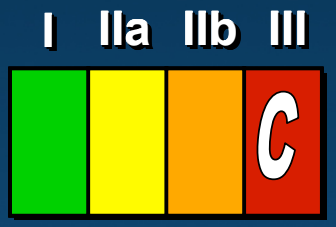
Revascularization Treatment for the Individual With PAD:

The Symptomatic Leg

Pharmacotherapy of Claudication



Endovascular intervention is not indicated as prophylactic therapy in an asymptomatic patient with lower extremity PAD.

There is no evidence that any symptomatic clinical outcome can be improved, or adverse limb event averted (including amputation) by any prophylactic revascularization method, including angioplasty or vascular surgical bypass.

Options in Limb Revascularization

- Endovascular reconstruction options
  - Percutaneous transluminal angioplasty (PTA)
  - Stents
- Surgical reconstruction options
  - Aortoiliac/aortofemoral reconstruction
  - Femoropopliteal bypass (above knee and below knee)
  - Femorotibial bypass

Indications for Revascularization in the Patient With Intermittent Claudication

- A predicted or observed lack of adequate response to exercise therapy and claudication pharmacotherapies.
- Presence of a severe disability, either being unable to perform normal work or having very serious impairment of other activities important to the patient.
- Absence of other disease that would limit exercise even if the claudication was improved (e.g., angina or chronic respiratory disease).
- The individual's anticipated natural history and prognosis.
- The morphology of the lesion (must be such that the appropriate intervention would have low risk and a high probability of initial and long-term success).

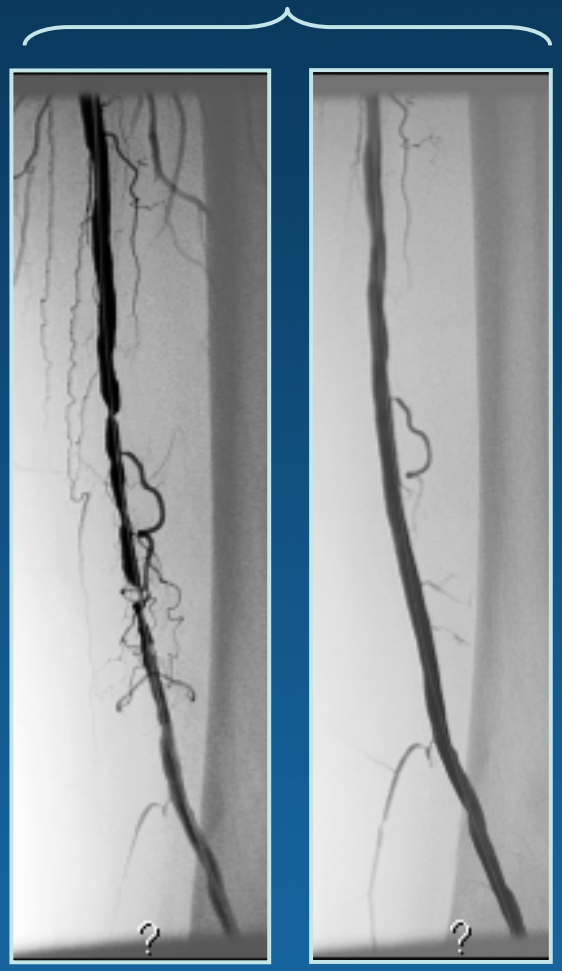
Also see Table 19 of Hirsch AT, et al. *J Am Coll Cardiol.* 2006;47:e1-e192.

