

Chapter 24  
Nursing Care of Patients  
with Occlusive Cardiovascular Disorders

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Health & Illness III





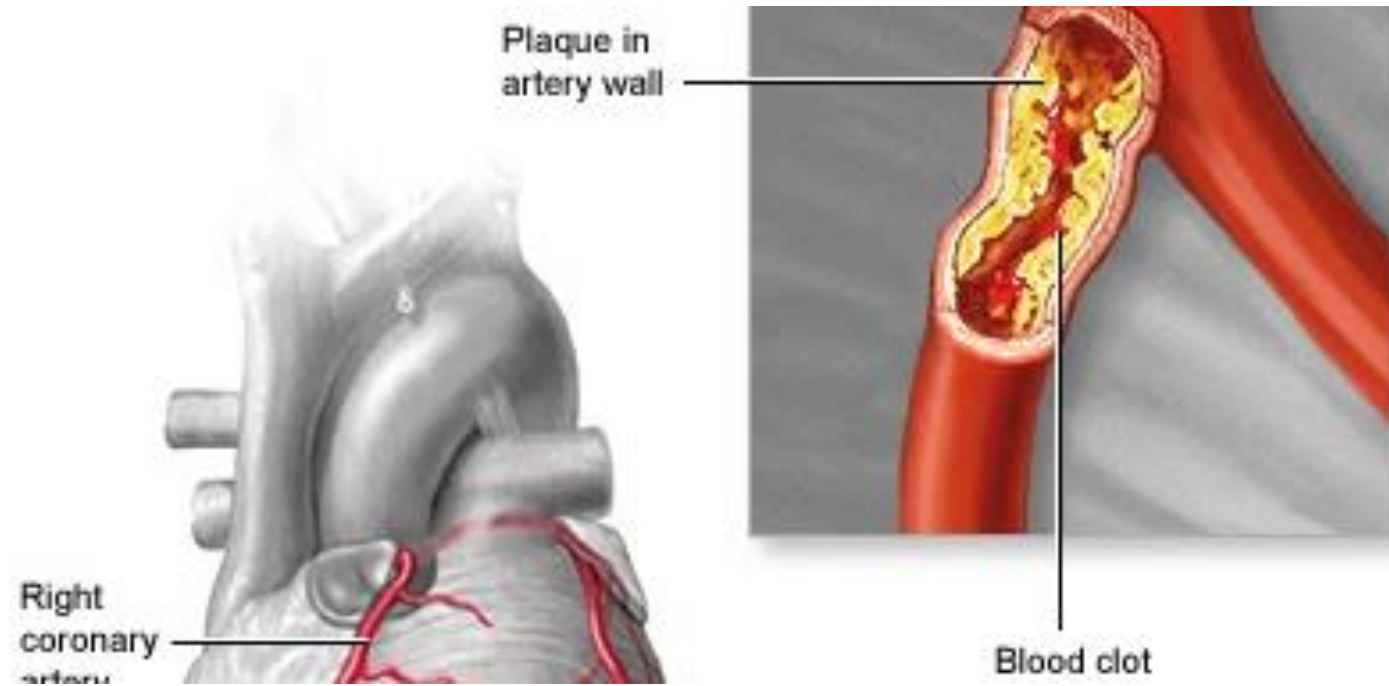
## Objectives

- Explain etiologies, signs, symptoms, therapeutics of:
- Coronary artery disease
- Angina pectoris
- Myocardial infarction
- Peripheral vascular disorders
- List data to collect for patients and describe therapeutic measures to treat coronary artery disease, angina pectoris, peripheral vascular disorders, and myocardial infarction
- Plan nursing care for patients with peripheral vascular disorder

You are at  
risk...  
I can help!

**You are at Risk...I can help you!**

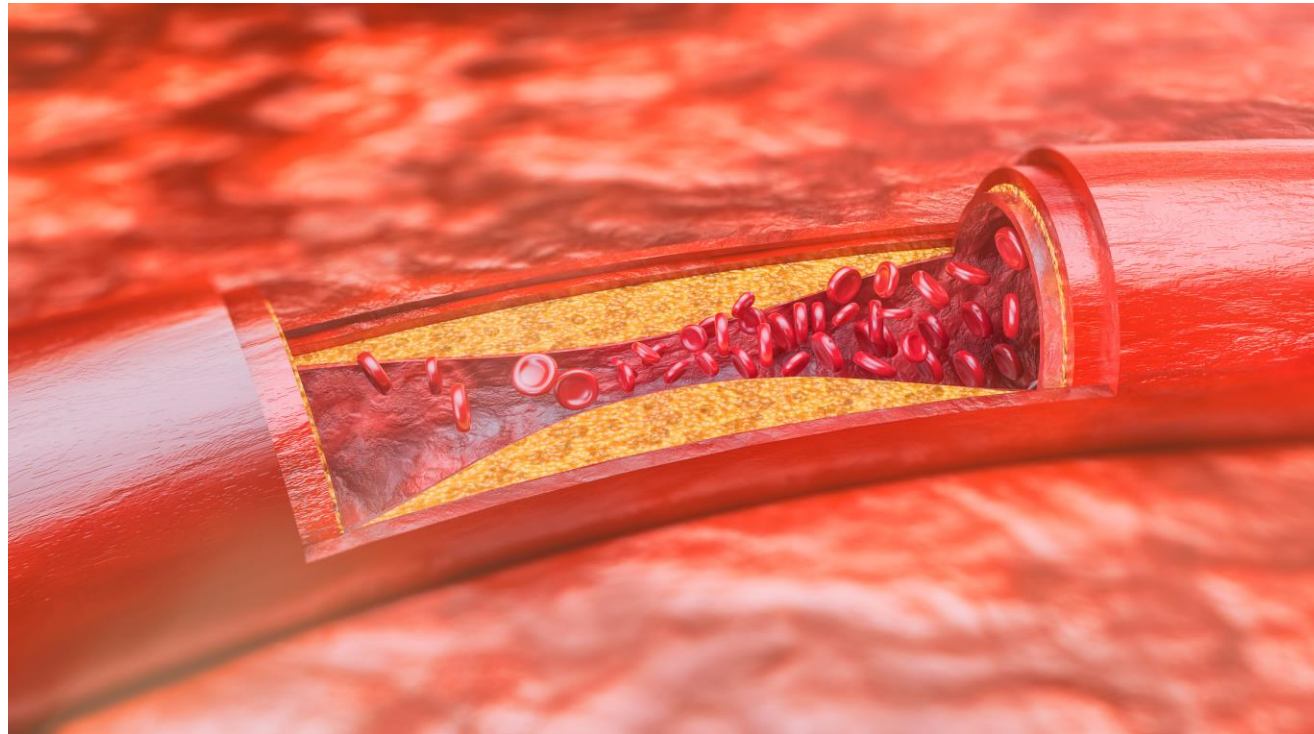
clusive Disorder	You are at risk	I can help you!
eriosclerosis mation of plaque (fatty buildup) in arteries	Total cholesterol levels above 200 mg/dL Elevated LDL, VLDL and low HDL	Encourage: <ul style="list-style-type: none"><li>• Healthy Diet</li><li>• Quit Smoking</li><li>• Exercise</li><li>• Medications</li><li>• Lowering lipids</li></ul>
ronary Artery Disease—Angina Pectoris	<ul style="list-style-type: none"><li>• Men older than 50</li><li>• Women after menopause</li><li>• African Americans</li><li>• Diabetics</li><li>• Hypertension</li><li>• Elevated LDL and low HDL</li><li>• Excessive alcohol use</li><li>• Obesity</li><li>• Sedentary lifestyle</li><li>• Emotional stress</li><li>• Smoking</li></ul>	Type of Medications:
ute Coronary Syndrome-Myocardial arction	<ul style="list-style-type: none"><li>• Conditions caused by lack of oxygen to heart</li><li>• <b>Silent Ischemia-</b></li><li>• Occurs without pain; older adults, hypertension, diabetics</li><li>• <b>Myocardial Infarction</b></li><li>• Also known as Heart attack</li><li>• Death of heart muscle</li><li>• Caused by blockage of coronary arteries</li><li>• Women: heart disease remains leading cause of death in women in U.S.</li></ul>	First hour after symptoms is crucial administering:  Oxygen:  Medications:  Monitor for:



Arteriosclerosis  
Formation of plaque (fatty buildup) in arteries



Causes coronary heart disease by obstructing blood flow in cardiac vessels



Diagnostic test-  
increased risk:



