

Overview of the 2024 ACC/AHA Guidelines for the Management of Lower Extremity Peripheral Artery Disease

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Disclosures

- None



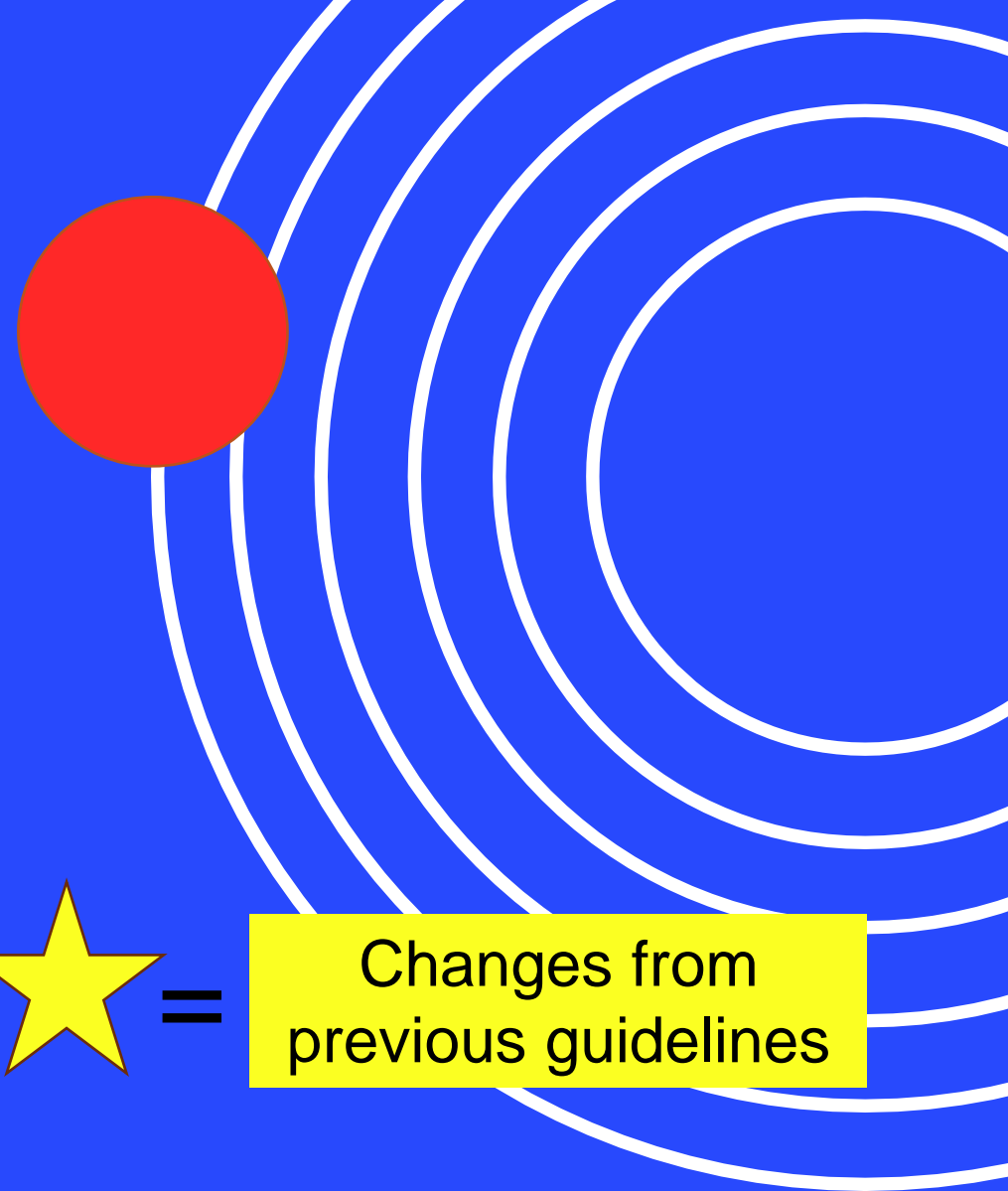
Background


- Initial comprehensive PAD guidelines 2005
- Focused update 2011
- Extensive update on just PAD 2016
- Comprehensive update May 14, 2024, focuses on atherosclerotic disease from aortoiliac segment down (no thrombosis, vasculitis, compression syndromes, pediatrics)
- Literature search 10/2020-6/2022, with additional studies through 5/2023