Aortoiliac Occlusive Disease:
Angioplasty With or Without Stenting

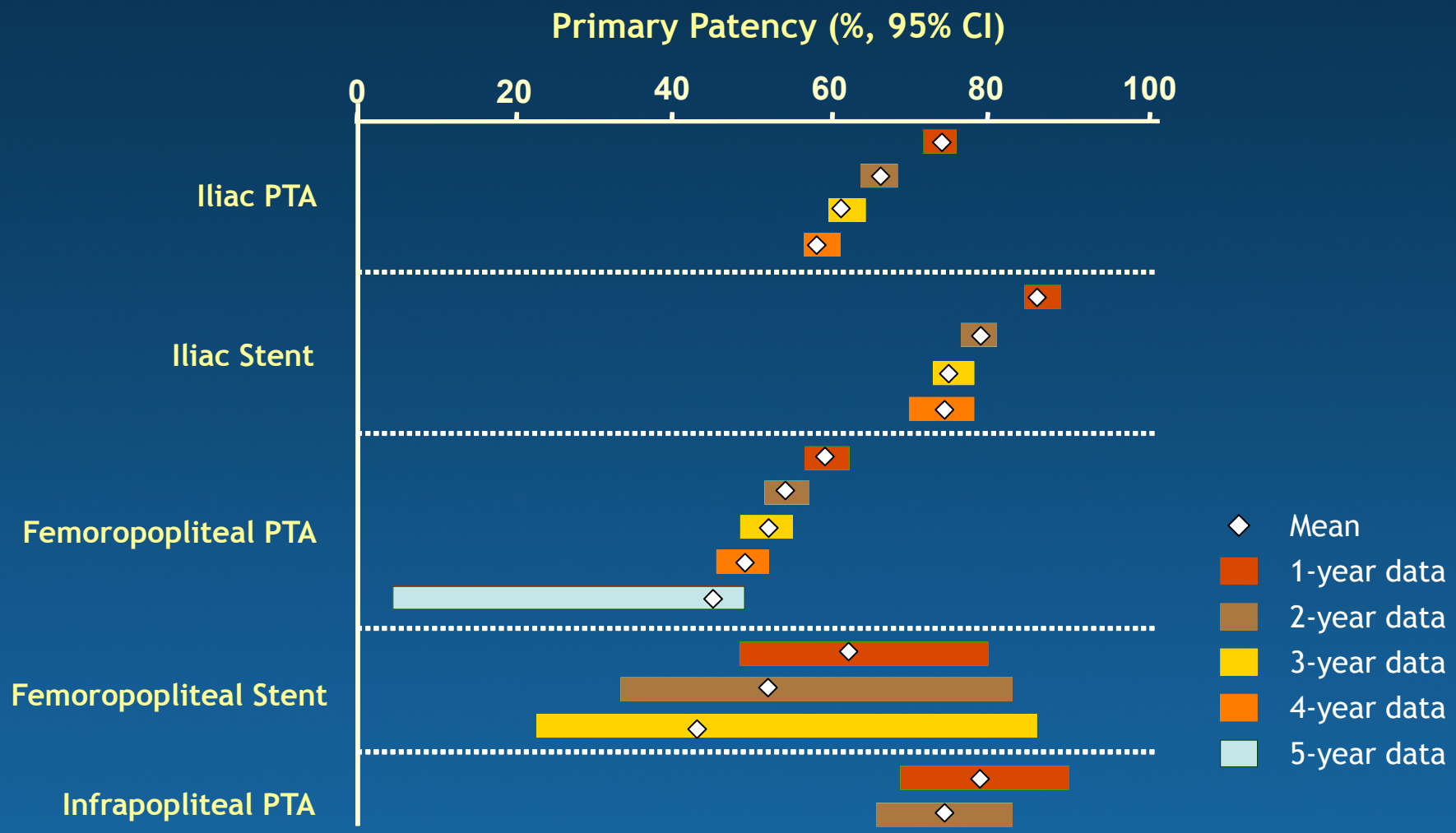
- High procedural success rates (90%)
- Excellent long-term patency (≥70% at 5 years)
- Factors associated with a poor outcome:
  - Long segment occlusion
  - Multifocal stenoses
  - Eccentric calcification
  - Poor runoff

Femoropopliteal Disease: *Endovascular Options*

- Excellent procedural success
- Reported patency varies widely
  - 30%–80% at 1 year
- Role of primary stenting for femoropopliteal disease remains incompletely defined



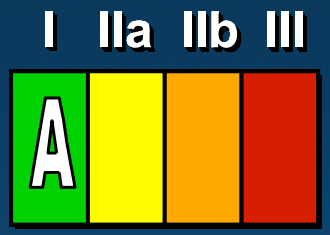
Durability of Endovascular Procedures



CI=confidence interval; PTA=percutaneous transluminal angiography

Hirsch AT, et al. *J Am Coll Cardiol.* 2006;47:e1-e192.