Total cholesterol levels  
above 200 mg/dL



Elevated LDL, VLDL and  
low HDL

# Therapeutic measures

**Healthy Diet**

**Quit  
Smoking**

**Exercise**

**Medications**

**Lowering  
lipids**

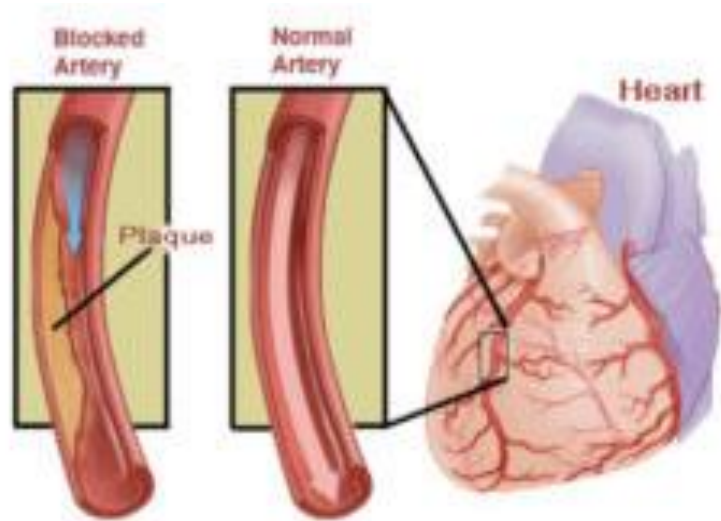
# Coronary artery diseases

Obstruction of blood flow to coronary arteries

## Those at risk

- Men older than 50
- Women after menopause
- African Americans
- Diabetics
- Hypertension
- Elevated LDL and low HDL
- Excessive alcohol use
- Obesity
- Sedentary lifestyle
- Emotional stress
- Smoking





[https://www.youtube.com/watch?v=f7EAVI8Vc\\_k](https://www.youtube.com/watch?v=f7EAVI8Vc_k)

## Angina Pectoris

Chest pain due to ischemia from reduced coronary blood flow and oxygen to heart muscle

# Types of Angina

## STABLE ANGINA

- Occur moderate exertion
- Lasts only a few minutes
- Relieved with rest and nitroglycerin

## UNSTABLE ANGINA

- Increases unpredictably with less exertion
- Not relieved by rest or medication
- Serious condition can lead to Myocardial infarction (MI)

# Types of Angina

## VARIANT OR VASOSPASTIC ANGINA

- Caused by coronary artery spasms
- Occurrence is cyclical-happens at same time each day
- Pain occur with exercise or rest, Often at night
- Serious

## MICROVASCULAR ANGINA

- Spasms of tiniest arteries of heart
- Reduces blood flow
- Pain is more severe and last longer

# Signs and symptoms



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## Chest pain that is...

- Discomfort
- Burning
- Fullness
- Heaviness
- Pressure
- Squeezing

## Can radiate down

- Arm
- Shoulder
- Neck
- Jaw
- Back

## May be

- Pale
- Diaphoretic
- Dyspneic

## Therapeutic Measures

# ANGINA And its Types



# Diagnostic Tests



ECG



Exercise stress test



Echocardiogram



Coronary angiography



# Therapeutic Measures

- Vasodilators

- **Nitroglycerin**-nitrate vasodilates to increase oxygen to myocardium and peripheral vessels...**heart does not have to work so hard**
- Sublingual tablet in buccal pocket-decreases burning and tingling sensation
- Education:
  - rise slowly
  - call 911 if doesn't relieve
  - replace nitroglycerin every 3-6 months
  - keep in original container-inactive with light
  - use of erectile dysfunction medication is contraindicated-can cause hypotension
  - avoid alcohol

- Calcium Channel Blockers

- Dilates peripheral arteries, decrease myocardial contractility and workload
- Norvasc, cardizem, if pulse is less than 60 or systolic BP less than 90mmHg-hold medication

# Therapeutic Measures

- **Beta Blockers**

- Decrease pulse, BP, cardiac output; Tenormin, Lopressor; contraindicated in asthma, heart block, bronchoconstriction; if pulse less than 60 or 90 BP-hold medication
- Education abrupt withdrawal may result in diaphoresis, palpitations, headache and tremors

- **Angiotensin-converting enzyme inhibitors**

- Blocks angiotensin (vasoconstrictor)
- Capoten, vasotec,
- if pulse less than 60 or 90 BP-hold medication
- Give 1 hour before meals
- Give capoten on empty stomach
- Take first dose at night to adjust to lower BP; rise slowly check BP weekly; report cough

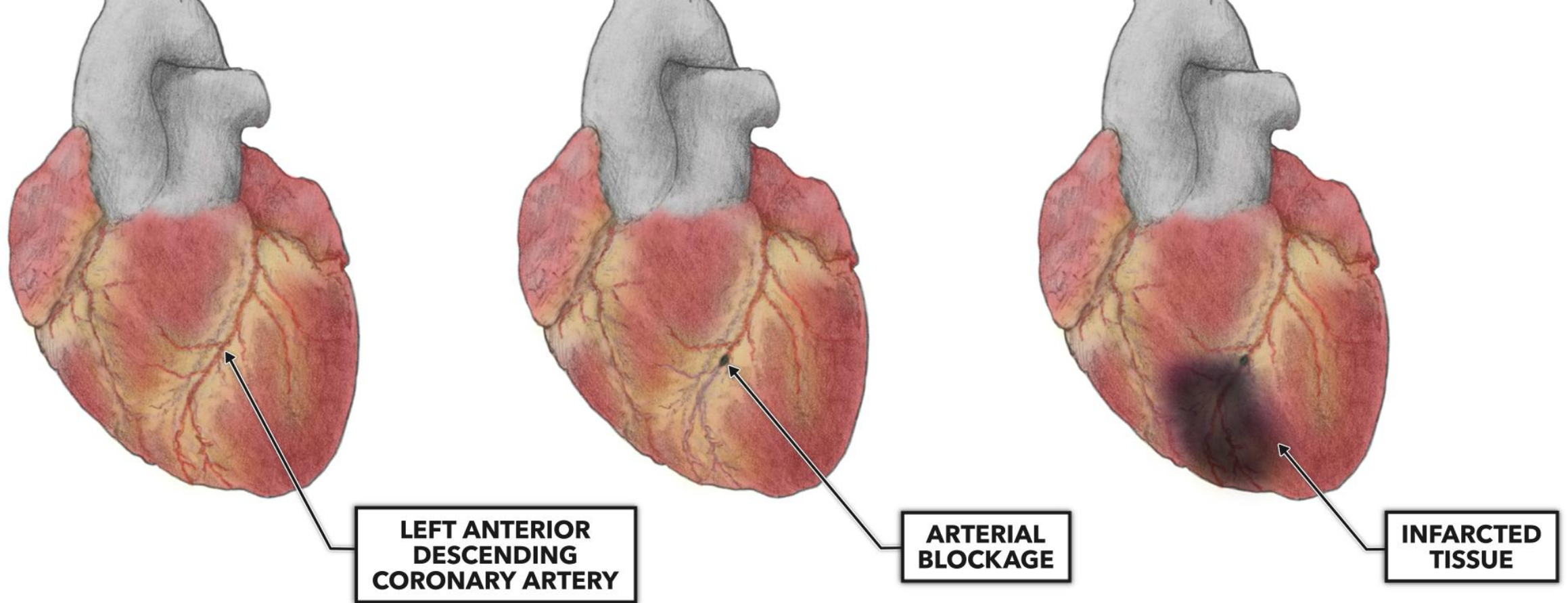
# Therapeutic Measures

## ■ Statins

- Reduces LDL
- Lipitor, Crestor, Zocor
- Monitor liver function; breakdown of skeletal muscle (rhabdomyolysis)
- Education: take in evening which cholesterol is highest, report muscle pain

