**PAD Algorithm**

**Assess for the presence of risk factors**

- Age less than 50 years, with diabetes and one other atherosclerosis risk factor (smoking, Dyslipidemia, hypertension, or hyperhomocysteinemia)
- Age 50 to 69 years and history of smoking or diabetes
- Age 70 years and older
- Leg symptoms with exertion (suggestive of claudication) or ischemic rest pain
- Abnormal lower extremity pulse examination
- Known atherosclerotic coronary, carotid, or renal artery disease

**Are Risk Factors Present?**

- **YES**
  - Monitor for presence of vascular symptoms:
    - assess walking impairment
    - presence of claudication
    - presence of ischemic rest pain
    - presence of nonhealing wounds and/or ABI measurement if asymptomatic
  - Are positive findings present?
    - **YES**
      - Assess for the presence of critical limb ischemia
    - **NO**

- **NO**
  - Initiate client education for Health Seeking Behaviors to identify:
    - Risk factors
    - Signs and symptoms for early detection of disease
    - Screening protocol for early identification.

**Are Risk Factors Present?**

- **YES**
  - Initiate the plan of care for a Risk For Ineffective Therapeutic Regimen management for asymptomatic PAD:
    - Smoking cessation
    - Antiplatelet therapy if CAD risk
    - Blood pressure control
    - Cholesterol management
    - Diabetes management
    - Patient teaching from box 1

- **NO**
  - Box 2
Assess for the presence of factors that increase the risk for amputation:

Factors that reduce blood flow to the microvascular bed:
- Diabetes
- Severe renal failure
- Severely decreased cardiac output (severe heart failure or shock)
- Vasospastic diseases or concomitant conditions (e.g., Raynaud's phenomenon, prolonged cold exposure)
- Smoking and tobacco use

Factors that increase demand for blood flow to the microvascular bed:
- Infection (e.g., cellulitis, osteomyelitis)
- Skin breakdown or traumatic injury

Are signs and symptoms pulselessness or pulse deficit, pallor, perishingly cold, acute pain, paralysis, paraesthesia Present?

Follow emergent plan of care for PC: critical limb ischemia
Monitor results from diagnostics to identify vascular lesions and severity:
- CT/ MR Angiography
- Doppler ultrasound
- Treadmill exercise testing with or without ABI measurement
- Contrast angiography

Are Risk Factors Present?

Are positive findings present?

Follow plan of care for revascularization

Initiate the plan of care for a risk for ineffective therapeutic regimen management for PAD according to PAD class:

Follow plan of care for a client experiencing claudication
### Collaborative Problem

#### Potential Complication: Critical limb ischemia

<table>
<thead>
<tr>
<th>ASSESS s/s of the acute complication in an extremity</th>
</tr>
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<tbody>
<tr>
<td>pulselessness or pulse deficit, pallor, perishingly cold, acute pain, paralysis, paraesthesia (this is a true emergency)</td>
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**Assess for contributing factors:**

Factors that reduce blood flow to the microvascular bed:

- Diabetes
- Severe renal failure
- Severely decreased cardiac output (CHF/shock)
- Vasospastic diseases
- Smoking and tobacco use

Factors that increase demand for blood flow to the microvascular bed:

- Infection
- Skin breakdown or traumatic injury

**Monitor for presence of the disorder**

- Perform neurovascular exam on extremities
- Consider ABI index or pulse oximetry on affected extremity
- Monitor CT/MR angiography results
- Monitor VS to identify decreased cardiac output and tissue perfusion, and impending infection every 4 hours when stable and more frequently if s/s are present

**Monitor for presence of contributing factors**

- Monitor Basic metabolic panel for worsening azotemia, hyperglycemia
- Perform EKG to identify embolic dysrhythmia
- Monitor results of echocardiogram to evaluate for worsening heart failure and thrombus
- Monitor CBC for signs of infection

**Additional assessment includes monitoring from presence of complications of an exacerbation of the disorder**

**Assess for s/s of shock**

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#### Potential Complication: Critical limb ischemia

**DO**

**Perform nursing actions that correct the disorder**

- Do not elevate extremity in presence of ischemia
  
  If the client develops sudden onset pulse deficit:
  
  Protect the limb from injury, place extremity in a neutral position to improve perfusion.
  
  - maintain IV access and hydration to enhance tissue perfusion
  
  - Apply oxygen and Call the physician.
  
