2023 MID-ATLANTIC CONFERENCE

11th ANNUAL CURRENT CONCEPTS IN

VASCULAR THERAPIES

2023

Hilton Virginia Beach Oceanfront
Virginia Beach, Virginia

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PAD: Time to Treat

Optimal Medical Management and When to Refer to Vascular Surgery

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Sentara Vascular Specialists

No Disclosures

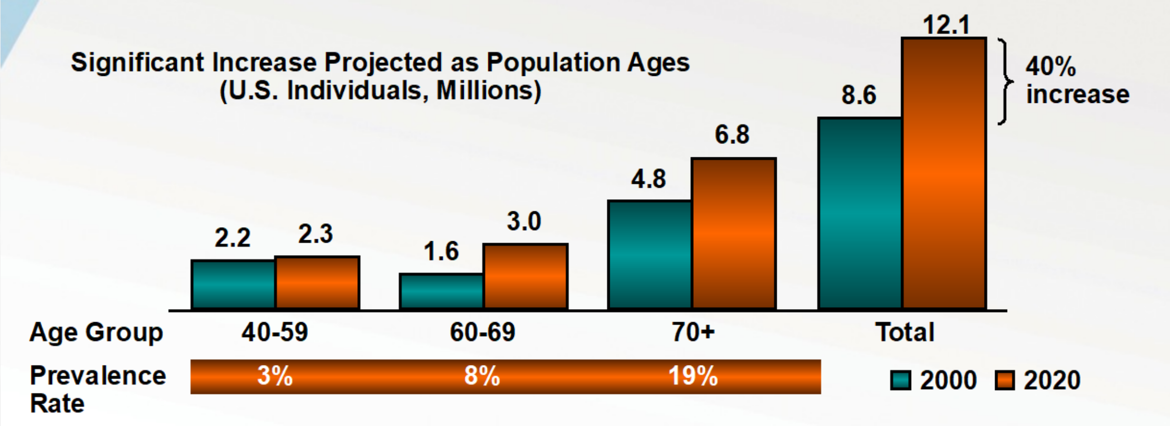
Goals of Presentation

- Introduction to PAD
- Diagnosis of PAD
- Management of PAD

Goals of Presentation

- **Introduction to PAD**
  - Diagnosis of PAD
  - Management of PAD

Why is PAD a serious healthcare issue?



- Longer lifespans/Rising incidence of diabetes
- Early detection and intervention can help prevent disease progression, leg ischemia and ultimately amputation along with reducing overall cardiovascular risk of Stroke/MI

