Clinical Practice Guideline: **Non-Invasive Vascular Studies**

Date of Implementation: **August 20, 2015**

Product: **Specialty**

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GUIDELINES

These guidelines are adapted from Medicare.

Non-invasive peripheral arterial examinations performed to establish the level and/or degree of arterial occlusive disease are reasonable and necessary if significant signs and/or symptoms of possible limb ischemia are present, and the patient is a candidate for invasive therapeutic procedures.

American Specialty Health – Specialty (ASH) considers services consisting of CPT® codes 93922, 93923, or 93924 (non-invasive peripheral arterial studies) to be medically

necessary **if at least one of the following indications** is present and documented in the patient's medical record:

1. Claudication is defined as pain occurring within 1 block or less of walking and/or of such severity that it interferes significantly with the patient's occupation or lifestyle.
2. Rest pain (typically including the forefoot), usually associated with diminished or absent pulses, which become increasingly severe with elevation and diminishes with placement of the leg in a dependent position. Diagnoses M79.604 - M79.609, M79.651 -M79.676, Pain in limb, foot and toes, should only be billed when the patient's symptoms meet these criteria ***and*** meets at least one additional criterion (of indications # 3 -7 listed below).
3. Tissue loss defined as gangrene or pre-gangrenous changes of the extremity or ischemic ulceration of the extremity occurring with diminished or absent pulses.
4. Aneurysmal disease.
5. Evidence of thromboembolic events.
6. Blunt or penetrating trauma (including complications of diagnostic and/or therapeutic procedures).
7. Lower extremities surgical procedure where vascular disease is clinically suspected.
8. Transcutaneous oxygen tension measurements are acceptable to evaluate healing potential in non-healing or difficult-to-heal wounds.
9. Follow-up studies for post-operative conditions (at least 1 of the following):
    - In the immediate post-operative period, patients may be studied if reestablished pulses are lost, become equivocal, or if the patient develops related signs and/or symptoms of ischemia with impending repeat intervention.
    - With regards to autogenous lower extremity vein bypass surgeries, a study can be performed at three-month intervals during the first year, and at six-month intervals thereafter.
    - Follow-up studies more frequent than every six months are not reasonable and necessary post-angioplasty in the absence of signs and symptoms of ischemia. Synthetic grafts may be studied if the patient develops signs and/or symptoms of occlusive disease.

AND the following diagnosis code rules are met:

Only **one** of the following diagnoses is required:

Medical Necessity ICD-10 Codes

ICD-10 Code	ICD-10 Code Description
E08.51 - E08.59, E09.51 - E09.59, E13.51 - E13.59	Diabetes mellitus due to underlying condition, drug induced diabetes mellitus, or other specified diabetes mellitus; with circulatory complications

ICD-10 Code	ICD-10 Code Description
E08.65	Diabetes mellitus due to underlying condition with hyperglycemia
E10.51 - E10.59	Type I diabetes mellitus with circulatory complications
E10.65	Type I diabetes mellitus with hyperglycemia
E11.51 - E11.59	Type II diabetes mellitus with circulatory complications
E11.65	Type II diabetes mellitus with hyperglycemia
G97.31 - G97.32, G97.51 - G97.52	Intraoperative or postprocedural hemorrhage and hematoma of a nervous system organ or structure complicating or following a nervous system procedure
G97.48 - G97.49	Accidental puncture and laceration of other nervous system organ or structure during a nervous system or other procedure
I70.201 - I70.209	Unspecified atherosclerosis of native arteries of extremities
I70.211 - I70.219	Atherosclerosis of native arteries of extremities with intermittent claudication
I70.221 - I70.229	Atherosclerosis of native arteries of extremities with rest pain
I70.231 - I70.249	Atherosclerosis of native arteries of extremities with ulceration
I70.231, I70.241	Atherosclerosis of native arteries of leg with ulceration of thigh
I70.232, I70.242	Atherosclerosis of native arteries of leg with ulceration of calf
I70.233, I70.243	Atherosclerosis of native arteries of leg with ulceration of ankle
I70.234, I70.244	Atherosclerosis of native arteries of leg with ulceration of heel and midfoot
I70.235, I70.245	Atherosclerosis of native arteries of leg with ulceration of other part of foot
I70.238 - I70.239, I70.248 - I70.249	Atherosclerosis of native arteries of leg with ulceration of other part of leg or unspecified site
I70.25	Atherosclerosis of native arteries of other extremities with ulceration
I70.261 - I70.269	Atherosclerosis of native arteries of extremities with gangrene
I70.291 - I70.299	Other atherosclerosis of native arteries of the extremities

ICD-10 Code	ICD-10 Code Description
I70.301 - I70.349, I70.35, I70.361 - I70.399, I70.601 - I70.649, I70.65, I70.661 - I70.749, I70.75, I70.761 - I70.799	Atherosclerosis of unspecified, nonbiological, and other type of bypass graft(s) of the extremities
I70.331, I70.341, I70.431, I70.441, I70.531, I70.541, I70.631, I70.641, I70.731, I70.741	Atherosclerosis of bypass graft(s) of leg with ulceration of thigh
I70.332, I70.342, I70.432, I70.442, I70.532, I70.542, I70.632, I70.642, I70.732, I70.742	Atherosclerosis of bypass graft(s) of leg with ulceration of calf
I70.333, I70.343, I70.433, I70.443, I70.533, I70.543, I70.633, I70.643, I70.733, I70.743	Atherosclerosis of bypass graft(s) of leg with ulceration of ankle
I70.334, I70.344, I70.434, I70.444, I70.534, I70.544, I70.634, I70.644, I70.734, I70.744	Atherosclerosis of bypass graft(s) of leg with ulceration of heel and midfoot
I70.335, I70.345, I70.435, I70.445, I70.535, I70.545, I70.635, I70.645, I70.735, I70.745	Atherosclerosis of bypass graft(s) of leg with ulceration of other part of foot
I70.338 - I70.339, I70.348 - I70.349, I70.438 - I70.439, I70.448 - I70.449, I70.538 - I70.539, I70.548 - I70.549, I70.638 - I70.639, I70.648 - I70.649, I70.738 - I70.739, I70.748 - I70.749	Atherosclerosis of bypass graft(s) of leg with ulceration of other part of leg or unspecified site
I70.361 - I70.369, I70.461 - I70.469, I70.561 - I70.569, I70.661 - I70.669, I70.761 - I70.769	Atherosclerosis of bypass graft(s) of the extremities with gangrene, lower extremity

