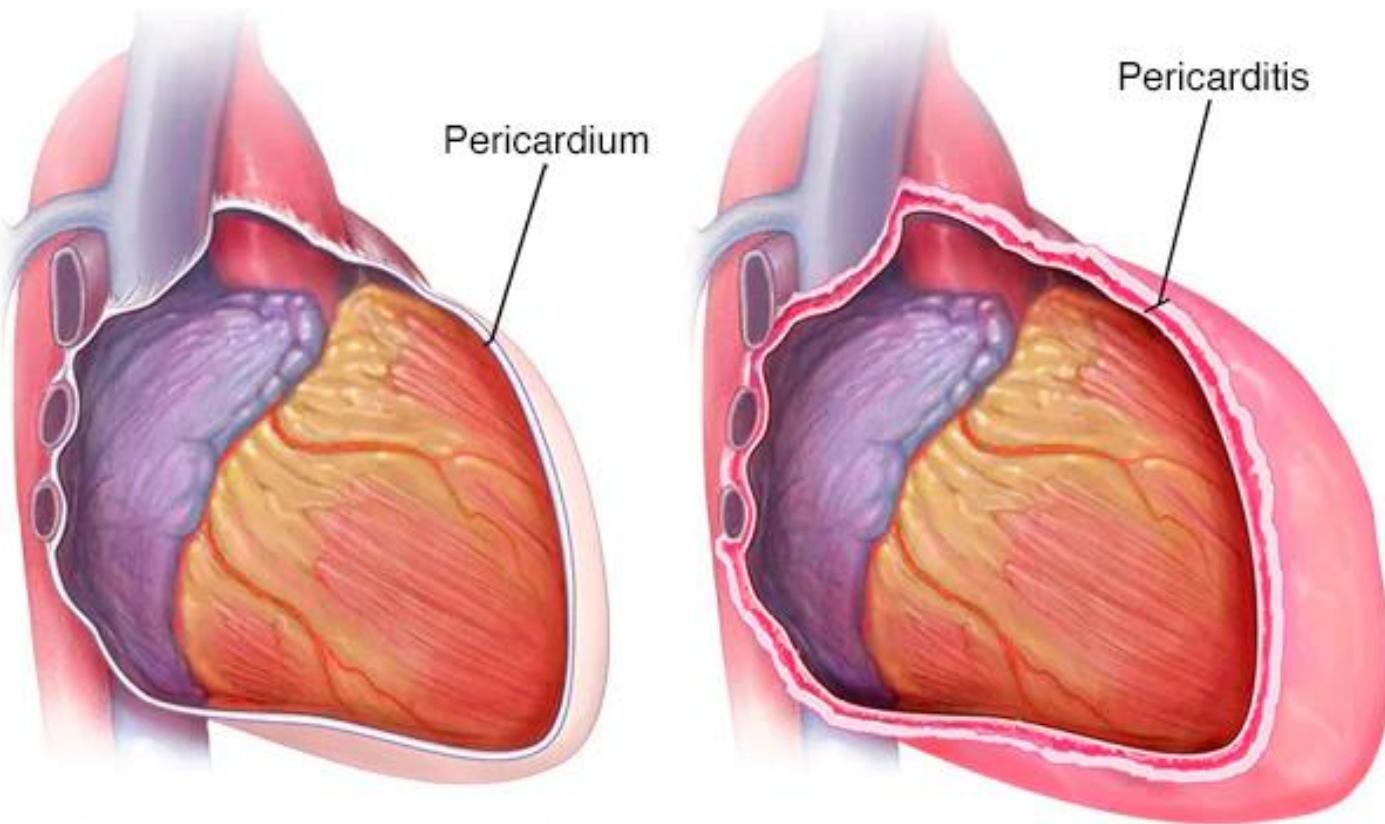
- <https://www.youtube.com/watch?v=xCyF7LawsE8>

Infective Endocarditis

- **Complications**
 - Organism breaks off-emboli
 - Heart structure damage-arrhythmia, myocardial infarction
 - Stenosis valves-Heart failure
- **Diagnostic Test**
 - Positive blood cultures
 - Echocardiogram
 - Chest x-ray, CT scan, MRI
 - infection in other areas
- **Treatment**
 - Hospitalization-IV Antibiotics 4-6 weeks; after 1 week afebrile-Home IV antibiotics
 - Replace damaged valves
- **Patient education**
 - Dental health; antibiotics before invasive procedures



Pericarditis



- Infection of the Pericardium
- Heart is restricted by infection and cannot fill properly—Cardiac output is reduced
- **Caused by:**
 - Infections
 - Dressler syndrome—inflammation of the pericardium as immune system response after damage to heart tissue
 - Heart attack
 - Cardiac surgery or traumatic injury
 - Medications
 - Neoplastic disease
 - Autoimmune disorders (Lupus, rheumatoid arthritis)



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Pericarditis-Signs and Symptoms

- Chest pain
- Cough
- Edema
- Fever
- Pericardial friction rub

Diagnostic tests:

CBC, ECG, Echocardiogram, MRI ,
Pericardiocentesis

Pericarditis Treatment



- Mild cases: may resolve without treatment
- Antibiotics
- Bedrest – reduce heart workload
- Nonsteroidal anti-inflammatory drugs
- Pericardial window-removing portion of pericardial layer
- Pericardiocentesis
 - <https://www.youtube.com/watch?v=rz6q-NzUiFY>
- Complications:
- Cardiac tamponade
 - Life threatening compression of fluid around heart
 - Requires emergency treatment with pericardiocentesis
- Nursing Care:
 - Pain
 - Anxiety
 - Maintaining normal cardiac function
 - Position sitting up and leaning forward relieves pain
 - Patient education about diagnosis

DIAC TAMPONADE

Cardiac Effusion/Cardiac Tamponade

- Life-threatening
- Compression of heart by fluid in pericardial sac
- Cardiac output decreases-Heartrate increases-then blood pressure decreases
- Immediate treatment is Pericardiocentesis
- Potential complications of Pericardiocentesis:
 - Bleeding
 - Infection
 - Pneumothorax
 - Heart damage

CUMULATION OF
FLUID IN THE PERICARDIAL
SAC IMPAIRS DIASTOLIC
FILLING AND REDUCES
CARDIAC OUTPUT

MMMECKS
PHRIARRD!