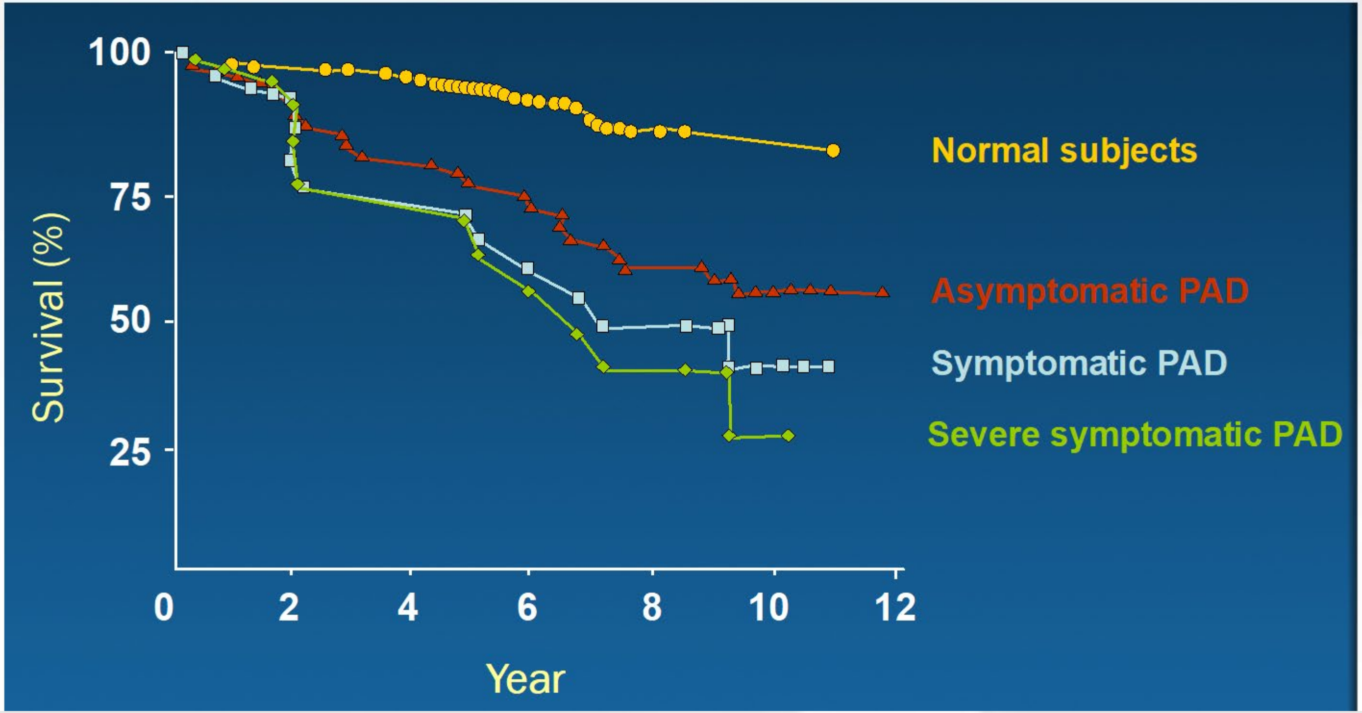
CORONARY ARTERY DISEASE

Cerebrovascular Disease

PAD

Proportion of PAD patients with CAD and/or CBVD = 61%

Long-Term Survival in Patients With PAD



Criqui MH et al. *N Engl J Med*. 1992;326:381-386.

5 Year Mortality Rates

Pancreatic	92%
Lung	81%
Ovarian Ca	53%
Myeloma	49%
Leukemia	39%
Colorectal Ca	36%
Renal	26%
Breast Ca	10.3%
Prostate	1.2%

- CLI 54% → 5 year mortality
- Major amputation 79% → 5 year mortality

Why is early diagnosis of PAD so important?

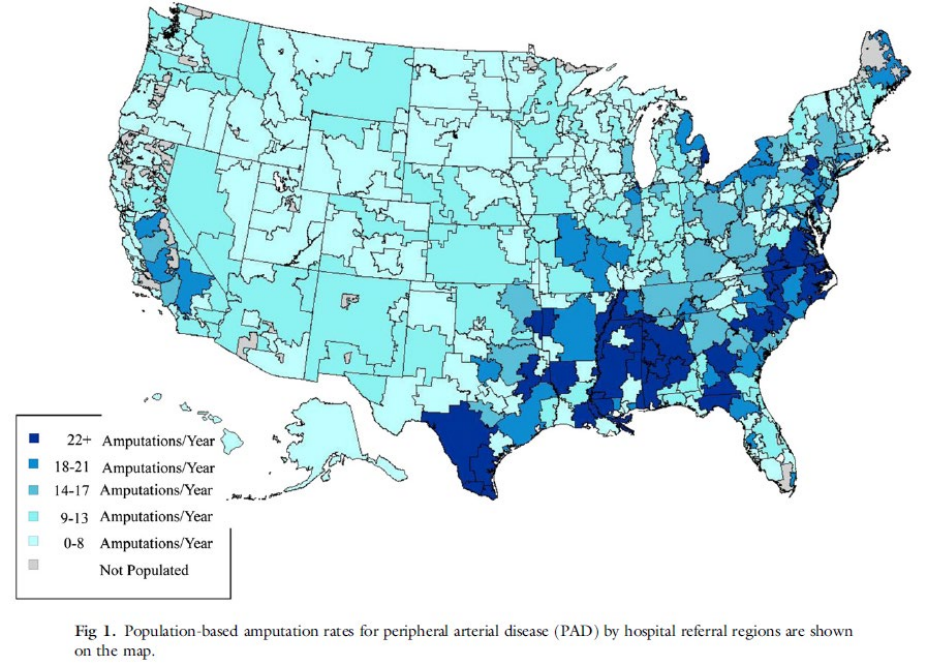


Fig 1. Population-based amputation rates for peripheral arterial disease (PAD) by hospital referral regions are shown on the map.