ICD-10 Code	ICD-10 Code Description
I70.401 - I70.449, I70.45, I70.461 - I70.499	Atherosclerosis of autologous vein bypass graft of the extremities
I70.501 - I70.549, I70.55, I70.561 - I70.599	Atherosclerosis of nonautologous biological bypass graft of the extremities
I70.92	Chronic total occlusion of artery of the extremities
I72.4	Aneurysm of artery of lower extremity
I73.00 - I73.01	Raynaud's syndrome
I73.1	Thromboangiitis obliterans [Buerger's disease]
I73.89	Other specified peripheral vascular diseases
I73.9	Peripheral vascular disease, unspecified
I74.3 - I74.4	Embolism and thrombosis of arteries of the lower extremities
I74.8	Embolism and thrombosis of other arteries
I74.9	Embolism and thrombosis of unspecified artery
I75.021 - I75.029	Atheroembolism of lower extremity
I77.0	Arteriovenous fistula, acquired
I77.1	Stricture of artery
I77.2	Rupture of artery
I77.3, I77.89	Arterial fibromuscular dysplasia and other specified disorders of arteries and arterioles
I77.5, M31.8 - M31.9	Necrosis of artery, other specified necrotizing vasculopathies, and unspecified necrotizing vasculopathy
I77.79	Dissection of other specified artery
I77.9	Disorder of arteries and arterioles, unspecified
I79.8	Other disorders of arteries, arterioles and capillaries in diseases classified elsewhere
I83.001 - I83.029	Varicose veins of lower extremities with ulcer
I87.9, I99.9	Unspecified disorder of vein and circulatory system
I96	Gangrene, not elsewhere classified
I97.418, I97.42, I97.618, I97.620, I97.621	Intraoperative or postprocedural hemorrhage and hematoma of a circulatory system organ or structure complicating or following a circulatory system procedure

ICD-10 Code	ICD-10 Code Description
I97.51 - I97.52	Accidental puncture and laceration of a circulatory system organ or structure during a circulatory system or other procedure
L76.01 - L76.02, L76.21 - L76.22	Intraoperative or postprocedural hemorrhage and hematoma of skin and subcutaneous tissue complicating or following a dermatologic procedure
L76.11 - L76.12	Accidental puncture and laceration of skin and subcutaneous tissue during a dermatologic or other procedure
L89.202, L89.212, L89.222, L89.502, L89.512, L89.522, L89.602, L89.612, L89.622, L89.892, L89.92	Pressure ulcer of lower extremity, stage 2
L89.203, L89.213, L89.223, L89.503, L89.513, L89.523, L89.603, L89.613, L89.623, L89.893, L89.93	Pressure ulcer of lower extremity, stage 3
L89.204, L89.214, L89.224, L89.504, L89.514, L89.524, L89.604, L89.614, L89.624, L89.94	Pressure ulcer, stage 4
L97.101 - L97.129	Non-pressure chronic ulcer of thigh
L97.201 - L97.229	Non-pressure chronic ulcer of calf
L97.301 - L97.329	Non-pressure chronic ulcer of ankle
L97.401 - L97.429	Non-pressure chronic ulcer of heel and midfoot
L97.501 - L97.529	Non-pressure chronic ulcer of other part of foot
L97.801 - L97.829	Non-pressure chronic ulcer of other part of lower leg
L97.901 - L97.929	Non-pressure chronic ulcer of unspecified part of lower limb
M79.604 - M79.609, M79.651 - M79.676	Pain in limb, foot, and toes*
M79.A21 -M79.A29	Nontraumatic compartment syndrome of lower extremity
M96.810 - M96.811, M96.830 - M96.831	Intraoperative or postprocedural hemorrhage and hematoma of a musculoskeletal structure complicating or following a musculoskeletal system procedure

ICD-10 Code	ICD-10 Code Description
M96.820 - M96.821	Accidental puncture and laceration of a musculoskeletal structure during a musculoskeletal system or other procedure
Q27.32	Arteriovenous malformation of vessel of lower limb
Q27.9	Congenital malformation of peripheral vascular system, unspecified
R09.89	Other specified symptoms and signs involving the circulatory and respiratory systems
S71.009A – S71.009S	Unspecified open wound, unspecified hip
S71.029A – S71.029S	Laceration with foreign body, unspecified hip
S75.801A - S75.899S	Injury of other blood vessels at hip and thigh level
S85.101A - S85.189S	Injury of tibial artery
S85.201A - S85.299S	Injury of peroneal artery
S85.801A - S85.819S, S85.891A - S85.899S	Injury of other blood vessels at lower leg level
S95.001A - S95.099S	Injury of dorsal artery of foot
S95.101A - S95.199S	Injury of plantar artery of foot
S95.201A - S95.299S	Injury of dorsal vein of foot
S95.801A - S95.899S	Injury of other specified blood vessels at ankle and foot level
T80.1XXA - T80.1XXS	Vascular complications following infusion, transfusion and therapeutic injection, initial encounter through sequela
T81.30XA - T81.30XS	Disruption of wound, unspecified, initial encounter through sequela
T81.31XA - T81.31XS	Disruption of external operation (surgical) wound, not elsewhere classified, initial encounter through sequela
T81.32XA - T81.32XS	Disruption of internal operation (surgical) wound, not elsewhere classified, initial encounter through sequela
T81.718A - T81.718S, T81.72XA - T81.72XS	Complication of other artery following a procedure, not elsewhere classified - Complication of vein following a procedure, not elsewhere classified
T81.89XA - T81.89XS	Other complications of procedures, not elsewhere classified, initial encounter
T82.312A - T82.319S, T82.322A - T82.329S, T82.332A - T82.339S, T82.392A - T82.399S,	Mechanical complication of other vascular grafts (femoral arterial graft (bypass), other vascular grafts, unspecified vascular grafts)