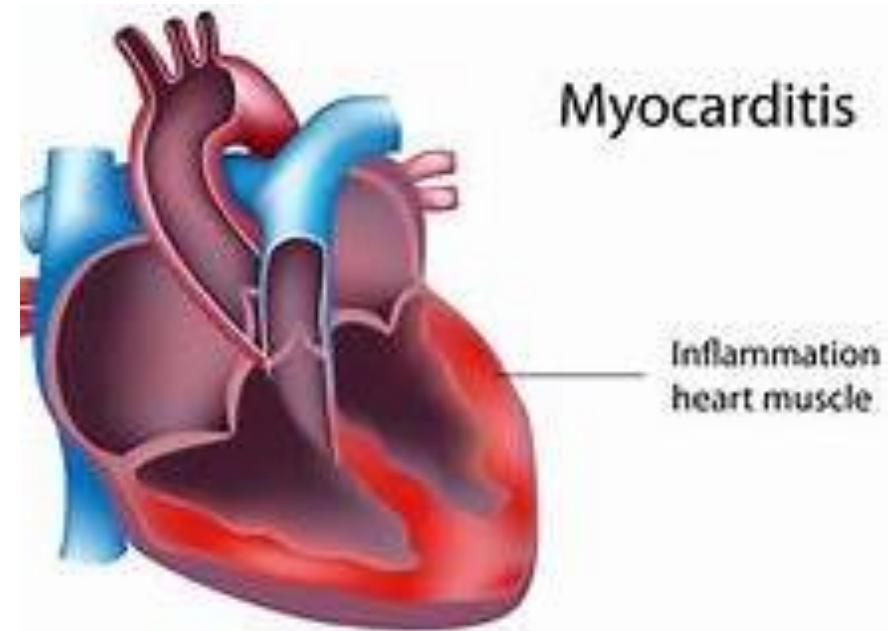
MUFFLED
HEART SOUNDS

I THINK HE
MEANT "BECK'S
TRIAD."

HYPOTENSION

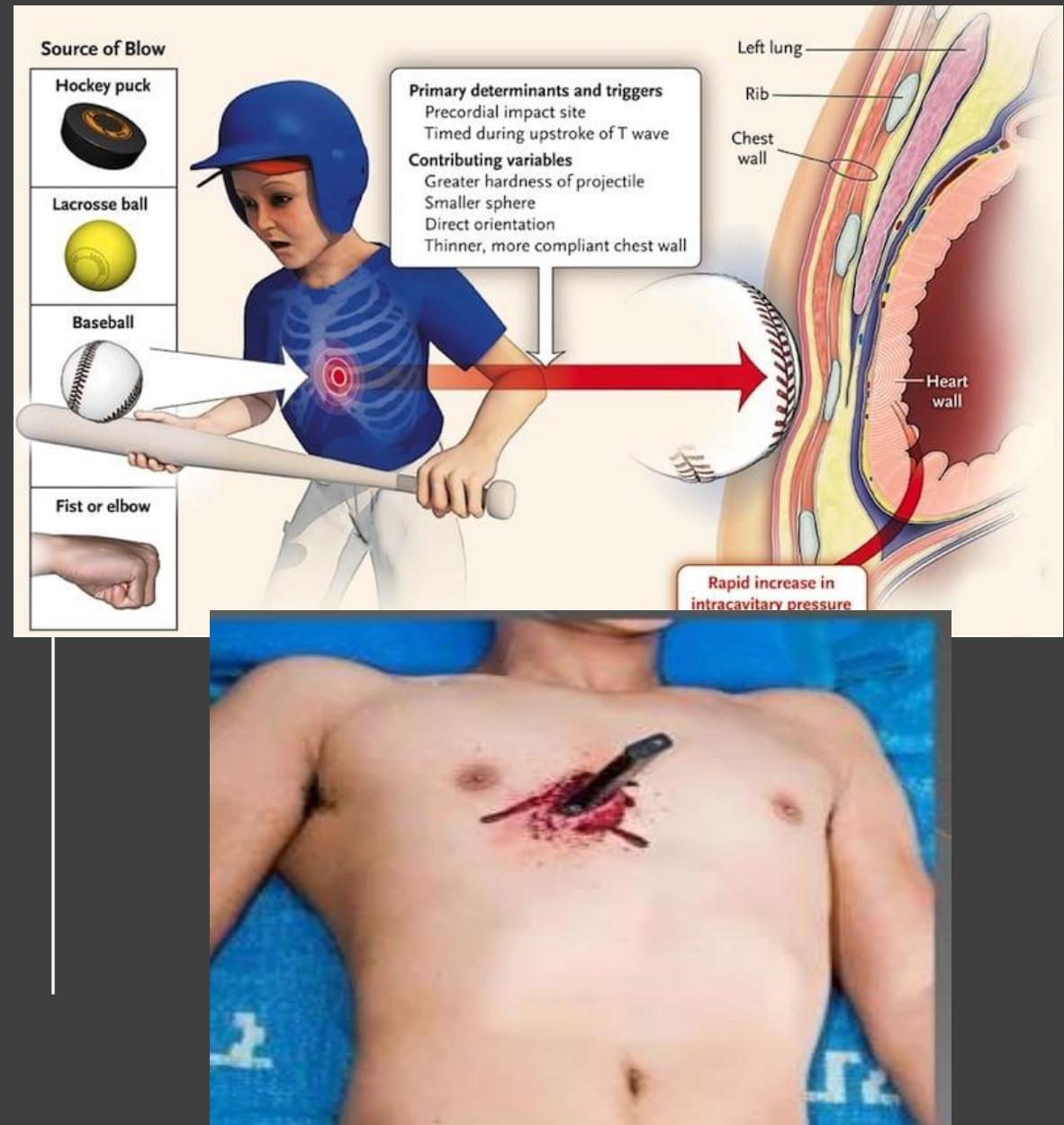
Myocarditis

- Inflammation of the myocardium
- **Heart may enlarge in response to infection**
- Most cases is benign
- Most commonly after viral infection
 - Can be from bacteria, fungi, rickettsia, lead toxicity, HIV rheumatic fever, lupus, cardiac transplant rejection
- **Signs and Symptoms:**
 - None to severe
 - Fatigue, fever, dyspnea, muscle aches, enlarged lymph nodes, chest pain after **viral infection**
- **Diagnosis:** endomyocardial biopsy during cardiac catheterization; chest xray, echocardiogram, ECG, CBC, viral antibodies, enzyme levels
- **Treatment:** Aimed at cause; reduce cardiac workload; bedrest, exercise increases inflammation and mortality; heart failure symptoms treated
- **Nursing Care:** maintaining normal cardiac function with monitoring V/S, Symptoms, administering medications, assisting with ADLs