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Changes from
previous guidelines





Asymptomatic PAD

- No leg symptoms
- May self limit to avoid symptoms
- 30-59% of patients with PAD

Chronic Symptomatic PAD

- Exertional leg symptoms
- No rest pain
- Up to 80% of patients with PAD

of

Chronic Limb Threatening Ischemia (CLTI)

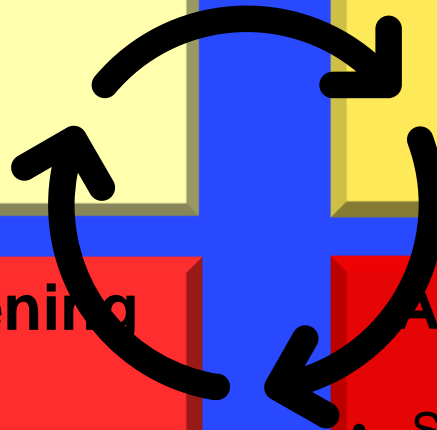
- Severe subset
- Rest pain, non healing wounds > 2 weeks
- Most amputations related to PAD
- 1 year mortality rate 25-35%
- 1 year amputation rate up to 30%
- Lower rates with revascularization

Acute Limb Ischemia (ALI)

- Severe subset
- Acute clinical symptoms <2 weeks
- Rutherford Classification System

Asymptomatic

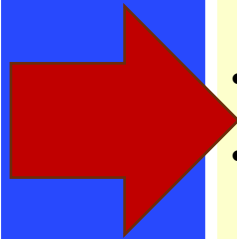
Symptomatic



Assessment of PAD

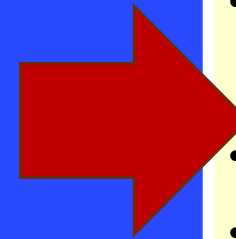
Increased Risk of PAD

- Age \geq 65
- Age 50-64 with risk factors for atherosclerosis (DM, tobacco use, HLD, HTN, CKD, family history of PAD)
- Age $<$ 50 with DM and one additional risk factor for atherosclerosis
- Known atherosclerotic disease in another vascular bed (coronary, carotid, subclavian, renal, mesenteric, AAA)



History

- Claudication symptoms
- Other non-joint related exertional lower extremity symptoms
- Ischemic rest pain
- Non-healing or slow healing lower extremity wounds
- Erectile dysfunction



Physical Exam

- Abnormal lower extremity pulse exam
- Vascular bruit
- Non-healing lower extremity wound
- Lower extremity gangrene
- Other exam findings (pallor/dependent rubor, nail bed changes, asymmetric hair growth)

PAD Related Risk Amplifiers and Health Disparities



Risk Amplifiers

- Older age (≥ 75 years)
- Diabetes
- Ongoing smoking
- CKD (25% PAD)
- ESRD (45% PAD)
- Poly-vascular disease (~50% PAD)
- Microvascular disease (neuropathy, retinopathy, nephropathy) 14-fold risk of PAD
- Depression



Health Disparities

- Race and Ethnicity (especially Black, Hispanic, and American Indian/Alaska Native)
- Lower socioeconomic status, lower education, limited access to food and exercise, inadequate health insurance, poor access to health care, impact of health on job

Increase risk of MACE and MALE

Important to assess for presence and recognize clinical impact

Develop treatment plan accordingly

Diagnostic Testing



Resting ABI

COR	RECOMMENDATIONS
1	History or physical examination findings suggestive of PAD, resting ABI with or without ankle PVR and/or Doppler waveforms to establish diagnosis of PAD
2a	In patients at increased risk of PAD, screening with resting ABI is reasonable
3: No Benefit	In patients not at increased risk of PAD and without history or physical exam findings of PAD, screening ABI not recommended

Exercise ABI/Additional Physiologic Testing

COR	RECOMMENDATIONS
1	Suspected PAD and noncompressible resting ABI, toe pressures/TBI should be performed
1	Chronic symptomatic PAD and normal or borderline resting ABI, exercise ABI should be performed
2a	PAD and abnormal resting ABI, exercise treadmill ABI testing to assess functional status and walking performance
2a	Chronic symptomatic PAD, segmental leg pressures with PVR and/or doppler waveforms is reasonable to perform in addition to resting ABI to help delineate anatomic level of PAD
2a	Suspected CLTI, toe pressure/TBI with waveforms, TcPO ₂ , and/or SPP is reasonable to perform in addition to resting ABI to establish the diagnosis of CLTI
2a	CLTI with non-healing wounds or gangrene, toe pressure/TBI with waveforms, TcPO ₂ , SPP, and/or other local perfusion measures to determine likelihood of wound healing without or after revascularization