ICD-10 Code	ICD-10 Code Description
T82.41XA - T82.49XS,	Mechanical complication of vascular dialysis catheter
T82.510A - T82.511S, T82.513A - T82.518S, T82.520A - T82.521S, T82.523A - T82.531S, T82.533A - T82.538S, T82.590A - T82.591S, T82.593A - T82.598S	Mechanical complication of other cardiac and vascular devices and implants (surgically created arteriovenous fistula, surgically created arteriovenous shunt, balloon (counterpulsation) device, infusion catheter, umbrella device, and other cardiac and vascular devices and implants)
T82.7XXA - T82.7XXS	Infection and inflammatory reaction due to other cardiac and vascular devices, implants and grafts, initial encounter through sequela
T84.81XA - T84.89XS	Other specified complications of internal orthopedic prosthetic devices, implants and grafts, initial encounter through sequela
T85.810A - T85.868S	Embolism, Fibrosis, Hemorrhage, Pain, stenosis, Thrombosis due to nervous system/other internal prosthetic devices, implants, grafts.
T85.890A - T85.898S	Other specified complications of nervous system/other internal prosthetic devices, implants and grafts not elsewhere classified.
T85.9XXA - T85.9XXS	Unspecified complication of internal prosthetic device, implant and graft, initial encounter through sequela
T87.1X1 - T87.1X2	Complications of reattached (part of) lower extremity
T87.1X9	Complications of reattached (part of) unspecified lower extremity
T87.2	Complications of other reattached body part
T88.8XXA - T88.8XXS	Other specified complications of surgical and medical care, not elsewhere classified, initial encounter through sequela
Z09	Encounter for follow-up examination after completed treatment for conditions other than malignant neoplasm
Z48.03, Z48.89	Encounter for change or removal of drains - Encounter for other specified surgical aftercare
Z48.812	Encounter for surgical aftercare following surgery on the circulatory system
*pain in limb, foot and toes (M79.604 - M79.609, M79.651 -M79.676) should only be billed when the patient's symptoms meet the criteria listed under Indications and Limitations of Coverage and/or Medical Necessity, Indications for peripheral arterial evaluations.	

GENERAL INFORMATION FOR NON-INVASIVE PERIPHERAL ARTERIAL STUDIES

Non-invasive peripheral arterial studies are useful in detecting extremity arterial compromise, functional severity, and hemodynamic significance of atherosclerosis. These procedures help to differentiate claudication from pain of non-vascular etiologies. Lower extremity non-invasive testing is also a valuable tool in monitoring graft complications including occlusions, early flow compromise secondary to technical problems, or chronic reoccurrence of anastomatic or distal disease and aneurysmal diseases of the artery. Information regarding collateral circulation can also be gained.

The basic modality of evaluation described in this guideline are indirect methods (e.g., Ankle/Brachial Index (ABI), segmental limb pressures, transcutaneous oxygen tension measurement (TcPO2), CW bi-dimensional Doppler and plethysmographic waveforms) that provide information regarding functional severity of disease.

Ankle/Brachial Index

The most common test is the Ankle-Brachial Index (ABI). This test measures the blood pressure at the ankle and elbow and is performed using a Doppler stethoscope. The pressure in both arms is measured using a standard blood pressure cuff. The pressure in the posterior tibial artery and the dorsalis pedis artery near each ankle are then measured using a pressure cuff and a stethoscope or an ultrasound probe. The highest pressure recorded at the ankle is divided by the highest pressure recorded at the brachial artery. This gives the ankle-brachial index.

Single Level Pressure and Physiologic Waveform

Blood pressure and physiologic waveform (Doppler velocity signal or plethysmography tracing) recordings are obtained bilaterally at a single level, usually the ankle.

Segmental Pressure and Physiologic Waveform

Blood pressures at various limb levels are measured to identify areas of regional hypotension. Physiologic waveforms (Doppler velocity signals or plethysmography tracings) are recorded at the same level to localize the level of disease to the inflow/outflow or runoff vessels.

Transcutaneous Oxygen Tension Measurement (TcPO2)

The quantity of oxygen available for diffusion to the skin depends on the quantity delivered by the influx of blood and what is extracted to meet metabolic demands. TcPO2 (Oxygen Tension) levels provide an index of the adequacy of tissue perfusion. Measurement may be made from any region of interest, usually the dorsum of the foot or upper calf. Whereas many claudicants have resting values in the normal range, measurements made from the feet of patients with limb-threatening ischemia are usually less than 20 mm Hg and frequently approach zero. This test is used in assessing the healing potential of wounds.

Stress Testing

Exercise testing provides a medium for evaluating the functional significance of arterial occlusive disease. Upon completion of a maximum appropriate stress testing, arterial signals and blood pressures are reassessed at the ankle level. A patient with arterial occlusive disease will respond to exercise with a decrease in the ankle blood pressure. The magnitude of the decrease and time to return to baseline establish the severity and functional significance of arterial obstruction. Stress testing is useful in differentiating the pain of arterial insufficiency from that of other conditions such as arthritis and neuropathies. It also will identify those patients whose symptoms of fatigue are due to coronary or pulmonary disease rather than arterial insufficiency.

A routine history and physical examination, which includes ABIs, can readily document the presence or absence of ischemic disease in a majority of cases. It is not reasonable and necessary to proceed beyond the physical examination for minor signs and symptoms unless related signs and/or symptoms are present which are severe enough to require possible invasive intervention.