Source: http://www.sirweb.org/patients/peripheral-arterial-disease/ http://www.tasc-2-pad.org/upload/SSRubriqueProduit/Fichier2/961.pdf

Goals of Presentation

- Introduction to PAD
- **Diagnosis of PAD**
- Management of PAD

Risk Factors

	High Risk Patients
Risk Factors	• Age: People over 50 • History of or currently smoking • Personal history of vascular disease, heart attack, or stroke • Diabetes • High blood pressure • High cholesterol • Lack of exercise / being overweight
Screening	**Ankle-brachial index (ABI)** **Doppler Ultrasound** **Treadmill exercise / reactive hyperemia test for further testing**

Common Symptoms

Asymptomatic	• Nearly everyone who has PAD suffers from an inability to walk as fast, or as far, as they could before PAD.
Classic claudication	• Lower extremity symptoms confined to the muscles with a reproducible onset with exercise and relief with rest.
“Atypical” leg pain	• Lower extremity discomfort during exertion but does not always resolve with rest, limiting exercises at similar distances
Critical limb ischemia	• Ischemic rest pain, nonhealing wound, or gangrene.
Acute limb ischemia	• 3Ps→Pain, Pulselessness, Pallor, Paresthesias, Paralysis. Poikilothermia

Source: http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001215/

Diagnostic tools for PAD

Where to start?

$$\text{ABI} = \frac{\text{Ankle systolic pressure}}{\text{Brachial systolic pressure}}$$

Normal	1.00-1.40
Borderline	0.91-0.99
PAD	≤0.90
Severe PAD	< 0.40
Non-compressible	>1.40

Be aware of the limitations of ABI testing!

Limitations of the ABI

- **Variability of measurement**
  - **As a rule, change in ABI > 0.15 from study to study is considered significant**
    - (Baker JD, Dix DE. Surgery 1981;89:134).
- **ABI does not localize disease within the limb**
- **ABI correlates poorly with symptoms and functional limitations**
- **Decreased sensitivity for mild disease**
  - Suspected PAD and normal or borderline resting ABI → Exercise ABI
  - ≥50% of these patients will have fall in ABI with exercise (aortoiliac disease)
- **ABI can be falsely elevated ABI in patients with calcified vessels**
  - CLI

Segmental Leg Pressures and Waveforms (AKA LE ARTERIAL DOPPLER!)

- Allow for segmental localization of disease and qualitative blood flow assessment
- Blood pressures measured at each cuff
  - 4 or 3 cuff leg method
  - Can assess metatarsal digits
- Waveforms recorded at each level
  - Blood pressure at each level
  - Pulse volume recordings (PVRs)
  - Doppler tracings
- Look for drop in blood pressure (>20-30 mm Hg) between each cuff and change in waveform to localize disease

3 cuff PVR + metatarsal + digit

Exercise ABI Testing

- Common indications
  - PAD suspected but normal or borderline ABI at rest
  - Assessment of degree of functional impairment due to claudication
- One lab's standard protocol: 12.5% grade, 2 MPH, up to 5 min (fixed load)
  - ECG *not* monitored in most labs
  - Unable to perform on patients significant cardiac/pulmonary disease
- Obtain ABI and ankle PVR tracings before, immediately post exercise, and in recovery
- Interpretation
  - **Normal:** No significant drop in ankle pressure or ABI with exercise
  - **Abnormal**: Fall in ankle pressure (>30 mm Hg) or ABI (>20%)[1] with change in PVR waveform
  - Not unusual for ankle pressures to fall to < 50 mm Hg or less (even to 0 mm Hg) in patients with severe occlusive disease