## ■ Antiplatelets

- Aspirin
- Plavix
- Enteric-coated aspirin daily use
- Monitor for bleeding



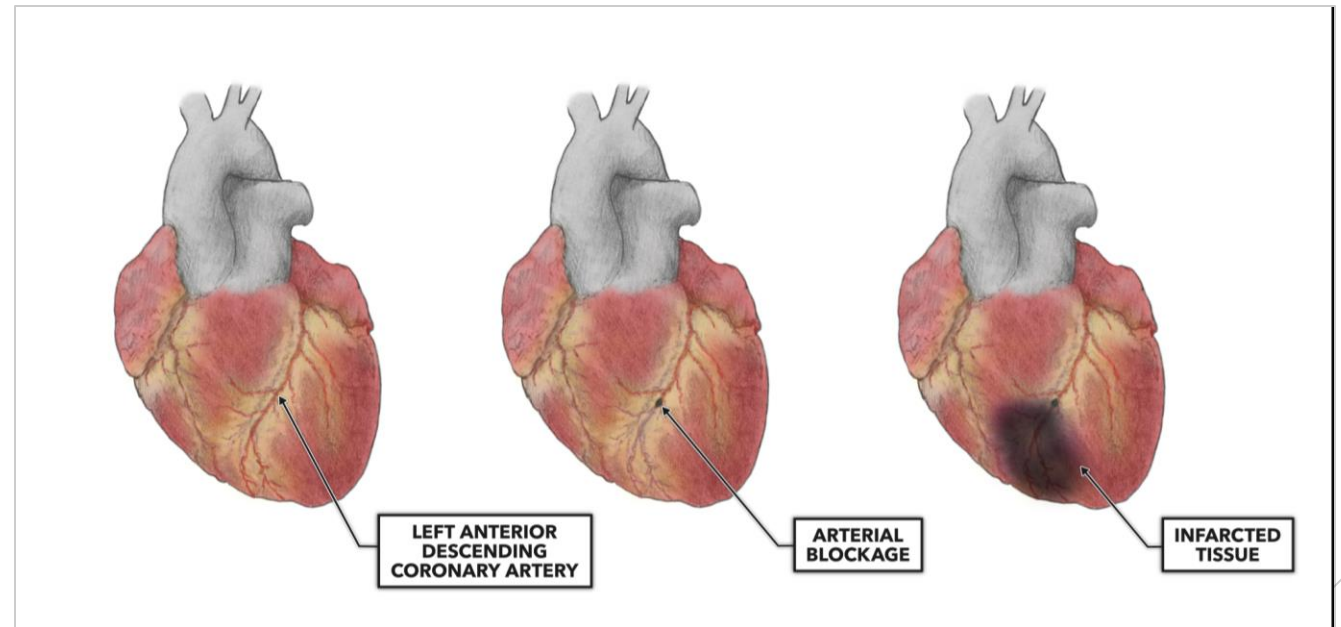
## Acute Coronary Syndrome

- Conditions caused by lack of oxygen to heart
- Silent Ischemia-
  - Occurs without pain; older adults, hypertension, diabetics

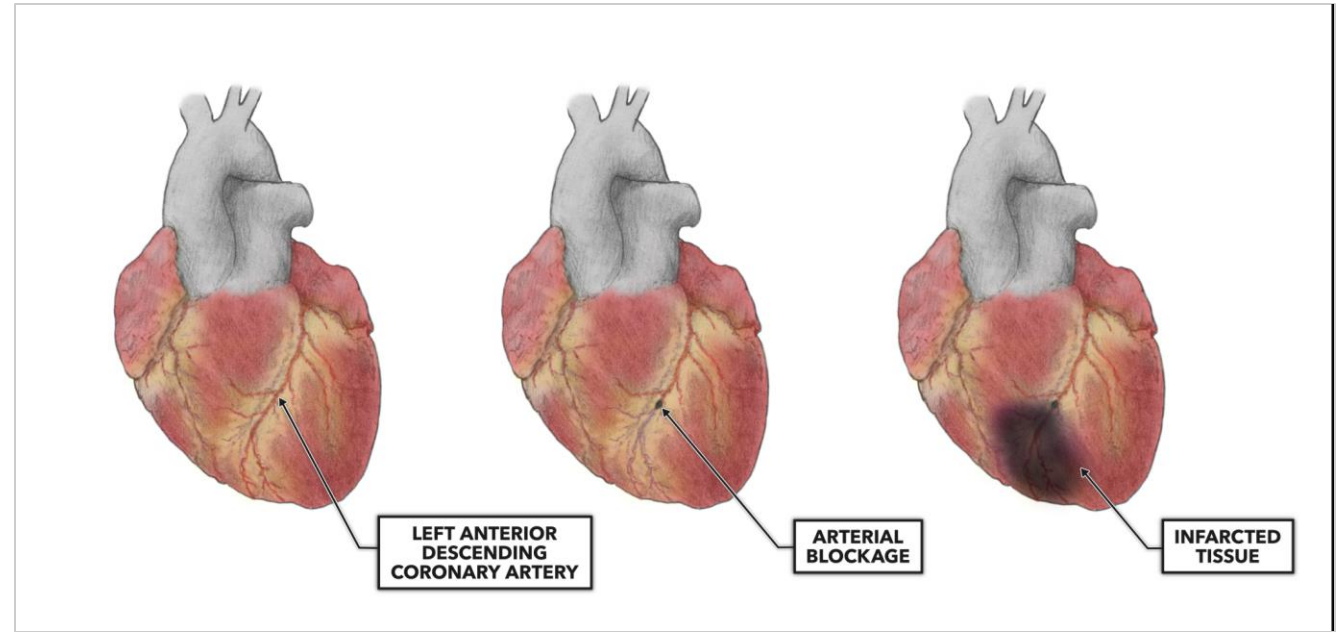
# Acute Coronary Syndrome

- Sudden Cardiac Death

- Cardiac arrest triggered by
  - lethal ventricular arrhythmias
  - asystole from abrupt occlusion of coronary artery



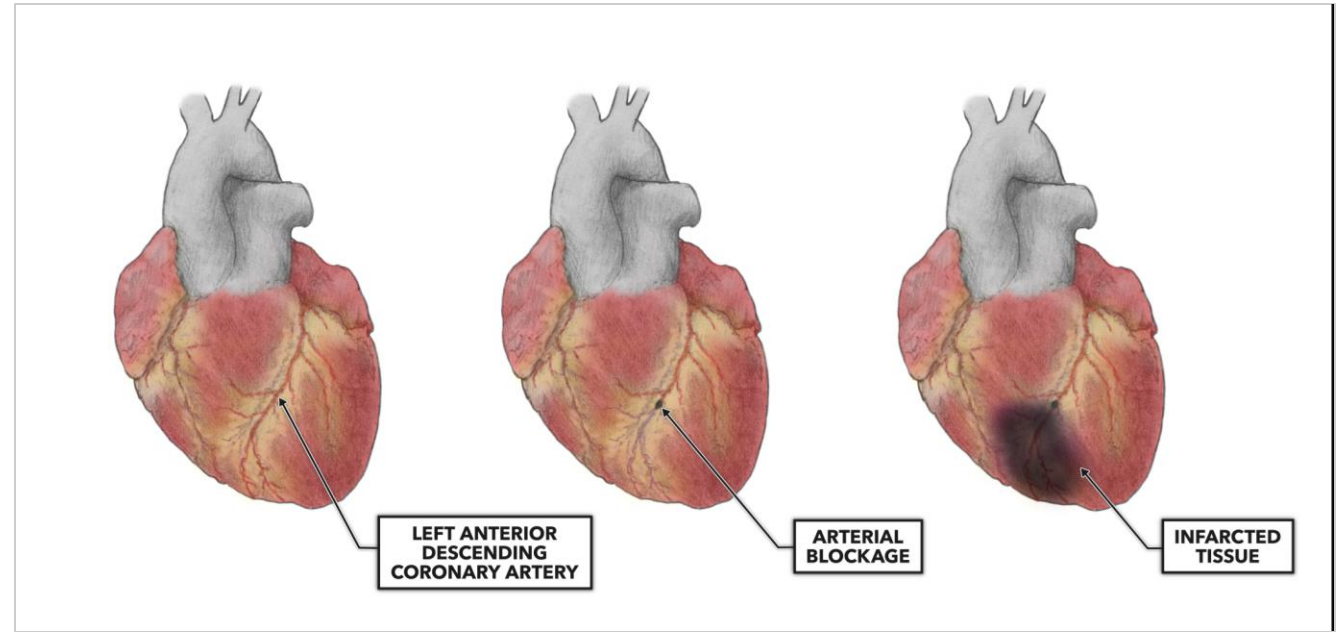
# Acute Coronary Syndrome



- **Myocardial Infarction**
  - Also known as Heart attack
  - Death of heart muscle
  - Caused by blockage of coronary arteries