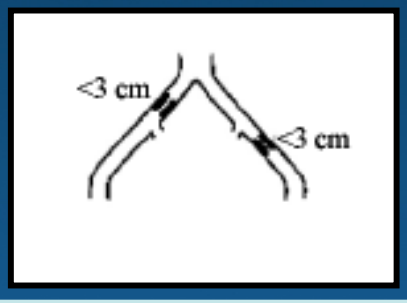
Endovascular Treatment for Claudication



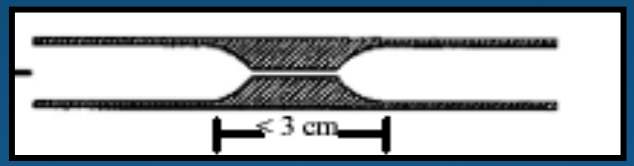
Endovascular intervention is recommended as the
preferred revascularization technique for TASC type A iliac and femoropopliteal lesions.

Iliac

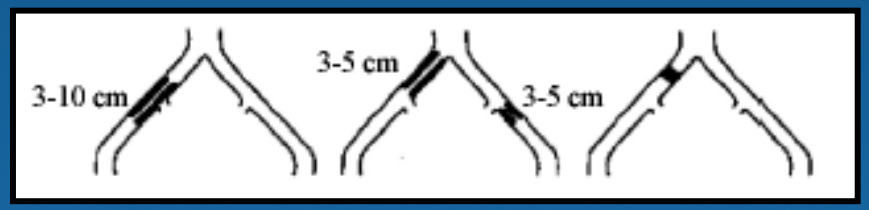
TASC A:
(PTA recommended)

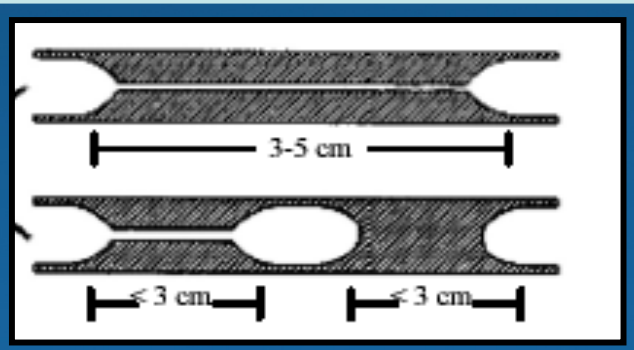


Femoropopliteal



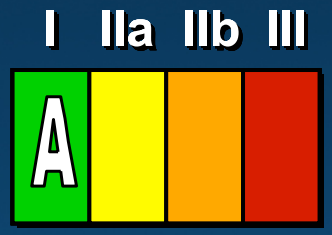
TASC B: (insufficient data to recommend)





TASC Working Group. *J Vasc Surg.* 2000;31(1Suppl):S1-S296.

Endovascular Treatment for Claudication

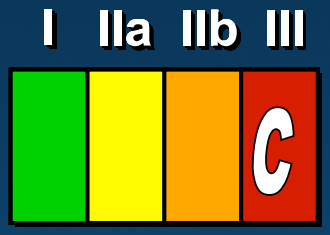


Endovascular procedures are indicated for individuals with a vocational or lifestyle-limiting disability due to intermittent claudication when clinical features suggest a reasonable likelihood of symptomatic improvement with endovascular intervention *and* …

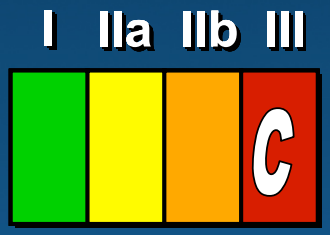
a. response to exercise or pharmacologic therapy is inadequate, *and/or*

b. there is a very favorable risk-benefit ratio (e.g., focal aortoiliac occlusive disease)

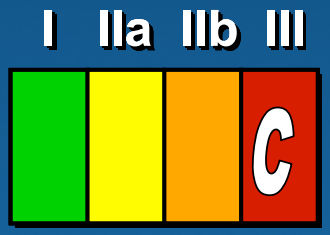
Endovascular Treatment for Claudication



Endovascular intervention is not indicated if there is no significant pressure gradient across a stenosis despite flow augmentation with vasodilators.

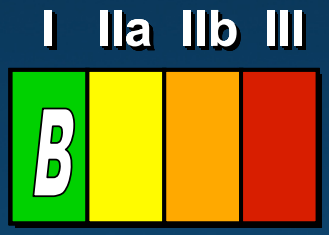


Primary stent placement is not recommended in the femoral, popliteal, or tibial arteries.