Cardiac Trauma

- Two Types
 - Nonpenetrating-injuries from blunt trauma (vehicle accidents, sports injury)
 - Penetrating-internal injuries reaching heart (gunshot, stabbing)
- If bleeding into pericardial sac-risk for cardiac tamponade
- Scarring of myocardium may decrease cardiac output



Cardiomyopathy

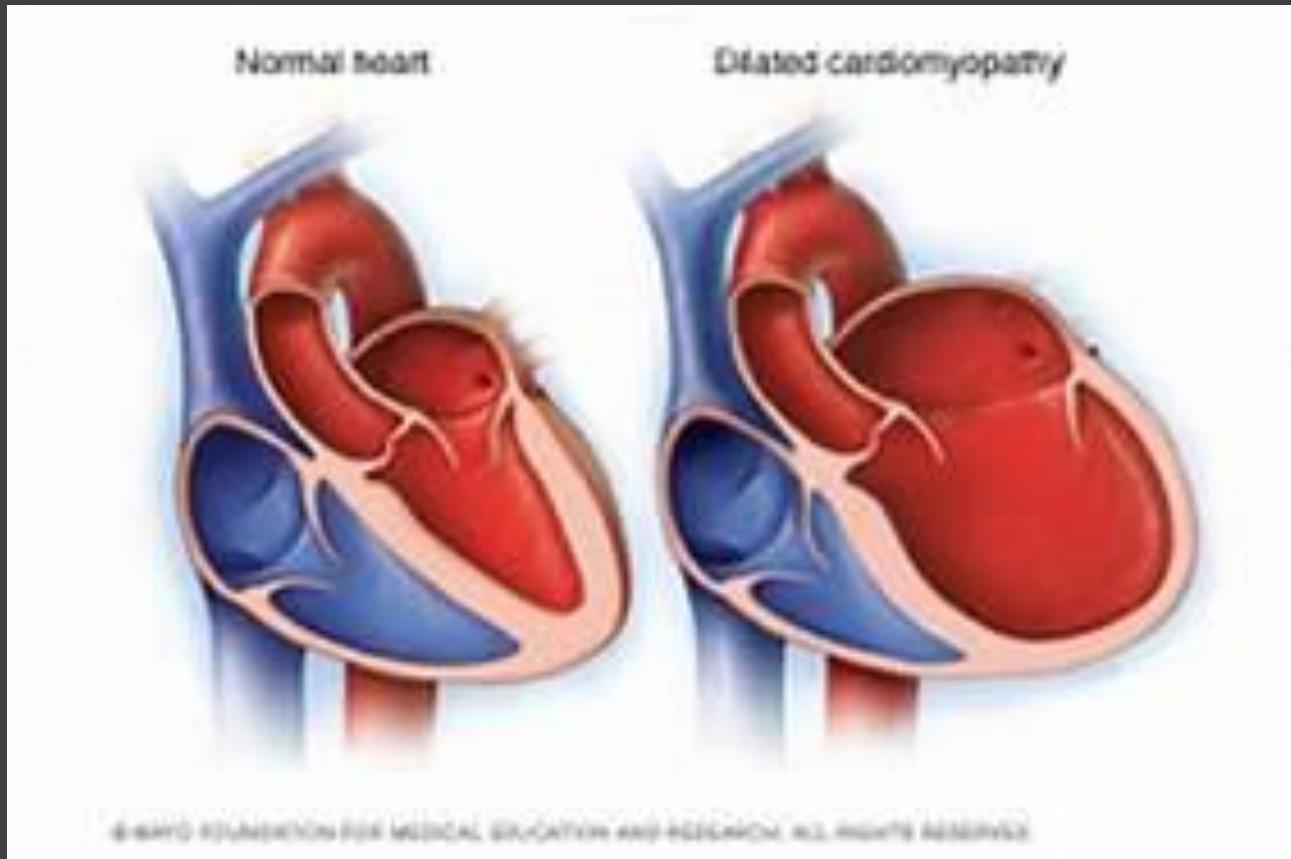
Abnormal and enlargement of heart

Leads to ineffective pumping

Three types

- Dilated
- Hypertrophic
- Restrictive

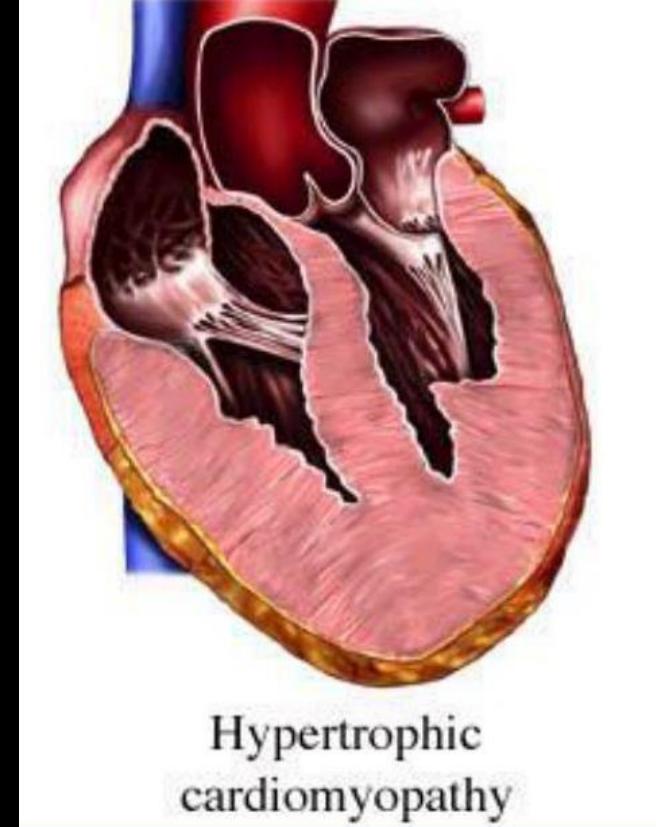
Dilated Cardiomyopathy



- Heart chambers increase-walls become thin
- Cardiac output is reduced
- Blood moves more slowly from left ventricle
- Creates blood clots