[1] Aboya[illegible] et al[illegible]HA ABI Sc[illegible]c Statement. Circulation 2012; [illegible]26:28[illegible]

Toe-Brachial Index (TBI)

- Very useful to to diagnose PAD with ABI > 1.4 or partially non-compressible vessels
  - Normal TBI > 0.7
- Important in evaluation of critical limb ischemia
  - Digital vessels almost always compressible
- Technique:
  - Great toe pressure measured using small digit cuff and a flow sensor
  - Ratio of toe pressure to brachial pressure
  - Room must be warm to avoid vasoconstriction

Image from Bonham PA. Nursing. 2003;33:54.

Role of Anatomic Imaging in PAD

- To map lesions anatomically and plan for revascularization
- For surveillance after revascularization to asses for patency and restenosis
- If there is a clinical suspicion of a “zebra”
  - Fibromuscular dysplasia
  - Popliteal entrapment
  - Cystic adventitial disease
  - Lower extremity aneurysmal disease
  - Vasculitis
  - Other

- **Similar to other tests, important to be aware of limitations.**
- **NOT Physiologic testing. Occluded vessel without symptoms does not = urgent referral**

Goals of Presentation

- Introduction to PAD
- Diagnosis of PAD
- **Management of PAD**

Medically Managing PAD

- What are our goals?
  - Prevent progression to CLTI
  - Improve ability to walk / Quality of life
  - Decrease mortality from atherosclerotic disease

TOBACCO CESSATION

- Singular most important intervention in PAD patients
- Impacts both mortality and limb outcomes
- Only 50% patients report being advised to quit

2016 PAD Guideline: Antiplatelet Agents

COR	LOE	Recommendations
		Antiplatelet therapy with aspirin alone (range 75–325 mg per day) or clopidogrel alone (75 mg per day) is recommended to reduce MI, stroke
IIb	B-R	In asymptomatic patients with borderline ABI (0.91–0.99), the usefulness of antiplatelet therapy to reduce the risk of MI, stroke, or vascular death is uncertain.

CNN health Life, But Better Fitness Food Sleep Mindfulness Relationships

Task force's updated guidelines do not recommend daily aspirin for heart health for most adults

Gerhard-Herman MD, et al. 2016 AHA/ACC PAD Guideline. Co-published: Circulation 2017;135:e726. J Am Coll Cardiol. 2017;69:e71.

Diabetes Management

- HgbA1C of 7 is goal (AVERAGE blood sugar of 154 mg/dL)
  - ACCORD Trial
    - RCT of DM2 to HgbA1C of 7-7.9% vs less than 6%
    - Primary Endpoint: Composite CV death, MI, stroke
    - ~10,000 pts included
    - Intensive-therapy group had relative increase in mortality of 22% and an absolute increase of 1.0%
  - Action in Diabetes and Vascular Disease (ADVANCE) study and the Veterans Affairs Diabetes Trial (VADT) failed to show tight glyemic control decreases mortality

Diabetes Management

SVS recs to prevent Diabetic Foot Ulcers

(1) annual foot examination by provider

(2) peripheral neuropathy testing w/ foot exam

(3) patient and family education about preventative foot care

(4) custom therapeutic footwear in high-risk patients, including those with significant neuropathy, foot deformities, or previous amputation,