Examples of signs and symptoms that do not indicate reasonableness and necessity:

- Continuous burning of the feet is considered to be a neurologic symptom.
- "Leg pain, nonspecific" and "Pain in Limb" as a single diagnosis is too general to warrant further investigation unless they can be related to other signs and symptoms.
- Edema rarely occurs with arterial occlusive disease unless it is in the immediate postoperative period, in association with another inflammatory process or in association with rest pain.
- Absence of relatively minor pulses (i.e., dorsalis pedis or posterior tibial) in the absence of symptoms. The absence of pulses is not an indication to proceed beyond the physical examination unless it is related to other signs and/or symptoms.
- Minor symptoms such as hair loss, relative coolness of a foot, and shiny, thin skin.
- Screening of an asymptomatic patient is not covered by ASH.

ABIs, as separate procedures, are not reimbursable. An abnormal ABI (i.e., <0.9 at rest) must be accompanied by another appropriate indication before proceeding to more sophisticated or complete studies, except in patients with severe elevated ankle blood pressure.

If an arteriogram is planned, an abnormal ABI should be sufficient to determine its necessity. In some instances, ABI may prove inadequate because of a stovepipe vessel with ischemic signs and symptoms; a digital pressure study could be done. A few patients that have borderline ABIs would qualify for exercise studies to determine if there was a

significant drop in pressure after exercise and an increase in symptoms. These qualify for further segmental studies.

In planning for foot and/or ankle surgery, a Transcutaneous Oximetry (TcPO2) or special waveform analysis should be considered adequate for determination of possible healing problems and extensive non-invasive vascular studies would not be required. This statement remains true for any surgery of the distal lower extremity in patients where healing is a concern. It is expected that the frequency will be no greater than twice in any 60-day period. Repetition of the test is only necessary when there is a need to modify treatment. Documentation to indicate reasonableness and necessity must be kept and made available to ASH upon request.

Unless a provocative function maneuver has been performed, ABIs must be included in CPT® 93922, whereas CPT® 93923 must include the segmental blood pressure measurements with

1) one of the following: segmental Doppler waveform analysis, segmental volume plethysmography, segmental transcutaneous oxygen tension measurements, **OR**
2) one of the following: measurements with postural provocative tests, measurements with reactive hyperemia.

An ABI performed without further vascular studies is not separately billable and is instead included in the office visit services.

CPT® codes 93922 and 93923 should not be billed together. Code 93922 is designated for limited bilateral studies at 1-2 levels or a unilateral study when recording either three or more levels or performing provocative functional maneuvers. On the other hand, code 93923 is intended for complete bilateral studies at three or more levels or a single-level study with provocative functional maneuvers. These codes are applicable to both lower and upper extremity arteries.

If you conduct one study on lower extremities and another on upper extremities, you may report codes 93922 or 93923 twice with modifier 59. According to CPT® Assistant (August 2009), code 93922 represents a non-invasive physiologic arterial study of either both upper extremities (UE) or both lower extremities (LE) performed at only one level. An example is an evaluation of non-imaging physiologic recordings of pressures, Doppler analysis of bi-directional blood flow, plethysmography, and/or oxygen tension measurements at each ankle. If the evaluation does not produce hard copy output or, for Doppler testing, produces a record that does not permit analysis of bi-directional blood flow direction, then the evaluation is considered part of E/M service and is not separately reportable.

Code 93923 represents a non-invasive physiologic arterial study of both UE or both LE performed at multiple levels. An example is the evaluation of multiple levels of non-imaging physiologic recordings of pressures, Doppler analysis of bi-directional blood flow, plethysmography, and/or oxygen tension measurements of the two LEs or two UEs. Code 93923 describes 'non-invasive physiologic studies of upper or lower extremity arteries,' indicating that if both the UE and the LE arteries are studied in this fashion, then code 93923 should be reported twice, once for the UE and once for the LE. In this instance, modifier 59, distinct procedural service, should be appended to the second listing of code 93923 on the claim form.

When only performing studies to the UE or LE, it is inappropriate to code 93922 in conjunction with 93923 because code 93923 includes segmental pressures and tracings and is used to report more complex bilateral non-invasive physiologic testing procedures. Do not report 93924 in conjunction with 93922, 93923.

Duplex scan for post-interventional follow-up which is typically limited in scope and unilateral in nature should use the unilateral or 'limited study' codes (i.e., 93926). Consequently, the 'complete' duplex scan codes (i.e., 93925) should seldom be used except in patients who had bilateral interventions.

Duplex scanning (93925 and 93926) and physiologic studies (93922, 93923, or 93924) are reimbursed during the same encounter if the physiologic studies are abnormal and/or to evaluate vascular trauma, thromboembolic events, or aneurysmal disease. When an uninterpretable study (i.e., poor quality or not in accordance with regulatory standards) results in performing another type of study, only the successful study should be billed. For example, when an uninterpretable non-invasive physiologic study (93922, 93923 or 93924) is performed, leading to the performance of a duplex scan (93925 or 93926), only the duplex scan should be billed.

GENERAL INFORMATION FOR NON-INVASIVE PERIPHERAL VENOUS STUDIES

ASH considers services consisting of CPT® codes 93970 and 93971 (non-invasive peripheral venous studies) to be medically necessary when the criteria as described below are met.

Indications for venous examinations are separated into four major categories: deep vein thrombosis (DVT), chronic venous insufficiency (CVI), vein mapping, and evaluation of pre- and post-procedural venous conditions. Studies are reasonable and necessary only if the patient can be a candidate for anticoagulation, thrombolysis or invasive therapeutic procedures for those indications.

Deep Vein Thrombosis

Deep Vein Thrombosis (DVT) is the most common vascular disorder that develops in hospitalized patients and can develop after trauma or prolonged immobility (i.e., sitting or bed rest). Unfortunately, the signs and/or symptoms of DVT are relatively non-specific and, due to the risk associated with pulmonary embolism (PE), objective testing is appropriate in patients that are candidates for anticoagulation or invasive therapeutic procedures for the following indications (at least one):

1. Clinical signs and/or symptoms of DVT including edema, tenderness, inflammation and/or erythema.
2. Clinical signs and/or symptoms of PE including hemoptysis, chest pain and/or dyspnea.
3. Unexplained lower extremity edema status-post major surgical procedures.