- Most frequent type of cardiomyopathy and causes of heart failure
- Causes:
 - Heredity
 - Infectious myocarditis
 - Hypertension
 - Heart valve disorders
 - MI
 - Chronic alcohol or cocaine use
 - Metals-lead, iron
 - HIV

Hypertrophic Cardiomyopathy

- Thickening of cardiac muscle wall
- Ventricular wall becomes rigid
- Causes
- Heredity

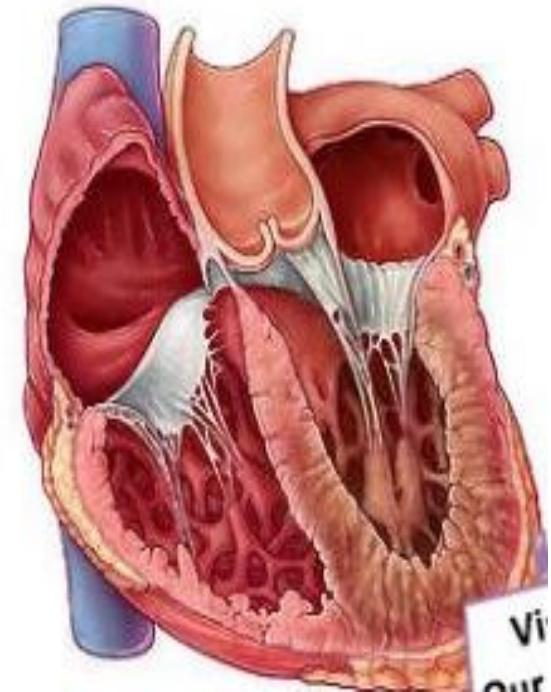
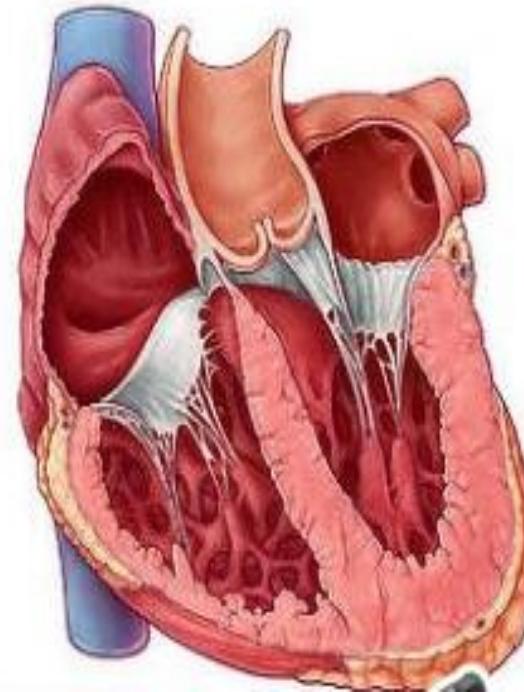


Hypertrophic
cardiomyopathy

Restrictive Cardiomyopathy

- Cardiac muscle is rigid and doesn't stretch
 - Systolic emptying of ventricle is normal
- Rarest form
- May be caused from amyloidosis-
Deposit protein amyloid into myocardial cells
- Treat underlying cause to reduce heart damage