# Acute Coronary Syndrome

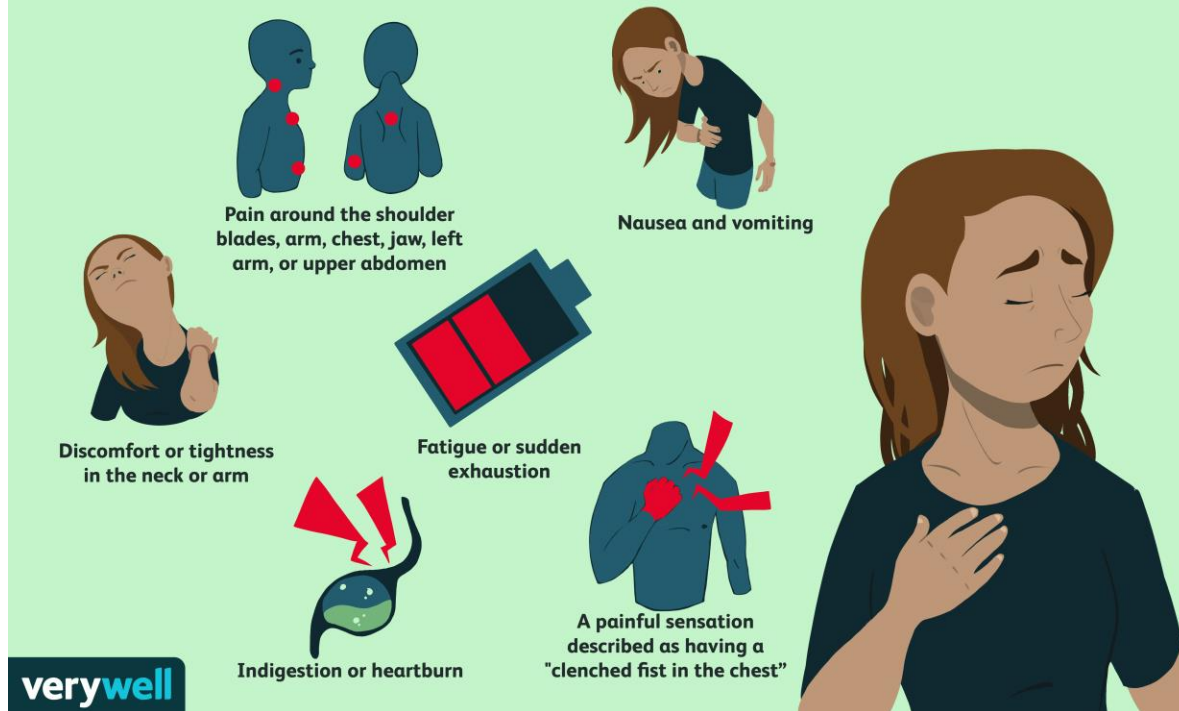


## ■ Myocardial Infarction

- Two types:
- NSTEMI-Non-ST-Segment-Elevation MI (partial blockage)
- STEMI-ST-Segment-Elevation-MI (deadliest-complete blockage)

# Myocardial Infarction- Signs & Symptoms

## Symptoms of ST-Segment Elevation Myocardial Infarction (STEMI)



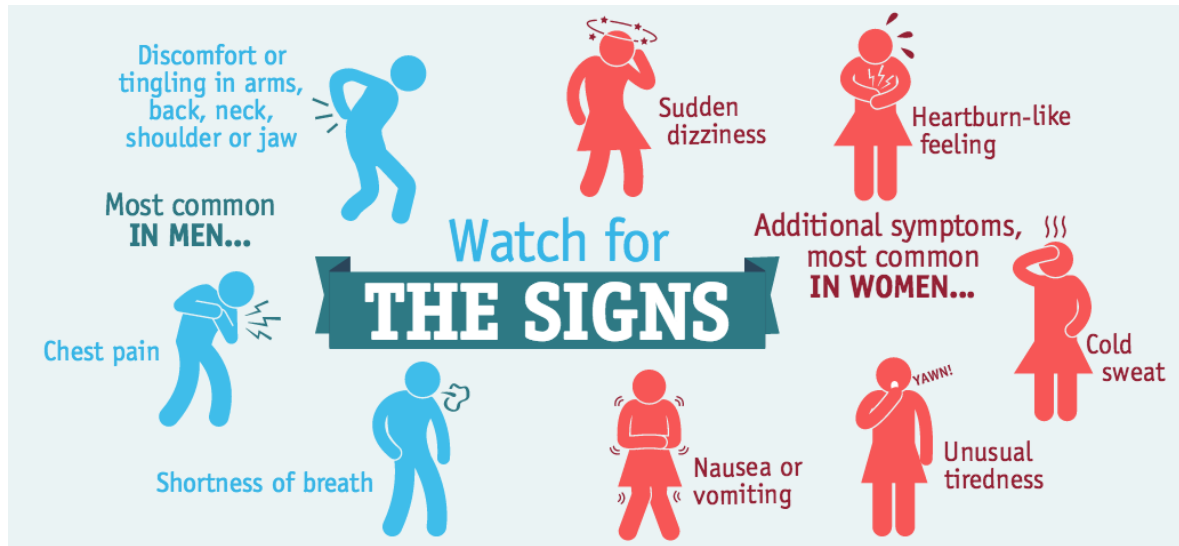
- Chest pain
- Does not get better with rest or nitroglycerin
- Crushing, viselike
- Elephant standing on chest
- Pain radiate to back, arms, shoulders, neck, or jaw
- Shortness of breath, dizziness, nausea, sweating
- Lungs
  - Crackles or wheezing with heart failure



## Myocardial Infarction- Timely Treatment

- May fail to recognize MI
- Waiting 2 to 24 hours before seeking medical care is common
- First hour after symptoms is crucial for administering medication to restore blood flow, minimize damage, save life
- Do not drive self to hospital; call 911

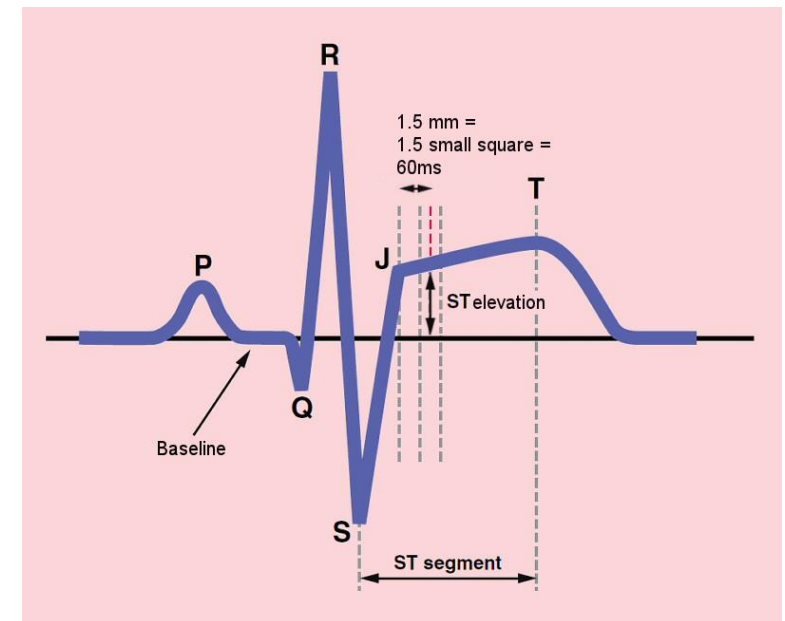
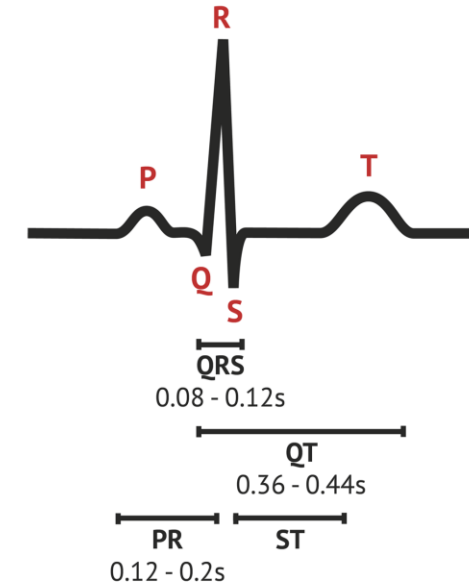
# Myocardial Infarction- Women and Heart Disease



- **Women: heart disease remains leading cause of death in women in U.S.**
- **Symptoms may atypical**
  - Extreme fatigue epigastric pain, jaw pain , indigestion nausea and vomiting
  - Prodromal symptoms of
    - Fatigue
    - Sleep disturbances
    - Shortness of breath

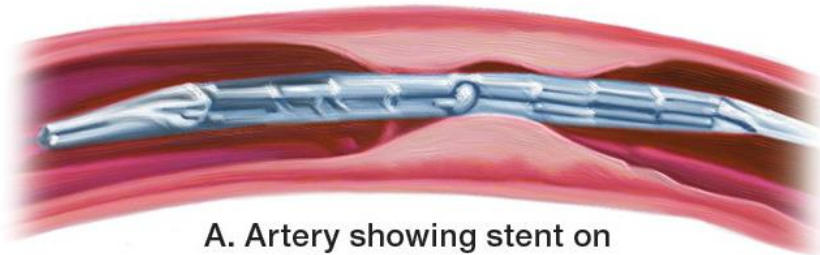
# Diagnostic Tests-MI

- Patient history
- ECG-Changes in "Q" "T" and "ST" segments
- Cardiac troponin
- Myoglobin
- Creatine Kinase
- Nitroglycerin and rest does not relieve pain with MI!