Diagnostic Imaging

- Functional limiting claudication despite GDMT
- Revascularization planning
- Patients with CLTI

Anatomic assessment to determine revascularization strategy (1)

- Duplex ultrasound
- CTA
- MRA
- Catheter angiography

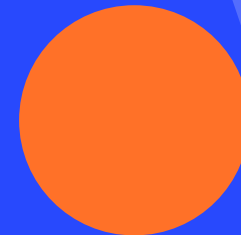
Suspected PAD with inconclusive ABI and physiological testing

Imaging to establish diagnosis (2b)

- Duplex ultrasound
- CTA
- MRA

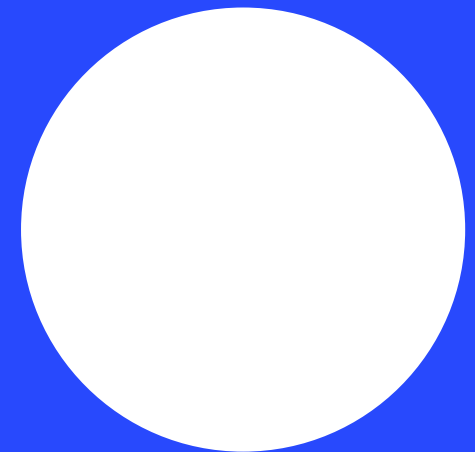
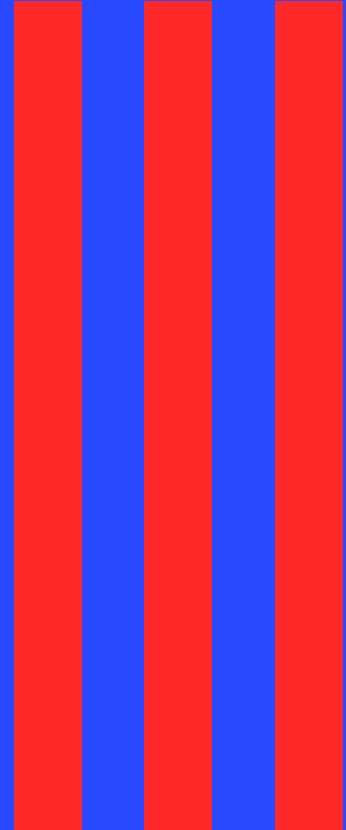
Confirmed diagnosis of PAD in whom revascularization is not being considered

Invasive or noninvasive imaging should not be performed solely for anatomic assessment (3 Harm)



Medical Therapy

- **Antiplatelet and Antithrombotic Therapy**
- **Lipid Lowering Therapy**
- **Antihypertensive Therapy**
- **Smoking Cessation**
- **Diabetic Management**
- **Preventative Foot Care**
- **Structured Exercise Therapy**
- **Other Medications**



Antiplatelet and Antithrombotic Therapy

Asymptomatic PAD

COR	RECOMMENDATIONS
2a	Single antiplatelet therapy is reasonable to reduce the risk of MACE

Symptomatic PAD

COR	RECOMMENDATIONS
1	Single agent antiplatelet therapy with aspirin alone (75-325 mg) or clopidogrel alone is recommended
1	Rivaroxaban 2.5 mg BID + low dose aspirin is recommended
2b	DAPT without recent revascularization in symptomatic PAD has uncertain benefit
2b	Adding vorapaxar to existing therapy is of uncertain benefit

Revascularized PAD

COR	RECOMMENDATIONS
1	Endovascular or surgical: antiplatelet therapy is recommended.
1	Endovascular or surgical: rivaroxaban 2.5 mg BID + low dose aspirin is recommended to reduce risk of MACE and MALE
2a	Endovascular: DAPT with P2Y12 antagonist and low dose aspirin for 1-6 months is reasonable
2a	If on full-intensity anticoagulation for other indication and are not at a high risk of bleeding, adding single antiplatelet therapy is reasonable
2b	If post prosthetic graft, DAPT with P2Y12 antagonist & low dose aspirin for at least 1 month may be reasonable