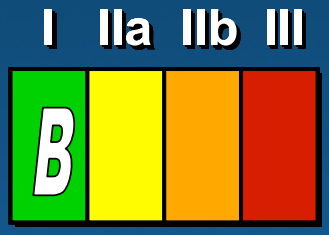


Endovascular intervention is not indicated as prophylactic therapy in an asymptomatic patient with lower extremity PAD.

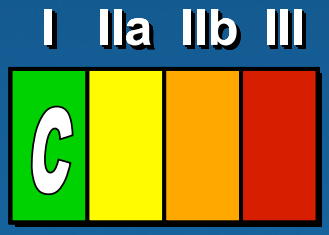
Endovascular Treatment for Claudication: *Iliac Arteries*



Provisional stent placement is indicated for use in iliac arteries as salvage therapy for suboptimal or failed result from balloon dilation (e.g., persistent gradient, residual diameter stenosis >50%, or flow-limiting dissection).



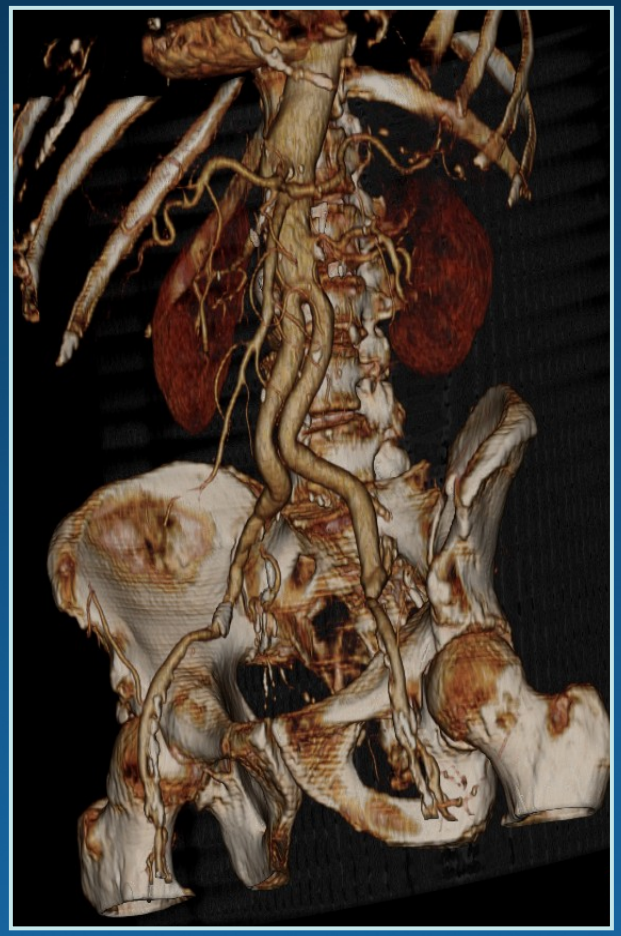
Stenting is effective as primary therapy for common iliac artery stenosis and occlusions.



Stenting is effective as primary therapy in external iliac artery stenosis and occlusions.

Aortoiliac Occlusive Disease: *Aortobiiliac/Aortobifemoral Bypass*

- Excellent long-term patency rate
  - 85%–90% at 5 years
- Requires general anesthesia
- 1%-3% mortality rate



Femoropopliteal Occlusive Disease: *Surgical Bypass*

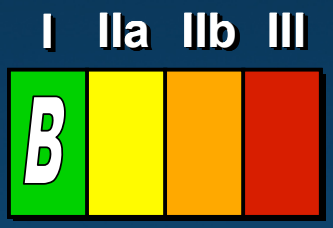
- 60%-80% 5 year patency rate
- Limb salvage rates are 70% at 5 years
- 1%-3% mortality rate

Durability of Surgical Interventions for Inflow Improvement

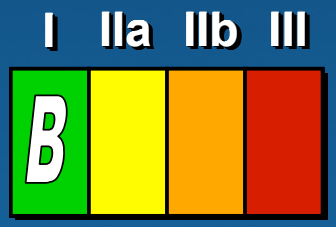
Inflow Procedure	Operative Mortality (%)	Expected Patency Rate at Follow-up (%)	Follow-up
Aortobifemoral bypass	3.3	87.5	5 years
Aortoiliac or aortofemoral bypass	1-2	85-90	5 years
Iliac endarterectomy	0	79-90	5 years
Femorofemoral bypass	6	71	5 years
Axillofemoral bypass	6	49-80	3 years
Axillofemoral-femoral bypass	4.9	63-67.7	5 years

Hirsch AT, et al. *J Am Coll Cardiol.* 2006;47:e1-e192.