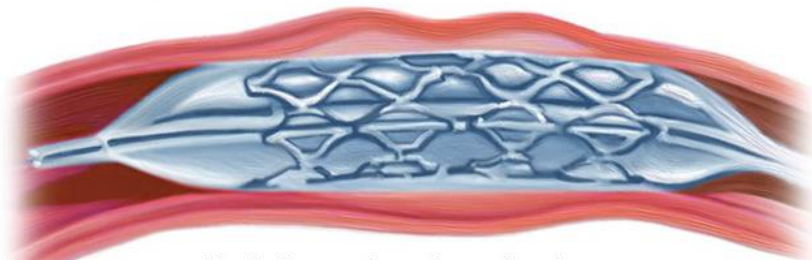


# Therapeutic Measures

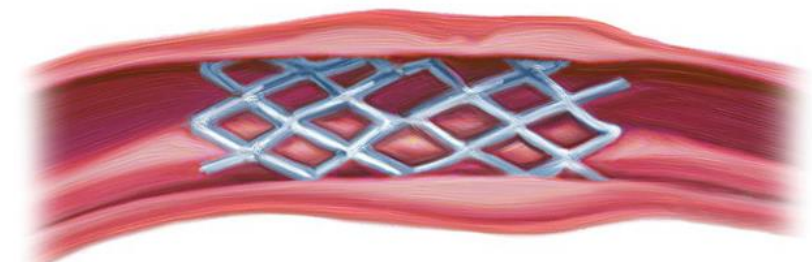
- Coronary Angioplasty
- Coronary Stent
- Thrombolytic Medications-dissolves clot
- Oxygen-2L/min
- Vasodilators
- Antiplatelet
- Analgesics
  - Morphine-most common
  - Given increments of 2 to 8 mg IV every 5 to 15 minutes
  - Monitor for
    - Hypotension
    - Respiratory depression
    - Oversedation
    - Morphine sensitivity



A. Artery showing stent on uninflated balloon



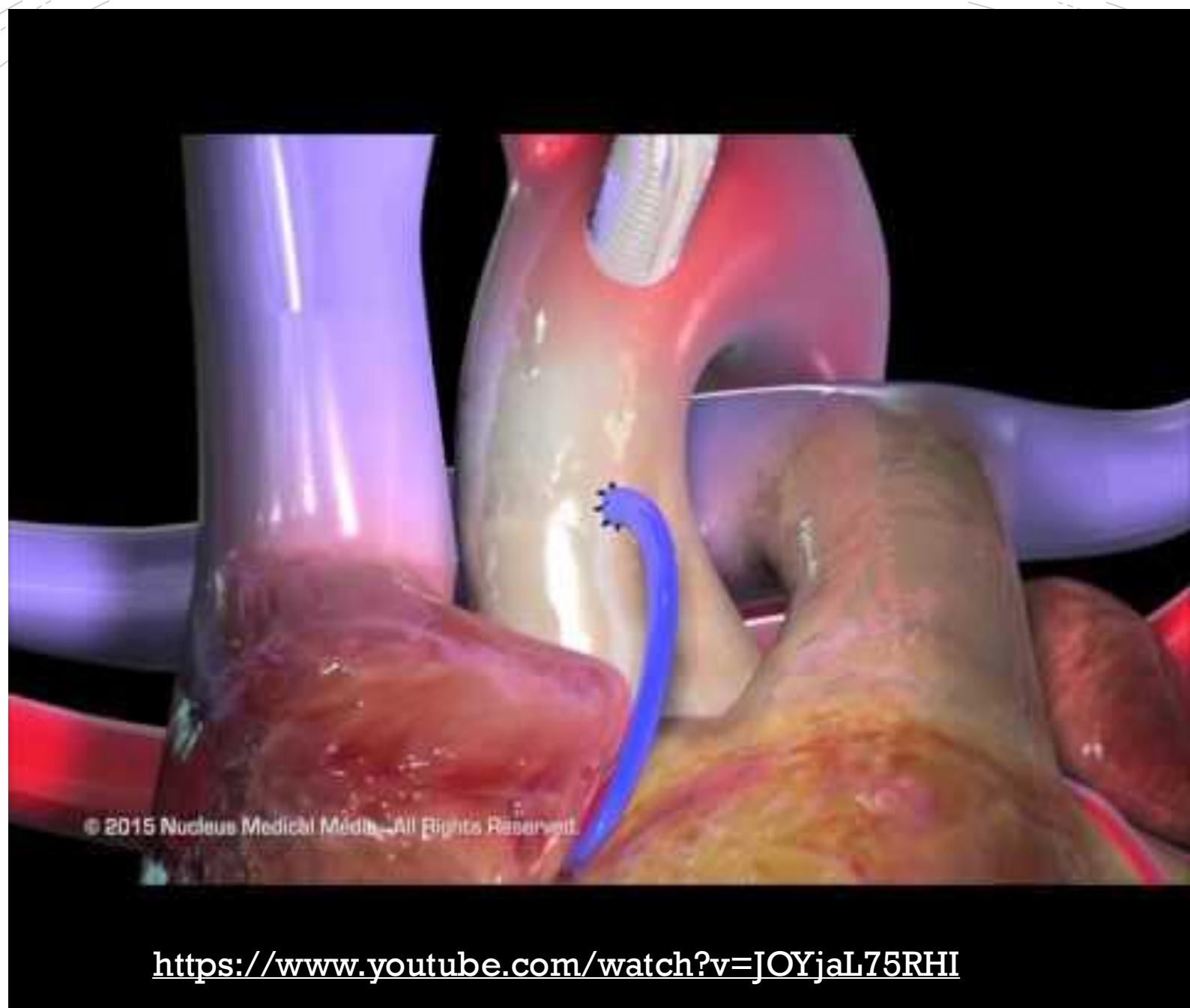
B. Artery showing stent on inflated balloon



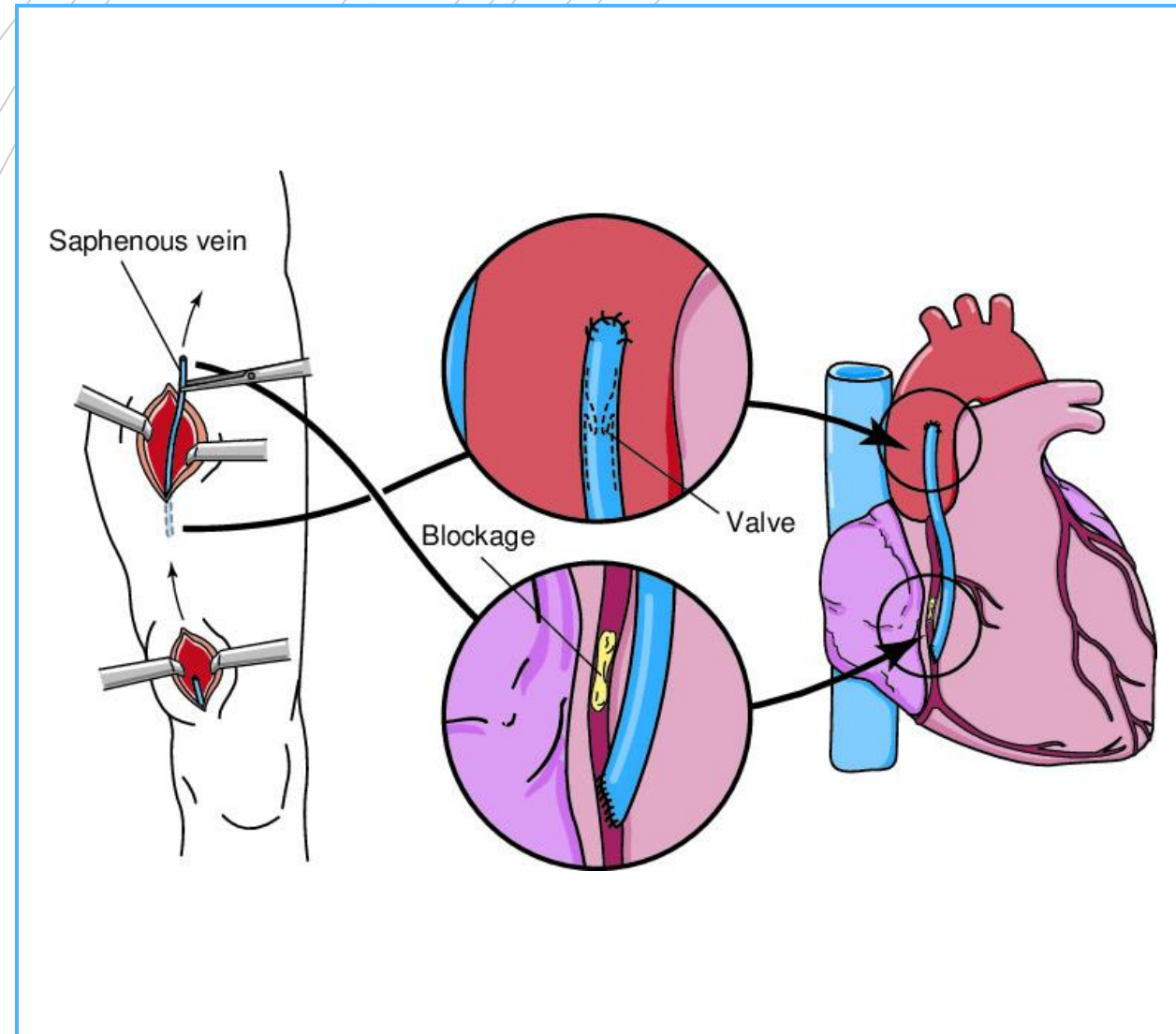
C. Artery showing expanded stent in place