  - Prepare client for Doppler studies/CT angiography to stage degree of occlusion
  
  - Prepare the client for transfer to the procedure room or OR for percutaneous intervention (Catheter Directed Thrombolitics or amputation)

  **Performs nursing actions to control contributing factors & minimize complications**

  - Administer IV heparin as prescribed according to protocol and adjust according to nomogram to prevent clot formation
  
  - Initiate bleeding precautions
  
  - Administer antibiotics as prescribed to treat infections
  
  - Perform wound care as ordered
  
  - Administer antidiabetics as prescribed to control diabetes
  
  - Administer antilipemics as prescribed to control hyperlipidemia

**CALL**

- Monitor client for hemodynamic instability. Initiate shock management and call MD

- Monitor for vascular compromise, restenosis vs. compartment syndrome, if percutaneous intervention or bypass surgery is ineffective as evidenced by the recurrence of the 6 P’s. If present provide supportive care and call the physician

- Monitor for active bleeding secondary to heparin therapy and initiate hemorrhage management & call MD

  **Prepare client for amputation if required.**
Aortic aneurysm Algorithm

Assess for the presence of risk factors:
- Increased incidence in clients who are of male gender
- Positive family history
- Advancing age
- Tobacco use
- Cardiovascular risk factors are associated with a greater risk

Monitor for presence of AAA symptoms:
- Monitor for back pain
- Abdominal pain
- Possibly radiating to the groin
- Presence of a pulsatile abdominal mass

Initiate client education for Health Seeking Behaviors to identify:
- Instruct client not to smoke.
- Review Risk factors
- Teach Signs and symptoms for early detection of disease
- Discuss lifestyle modifications required to prevent progression of atherosclerosis protocol for early identification.

Are positive findings present?

Are Risk Factors Present?

YES

YES

Assess for the presence of acute aortic dissection/rupture

NO

NO

NO

Initiate the plan of care for a Risk For Ineffective Therapeutic Regimen management for asymptomatic AAA:
- Smoking cessation
- Antiplatelet therapy if CAD risk
- Blood pressure control
- Cholesterol management
- Diabetes management
- Encourage periodic H&P and Ultrasound screening to measure aneurysm size
- Teach client about surgical intervention for aneurysm > 5 cm
## Collaborative Problem

### Potential Complication: Acute aortic dissection

**ASSESS s/s of the acute complication**
- Monitor for back pain
- Abdominal pain described as ripping or tearing
- Possibly radiating to the groin
- Presence of a pulsatile abdominal mass
- Associated symptoms include, DB, syncope, diaphoresis

**Assess for contributing factors:**
- male gender
- positive family history
- advancing age
- tobacco use
- presence cardiovascular risk factors are associated with a greater risk

**Monitor for presence of the disorder**
- Monitor VS for hemodynamic instability; hypotension, tachycardia, tachypnea
- Monitor for positive D-Dimer assay
- Monitor for declining hemoglobin and hematocrit
- Monitor I/O for urine output < 30 ml/hr

**Monitor diagnostic testing:**
- Monitor Chest XRAY for widening mediastinum in thoracic dissection
- Mon CT angiography vs MRA results for diagnosis of aneurysm in presence of acute symptoms
- Monitor ultrasound results in high risk populations without symptoms

**Monitor for presence of contributing factors**
- The nurse checks labs and diagnostic tests that confirm the presence of contributing factors

**Additional assessment includes monitoring from presence of complications of an exacerbation of the disorder**
- Monitor closely for elevated blood pressures which exacerbate the disorder

### DO

Perform nursing actions that correct the acute exacerbation of the disorder

1. Provide Oxygen
2. initiate IV access with Large bore IVs
3. prepare client for emergency surgery intervention if dissection is occurring
4. administer IV beta blocker therapy to maintain SBP between 100 - 120 mm Hg and HR between 60-80 beats per minute to reduce risk of expansion of the aneurysm

Performs nursing actions to minimize complications of an exacerbation of the disorder

1. monitor hourly output, BMP, CBC for signs of hemorrhage, renal failure
2. administer morphine sulfate for acute pain

### CALL

Monitor client for hemodynamic instability at increasing frequency to identify hypovolemia & hemorrhage.

Initiate shock management and call MD

Type and cross client for Packed RBCs & prepare to administer blood products.

Monitor for vascular compromise to extremities using peripheral neurovascular exam that occurs as a result of expanding aneurysms and emboli and call MD if present.