Restrictive Cardiomyopathy



Cardiomyopathy

Signs and Symptoms

- Angina
- Arrhythmias
- Shortness of breath
- Fatigue
- Syncope

Diagnostic Tests

- Chest x-ray
- Echocardiogram
- ECG
- Stress test



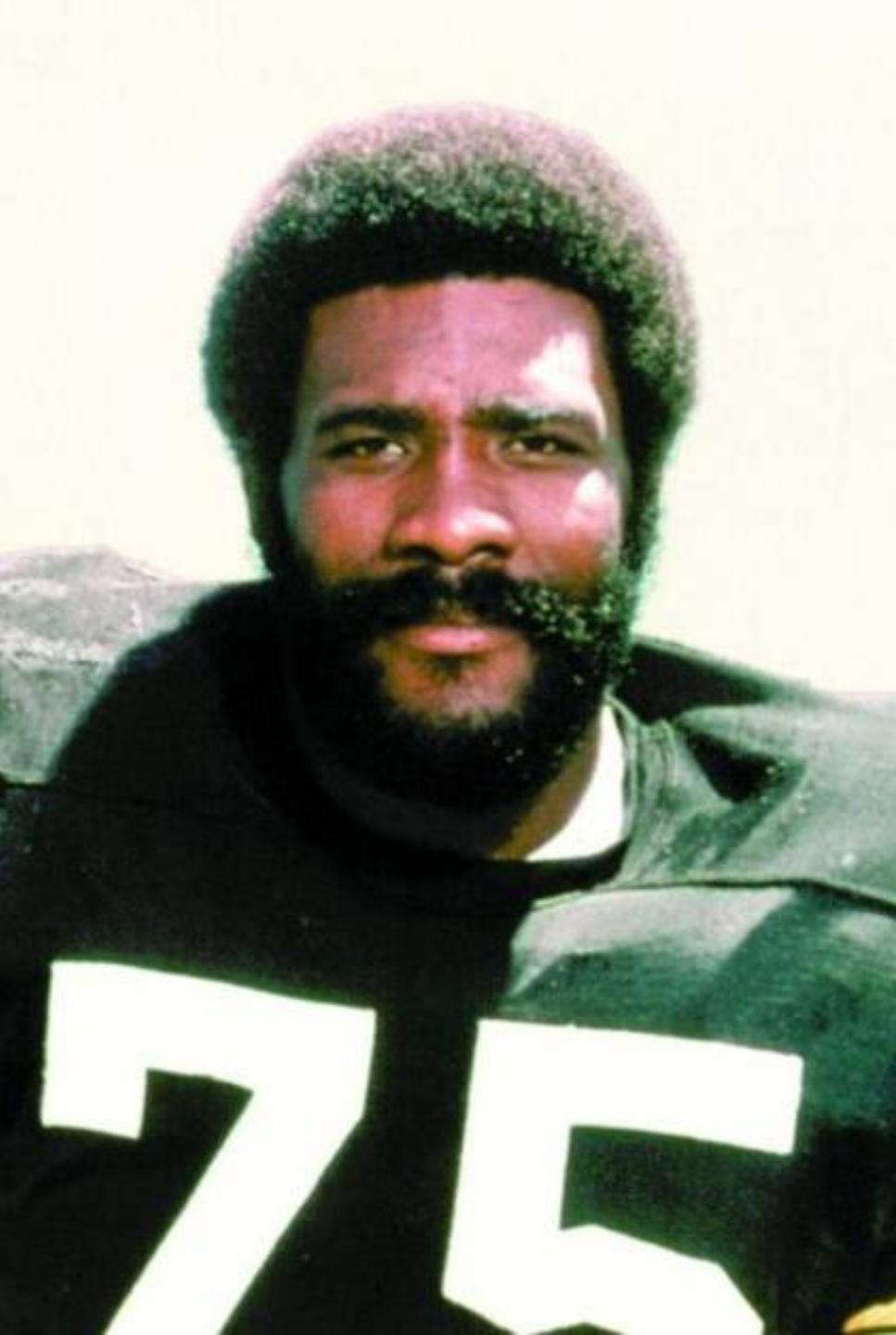
Cardiomyopathy

Treatment

- Treat underlying cause
- Palliative
- Manage heart failure symptoms

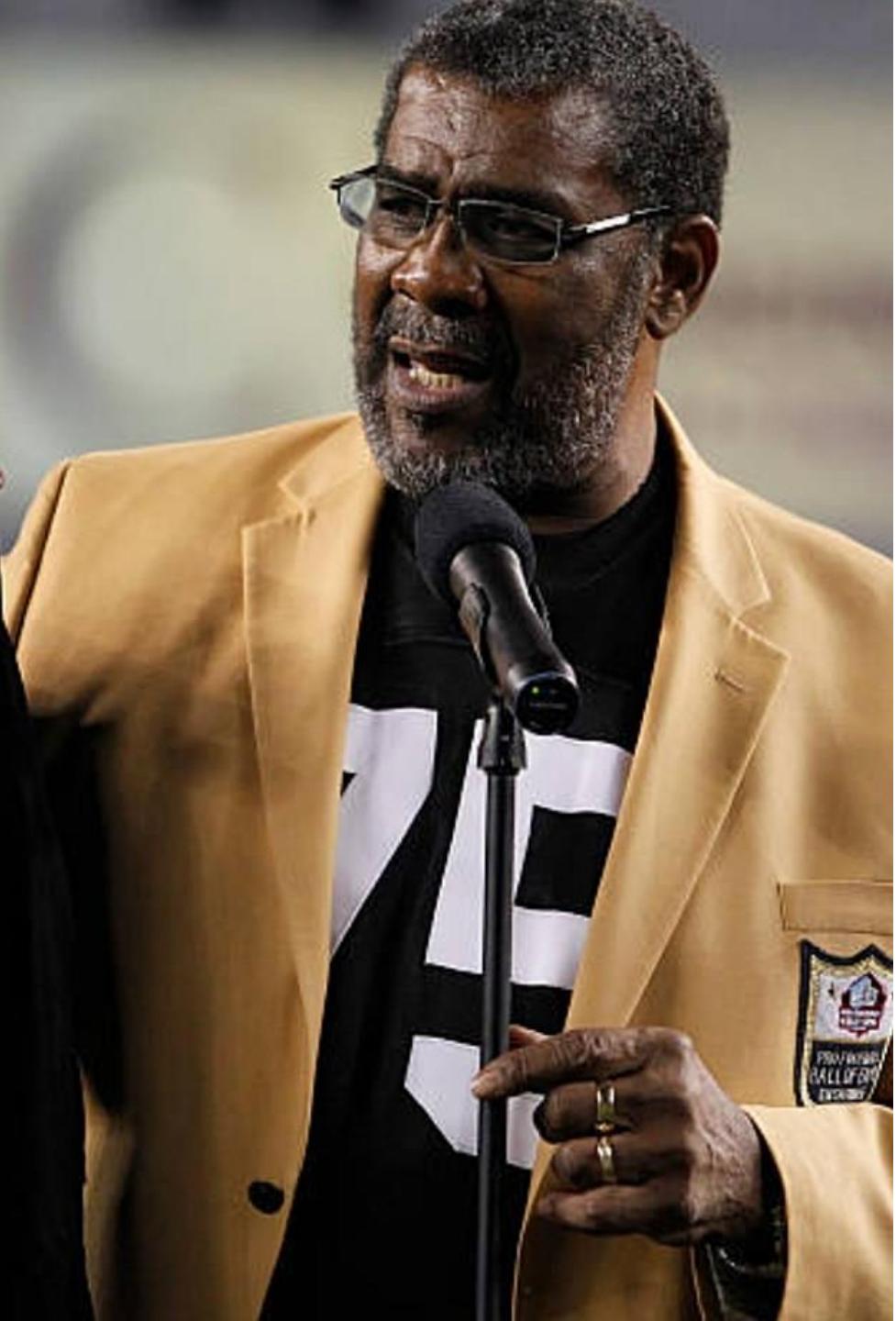
Nursing Care

- Maintaining normal cardiac function
- Increasing activity tolerance
- Relieving anxiety
- Reportable signs to provider-symptoms getting worse
- Education increase sense of control, decreases anxiety, aids informed decision making



