2011 Imaging Criteria

CTA/MRA, Lower Extremity[1, 2, 3]

ICD-9-CM: 88.40
CPT: 73706, 73725
I/O Setting: Outpatient

INDICATION(S)

100 Chronic lower extremity arterial disease and revascularization planned
200 Lower extremity vein graft stenosis by duplex US
300 Peripheral aneurysm by PE/duplex US and angiography not planned

100 Chronic lower extremity arterial disease and revascularization planned **[All]**[4*MDR, 5, 6]
- 110 Sx/findings **[One]**
  - 111 Rest pain[7]
  - 112 Nonhealing ulcers/wounds lower leg/foot[8]
  - 113 Gangrene/impending gangrene of foot/toe
  - 114 Claudication **[Both]**[9]
    - -1 Interferes with ADLs[10]
    - -2 Unimproved **after** medical management **[All]**[11, 12]
      - A) Exercise ≥ 12 wks[13]
      - B) Smoking cessation/reduction ≥ 6 mos/nonsmoker[14]
      - C) Cholesterol management ≥ 6 mos[15]
      - D) Medication **[One]**[16]
        - 1) Cilostazol/pentoxifylline ≥ 6 mos
        - 2) Contraindicated/not tolerated[17]
- 120 Noninvasive testing **[One]**[18]
  - 121 Resting ABI ≤ 0.7
  - 122 Resting ABI > 0.7 **and [One]**
    - -1 Exercise/hyperemic ABI ≤ 0.7[19]
    - -2 Toe pressure ≤ 50 mmHg
    - -3 Transmetatarsal/ankle PVR amplitude ≤ 5 mm[20]
    - -4 Transcutaneous Po_2 ≤ 30 mmHg(4.0 kPa)[21]
- 130 Angiography not planned

200 Lower extremity vein graft stenosis by duplex US **[Both]**
- 210 Findings by duplex US **[One]**
  - 211 Acceleration > 2x peak systolic velocity[22]
  - 212 Peak systolic velocity > 200 cm/sec[22]
  - 213 Flow **[Both]**

-1 Decreased from prior duplex US

-2 < 40 cm/sec

220 Angiography not feasible/contraindicated[23]

300 Peripheral aneurysm by PE/duplex US and angiography not planned[6, 24*MDR, 25]

Notes

(1)
CTA is an application of CT that produces images of the blood vessels. Image acquisition is rapid and is not associated with the risk and cost of a conventional angiogram (Chow and Rubin, Radiol Clin North Am 2002; 40(4): 729-749). Although the indications for its use in evaluation of peripheral vascular disease are the same as for MRA, CTA is not currently as widely used.

(2)
Whether to perform MRA or CTA is a matter of clinical judgment. MRA is not appropriate for patients with contraindications for MRI. Contraindications to CTA are similar to those for angiography and include renal impairment (e.g., elevated creatinine) and iodine contrast allergy.

(3)
The following are examples of relative and absolute contraindications to the use of magnetic resonance imaging:
- Implanted devices that are electrically or magnetically activated (e.g., cardiac pacemakers, automatic cardioverter defibrillators, drug infusion pumps, cochlear implants)
- Ferromagnetic metal objects (e.g., cerebral aneurysm clips, intraocular metallic foreign body, prostheses, screws)
- Pregnancy, first trimester
- Renal insufficiency in cases when magnetic resonance imaging is performed with gadolinium-based contrast

(4)-MDR:
If the patient is not a candidate for revascularization, secondary medical review is required.

(5)
Angiographic information to assess lower extremity vascular anatomy is indicated before planned revascularization (angioplasty or bypass surgery) for chronic occlusive disease.

(6)
MRA is an application of MRI that produces images of blood vessels for noninvasive evaluation of the arterial as well as venous circulation. Unlike a conventional angiogram or CTA, MRA does not involve ionizing radiation or the administration of iodinated IV contrast which is nephrotoxic and can cause an allergic reaction in some patients. MRA is not usually performed in addition to an angiogram, but as a substitute for angiogram.

(7)
Foot pain at rest or when the foot is positioned horizontally (often waking the patient at night) indicates ischemia from inadequate blood flow. Intermittent day and night foot pain, unrelated to leg position, is rare with PAD.

(8)
This criteria point addresses ischemic ulcers only and does not cover neuropathic nonhealing wounds or ulcers of the lower leg or foot.

(9)-DEF:
Claudication is pain occurring with activity (e.g., after walking) and relieved by rest. It usually manifests as pain in the calf. However, aortoiliac disease may present with buttock, thigh, or hip pain.

(10)
Activities of daily living (ADLs) are frequently divided into those simple activities relating to basic self-care and those that involve more complex interactions with others and the environment (called instrumental activities of daily living or IADLs). This criterion includes both types of activity. Whether a condition is of sufficient severity to interfere with ADLs or IADLs is somewhat subjective. There should be an indication that symptoms impede the patient's ability to effectively work, shop, manage at home, care for family members, or tend to personal hygiene.