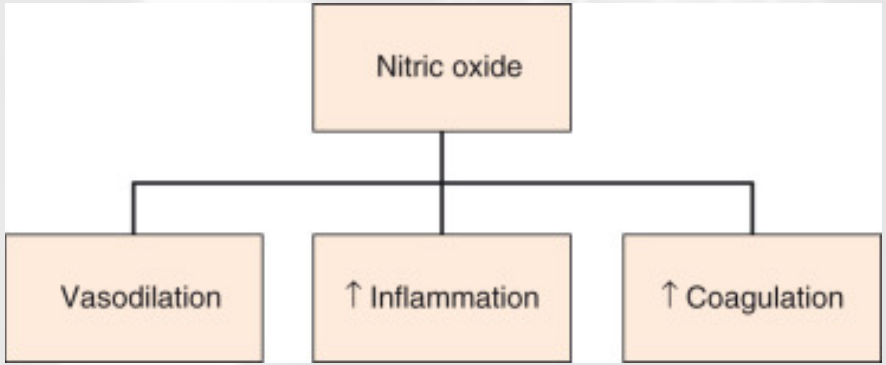
(5) glycemic control (hemoglobin A1c <7%).

Blood Pressure Control

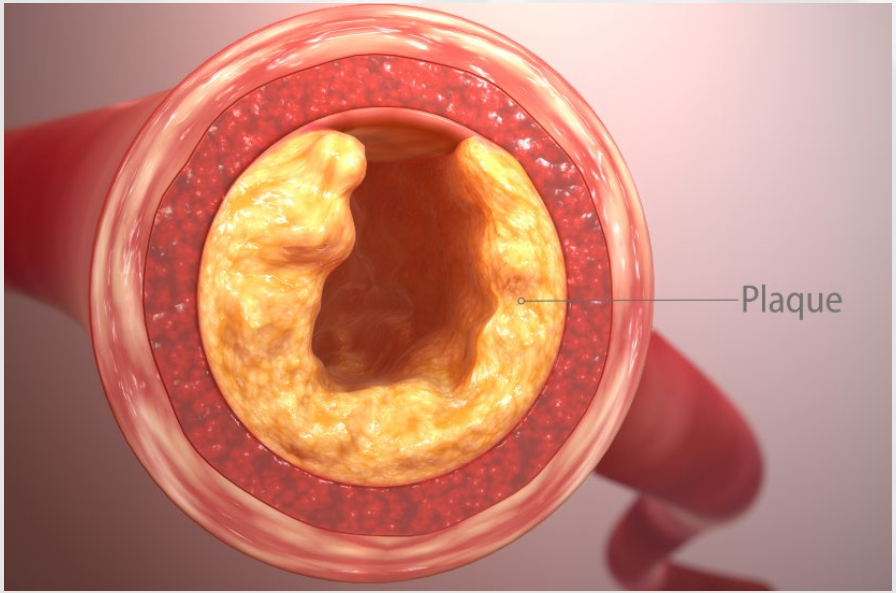
Goal SBP less than 140/90
(150/90 >60y/o)

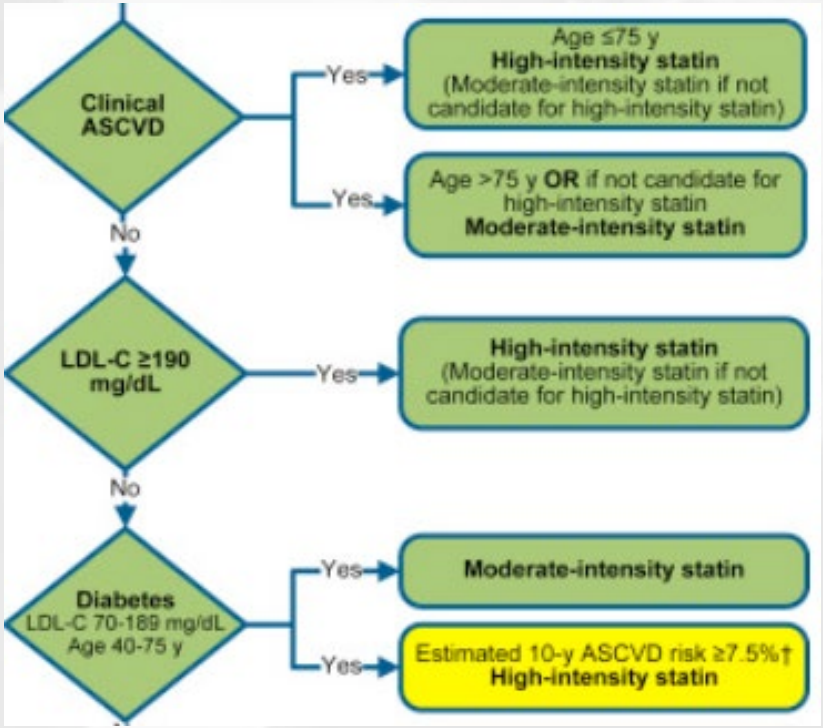
Stage	Systolic (mm Hg)	Diastolic (mm Hg)
Normal blood pressure	<120	<80
Prehypertension	120-139	>80-89
Stage 1 hypertension	140-159	>90-99
Stage 2 hypertension	>160	>100