All PAD

COR	RECOMMENDATIONS
3: Harm	In PAD, without another indication, full intensity oral anticoagulation should not be used to reduce the risk of MACE and MALE

Medical Therapy

Lipid Lowering

COR	RECOMMENDATIONS
1	High intensity statin to lower LDL-C by $\geq 50\%$
2a	If LDL-C remains ≥ 70 mg/dL on maximally tolerated statin, adding ezetimibe or a PCSK9 inhibitor is reasonable

High Intensity Statin

- Atorvastatin 40-80mg
- Rosuvastatin 20-40mg

PCSK9 Inhibitors

- Repatha
- Praluent

GLP1-receptor agonists

- Trulicity
- Byetta
- Victoza
- Ozempic
- Wegovy
- Rybelsus

Antihypertensive

COR	RECOMMENDATIONS
1	Antihypertensive therapy to reduce the risk of MACE
1	SBP goal <130 mmHg DBP goal <80
1	Use ACEI or ARBs to reduce the risk of MACE

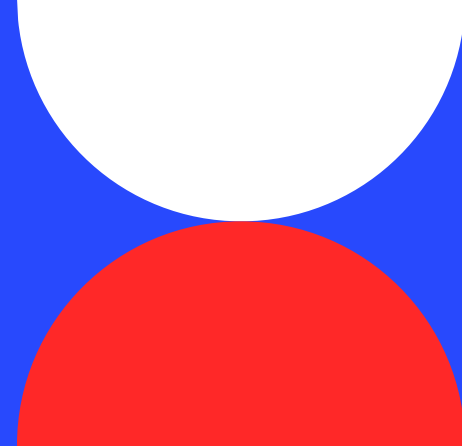
Diabetes

COR	RECOMMENDATIONS
1	Multidisciplinary team approach
1	Glycemic control with GLP1-receptor agonists to reduce risk of MACE
2b	Glycemic control may be beneficial

SLGT2 Inhibitors

- Brenzavvy
- Invokana
- Farxiga
- Jardiance
- Steglatro
- Inpefa

Other Therapies



Preventative Foot Care

COR	RECOMMENDATIONS
1	Educating patients & family on preventive foot care (not just DM)
1	Foot inspection by clinician at every visit
1	Therapeutic footwear for those at high risk for ulcers/amputation
1	Comprehensive foot evaluation annually to identify risk factors for ulcers and amputation
2a	Referral to a foot care specialist for preventive care and longitudinal surveillance is reasonable



Smoking Cessation

COR	RECOMMENDATIONS
1	Remind patients at every visit to quit or maintain cessation of tobacco use
1	Pharmacotherapy should be included in tobacco cessation plans combined with counseling and referral to smoking cessation program
1	Advise patients to avoid secondhand smoke exposure

Leg Symptoms

COR	RECOMMENDATIONS
1	Cilostazol is recommended to increase walking distance and reduce symptoms
2b	Cilostazol may help reduce restenosis after endovascular therapy in femoropopliteal disease
3: No Benefit	In chronic symptomatic PAD pentoxifylline and chelation therapy are not recommended for treatment of claudication.
3: Harm	In patients with PAD and congestive heart failure cilostazol is not recommended



Exercise Therapy

Chronic symptomatic PAD

COR	RECOMMENDATIONS
1	Supervised exercise therapy is recommended
1	A structured community-based program with behavioral change techniques is effective
2a	Non-walking structured exercise programs can be beneficial
2b	Usefulness of unstructured exercise programs is uncertain



Post Revascularization for chronic symptomatic PAD

COR	RECOMMENDATIONS
1	Supervised exercise therapy is effective



Functionally limiting claudication

COR	RECOMMENDATIONS
1	Supervised exercise therapy or structured community-based exercise therapy should be the initial treatment option



Revascularization

- **Asymptomatic PAD**
- **Chronic Symptomatic PAD**
- **Chronic Limb Threatening Ischemia**
- **Acute Limb Ischemia**