Frequency of follow-up studies will be carefully monitored for reasonableness and medical necessity. Bilateral limb edema in the presence of signs and/or symptoms of congestive heart failure, exogenous obesity and/or arthritis should rarely be an indication for venous studies.

Chronic Venous Insufficiency

Chronic venous insufficiency (CVI) may be divided into three categories: primary varicose veins, post-thrombotic (post-phlebitic) syndrome, and recurrent DVT. Objective tests of venous function may be indicated in patients with ulceration, thickening and discoloration suspected to be secondary to venous insufficiency in order to confirm this diagnosis, by documenting venous valvular incompetence, prior to treatment. It is not medically necessary to study asymptomatic varicose veins.

Vein Mapping

Vein mapping is considered medically reasonable and necessary when the patient's clinical evaluation indicates one of the following:

- Previous partial harvest of the vein.
- Previous thrombophlebitis or DVT in the leg.
- Severe varicose veins.
- Previous history of vein stripping, ligation, or sclerotherapy.
- Obesity to the degree it interferes with clinical determination.
- Other indications must be clearly supported by medical documentation.

Evaluation of Post-procedural Venous Conditions

Evaluation of postoperative complications and limited follow-up of the vascular system procedures are reasonable and necessary.

AND the following diagnosis code rules are met:

Group 1
Only **one** of the following diagnoses is required:

Group 1 Codes

ICD-10 Code	ICD-10 Code Description
E08.52	Diabetes mellitus due to underlying condition with diabetic peripheral angiopathy with gangrene
E09.52	Drug or chemical induced diabetes mellitus with diabetic peripheral angiopathy with gangrene
E10.52	Type 1 diabetes mellitus with diabetic peripheral angiopathy with gangrene
E11.52	Type 2 diabetes mellitus with diabetic peripheral angiopathy with gangrene
E13.52	Other specified diabetes mellitus with diabetic peripheral angiopathy with gangrene
G97.31 - G97.32, G97.51 - G97.52	Intraoperative or postprocedural hemorrhage and hematoma of a nervous system organ or structure complicating or following a nervous system procedure
G97.48 - G97.49	Accidental puncture and laceration of other nervous system organ or structure during a nervous system or other procedure
I70.231, I70.241	Atherosclerosis of native arteries of leg with ulceration of thigh
I70.232, I70.242	Atherosclerosis of native arteries of leg with ulceration of calf
I70.233, I70.243	Atherosclerosis of native arteries of leg with ulceration of ankle
I70.234, I70.244	Atherosclerosis of native arteries of leg with ulceration of heel and midfoot
I70.235, I70.245	Atherosclerosis of native arteries of leg with ulceration of other part of foot
I70.238 - I70.239, I70.248 - I70.249	Atherosclerosis of native arteries of leg with ulceration of other part of leg or unspecified site
I70.331, I70.341, I70.431, I70.441, I70.531, I70.541, I70.631, I70.641, I70.731, I70.741	Atherosclerosis of bypass graft(s) of leg with ulceration of thigh

ICD-10 Code	ICD-10 Code Description
I70.332, I70.342, I70.432, I70.442, I70.532, I70.542, I70.632, I70.642, I70.732, I70.742	Atherosclerosis of bypass graft(s) of leg with ulceration of calf
I70.333, I70.343, I70.433, I70.443, I70.533, I70.543, I70.633, I70.643, I70.733, I70.743	Atherosclerosis of bypass graft(s) of leg with ulceration of ankle
I70.334, I70.344, I70.434, I70.444, I70.534, I70.544, I70.634, I70.644, I70.734, I70.744	Atherosclerosis of bypass graft(s) of leg with ulceration of heel and midfoot
I70.335, I70.345, I70.435, I70.445, I70.535, I70.545, I70.635, I70.645, I70.735, I70.745	Atherosclerosis of bypass graft(s) of leg with ulceration of other part of foot
I70.338 - I70.339, I70.348 - I70.349, I70.438 - I70.439, I70.448 - I70.449, I70.538 - I70.539, I70.548 - I70.549, I70.638 - I70.639, I70.648 - I70.649, I70.738 - I70.739, I70.748 - I70.749	Atherosclerosis of bypass graft(s) of leg with ulceration of other part of leg or unspecified site
I70.361 - I70.369, I70.461 - I70.469, I70.561 - I70.569, I70.661 - I70.669, I70.761 - I70.769, I73.01	Atherosclerosis of bypass graft(s) of the extremities with gangrene, lower extremity
I80.00 - I80.03	Phlebitis and thrombophlebitis of superficial vessels of lower extremity
I80.10 - I80.13	Phlebitis and thrombophlebitis of femoral vein
I80.201 - I80.299	Phlebitis and thrombophlebitis of other and unspecified deep vessels of lower extremities
I80.3	Phlebitis and thrombophlebitis of lower extremities, unspecified
I80.8	Phlebitis and thrombophlebitis of other sites
I82.220 - I82.221	Acute and chronic embolism and thrombosis of inferior vena cava

ICD-10 Code	ICD-10 Code Description
I82.401 - I82.499, I82.4Y1 - I82.4Y9, I82.4Z1 - I82.4Z9	Acute embolism and thrombosis of deep veins of lower extremity
I82.501 - I82.599, I82.5Y1 - I82.5Y9, I82.5Z1 - I82.5Z9	Chronic embolism and thrombosis of deep veins of lower extremity
I82.811 - I82.819	Embolism and thrombosis of superficial veins of lower extremities
I82.890, I82.90	Acute embolism and thrombosis of other specified and unspecified veins
I82.91	Chronic embolism and thrombosis of unspecified vein
I83.001 - I83.029	Varicose veins of lower extremities with ulcer
I83.10 - I83.12	Varicose veins of lower extremities with inflammation
I83.201 - I83.229	Varicose veins of lower extremities with both ulcer and inflammation
I83.811 - I83.899	Varicose veins of lower extremities with other complications
I83.90 - I83.93	Asymptomatic varicose veins of lower extremities
I87.001 - I87.099	Postphlebetic syndrome
I87.1	Compression of vein
I87.2	Venous insufficiency (chronic) (peripheral)
I87.311 - I87.399	Chronic venous hypertension (idiopathic) with ulcer, inflammation, and other complications of the lower extremity
I96	Gangrene, not elsewhere classified
I97.418, I97.42, I97.618, I97.62	Intraoperative or postprocedural hemorrhage and hematoma of a circulatory system organ or structure complicating or following a circulatory system procedure
I97.51 - I97.52	Accidental puncture and laceration of a circulatory system organ or structure during a circulatory system or other procedure
L02.415 - L02.419	Cutaneous abscess of lower limb
L02.611 - L02.619	Cutaneous abscess of foot