# Coronary Artery Bypass Graft (CABG)



# Treatment of MI: Coronary Artery Bypass Graft (CABG)



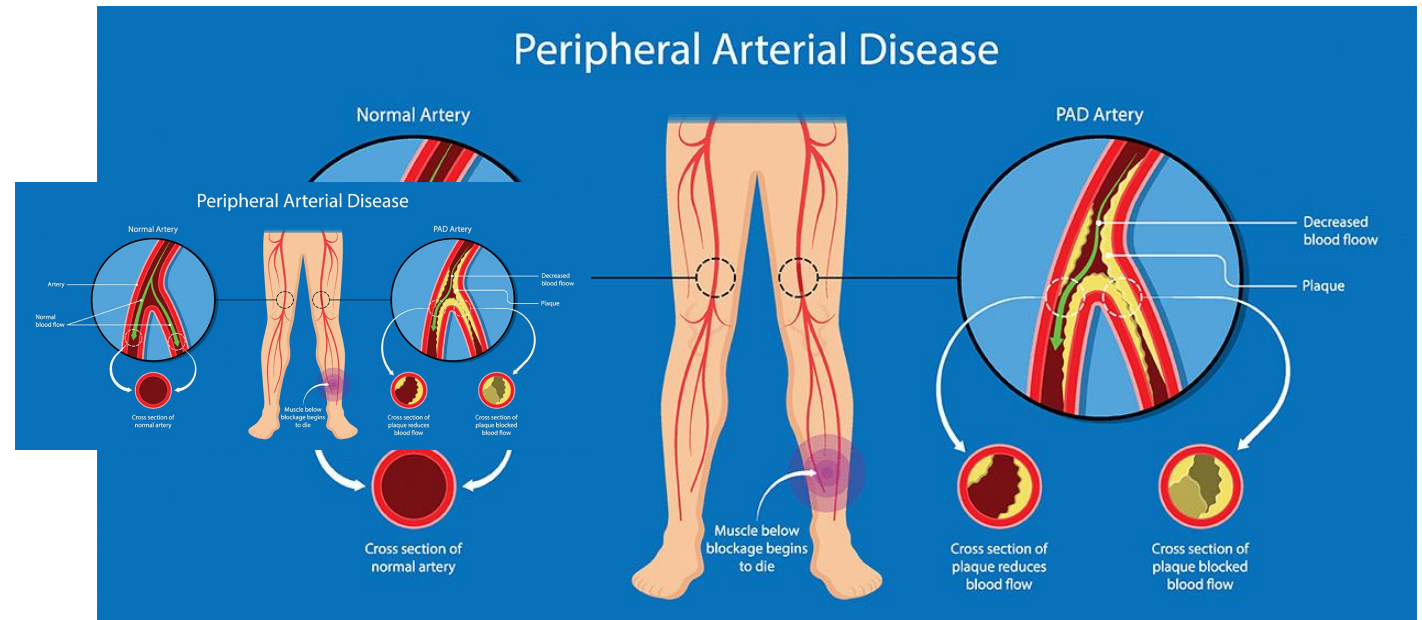
- **During surgery**
- Saphenous vein from leg or mammary artery from chest wall is used to reroute blood around segment of narrowed coronary artery
- <https://www.mcleodhealth.org/blog/beating-heart-bypass-surgery-matter-millimeters-2/>
- Two Types
- **Arrested Heart Surgery**
  - Heart is stopped
  - **Cardiopulmonary bypass machine** in use
- **Beating Heart Surgery**
  - Heart continues beating during surgery
  - Cardiopulmonary bypass machine **is not used**

# Peripheral Vascular Disease

**Arterial or  
venous**

**Common in  
elderly and  
diabetic  
population**

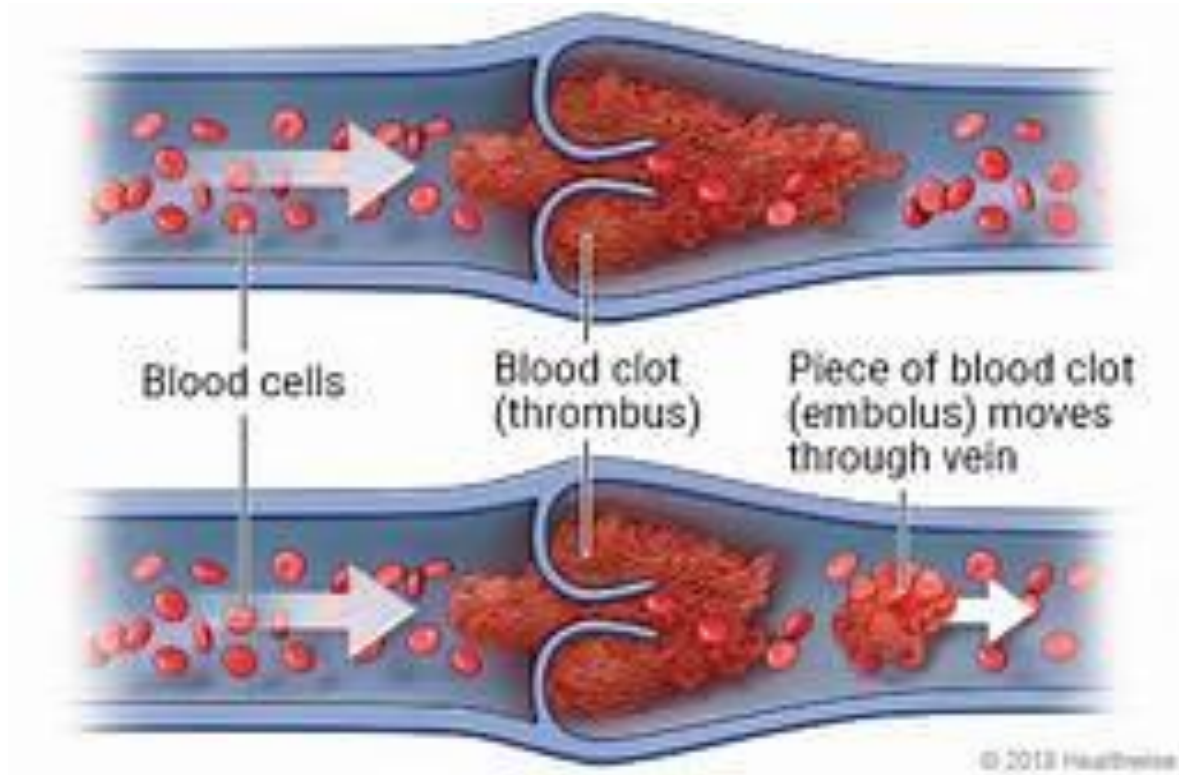
# Peripheral Vascular Disease



# Peripheral Artery Disease-Treatment

- Diet
  - Low fat, cholesterol
- Medications
  - Vasodilators
  - Thrombolytics
- Invasive Therapies
  - Percutaneous transluminal angioplasty; peripheral atherectomy-removes plaque
  - Stents

# Arterial Thrombosis and Embolism



- Sudden and dramatic
- Thrombus (clot) in artery
  - Normally in legs
- Embolus (clot breaks off and travels)





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## Arterial Thrombosis and Embolism Signs and Symptoms