Meet Mr. Charles Greene ("Mean" Joe Green)

- Mr. Greene is a 74 year-old male who prefers to be called "Mean" Joe Greene. He is a former professional defensive tackle football player for the Pittsburgh Steelers (1969 to 1981), two time NFL Defensive Player of the Year, and All-Pro with 10 Pro Bowl appearances. Mr. Greene is from Temple Texas and his #75 jersey was retired on Oct. 1, 2021. Mr. Greene is attending a community wide event promoting cardiac health, in which you are the Keynote Speaker. Following your presentation, Mr. Greene approaches you with the following questions:



Mr. Charles Greene ("Mean" Joe Green)

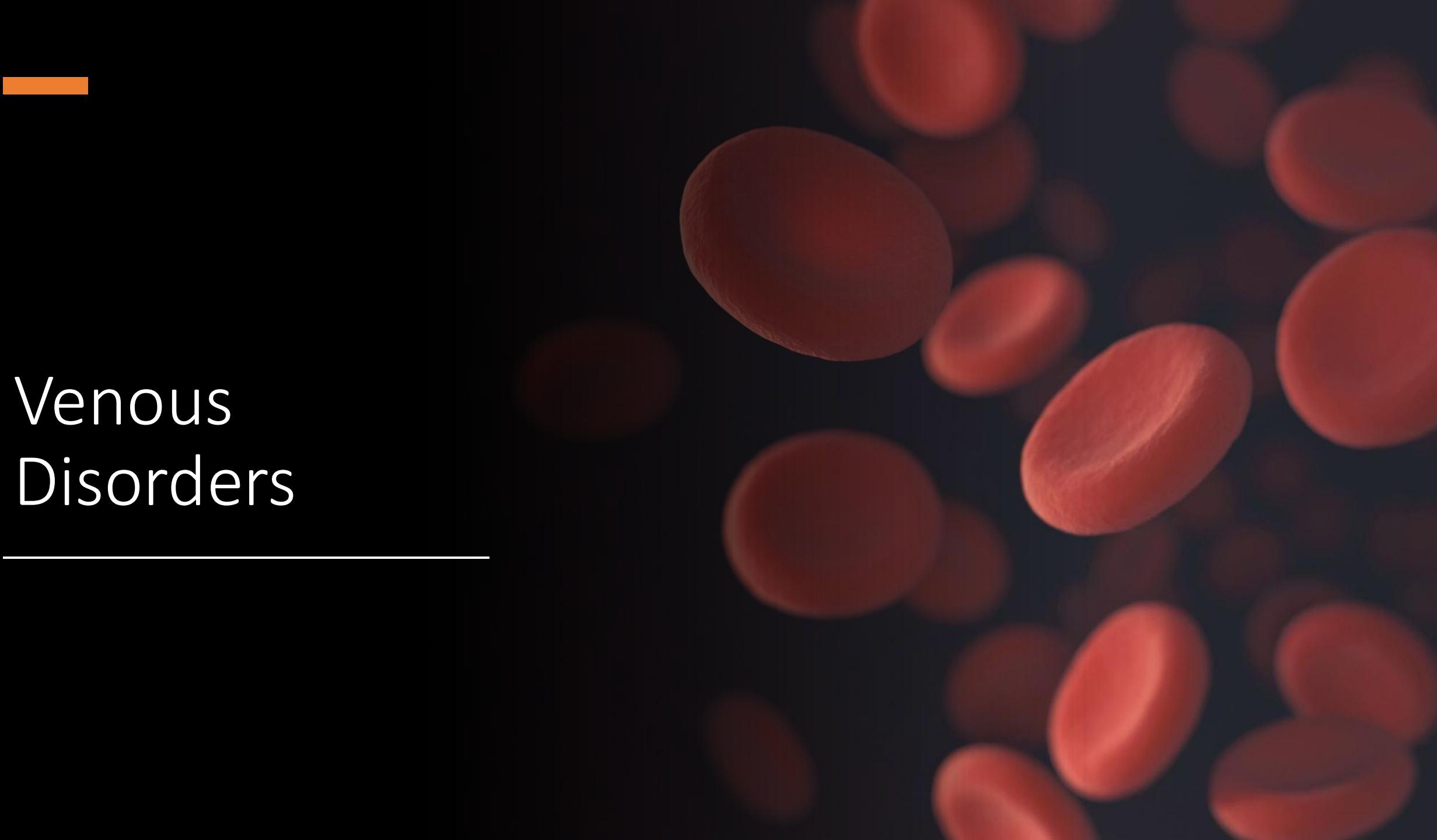
"My aunt has mitral valve prolapse, and every time she has dental surgery, she has to take antibiotics before the surgery. Why is this?" **What are you to say to Mean Joe?**

"I read that cardiomyopathy can cause complications, but I am still unsure what they may be. Can you explain what can happen to those with this disease?" **What will you tell Mean Joe?**

"When you were talking about pericardiocentesis, it reminded me of a game when we were playing the Patriots and the Running Back got hit and ended up having to have that procedure." **What is the correlation between Mr. Greene's story and pericardiocentesis? What would have been the risk to the player if they had not performed it immediately?**

"One more thing before I go. When I was playing for the Steelers, there was a player who came down with endocarditis. We all were worried about our buddy and couldn't figure out how he even knew he had it. What are some symptoms of this?" **What will you tell the Temple Icon?**

- 
- A medium shot of a man with dark skin and short hair. He is wearing a white button-down shirt over a yellow, white, and grey vertically striped vest. He is leaning forward, holding a dark-colored bottle with both hands and drinking from it. A white plate with some food is on a surface in front of him.
- <https://www.youtube.com/watch?v=DjaWKK6ylQg>

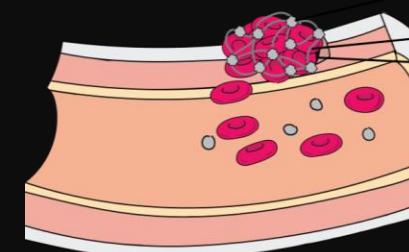
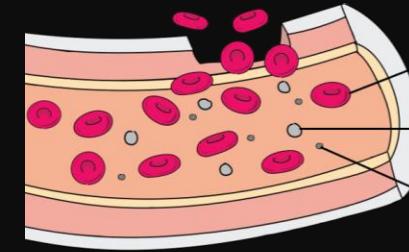


A cluster of red blood cells against a dark background.

