

Peripheral Artery Disease (PAD) - 2022

- Involves progressive narrowing and degeneration of arteries of upper and lower extremities
- Atherosclerosis is the leading cause in majority of cases

Description

- Typically appears at ages in 60s to 80s
- Largely undiagnosed
- Risk factors
 - Tobacco use
 - Hyperlipidemia
 - Hypertension
 - Diabetes mellitus
 - Age over 60

Clinical Manifestations

- Classic symptom of PAD - intermittent claudication
 - Ischemic muscle pain that is caused by a constant level of exercise
 - Resolves within 10 minutes or less with rest
 - Reproducible
- Paresthesia
 - Numbness or tingling in the toes or feet
 - Produces loss of pressure and deep pain sensations
 - Injuries often go unnoticed by patient
- Thin, shiny, and taut skin
- Loss of hair on the lower legs
- Diminished or absent pedal, popliteal, or femoral pulses
- Pallor of foot with leg elevation
- Dependent rubor (redness)
- Pain at rest
 - Occurs in the foot or toes
 - Aggravated by limb elevation
 - Occurs from insufficient blood flow
 - Occurs more often at night

Complications of Untreated PAD

- Atrophy of the skin and underlying muscles
- Delayed healing
- Wound infection
- Tissue necrosis
- Arterial ulcers
 - Non-healing arterial ulcers & gangrene are most serious complications
 - May result in amputation
 - If adequate blood flow not restored
 - If severe infection occurs

Diagnostic Studies (Table 37-2)

- H & P
- Doppler ultrasound studies

- Segmental blood pressure-Take BP at thigh, knee, and ankle. A drop in segmental BP of >30 mm Hg suggests PAD. (link to video)
<https://www.youtube.com/watch?v=g77EgNWBIZg>
- Ankle-brachial index (ABI)- The ABI is calculated by dividing the ankle systolic BPs by the higher of the left and right brachial systolic BP
- Duplex imaging-show structure of blood vessels and if blood flow is blocked, as well as the speed and direction of blood flow.
- Magnetic resonance angiography (MRA)- MRI that delineates the location and extent of PAD
- Angiography – Cath Lab procedure; contrast dye injected into a catheter in vessel

Interprofessional Care (Table 37.2)

- Risk Factor Modification
 - Both drug therapy & lifestyle changes
 - Manage HTN
 - DASH diet
 - Tobacco cessation
 - Diabetes management
 - Aggressive lipid management
- Encourage exercise
 - Builds collateral circulation
 - Walk until pain, stop and rest, continue
- Teaching to promote vasodilation/avoid vasoconstriction
 - No direct heat (i.e. heating pads)
 - Avoid exposure to cold (vasoconstriction!)
 - Avoid stress, caffeine, nicotine
 - Vasoconstriction lasts up to 1 hour after smoking/tobacco use

Drug Therapy

- Antiplatelet agents
 - aspirin
 - clopidogrel (Plavix)
 - Inhibit platelet aggregation
- Treatment of intermittent claudication
 - cilostazol
 - Inhibits platelet aggregation
 - ↑ vasodilation
 - pentoxifylline (Trental) – Prescribed for treatment of intermittent claudication
 - ↑ Erythrocyte flexibility
 - ↓ Blood viscosity and platelet stickiness
- Statins
 - simvastatin (Zocor)
 - atorvastatin (Lipitor)
 - rosuvastatin (Crestor)
 - Lower LDL and triglyceride levels & raise HDL levels (a little)
- Fibric Acid Derivatives
 - fenofibrate (Tricor)
 - gemfibrozil (Lopid)
 - Lower VLDL, LDL & triglyceride levels; raise HDL levels (a little)

Therapeutic Procedures

- Indications
 - Intermittent claudication symptoms become incapacitating
 - Pain at rest

- Ulceration or gangrene severe enough to threaten viability of the limb

Interventional Radiology Procedures

- Percutaneous transluminal angioplasty (PTA)
 - Involves the insertion of a catheter through the femoral artery
 - Catheter contains a cylindrical balloon
 - Balloon is inflated dilating the vessel by compressing atherosclerotic intimal lining
 - Stent is placed
- Atherectomy
 - Removal of the obstructing plaque
 - Performed using a cutting disc, laser, or rotating diamond tip
- Cryoplasty
 - Combines percutaneous transluminal angioplasty and cold therapy
 - Liquid nitrous oxide

Surgical Therapy

- Peripheral artery bypass surgery with autogenous vein or synthetic graft to re-route circulation around the occlusion
- Endarterectomy
 - involves opening the artery and removing the obstructing plaque
- Patch graft angioplasty
 - opening the artery, removing plaque, and sewing a patch to the opening to widen the lumen.
- Amputation
 - may be required if tissue necrosis is extensive, gangrene or osteomyelitis develops, or all major arteries in the limb are blocked

Top 2 Nursing Diagnoses (priorities of care) Pre-procedure:

1)

Assessments:

- 1.
- 2.
- 3.

