Peripheral Arterial Disease

An Epidemic of Poverty and Race

Tiffany Staab MSN-FNP

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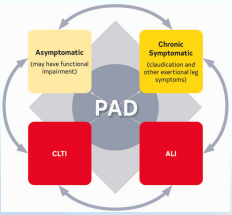
What is Peripheral Arterial Disease

PAD/PVD
4 Clinical Subsets



1. Asymptomatic: 20-59% of patients with objective proven PAD report no leg symptoms, increase risk of MACE and mortality, may have slight functional impairment

2. Chronic Symptomatic PAD: Claudication- pain, aching, cramping, or tired/fatigued feeling located in the buttocks, thigh, calf, or foot. Other: tingling, numbness, burning, throbbing, or shooting

(Gonik et al., 2024)

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4 Clinical Substrate Continued

3. Acute Limb Ischemia (ALI)

- (<2 wk duration) include pain, pallor, pulselessness, poikilothermia (coolness), paresthesias, and potential for paralysis

TABLE I. RUTHERFORD CLASSIFICATION OF ACUTE LIMB ISCHEMIA

Rutherford Class	Sensory Impairment	Motor Impairment	Doppler Signals
Class I (No immediate threat)	None	None	Arterial: audible Venous: audible
Class 2a (Marginally threatened)	Minimal	None	Arterial: audible Venous: audible
Class 2b (Immediately threatened)	Involves forefoot with possible rest pain	Mild to moderate	Arterial: absent Venous: present
Class 3 (Irreversible ischemia)	Insensate	Severe, rigorous	Arterial: absent Venous: absent

Adapted from Guruwanza N. Atraumatic acute limb ischemia: clinical presentation, classification, assessment and management- a review. Int J Vasc Surg Med. 2017;3:046-052. doi: 10.9752/2455-5402.000029

(Gonik et al., 2024)

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4 Clinical Substrate Continued

Chronic Limb Threatening Ischemia

- Manifests as ischemic rest pain, nonhealing wounds/ulcers, or gangrene with symptoms present for >2 wk
- Responsible for most major and minor amputations related to PAD
- Estimated 1-year mortality rate of 25-35% and 1-year amputation rate up to 30%
  - Reduced risk of above when CLTI patients undergo revascularization

Table 3. Fontaine classification of peripheral arterial disease severity.

Grade	Patient presentation
I	Asymptomatic
II	Intermittent claudication
IIa	Pain with walking more than 200 m
IIb	Pain with walking less than 200 m
III	Rest/nocturnal pain
IV	Necrosis and gangrene

Table 3 Wound, Ischaemia, foot Infection (WIfI) clinical stage associated with amputation risk and revascularisation benefit

Stage	Major amputation risk at 1 year (estimated %)	Revascularisation benefit score
1	2–3	Very low
2	8–9	Low
3	25	Moderate
4	50	High

This table shows the clinical stages calculated from the WIfI system and how the stages are associated with amputation risk and revascularisation benefit.

(Gonik et al., 2024)

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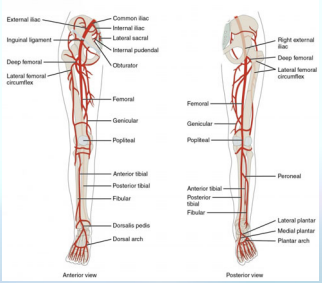
Where is Peripheral Arterial Disease

(PAD/PVD)



(OpenStax CNX, 2024)

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Who are Effected

- EVERYONE!!!!
  - Those at increased risk:
    - Age ≥65 y increased with age ≥75 y
    - Age 50-64y: diabetes, history of smoking, dyslipiemia, hypertension, CKD, family history of PAD
    - Age <50: diabetes and 1 additional risk factor for atherosclerosis
    - Individuals with known atherosclerosis disease in other vascular bed (CAD, carotid, subclavian, renal, mesenteric artery stenosis, AAA

(Gonik et al., 2024)

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Slide 6

TS1 Diabetes is associated with a greater risk of lower extremity amputation.

The 5-y mortality rate with active smoking and chronic symptomatic PAD is 40%–50%.

80-90% revascularized for severe limb symptoms are current smokers.

Tiffany Staab, 1/24/2025

History and Physical Exam

- History: Common symptoms
  - Claudication: aching, burning, cramping, discomfort, fatigue: Buttocks, thigh, calf, or ankle
    - Exacerbating factors: exercise, ?uphill, ask the distance
    - Symptom reliefe: <10 minutes
    - Nonhealing or slow healing wound: rule out PAD
- Physical exam
  - Abnormal LE pulses
  - Vascular Bruit: epigastric, periumbilical, groin
  - Asymmetrical hair growth, nail bed changes, calf muscle atrophy, dependent rubor, elevation pallor

(Gonik et al., 2024)

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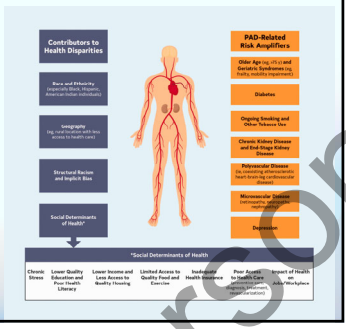
Health Disparities and PAD