Asymptomatic PAD

COR

RECOMMENDATIONS

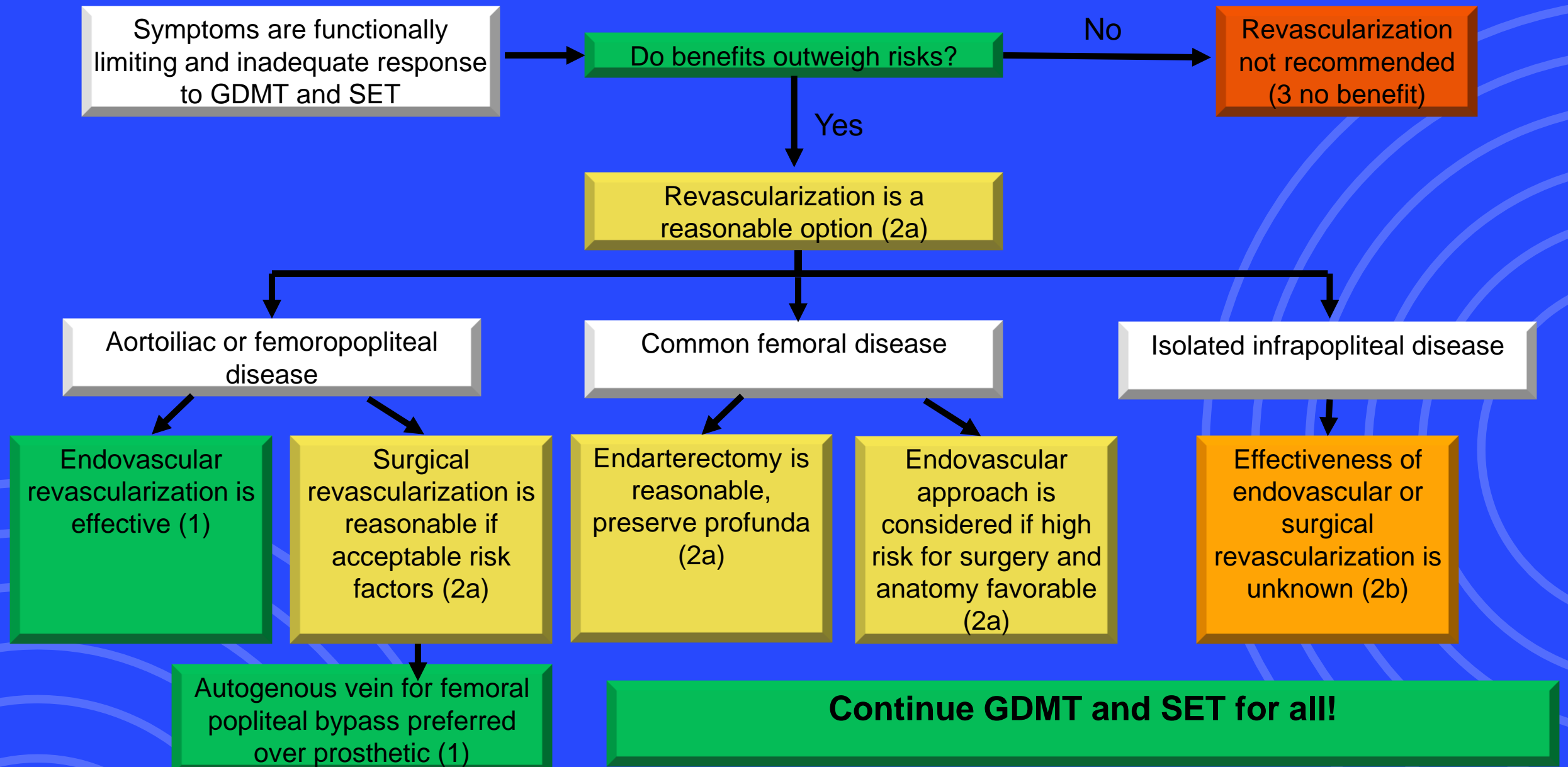
2a

In patients with asymptomatic PAD, it is reasonable to perform procedures to reconstruct diseased arteries if needed for the safety, feasibility, or effectiveness of other procedures.