Surgical Treatment for Claudication



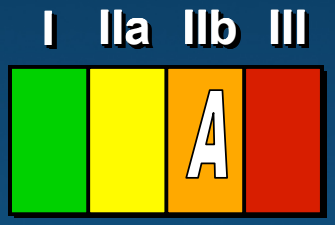
Surgical interventions are indicated for patients with symptoms of claudication who have significant functional disability that is vocational or lifestyle limiting, who are unresponsive to exercise or pharmacotherapy and who have a reasonable likelihood of symptomatic improvement.



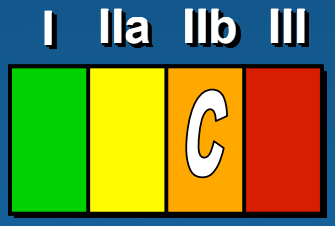
For individuals with combined inflow and outflow disease with CLI, inflow lesions should be addressed first.

Pharmacotherapy for Critical Limb Ischemia

There are currently no Class I or IIa recommended medical (pharmacological) treatments for CLI to improve limb outcomes (e.g., improve wound healing or amputation prevention)

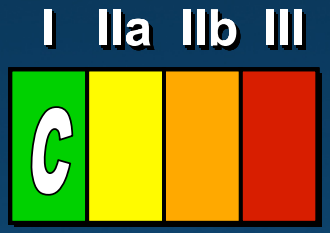


Parenteral administration of PGE-1 or iloprost
for 7 to 28 days may be considered to reduce ischemic pain and facilitate ulcer healing in patients with CLI, but its efficacy is likely to be
limited to a small percentage of patients.



The efficacy of angiogenic growth factor therapy for treatment of CLI is not well established and is best investigated in the context of a placebo-controlled trial.

Endovascular Treatment for Critical Limb Ischemia



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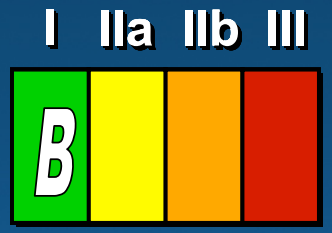


For individuals with combined inflow and outflow disease in whom symptoms of CLI or infection persist after inflow revascularization, an outflow revascularization procedure should be performed.

Endovascular Treatment for Critical Limb Ischemia

Effective endovascular treatment will usually:

- Achieve pulsatile flow to the foot.
- Restore straight-line flow to the pedal arch in order to achieve clinical success.

Note:

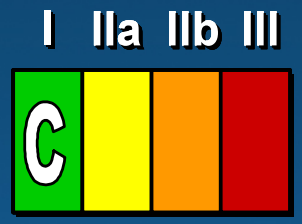
- Dilation of a proximal (inflow) lesion alone in the setting of a distal arterial occlusion may not be adequate to achieve wound healing.
- Balloon angioplasty with bail-out (provisional) stent placement is the treatment of choice.

Endovascular Treatment for Critical Limb Ischemia

- Appropriate patient and lesion selection is critical to success.
- Focal stenoses do best.
  - ≤ 6 cm occlusions
  - ≤ 5 stenotic lesions
- Success is measured by:
  - Relief of rest pain
  - Healing of ulcers
  - Avoidance of amputation

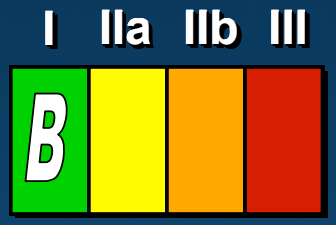
Surgery for Critical Limb Ischemia

Surgery is not indicated in patients with severe decrements in limb perfusion in the absence of clinical symptoms of CLI.



Patients who have significant necrosis of the weight-bearing portions of the foot, an incorrectable flexion contracture, paresis of the extremity, refractory ischemic rest pain, sepsis, or a very limited life expectancy due to comorbid conditions should be evaluated for primary amputation.