4-fold higher rate of major limb amputation, 30% higher rate of CVD mortality, and 45% higher rate of stroke among Black Americans compared with non-Hispanic White American
PAD were much higher in Black women, these higher rates were observed a decade later compared with men : >60 years of age

Patterns of higher PAD prevalence in Black American patients persist even when accounting for traditional risk factors

Cuban American higher risk of PAD compared to Mexican Americans, followed by Puerto Rican American, Central American, Dominican American



(Allison et al., 2023)

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Management

(Gonik et al., 2024)

- **Antiplatelets/Anticoagulation:**
  - Aspirin 81mg daily or Clopidogrel 75mg daily: DAPT: 1-6 months after endovascular revascularization
  - Xarelto 2.5mg BID+Aspirin 81mg daily
- **Lipid Lowering**
  - High intensity statin therapy, PCSK9-i, Zetia 10mg daily
  - Target LDL <55-70
- **Hypertension management**
  - ACEi/ARB
- **Peripheral Vasodilators**
  - Cilostazol: assists with claudication similar to anti-anginal: BLACK BOX warning
- **Diabetes Management**
  - SGLT2-I and GLDP-1 therapy
- **Exercise Program**
  - Supervised Exercise Program
  - Home-Based Exercise Programs with behavioral change therapy
  - Walk 1 hour a day
- **Diet Therapy**
  - Fruit and Vegetables which contain flavonoid and polyphenols: reduce inflammation, reduce atherosclerosis, improve endothelial function
  - Vitamin K: may decrease arterial calcifications
  - High fiber diet: assist lowering total and low density lipoprotein
  - Mediteranean and DASH diet
  - Vitamin D: can up-regulate nitric oxide, and lower circulating 25-hydroxyvitamin D endothelial dysfunction and lower prevalence of PAD

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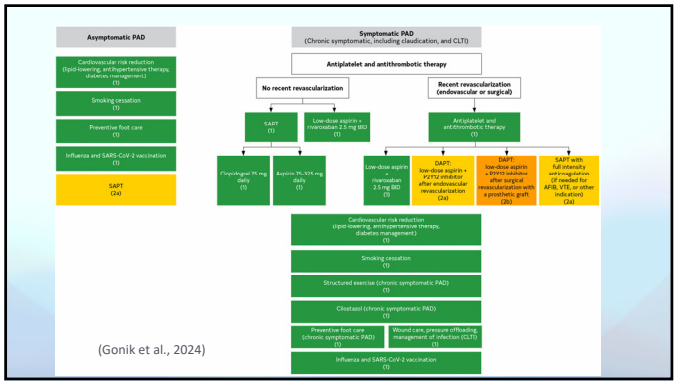

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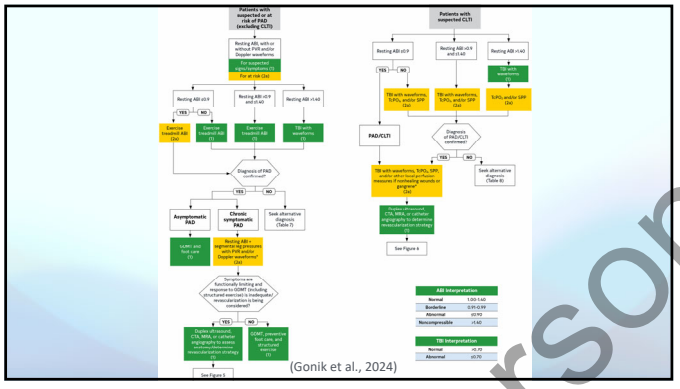

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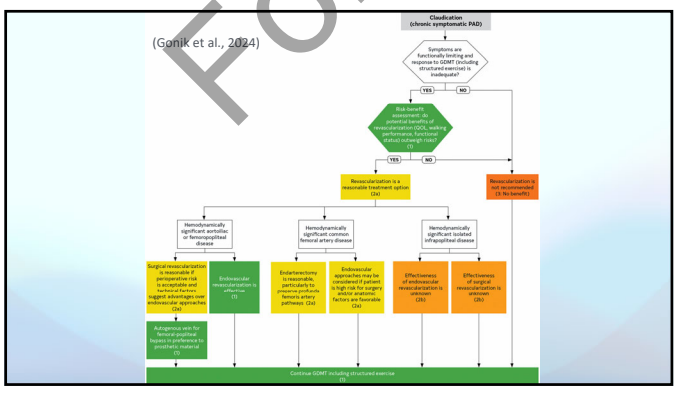