Venous Disorders

Thrombophlebitis

- Formation of blood clot and inflammation within the vein
- Normally affects legs, thighs, pelvis-can be superficial or deep vein
- Three factors involved in formation:
 - Stasis of blood flow
 - Damage to lining of vein wall
 - Increased blood coagulation
- https://www.youtube.com/watch?v=1N_b_xIzFGOI



Thrombophlebitis-Prevention

Immobility

- Change positions

Prophylactic antiembolism devices

- Compression stockings
- Intermittent pneumatic compression devices

Prophylactic medications

- Heparin-postop
 - Give SQ
 - Monitor platelet count
 - Monitor for bleeding
 - Antidote: Protamine sulfate
- Warfarin (Coumadin)
 - Monitor INR for therapeutic levels
 - Bleeding
 - Education patient to report bleeding
 - Use acetaminophen for analgesia instead of aspirin
 - Antidote: vitamin K

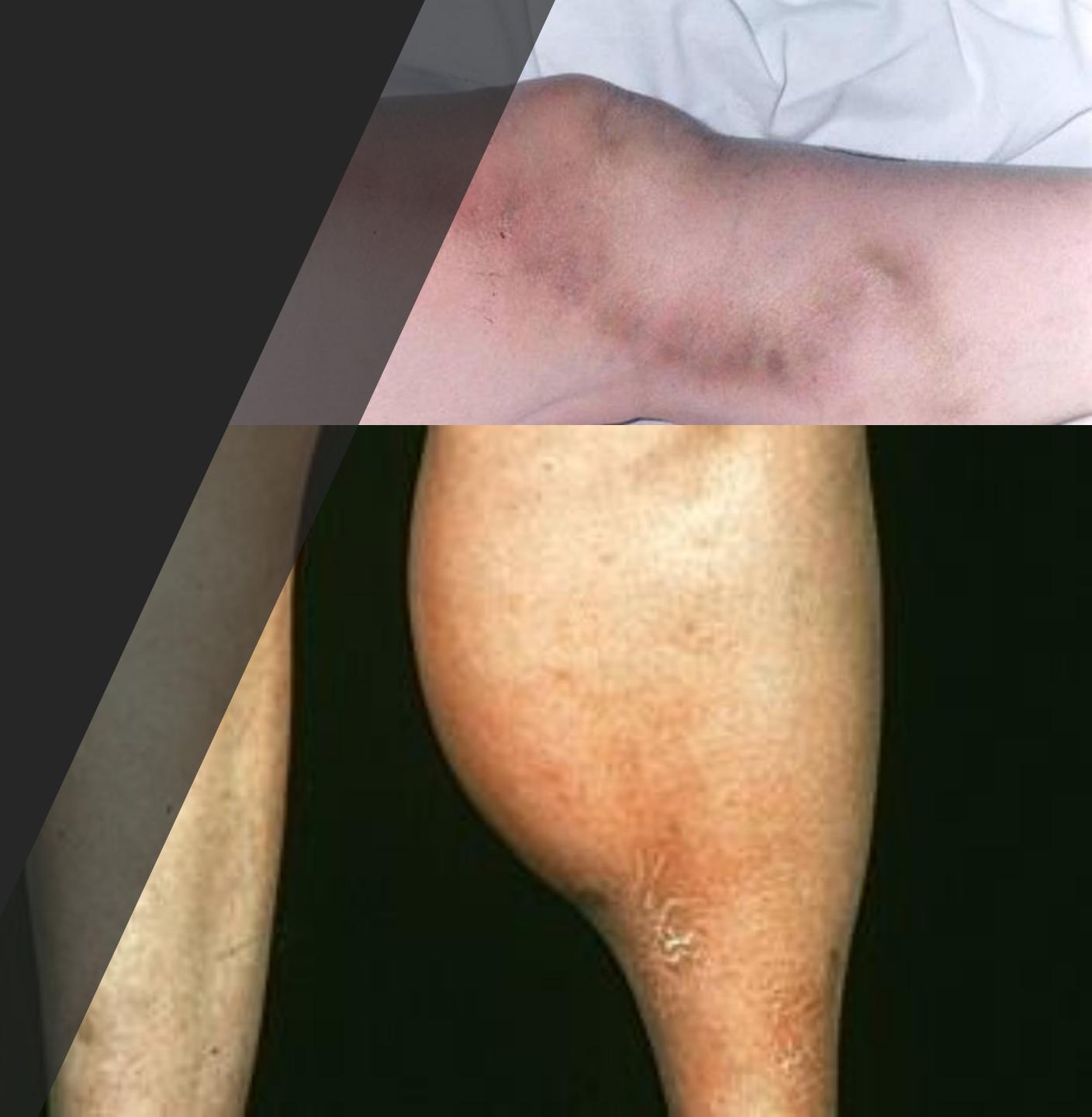
Thrombophlebitis- Signs and Symptoms

- Superficial Veins
 - Redness
 - Warmth
 - Swelling
 - Tenderness
 - Feels like a firm cord (termed induration)
 - Saphenous vein-most common
 - When in arm-IV therapy most common cause



Thrombophlebitis- Signs and Symptoms

- Deep Veins
 - 50%-no symptoms
 - Swelling
 - Pain
 - Warmth
 - Venous distention
 - Edema
 - Tenderness in calf
 - Fever can be present
- Cyanosis and edema-vena cava involved



Thrombophlebitis- Complications



- Pulmonary embolism
- Chronic venous insufficiency- damage to valves in vein
- Post-thrombotic syndrome (PTS)
 - Follows DVT
 - Damaged vein valves
 - Pain
 - Swelling
 - Leg ulcers

Thrombophlebitis-Treatment

Goal-

- Prevent pulmonary emboli
- Relieve pain

Superficial

- Treated at home
- Warm, moist heat
- Analgesic
- NSAIDS
- Compression stocking
- Leg elevation