ICD-10 Code	ICD-10 Code Description
L03.115 - L03.116, L03.125 - L03.126	Cellulitis and acute lymphangitis of lower part of limb
L53.9	Erythematous condition, unspecified
L76.01 - L76.02, L76.21 - L76.22	Intraoperative or postprocedural hemorrhage and hematoma of skin and subcutaneous tissue complicating or following a dermatologic procedure
L76.11 - L76.12	Accidental puncture and laceration of skin and subcutaneous tissue during a dermatologic or other procedure
L97.101 - L97.129	Non-pressure chronic ulcer of thigh
L97.201 - L97.229	Non-pressure chronic ulcer of calf
L97.301 - L97.329	Non-pressure chronic ulcer of ankle
L97.401 - L97.429	Non-pressure chronic ulcer of heel and midfoot
L97.501 - L97.529	Non-pressure chronic ulcer of other part of foot
L97.801 - L97.829	Non-pressure chronic ulcer of other part of lower leg
L97.901 - L97.929	Non-pressure chronic ulcer of unspecified part of lower leg
M66.0, M71.20 - M71.22	Rupture of popliteal cyst - Synovial cyst of popliteal space [Baker], knee
M79.604 - M79.609, M79.651 - M79.676	Pain in limb, foot, and toes*
M79.89	Other specified soft tissue disorders
M79.A21 - M79.A29	Nontraumatic compartment syndrome of lower extremity
M96.810 - M96.811, M96.830 - M96.831	Intraoperative or postprocedural hemorrhage and hematoma of a musculoskeletal structure complicating or following a musculoskeletal system procedure
M96.820 - M96.821	Accidental puncture and laceration of a musculoskeletal structure during a musculoskeletal system or other procedure
Q27.32	Arteriovenous malformation of vessel of lower limb
Q27.39	Arteriovenous malformation, other site
Q27.9	Congenital malformation of peripheral vascular system, unspecified
R22.40 - R22.43, R22.9	Localized swelling, mass and lump, lower limb and unspecified
R23.4	Changes in skin texture

ICD-10 Code	ICD-10 Code Description
R60.0 – R60.9	Edema
S75.201A - S75.299S	Injury of greater saphenous vein at hip and thigh level
S75.801A - S75.899S	Injury of other blood vessels at hip and thigh level
S85.001A - S85.099S	Injury of popliteal artery
S85.101A - S85.189S	Injury of tibial artery
S85.201A - S85.299S	Injury of peroneal artery
S85.301A - S85.499S	Injury of greater and lesser saphenous vein at lower leg level
S85.501A - S85.599S	Injury of popliteal vein
S85.801A - S85.899S	Injury of other blood vessels at lower leg level
S95.001A - S95.099S	Injury of dorsal artery of foot
S95.101A - S95.199S	Injury of plantar artery of foot
S95.201A - S95.899S	Injury of dorsal vein of foot
T80.1XXA - T80.1XXS	Vascular complications following infusion, transfusion and therapeutic injection
T81.4XXA - T81.4XXS	Infection following a procedure
T81.718A - T81.718S, T81.72XA - T81.72XS	Complication of other artery following a procedure, not elsewhere classified - Complication of vein following a procedure, not elsewhere classified
T81.89XA - T81.89XS	Other complications of procedures, not elsewhere classified
T84.81XA - T84.89XS	Other specified complications of internal orthopedic prosthetic devices, implants and grafts
T87.1X1 - T87.1X9	Complications of reattached (part of) lower extremity
T87.2	Complication of other reattached body part
T88.8XXA - T88.8XXS	Other specified complications of surgical and medical care, not elsewhere classified
Z09	Encounter for follow-up examination after completed treatment for conditions other than malignant neoplasm
Z86.718	Personal history of other venous thrombosis and embolism
Z86.72	Personal history of thrombophlebitis
* Pain in limb, foot, and toes diagnosis (M79.604 - M79.609, M79.651 -M79.676) is to be used only for pain with pressure	

Group 2

Two diagnoses are required: Either Z01.810 or Z01.818 plus any one of the Group 2 Codes in the table below:

Group 2 Codes

ICD-10 Code	ICD-10 Code Description
I70.201 - I70.209	Unspecified atherosclerosis of native arteries of extremities*
I70.211 - I70.219	Atherosclerosis of native arteries of extremities with intermittent claudication*
I70.221 - I70.229	Atherosclerosis of native arteries of extremities with rest pain*
I70.231 - I70.249	Atherosclerosis of native arteries of extremities with ulceration*
I70.25	Atherosclerosis of native arteries of other extremities with ulceration*
I70.261 - I70.269	Atherosclerosis of native arteries of extremities with gangrene*
I70.291 - I70.299	Other atherosclerosis of native arteries of the extremities*
I70.301 - I70.349, I70.35, I70.361 - I70.399, I70.601 - I70.649, I70.65, I70.661 - I70.749, I70.75, I70.761 - I70.799	Atherosclerosis of unspecified, nonbiological, and other type of bypass graft(s) of the extremities*
I70.401 - I70.449, I70.45, I70.461 - I70.499	Atherosclerosis of autologous vein bypass graft of the extremities*
I70.501 - I70.549, I70.55, I70.561 - I70.599	Atherosclerosis of nonautologous biological bypass graft of the extremities*
I70.92	Chronic total occlusion of artery of the extremities*
Z01.810	Encounter for preprocedural cardiovascular examination*
Z01.818	Encounter for other preprocedural examination

Procedures for screening purposes only will be denied as routine services.