3:
Harm

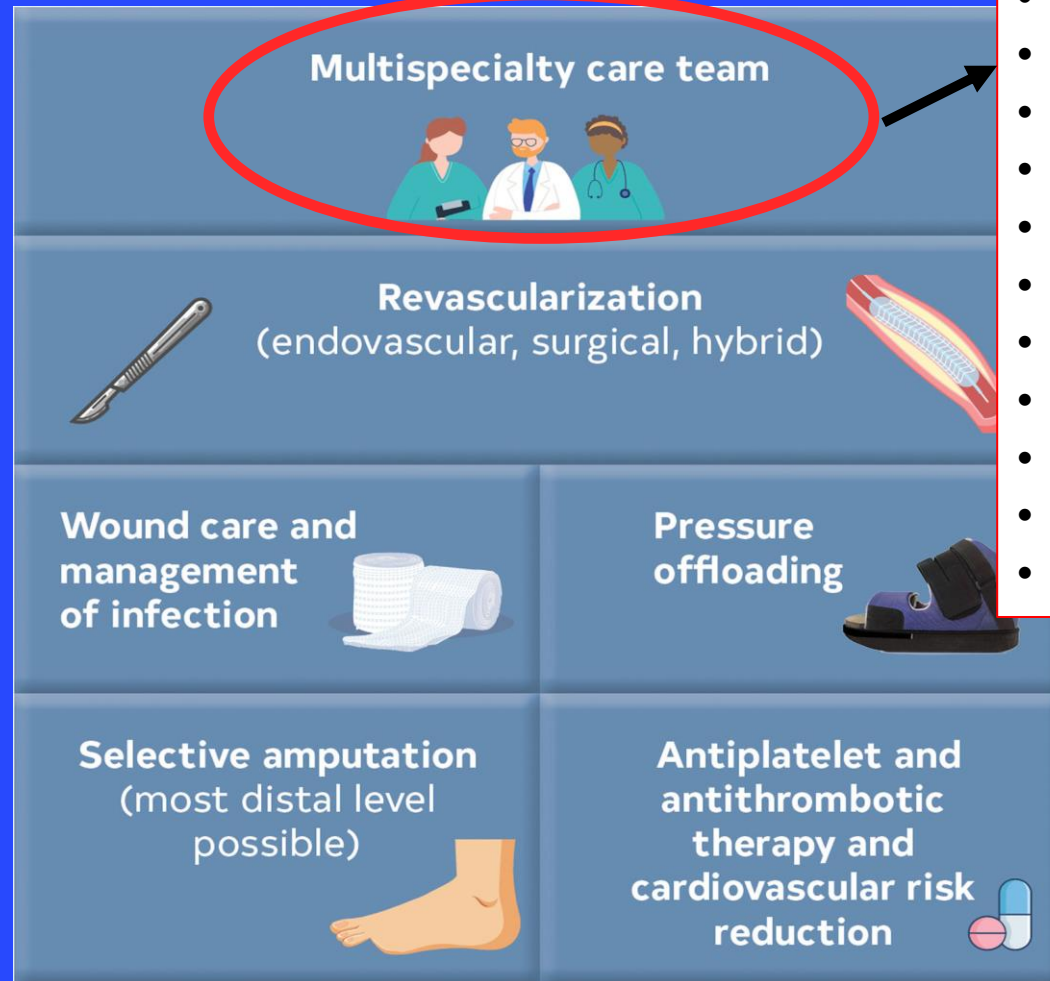
In patients with asymptomatic PAD, revascularization should **NOT** be performed to prevent the progression of disease.