(11)
Cigarette smoking is a risk factor for developing peripheral arterial disease (PAD) and claudication. The incidence of claudication is more common in smokers than nonsmokers and the severity of PAD increases with the number of cigarettes smoked (Lipsitz and Kim, Cardiol Clin 2008; 26(2): 289-298, vii; Norgren et al., Eur J Vasc Endovasc Surg 2007; 33 Suppl 1: S1-75). Smoking cessation has been shown to result in improvements in intermittent claudication and development of rest pain and is the most effective intervention for patients with PAD (Lipsitz and Kim, Cardiol Clin 2008; 26(2): 289-298, vii; Hobbs and Bradbury, Eur J Vasc Endovasc Surg 2003; 26(4): 341-347; Pentecost et al., J Vasc Interv Radiol 2003; 14(9 Pt 2): S495-515). Exercise has been shown to significantly increase walking time and walking ability (Leng et al., Cochrane Database Syst Rev 2000; (2): CD000990).

(12)
Medical management for the treatment of claudication should include blood pressure management, control of DM, smoking cessation, and antiplatelet or thrombolytic therapy.

(13)
Exercise has been shown to significantly increase walking time and walking ability (Leng et al., Cochrane Database Syst Rev 2000; (2): CD000990). Supervised exercise programs have been shown to be more effective than unsupervised programs. Ideally, an exercise trial should include supervised exercise sessions of 30 to 60 minutes 3 times per week for a minimum of 12 weeks (Norgren et al., Eur J Vasc Endovasc Surg 2007; 33 Suppl 1: S1-75; Bendermacher et al., Cochrane Database Syst Rev 2006; (2): CD005263; Hirsch et al., J Am Coll Cardiol 2006; 47(6): 1239-1312).

(14)
Discontinuation of smoking and other tobacco use should be documented. Cigarette smoking is a risk factor for developing peripheral arterial disease (PAD) and claudication. The incidence of claudication is more common in smokers than nonsmokers and the severity of PAD increases with the number of cigarettes smoked (Lipsitz and Kim, Cardiol Clin 2008; 26(2): 289-298, vii; Norgren et al., Eur J Vasc Endovasc Surg 2007; 33 Suppl 1: S1-75). Smoking cessation has been shown to result in improvements in intermittent claudication and development of rest pain and is the most effective intervention for patients with PAD (Lipsitz and Kim, Cardiol Clin 2008; 26(2): 289-298, vii; Hobbs and Bradbury, Eur J Vasc Endovasc Surg 2003; 26(4): 341-347; Pentecost et al., J Vasc Interv Radiol 2003; 14(9 Pt 2): S495-515).

(15)
The goal for cholesterol is LDL < 100 mg/dL(2.59 mmol/L). If this cannot be met, the patient should have had a trial of cholesterol lowering medication for 6 months. In addition, a goal of LDL < 70 mg/dL(1.81 mmol/L) is reasonable for higher risk patients (Smith et al., Circulation 2006; 113(19): 2363-2372).

(16)
A trial of cilostazol is recommended for the treatment of claudication and has been shown to improve symptoms and increase walking distance. Pentoxifylline is a second-line alternative to cilostazol (Robless et al., Cochrane Database Syst Rev 2008; (1): CD003748; Hirsch et al., J Am Coll Cardiol 2006; 47(6): 1239-1312).

(17)
Cilostazol can be used in patients with intermittent claudication in the absence of heart failure (Hirsch et al., J Am Coll Cardiol 2006; 47(6): 1239-1312).

(18)
When pulses are diminished or absent, the ABI provides an objective measurement of vascular perfusion. The ABI is the ratio of ankle to brachial systolic pressure and is normally equal to 1.0 in patients without PAD. The ABI of patients with intermittent claudication is generally between 0.4 and 0.9, representing mild to moderate obstruction (White, N Engl J Med 2007; 356: 1241-1250). Below this range, patients develop rest pain, nonhealing ulcers, or gangrene. An absolute ankle pressure of lower than 40 mmHg is associated with limb-threatening ischemia. Resting ABIs may be artificially elevated in certain patients (e.g., patients with DM, chronic renal failure, arterial calcifications) due to arterial stiffness (lack of elasticity) (Lipsitz and Kim, Cardiol Clin 2008; 26(2): 289-298, vii; Hirsch et al., J Vasc Interv Radiol 2006; 17(9): 1383-1397; quiz 1398).

(19)
An exercise ABI (performed with treadmill testing) or a hyperemic ABI (performed with a thigh tourniquet) may be especially helpful in detection of aortoiliac occlusive disease. The decrease in BP during the test and its recovery time are proportional to the extent of arterial occlusion.

(20)
A depressed or flattened wave form by PVR (≤ 5 mm) indicates severe disease.

(21)
The measurement of the Po_2 may help determine whether perfusion is sufficient for wound healing.

(22)
These measurements compare the highest flow velocity within the graft (likely at an area of stenosis) to the lowest flow velocity within the graft.

(23)
Patients considered high-risk for angiography include those with renal insufficiency (risk is related to the contrast used for angiogram), iodine contrast allergy or those requiring graft, brachial artery, or venous puncture (Brillet et al., J Vasc Interv Radiol

2003; 14(9 Pt 1): 1139-1145). In some cases carbon dioxide can be used as a contrast material, allowing angiography in patients with an allergy or renal disease (Kalva and Mueller, Radiol Clin North Am 2008; 46(4): 663-683, v).

(24)-MDR:

Because MRA and CTA offer an alternative to angiography, requests for MRA or CTA of the lower extremity vasculature when angiography is planned require secondary medical review.

(25)-DEF:

Aneurysms are abnormal dilatations of blood vessels (usually arteries) that involve all three layers of the vessel wall (intima, media and adventitia) and communicate directly with the vessel lumen.