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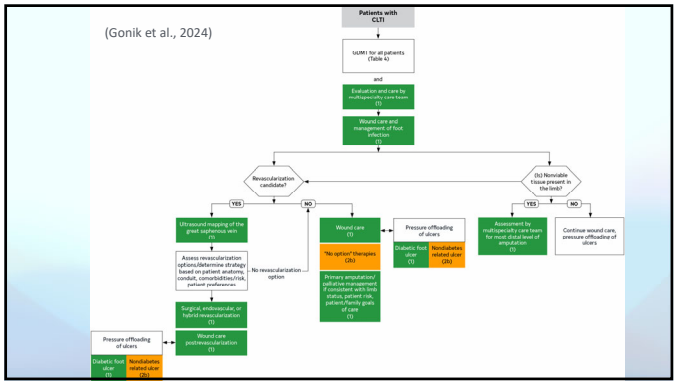

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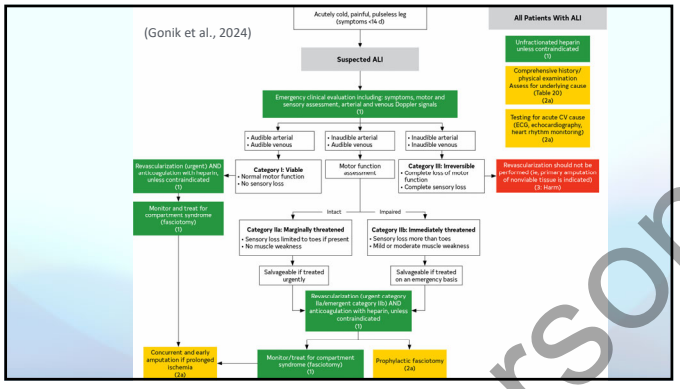

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Case Study

- 65 year old white male, with history of Type II DM, Hypertension, Hyperlipidemia. Smoking history: 40 pack year quit 2020. Notes sharp pain in bilateral lower extremities R>L with burning on a 45 minute walk, noting he has to stop 200 yards for <5 min to recover, then continues to walk.
  - PE: no wounds, limited hair growth in bilateral ankles, posterior tibial pulses +1 bilaterally
  - VS: BP: 145/80, HR 67. Lipid panel: TC 200, TG 180, LDL: 90, HDL: 56, Hgb A1c 8.0, BUN: 20 Creatinine: 0.8
  - Medication: Rosuvastatin 10mg, metformin 1000mg BID, Losartan 25mg daily

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ABI

Conclusions

1. Resting ABI of the right lower extremity 0.54 (moderate PAD) and the right lower extremity 0.82 (mild PAD).
2. Post walking ABI dropped to 0.16 and 0.36 suggest significant arterial occlusive disease worse on the right.
3. Abnormal TBI bilaterally.
4. Patient complained of left calf tightness at 1 minute and 10 seconds 43 yd maximum walking distance 124 yd.
5. Pulse wave and pressure gradient suggest significant arterial occlusive disease bilaterally worse on the right.

Findings

Right: Resting Index: ABI (PT)- 0.54 ABI (DP)- 0.46 TBI- 0.61
Post-exercise ABI: 0.16
Left: Resting Index: ABI (PT)- 0.82 ABI (DP)- 0.63 TBI- 0.78
Post-exercise ABI: 0.36

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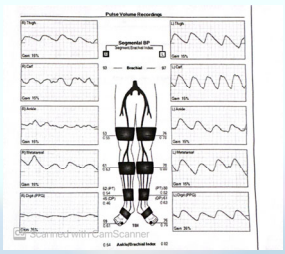
ABI Cont



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Questions

- What medication optimization would one consider?
- Which type of PAD?
- What are his specific risk factors?
- Management considerations for PAD?

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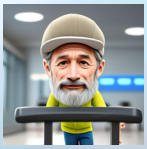
PAD walking program

- Similar to cardiac rehab, specific to walking and PAD management.
- Intermittent walking to mild-moderate pain, required to improve inflammation, improved muscle strength, increased calf blood flow.
- 30-45 min, interval training and walking. 2-3x week for 12-16 weeks.
- Goal is 30-45 min of uninterrupted movement.
- Covered by medicare and most commercial insurances



(Gonik et al., 2024)

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ART Assist Device

- Arterial intermittent pneumatic compression device
  - Chronic PAD individuals whom revascularization is not an option
  - Assist with wound healing and relieve ischemic rest pain

(Gonik et al., 2024), (Allison et al., 2023) (ACI Medical LLC, 2025).

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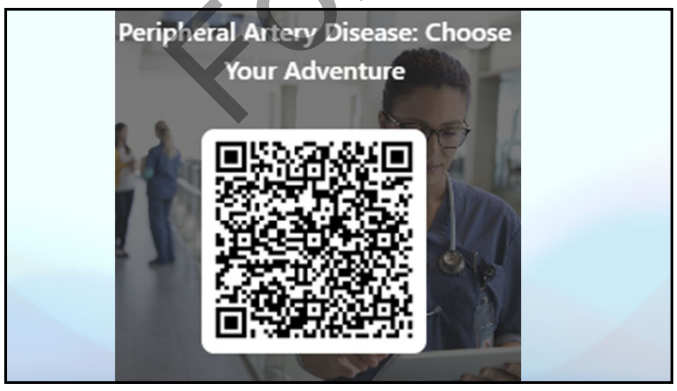

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