When the evaluation, management and treatment of the varicose vein are considered to be cosmetic only, billing for these services will be denied as cosmetic.

GENERAL INFORMATION FOR NON-INVASIVE PERIPHERAL VENOUS STUDIES

Non-invasive peripheral venous studies are useful in the diagnosis of valvular insufficiency and the evaluation of deep and superficial venous thrombosis.

The following is a list of procedures considered reasonable for ASH reimbursement for non-invasive peripheral venous studies:

- Duplex venous evaluation including response to compression and other maneuvers (93970 and 93971)
- Duplex scans for post-interventional follow-up studies are typically limited in scope and are unilateral in nature. Consequently, the complete duplex scan codes (93970) should seldom be used in the post-interventional setting.
- Routine performance of both duplex scanning (93970 or 93971) and physiological tests of extremity veins during the same encounter is not reasonable and necessary.

The performance of duplex scanning in symptomatic patients with positive physiologic study results is reasonable and necessary.

Doppler Ultrasound

Doppler waveform analysis is when a measurement and a visual record are made of the shift in frequency of a continuous ultrasonic wave proportional to the blood-flow velocity in underlying vessels. Patients suspected of DVT are subjected to leg vein compression ultrasonography (CUS) that actually confirms DVT in only 16 to 28% of outpatients in large prospective management studies. CUS has a high positive predictive value of more than 98% for proximal DVT but usually misses calf vein thrombosis. Its negative predictive value for proximal DVT is about 97-98%, on the basis of which repeated scanning at day 7 after a negative first CUS (serial CUS) in outpatients with a first suspicion of DVT is advocated. Serial CUS testing is safe, but you have to repeat 100 CUS to find 1 or 2 CUS positive for deep vein thrombosis (DVT), which is not cost-effective indicating the need to improve the diagnostic work-up of DVT. Additional clinical tests are required to improve diagnosis of DVT. Currently, repeat or serial venous ultrasonography seems advisable for negative examinations in symptomatic patients who are highly suspicious for DVT and in whom an alternative form of imaging is contraindicated or not available.

Impedance Plethysmography (IPG)

IPG measures the volume changes of the limb in response to the inflation and deflation of a thigh cuff. The test is highly sensitive (92%) and specific (95%) for symptomatic proximal DVT (Deep Vein Thrombosis) and has a high positive predictive value (90%). A normal result essentially excludes the diagnosis of proximal DVT. The sensitivity of IPG is low in calf vein thrombosis (20%) and in screening for DVT in asymptomatic postoperative high-risk patients (22%).

Air Plethysmography

Air plethysmography has the ability to measure each of venous reflux, obstruction, and poor calf muscle pump function and, by doing so, has improved the understanding of venous pathophysiology. The air plethysmograph consists of a 35-cm-long polyurethane tubular air chamber that surrounds the entire leg; thus, it allows for measurements along the entire leg. Changes in the volume of the leg as a result of filling or emptying of veins produce corresponding changes in the pressure of the air chamber. Thus, leg volume changes can be measured in milliliters according to the calibration. According to a 2006 study (Locker, Goodacre, Sampson, Webster, Sutton, 2006) sensitivity and specificity (95% CI) were 85% (79% to 90%) and 91% (81% to 95%) for air plethysmography.

Strain Gauge Plethysmography

Ambulatory strain gauge plethysmography (ASGP) is used to measure calf volume changes in the upright position without the need to change position from the supine to the upright. This avoids the venoarteriolar reflex, which causes precapillary arteriolar vasoconstriction that may influence the venous return time. Strain gauges are applied to both ankles above the malleolus to avoid artifacts related to calf muscle contraction. Strain gauges are electrically calibrated in situ to percentage volume change (mL/100 mL). After a bout of exercise, the patient must stand completely still until full-volume refilling takes place, which in a normal person occurs between 1 and 2 minutes after cessation of the exercise. The plethysmographic recording allows calculation of venous refilling time (RT) and expelled volume (EV). The second part of the examination involves the application of a below knee compression cuff that is 2.5 cm wide and inflated to a pressure of 70 mm Hg. In patients with isolated superficial venous reflux, this compression will normalize the venous return time. Reference values for normal controls are RT of 42 to 96 seconds and EV of 0.7 to 3.1 mL/100 mL. The positive predictive value for the presence of chronic vein insufficiency was 100% for both RT and EV, and the negative predictive value for absence of chronic venous disease was 94% for RT and 75% for EV.274 Thus, ASGP is suitable for screening to exclude venous disease. According to a study by Locker et al. (2006) sensitivity and specificity (95% CI) were 83% (81% to 85%) and 81% (79% to 82%) for strain-gauge plethysmography.

GENERAL INFORMATION FOR BOTH ARTERIAL AND VENOUS STUDIES

Procedures rendered not meeting the criteria stated in this policy will be denied as not reasonable and necessary. Vascular studies include patient care required to perform the studies, supervision of the studies and interpretation of study results with copies for patient records of hard copy output with analysis of all data, including bi-directional vascular flow or imaging when provided. Since the signs and symptoms of arterial occlusive disease and venous disease are so divergent, the performance of simultaneous arterial and venous studies during the same encounter should be rare. Therefore, documentation clearly supporting reasonableness and necessity of both procedures performed during the same encounter must be available for post-payment audit.

Methods not acceptable for reimbursement:

- Mechanical oscillometry
- Inductance plethysmography
- Capacitance plethysmography
- Photoelectric plethysmography
- Thermography (CPT® 93740)

"Vascular studies include patient care required to perform the studies, supervision of the studies and interpretation of study results with copies for patient records of hard copy output with analysis of all data, including bidirectional vascular flow or imaging when provided.