Surgery for Critical Limb Ischemia



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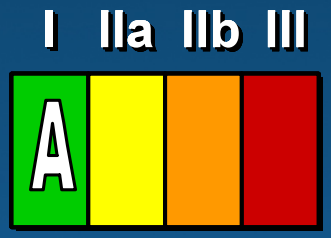
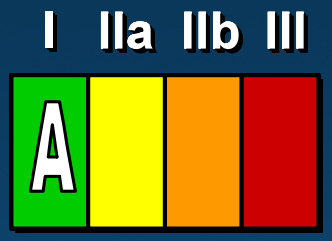
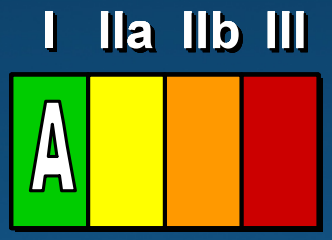


When surgery is to be undertaken, an aorto-bifemoral bypass is recommended for patients with symptomatic, hemodynamically significant, aorto-bi-iliac disease requiring intervention.

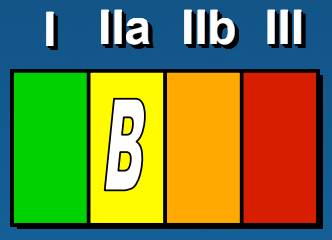
Surgery for Critical Limb Ischemia



Bypasses to the above-knee popliteal artery should be constructed with autogenous
saphenous vein when possible.

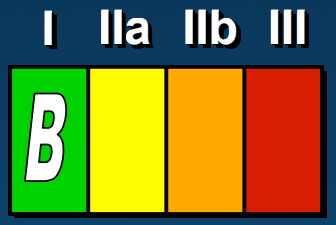


Bypasses to the below-knee popliteal artery should be constructed with autogenous vein when possible.

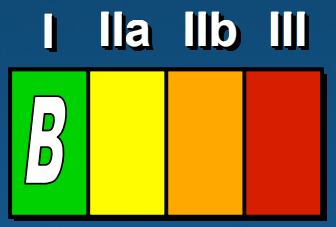


Prosthetic material can be used effectively for bypasses to the below knee popliteal artery when no autogenous vein from ipsilateral or contralateral leg or arm is available.

Surgery for Critical Limb Ischemia



Femoral-tibial artery bypasses should be constructed with autogenous vein, including ipsilateral greater saphenous vein, or if unavailable, other sources of vein from the leg or arm.



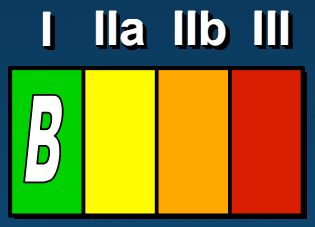
Composite sequential femoropopliteal-tibial bypass, or bypass to an isolated popliteal arterial segment that has collateral outflow to the foot, are acceptable methods of revascularization and should be considered when no other form of bypass with adequate autogenous conduit is possible.

Identification of the Symptomatic Patient with Acute Limb Ischemia

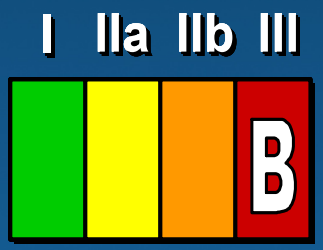
- **The hallmark clinical symptoms and physical examination signs of acute limb ischemia include the 5 "Ps" that suggest limb jeopardy:**
  - pain, paralysis, paresthesias, pulselessness, and pallor (and perhaps a sixth "P," polar).

- **Acute arterial embolism is suggested by:**
  - the sudden onset or sudden worsening of symptoms
  - a known embolic source
  - the absence of antecedent claudication or other manifestations of obstructive arterial disease, or
  - the presence of normal arterial pulses and Doppler systolic blood pressures in the contralateral limb.