Thrombophlebitis-Treatment

Deep

- Hospitalization-about 5 days
- Warm, moist heat
- Elevation of leg above heart level
- Compression stocking
- Anticoagulants
- Surgery-venous thrombectomy
- Vena cava filter-traps clots traveling towards lung

Observe for edema, skin color changes , ulcers

Education

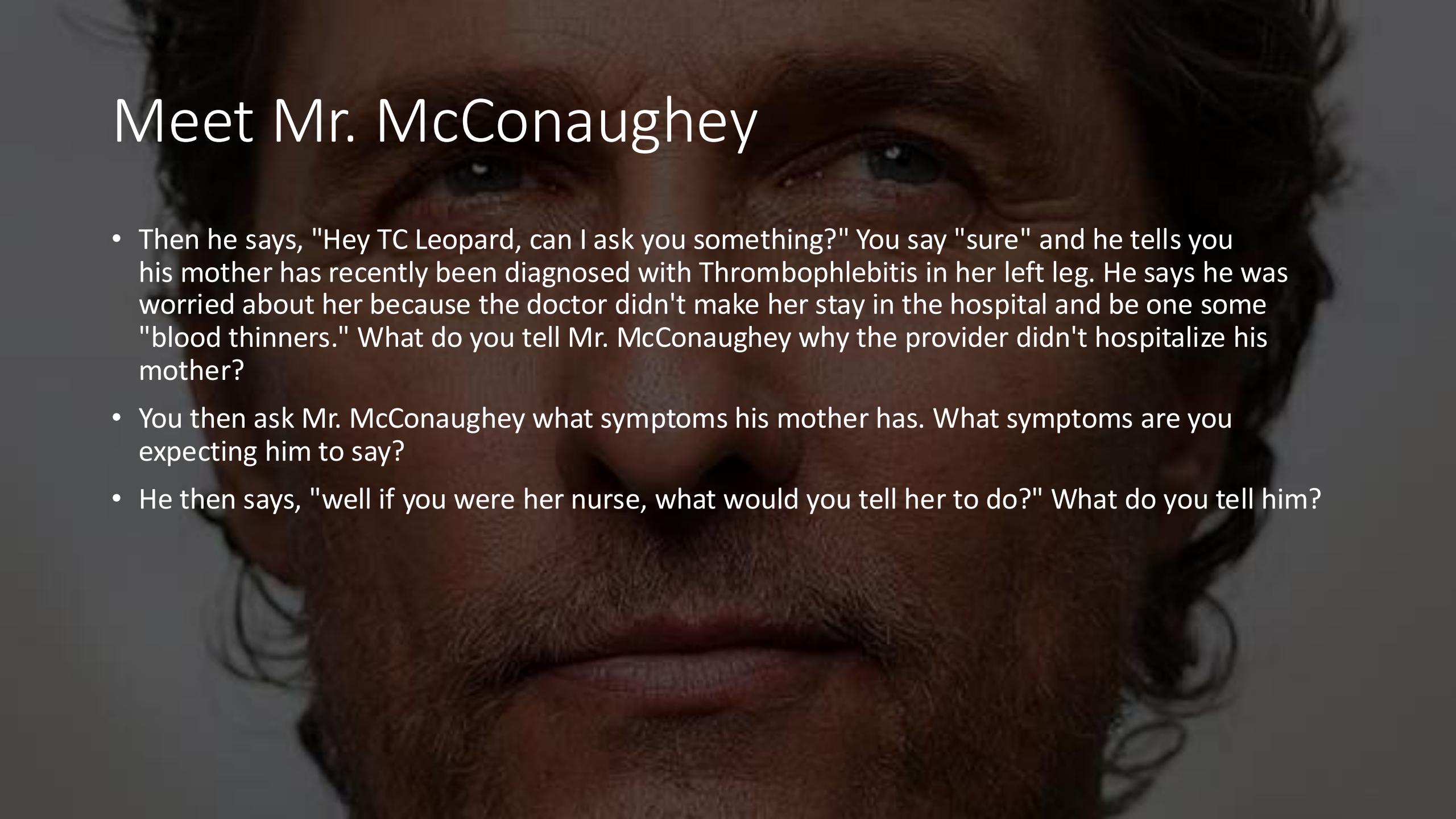
- Do not cross legs or wear constrictive clothing



Meet Mr. McConaughey

- Mr. Matthew McConaughey is a 53 year-old male from Texas. He is an American actor playing in numerous movies from his *Dazed and Confused* (1993) to *The Wedding Planner*, *How to lose a guy in 10 days*, *Failure to Launch*, to *The Lincoln Lawyer* and numerous more.
- While visiting the Capital in Austin, you notice Mr. McConaughey sitting on a bench inside the Capital and decide to go over and meet him.
- As you walk towards Mr. McConaughey, he smiles, and you introduce yourself. Small talk proceeds and he asks you what you do for a living. You share you are a nursing student at Temple College, and he responds with "alright, alright, alright."

ALRIGHT ALRIGHT



Meet Mr. McConaughey

- Then he says, "Hey TC Leopard, can I ask you something?" You say "sure" and he tells you his mother has recently been diagnosed with Thrombophlebitis in her left leg. He says he was worried about her because the doctor didn't make her stay in the hospital and be on some "blood thinners." What do you tell Mr. McConaughey why the provider didn't hospitalize his mother?
- You then ask Mr. McConaughey what symptoms his mother has. What symptoms are you expecting him to say?
- He then says, "well if you were her nurse, what would you tell her to do?" What do you tell him?

Meet Mr. McConaughey

- He thanks you for your time, education, and reassurance for his mother. Then he asks if he could get a Temple College Leopard's t-shirt to wear on Saturdays instead of the team shirt, he "usually wears." You come back to the college and share your experience with Dr. X and she asks if you gave him the TC shirt yet...to which you said, "Not yet." Dr. X says, "don't you worry about getting it to him....I would be more than happy to do that!"
- You respond by saying "alright, alright, alright."
- <https://www.youtube.com/watch?v=fzbVXCUhUOY>