The use of a simple hand-held or other Doppler device that does not produce hard copy output or that produces a record that does not permit analysis of bidirectional vascular flow, is considered to be part of the physical examination of the vascular system and is not separately reported." (CPT® 2023, p 788)

Non-invasive vascular diagnostic studies may be personally performed by a physician or technologist. The accuracy of non-invasive vascular diagnostic studies depends on the knowledge, skill and experience of the technologist and physician performing and interpreting the study. Consequently, the physician performing and/or interpreting the study must be capable of demonstrating documented training through recent residency training or post-graduate Continuing Medical Education (CME) and experience and maintain that documentation for post-payment review.

All non-invasive vascular diagnostic studies, when performed by a technologist, must be performed by a technologist who has demonstrated competency in ultrasound by receiving one of the following credentials in vascular ultrasound technology:

- Registered Vascular Specialist (RVS) provided by Cardiovascular Credentialing International (CCI).
- Registered Vascular Technologist (RVT) provided by the American Registry of Diagnostic Medical Sonographers (ARDMS).

- Vascular Sonographer (VS) provided by the American Registry of Radiologic Technologists, Sonography (ARRT)(S).

Alternately, such studies must be performed in a facility or vascular laboratory accredited by one of the following nationally recognized accreditation organizations:

- American College of Radiology (ACR) Vascular Ultrasound Accreditation Program.
- Intersocietal Commission for the Accreditation of Vascular Laboratories (ICAVL).

If a vascular laboratory or facility is accredited, the technologists performing non-invasive peripheral studies in that laboratory are considered to have demonstrated competency in vascular ultrasound.

Non-invasive vascular procedures will not be covered when performed based on internal protocols of the testing facility; a referral for one non-invasive study is not a blanket referral for all studies. The provider treating the patient must specifically order the procedures in writing; an order must be on record for each non-invasive study performed.

It is expected that the machine used is of sufficient quality to render acceptable results. When an uninterpretable study (i.e., poor quality or not in accordance with regulatory standards) results in performing another type of study, only the successful study should be billed.

Documentation Requirements:

- Documentation supporting the medical necessity should be legible, maintained in the patient's medical record and made available to ASH upon request.
- In the case of vascular studies and their interpretations, a hard copy (or a soft copy convertible to a hard copy) must be maintained as a permanent record of the study performed and must be of a quality that meets accepted radiologic standards.
- Medical necessity for performance of simultaneous arterial and venous studies should be rare. Subsequently, documentation must clearly support the reasonableness and medical necessity for both procedures performed during the same encounter.

1 **CPT® Codes and Descriptions**

CPT® Code	CPT® Code Description
93922	Limited bilateral non-invasive physiologic studies of upper or lower extremity arteries, (e.g., for lower extremity: ankle/brachial indices at distal posterior tibial and anterior tibial/dorsalis pedis arteries plus bidirectional, Doppler waveform recording and analysis at 1-2 levels, or ankle/brachial indices at distal posterior tibial and anterior tibial/dorsalis pedis arteries plus volume plethysmography at 1-2 levels, or ankle/brachial indices at distal posterior tibial and anterior tibial/dorsalis pedis arteries with, transcutaneous oxygen tension measurement at 1-2 levels)
93923	Complete bilateral non-invasive physiologic studies of upper or lower extremity arteries, 3 or more levels (e.g., for lower extremity: ankle/brachial indices at distal posterior tibial and anterior tibial/dorsalis pedis arteries plus segmental blood pressure measurements with bidirectional Doppler waveform recording and analysis, at 3 or more levels, or ankle/brachial indices at distal posterior tibial and anterior tibial/dorsalis pedis arteries plus segmental volume plethysmography at 3 or more levels, or ankle/brachial indices at distal posterior tibial and anterior tibial/dorsalis pedis arteries plus segmental transcutaneous oxygen tension measurements at 3 or more levels), or single level study with provocative functional maneuvers (e.g., measurements with postural provocative tests, or measurements with reactive hyperemia)
93924	Noninvasive physiologic studies of lower extremity arteries, at rest and following treadmill stress testing, (i.e., bidirectional Doppler waveform or volume plethysmography recording and analysis at rest with ankle/brachial indices immediately after and at timed intervals following performance of a standardized protocol on a motorized treadmill plus recording of time of onset of claudication or other symptoms, maximal walking time, and time to recovery) complete bilateral study

CPT® Code	CPT® Code Description
93925	Duplex scan of lower extremity arteries or arterial bypass grafts; complete bilateral study
93926	Duplex scan of lower extremity arteries or arterial bypass grafts; unilateral or limited study
93970	Duplex scan of extremity veins including responses to compression and other maneuvers; complete bilateral study
93971	Duplex scan of extremity veins including responses to compression and other maneuvers; unilateral or limited study

PRACTITIONER SCOPE AND TRAINING

Practitioners should practice only in the areas in which they are competent based on their education, training and experience. Levels of education, experience, and proficiency may vary among individual practitioners. It is ethically and legally incumbent on a practitioner to determine where they have the knowledge and skills necessary to perform such services and whether the services are within their scope of practice.

It is best practice for the practitioner to appropriately render services to a member only if they are trained, equally skilled, and adequately competent to deliver a service compared to others trained to perform the same procedure. If the service would be most competently delivered by another health care practitioner who has more skill and training, it would be best practice to refer the member to the more expert practitioner.

Best practice can be defined as a clinical, scientific, or professional technique, method, or process that is typically evidence-based and consensus driven and is recognized by a majority of professionals in a particular field as more effective at delivering a particular outcome than any other practice (Joint Commission International Accreditation Standards for Hospitals, 2020).

Depending on the practitioner's scope of practice, training, and experience, a member's condition and/or symptoms during examination or the course of treatment may indicate the need for referral to another practitioner or even emergency care. In such cases it is prudent for the practitioner to refer the member for appropriate co-management (e.g., to their primary care physician) or if immediate emergency care is warranted, to contact 911 as appropriate. See the *Managing Medical Emergencies (CPG 159 – S)* policy for information.

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