- Endothelial Dysfunction decreases NO



Lipid Lowering Agents





Symptom Management

- Cilostazol
  - PDE 3 inhibitor
  - 50% improvement in claudication symptoms
  - No demonstrated mortality benefit
  - 3-month trial at a dose of 100 mg twice daily
  - Contraindicated in CHF, CKD, and hepatic impaired pts
  - Headaches, nausea, diarrhea common side-effects

Exercise Therapy

- What is it?

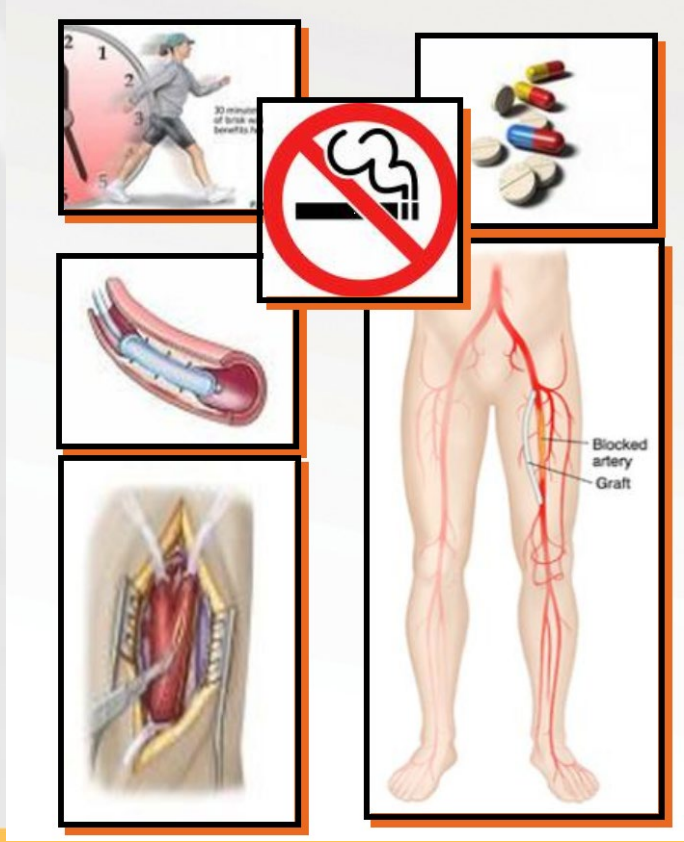
SENTARA®

Vascular Rehabilitation

- Supervised exercise
- Minimum 3 times per week
- 30-60 minute sessions
- 12 weeks duration

Treatment Options for PAD

- **Lifestyle Change**
  - Exercise regularly
  - Smoking cessation
  - Low fat diet to reduce cholesterol
- **Medications**
  - Blood pressure control
  - Antiplatelet therapy
  - Cholesterol-lowering agents
  - Vasodilators to dilate arteries



Conclusions

GOALS OF TREATMENT

CLI vs. PAD

- **CLI** → **Limb salvage**

- **PAD** →
  - CV risk reduction
  - Symptom management
  - Preserve functional status
  - Improve QOL