**Six  
P's**

**Pain**

**Pallor**

**Pulselessness**

**Paresthesia**

**Paralysis**

**Poikilothermia**

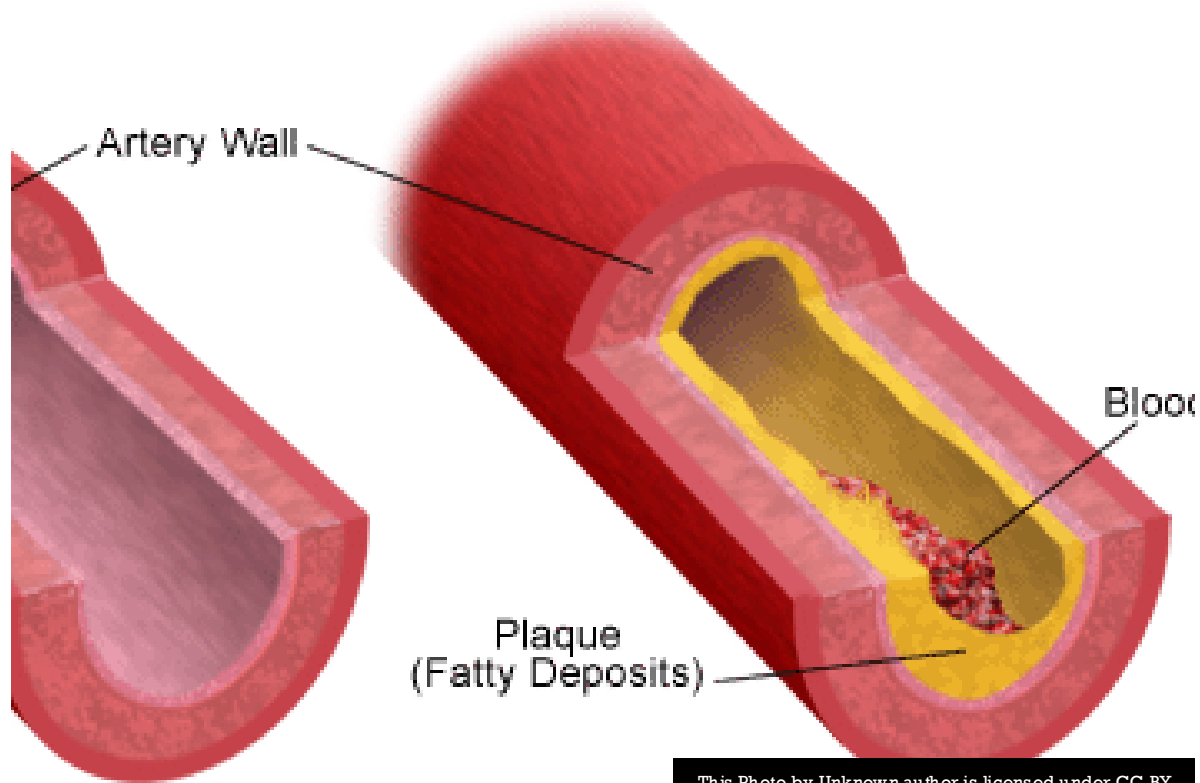


## Arterial Thrombosis and Embolism **Treatment**

- **Treat ASAP** or necrosis can occur
- **Goal is to save affected limb**
- **Anticoagulant therapy**
  - IV heparin followed by Coumadin
- **If loss of limb is imminent**
  - **Surgery or thrombolytic**

## Diseased Artery

Diseased Artery



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## Peripheral Artery Disease

- Chronic, progressive narrowing of arteries that lead to obstruction or occlusion
- Lower extremities
- Atherosclerosis-most common

# PAD-Signs and Symptoms

- May not have symptoms
- Symptoms often occur late
- Changes in extremities
  - Pain in calves with activity-intermittent claudication
- Blood supply to muscle is decrease, muscles are unable to receive adequate oxygen
  - Ischemia develops
  - Skin color changes-decreased blood supply
  - Extremity is pale when leg is elevated
  - Leg in dependent position-reddish-purple or cyanotic
  - Cool to touch
  - Hair loss
  - Dry, flaky, scaly, pale, mottled skin

# Raynaud's Disease



- <https://www.youtube.com/watch?v=Dd4-YDxiPlg>
- Vasoconstriction from cold and stress
- Mainly affects women and hands
- Caused by spasms in arteries in fingers and toes
- **When exposed to cold**
- Vessels constrict
- Causing ischemia
- Hyperemia (redness of hands from dilation of vessels)
- Over time vessels can remain constricted leading to gangrene and necrosis



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# Raynaud's Disease-Treatment

## ■ Education

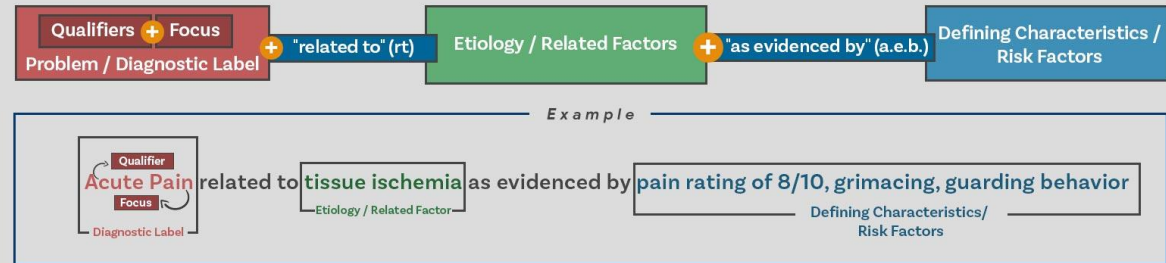
- **Keep hands warm**
- **Gloves**
- **Preparing food**
- **No smoking, caffeine, alcohols or stress**

## ■ Vasodilators



# Nursing Diagnosis for Peripheral Arterial Occlusive Disorders

## Components of a NANDA-I Nursing Diagnostic Statement



Nurseslabs.com/NURSING-DIAGNOSIS/

- **Acute pain**
  - Pain assessment
  - Administer pain medications, monitor for intermittent claudication
- **Ineffective tissue perfusion**
  - Monitor peripheral pulses
  - Report absent pulses
  - Monitor skin for ulcerations/breakdown
  - Activity intolerance
  - Walking program

# Aneurysms



- **Bulging, ballooning, dilation at a weakened point of an artery**
- Cause is unknown
- **Risk factors:**
  - Atherosclerosis, hypertension, smoking, trauma, congenital abnormalities, hereditary
- **Most common type is abdominal aorta aneurysm (AAA)**
- Survival rates are higher with elective surgery



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## Aneurysms-Signs & Symptoms

- Very few until AAA grows
- **Classic sign is back or flank pain**
- Severe, sudden back, flank, or abdominal pain and a pulsating abdominal mass-rupture!
- If an aneurysm ruptures
  - Immediate surgery, mortality is high

# Aneurysms-Diagnostic Test and Treatment

CT scan and abdominal ultrasound

## Treatment

- Lower blood pressure
- Monitor for growth
- Surgical intervention
  - Bypass graft

## Educate

- **Avoid heavy lifting**
- Gentle exercise
- Stop smoking
- B/P control

Aneurysm over 5 cm-rupture risk is greatest



## Varicose Veins

- Elongated, tortuous, dilated veins
- Cause is unknown
- Thought to be **structural defect in vessel walls and vein valves** being incompetent
- Causes
  - Heredity
  - Pregnancy
  - Prolonged standing
  - Obesity

# Varicose veins- Signs and Symptoms

## Disfigurement of lower extremities

- Dull pain relieved by walking or elevating leg

## Treatment

- **Improve circulation**
- **Relieve pain**
- **Avoid complications**

## Cosmetic concerns

- Compression stocking
- Surgical intervention
- Laser treatment
- Stripping
- Ablation



# Varicose Vein Ablation



<https://www.youtube.com/watch?v=i6GKbIMvDuc>

# Venous Stasis: Ulcers

Result of chronic venous insufficiency

Reduce venous blood return leads to...

Blood flow congestion leading to...

Decreased circulation leading to...

Discoloration of lower extremity and leathery appearance

Ulcers develop due to:

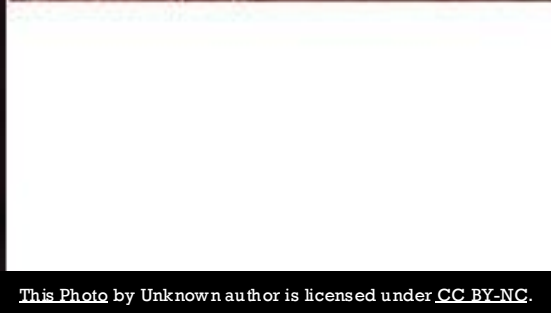
Increased pressure and rupture of small veins

Difficult to cure



SFS

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# Venous Stasis Ulcers- Treatment

## Focus to decrease edema and heal ulcers

- Compression stockings, bandages
- Start at foot and go up, rewrap twice a day
- Bedrest with elevation of feet above heart
- Avoid long periods of standing
- Exercise and walk