Interventions:

- 1.
- 2.
- 3.

2.)

Assessments:

- 1.
- 2.
- 3.

Interventions:

- 1.
- 2.
- 3.

Post-Procedure Care

- Frequent Neurovascular checks after procedure!
 - Pain
 - Pulses (especially *distal* to operative site)
 - Pallor (skin color)
 - Poikilothermia (temperature)
 - Paresthesia (sensation)
 - Paralysis (movement of extremity)
- Monitor for potential complications
 - Bleeding
 - Hematoma
 - Sudden loss of pulses, increased pain, etc.
- Assess dressings frequently
- Open surgical procedures:
 - Avoid bending of hip and knee except for exercise
 - Turn & position frequently
 - Early ambulation
 - Keep hydrated (IV therapy prn)

Client Teaching

- Management of risk factors
 - No smoking, healthy diet, increase fluids
- Long-term antiplatelet (aspirin or clopidogrel (Plavix)) therapy
- Encourage physical activity
- Importance of meticulous foot care
 - Keep clean & dry, good-fitting shoes, no barefoot
- Know when to call the doctor – Reinforce 6 P's!

Other Arterial Conditions

Thromboangiitis Obliterans (Buerger's Disease)

- Non-atherosclerotic
- Inflammatory disorder
- Recurrent
- Constricted or obstructed arteries and veins
 - Arms & legs
 - Less likely cerebral, mesenteric, pulmonary, renal, or coronary arteries

Etiology

- Rare
- Young men (less than 45y)
- Occurs with tobacco or marijuana use
- No CVD risk factors
- Inflammatory process with clots
- Leads to tissue ischemia
- Ischemia to distal then proximal vessels

Clinical Manifestations

- Possible intermittent claudication or rest pain
- Ischemic ulcers and/or gangrene
- Color/temperature changes
- Paresthesia
- Superficial vein thrombosis (SVT)
- Cold sensitivity

Diagnostics

- No specific tests
- Based on age of onset
- Tobacco use history
- Clinical symptoms
- Exclude other diseases
 - DM, autoimmune, source of emboli and thrombi

Collaborative Care

- Stop Tobacco/Marijuana use in any form!
- **Conservative treatment:**
 - Avoid injury/cold temps
 - Abx if infected ulcers
 - Analgesics prn pain
- Anticoagulants and vasodilators have little positive effect
- IV iloprost (Ventavis) somewhat effective – vasodilator, used for rest pain and ulcer healing
- Bypass ineffective

Collaborative Care

- Sympathectomy
- Implantation of spinal cord stimulator
- Both interventions
 - Improve blood flow
 - Reduce pain
- If severe: amputation

Raynaud's phenomenon

- Vasospastic disorder of small cutaneous arteries
- Affects fingers, toes, ears, and nose

- More often in women (15-40y)

Etiology

- Abnormal vasospastic reaction from exaggerated SNS response
- Other contributing factors: cold environment, fingertip pressure (i.e. typist, piano player), exposure to lead
- May be secondary to underlying disease
 - Thyroid conditions
 - Lupus
 - Scleroderma

Clinical Manifestations

- Characterized by vasospasm-induced color changes
 - White- decreased perfusion
 - Blue- cyanosis
 - Red- restored perfusion
- Lasts minutes to hours
- If frequent/prolonged attacks
 - Skin thick, nails brittle
 - Tiny lesions/ulcers

Diagnostics

- Persistent symptoms for 2 yrs.
- Rule out underlying disorder

Collaborative Care

Client teaching to prevent episodes:

- Protect hands/feet from heat and cold
- Stop vasoconstrictive substances
 - Tobacco, caffeine, cocaine
- Stress management
- Warm water can decrease vasospasms

Medications

- Calcium channel blocker
 - nifedipine (Procardia)
 - Relaxes arteriole smooth muscles
- Vasodilators
 - sildenafil
 - Topical nitroglycerine
 - IV iloprost (Ventavis)
- Abx
- Analgesics prn

Surgery

- Advanced and severe cases
 - Debridement
 - Sympathectomy
 - For advanced cases-cut sympathetic nerves to hand/foot to stop vasoconstriction and decrease pain