Acute Limb Ischemia (ALI)

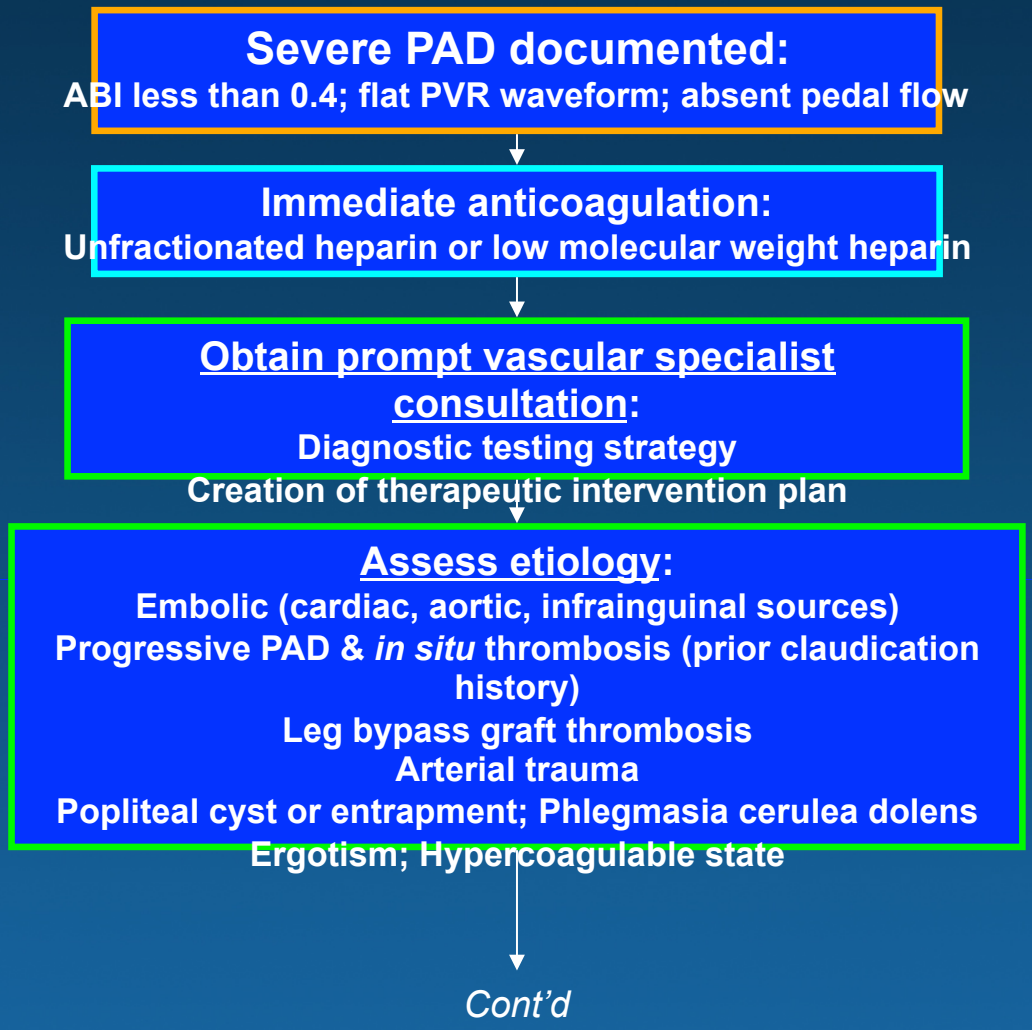


Patients with ALI and a salvageable extremity should undergo an emergent evaluation that defines the anatomic level of occlusion, and that leads to prompt endovascular or surgical intervention.



Patients with ALI and a non-viable extremity should not undergo an evaluation to define vascular anatomy or efforts to attempt revascularization.