Chronic Symptomatic PAD



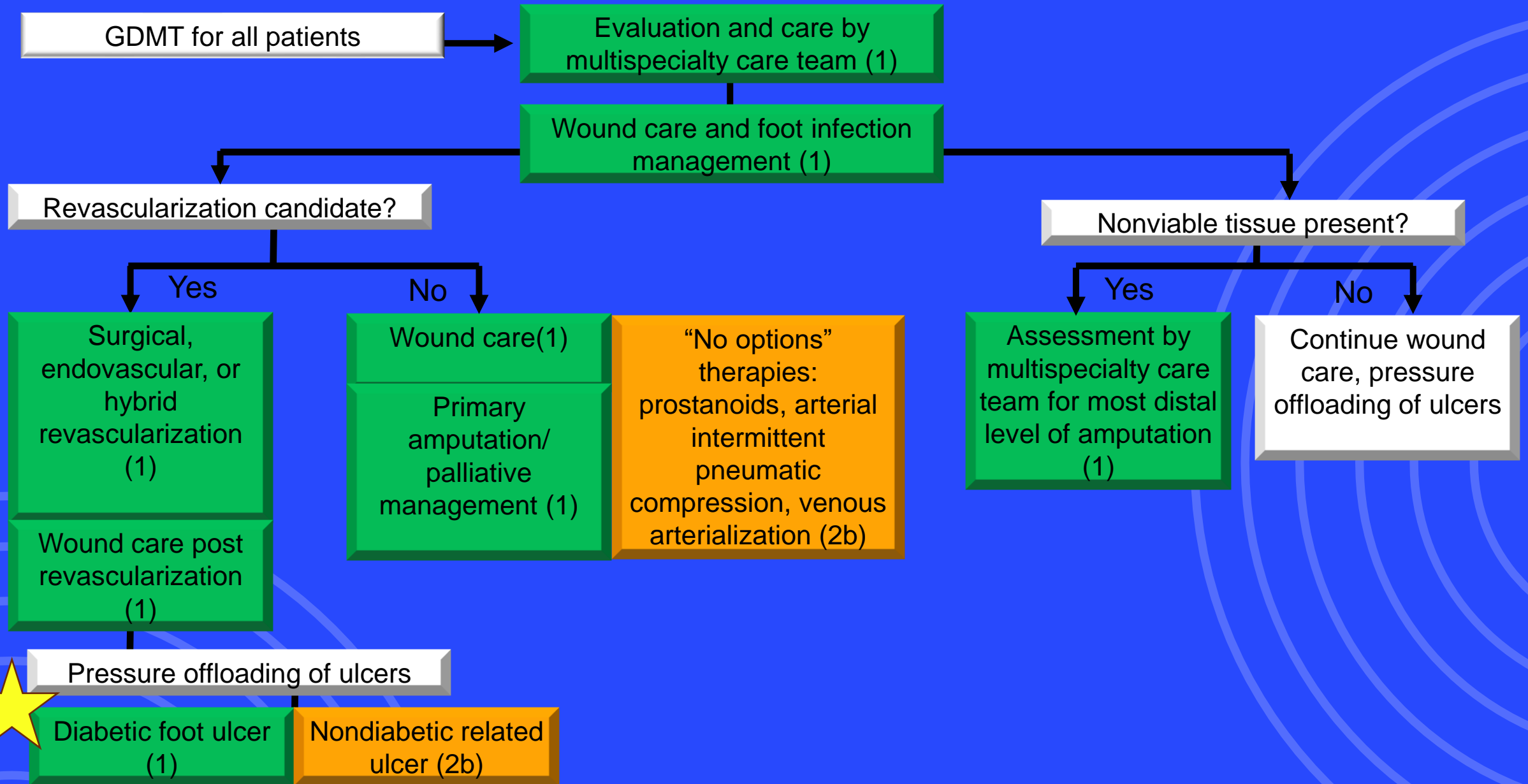
Chronic Limb Threatening Ischemia

Objective is to evaluate all revascularization and therapeutic options with goal of preserving a functional limb