## Don't cross legs or wear constrictive clothing

## Topical antibiotic

## Unna Boot with Zinc

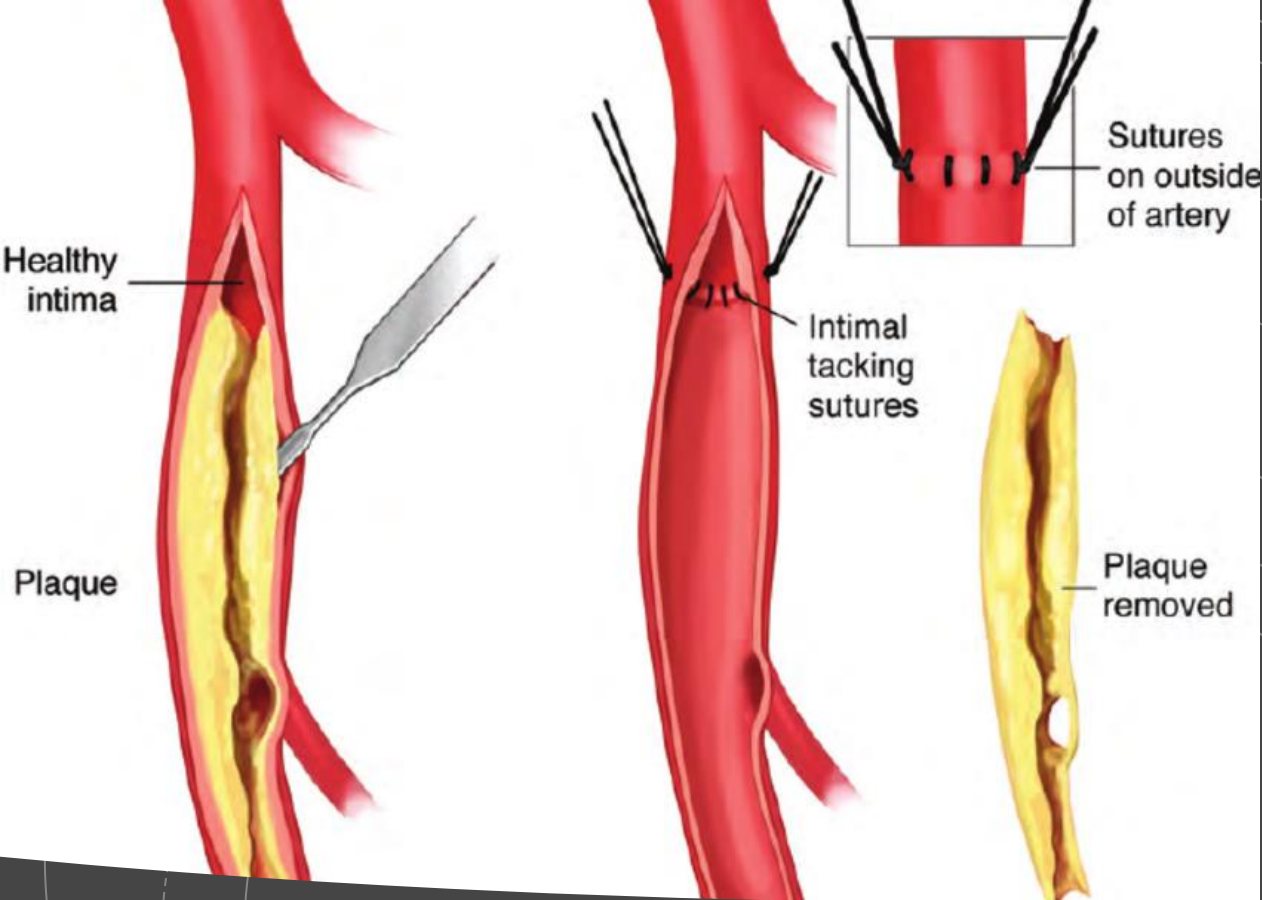
## Skin grafting



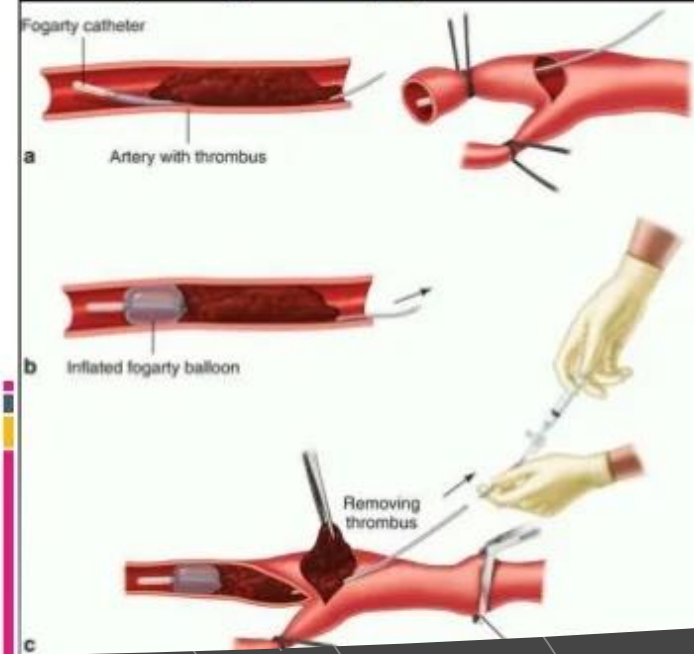
# Venous Stasis Ulcers- Treatment





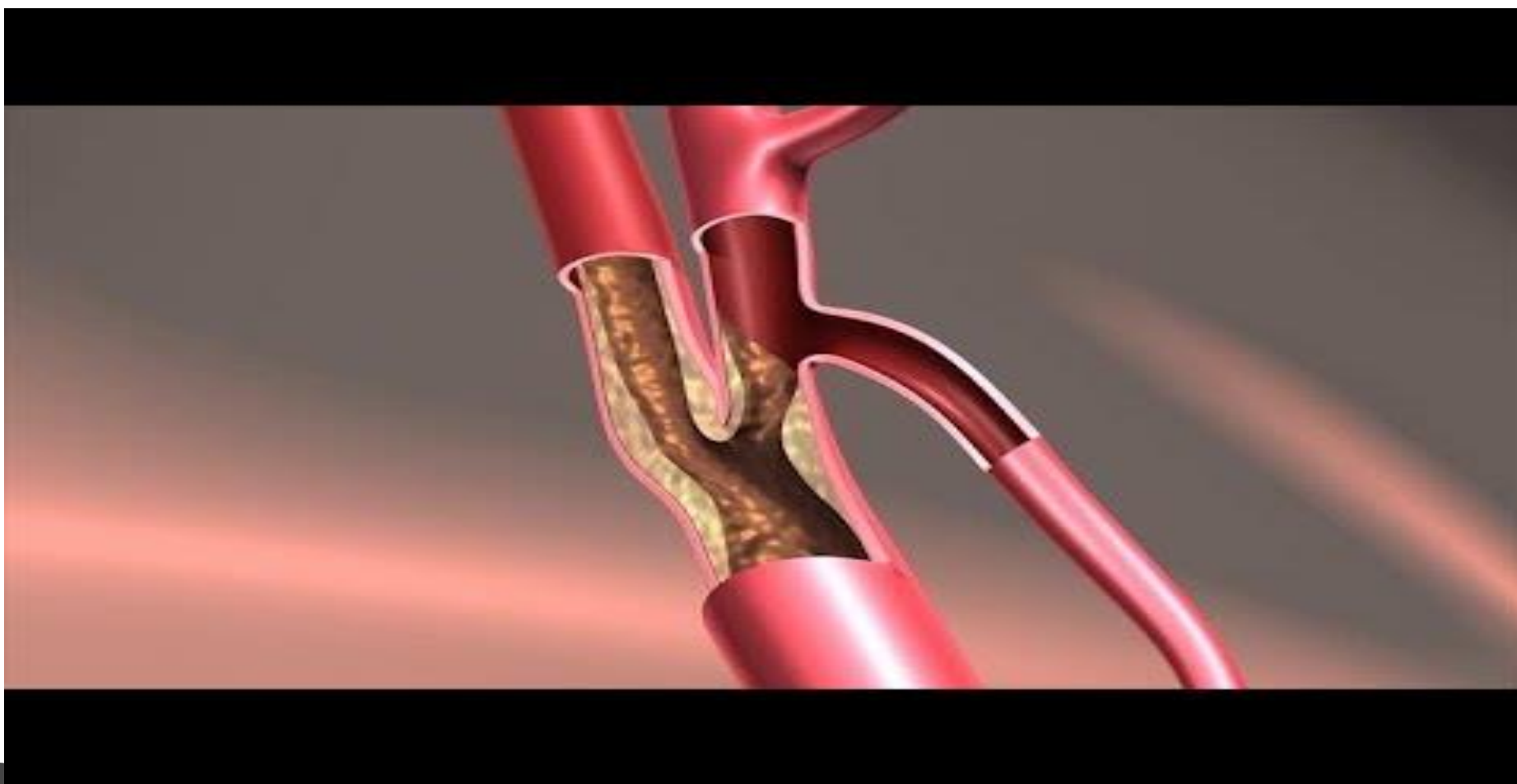


## Embolectomy catheters (Fogarty)



## Vascular Surgery

- Embolectomy and Thrombectomy
  - Used to restore blood flow
- Vascular bypass and grafts
  - Used for aortic aneurysms



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

# Vascular Surgery

- Endarterectomy
  - Arteriosclerotic plaques are dissected from the lining of the arterial wall
  - Most used for carotid artery



# Vascular Surgery-Complications

## Hemorrhage

- Manual pressure applied to site of bleeding
- Notify HCP immediately

## Drainage may cause swelling and hematoma

- Drain can be placed to help

## Extensive surgeries may result in significant blood loss

- Fluid volume deficit or shock

## Assess pedal pulses

# Nursing Process for Patient After Vascular Surgery

## Head-to-toe assessment

- Patent airway
- Vital signs monitored
- Address pain
- IV and drains
- Abdominal girth
- Neurovascular checks
- Extremity movement and sensation
  - Pulses
  - Temperature
  - Color, capillary refill

## Intake and Output

## Labs

- CBC
- INR
- PTT
- Electrolytes

Report abnormalities immediately to HCP