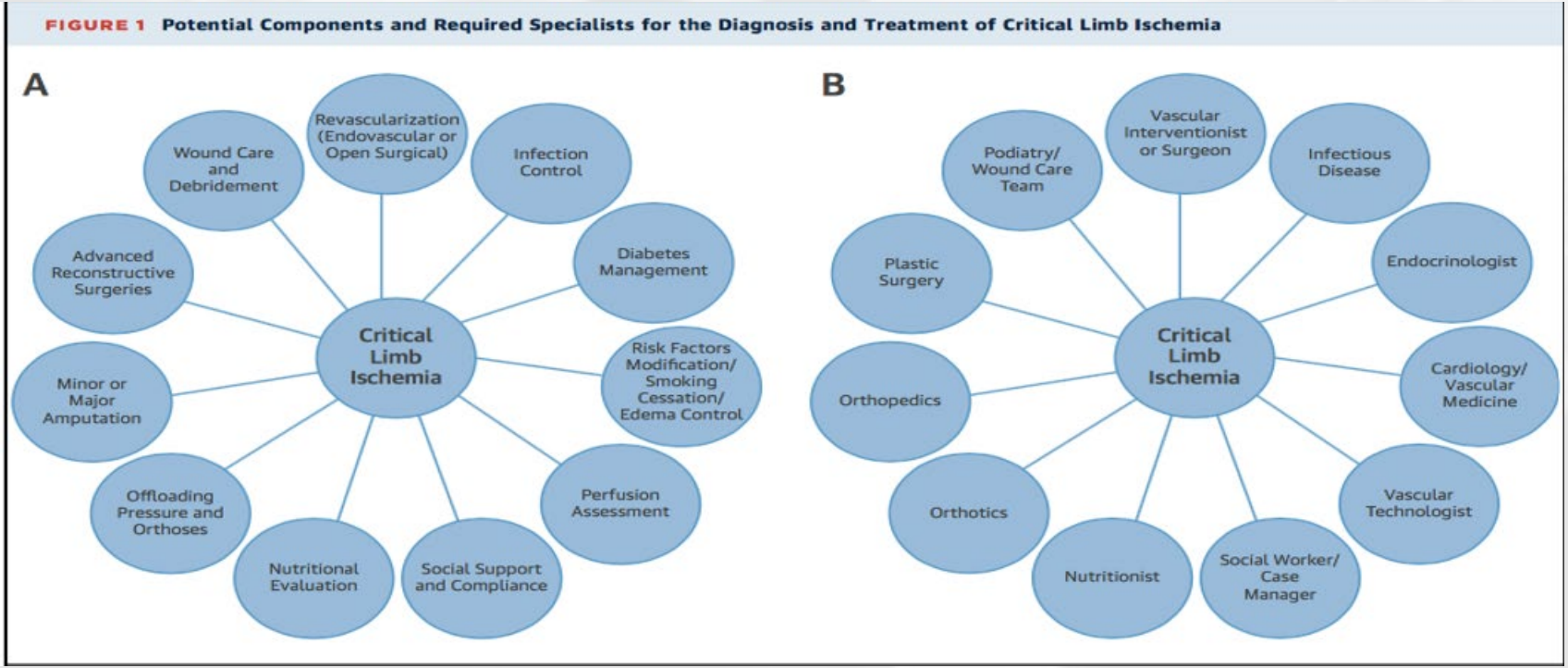
Conclusions

CLI vs. PAD

- Stable claudication is **not urgent**.
- Acute worsening of chronic claudication and chronic CLI (ischemic rest pain or nonhealing wounds) also represent **more urgent** scenarios that warrant expedited physician referral.
- ALI is the acute development of foot or toe pain with exam findings consistent with ischemia (pain, pulselessness, pallor, coolness, and sensorimotor impairment) and represents a **vascular emergency**.

- **ALL OF THESE PATIENTS NEED VASCULAR SURGERY REFERRAL! PLEASE FEEL FREE TO GET OUR CELL PHONE NUMBER OR MESSAGE US DIRECTLY ON EPIC TO LET US HELP YOU EXPEDITE GETTING THESE PATIENTS TAKEN CARE OF!!**

Conclusions



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Thank You!

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