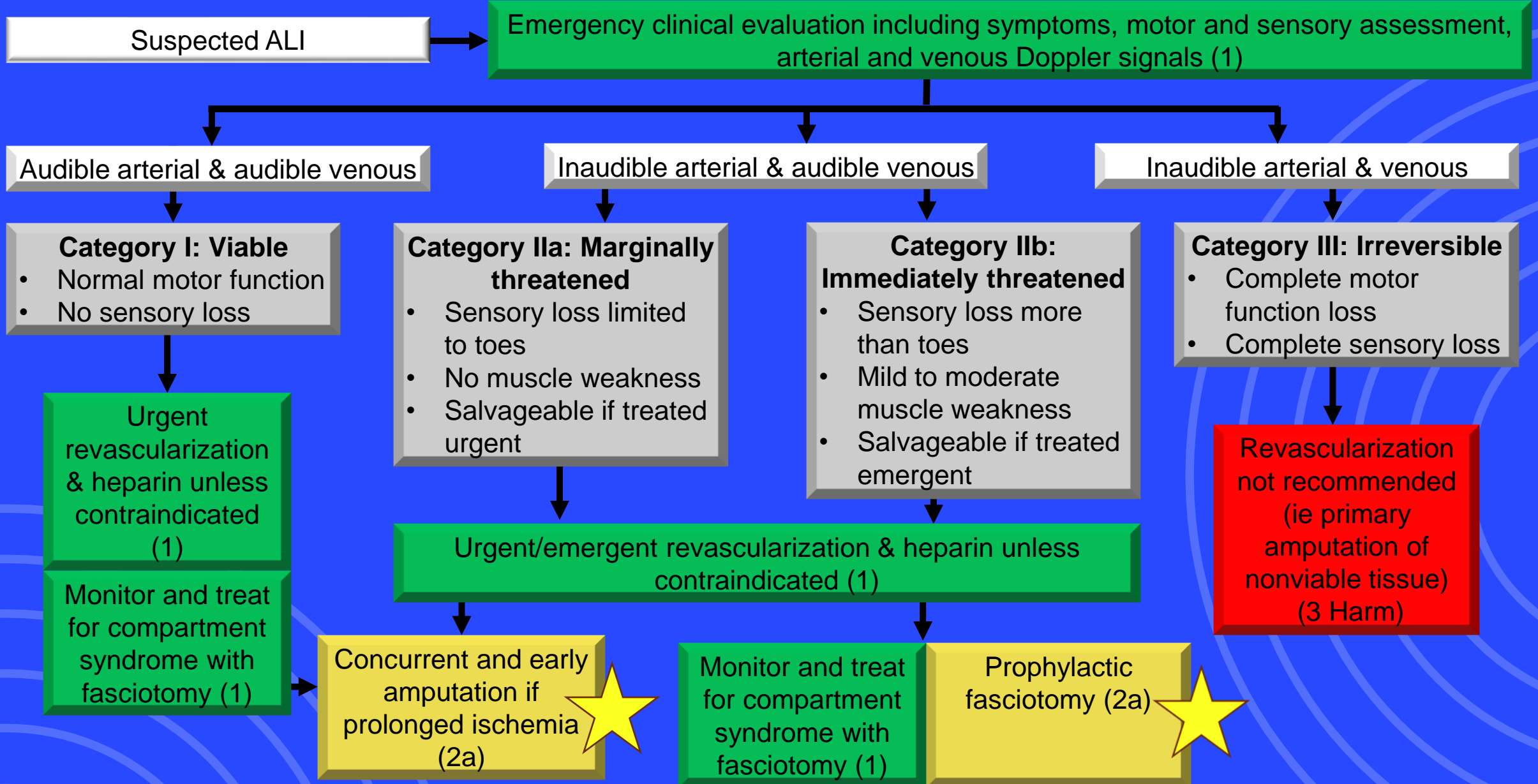


- Vascular
- Podiatry
- Endocrinology
- Interventional Radiology
- Cardiology
- Infection Disease
- Internal Medicine
- Nursing
- APP
- PMR
- PT/OT
- Case Management

Chronic Limb Threatening Ischemia



Acute Limb Ischemia



Acute Limb Ischemia

Establishing Etiology

COR	RECOMMENDATIONS
1	History and physical examination should be performed to determine the cause of thrombosis or embolization.
2a	Testing for a cardiovascular cause of thromboembolism can be useful.

Underlying Causes

- Underlying PAD
- Cardioembolic
- Iatrogenic/access site
- Aortic or dissection
- Arterial trauma
- Aneurysmal related
- Hypercoagulable state
- Cancer associated
- Proinflammatory states

Additional Evaluation

- EKG
- Echocardiogram
- Aortic imaging
- Labs

Longitudinal Follow Up of PAD

General

COR	RECOMMENDATIONS
1	With or without revascularization, routine clinical evaluation, including assessment of limb symptoms and functional status, lower extremity pulse and foot assessment, and progress of risk factor management is recommended.
1	Coordination among specialists to improve management and outcomes.
1	With or without revascularization, periodic assessment of functional status and health-related QOL.
1	Long-term use of GDMT to prevent MACE and MALE is recommended.
2a	Telehealth can be used for vascular evaluation and management and longitudinal follow-up, depending on the urgency of presenting symptoms.

Post Revascularization

COR	RECOMMENDATIONS
1	After lower extremity revascularization include periodic clinical evaluation of lower extremity symptoms and pulse and foot assessment is recommended.
1	After lower extremity revascularization with new lower extremity signs or symptoms, ABI and arterial duplex ultrasound is recommended.
2a	After endovascular procedures without new lower extremity signs or symptoms, it is reasonable to perform ABI and arterial duplex ultrasound surveillance within the first 1 to 3 months post procedure, then repeat at 6 and 12 months, and then annually.
2a	After infrainguinal, autogenous vein bypass graft(s) without new lower extremity signs or symptoms, it is reasonable to perform ABI and arterial duplex ultrasound surveillance within the first 1 to 3 months post procedure, then repeat at 6 and 12 months, and then annually.
2b	After infrainguinal, prosthetic bypass graft(s) without new lower extremity signs or symptoms, the effectiveness of ABI and arterial duplex ultrasound surveillance is uncertain.



Thank you

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