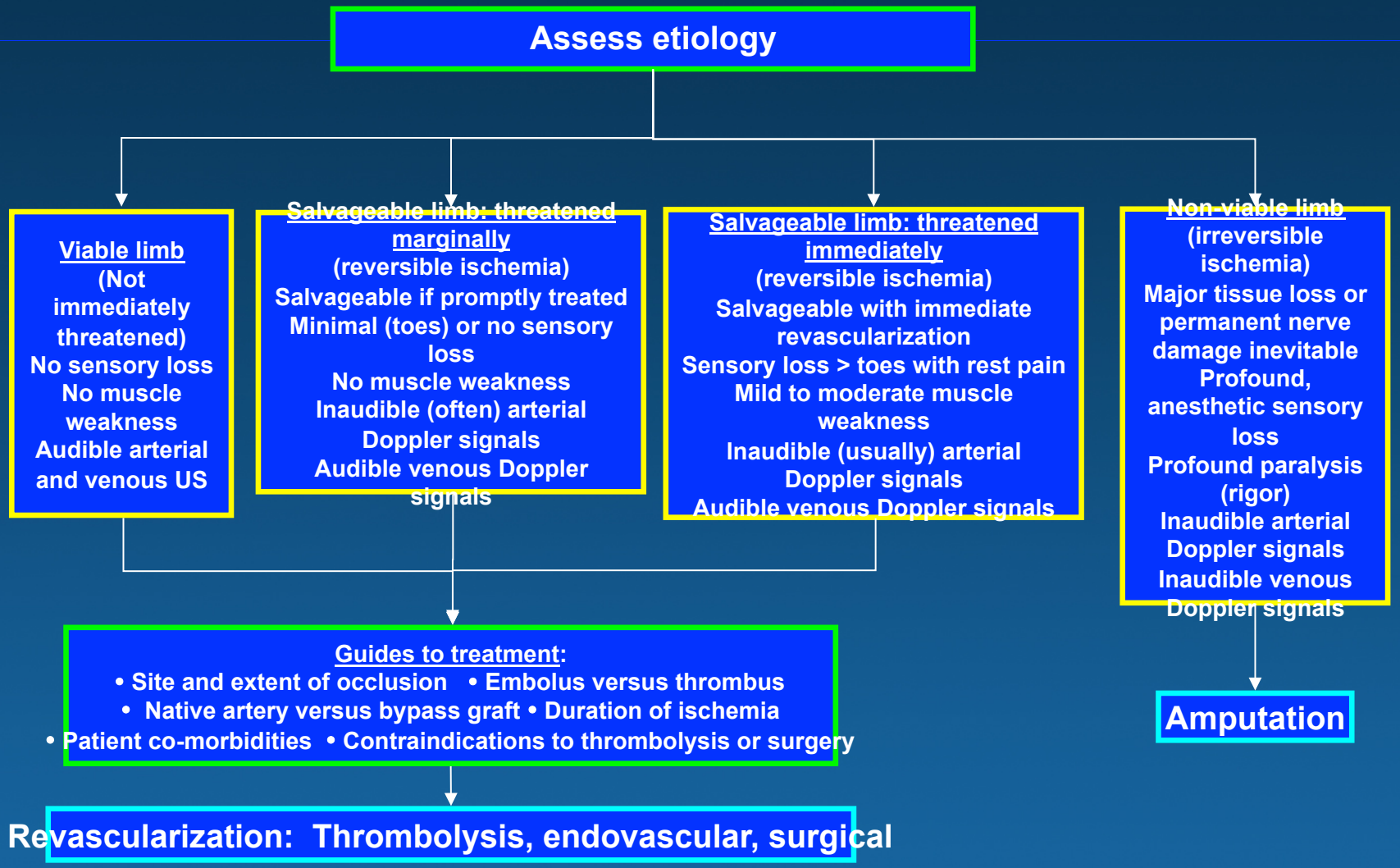
Treatment of Acute Limb Ischemia (ALI)



ABI=ankle-brachial index; PVR=pulse-volume recording.

Hirsch AT, et al. *J Am Coll Cardiol.* 2006;47:e1-e192.

Treatment of Acute Limb Ischemia (ALI)



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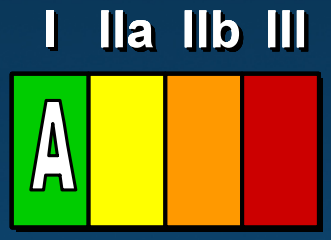
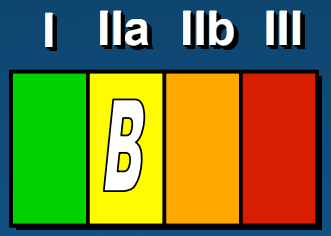
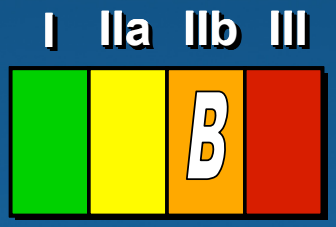
Acute Limb Ischemia (ALI)







Catheter-based thrombolysis is an effective and beneficial therapy and is indicated for patients with acute limb ischemia (Rutherford categories I and IIa) of less than 14 days' duration.

Mechanical thrombectomy devices can be used as adjunctive therapy for acute limb ischemia due to peripheral arterial occlusion.

Catheter-based thrombolysis or thrombectomy may be considered for patients with acute limb ischemia (Rutherford category IIb) of more than 14 days' duration.