Peripheral Venous Disease

Clinical Guidelines for Medical Necessity Review

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Important Notices

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Other Notices:

Guideline Information:

Disease Area: Cardiology
Care Path Group: General Cardiology
Care Path Name: Peripheral Venous Disease
Type: [**X**] Adult (18+ yo) | [_] Pediatric (0-17yo)

Physician author: Steven A. Kagan, MD RVT
Peer reviewed by: Islam M. Othman, MD (Interventional Cardiologist), Carter Newton, MD FACC (Cardiologist), Russell Rotondo, MD FACC (Cardiologist)
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Care Path Overview

Care Path Clinical Discussion

The peripheral venous system transports venous (i.e., deoxygenated) blood from the periphery back to the central venous circulation. Superficial veins drain into deep veins via perforating veins. Venous pressure gradients, skeletal muscle contractions and competent venous valves are critical components of a functional peripheral venous system.[1]

Venous insufficiency is a condition where incompetent venous valves interfere with normal venous return. Patients most frequently display signs and symptoms of venous insufficiency in the lower extremities.

Symptoms of mild or moderate chronic venous insufficiency (CVI) include (but are not limited to) lower extremity heaviness, aching, and itching. Signs of CVI include varicose veins, swelling, and brown-colored skin. Severe venous insufficiency can lead to permanent skin damage (lipodermatosclerosis) and skin ulceration in the extremities.[1,2]

Venous insufficiency can usually be diagnosed with a careful history and physical examination. Noninvasive venous testing can confirm the diagnosis and can quantify the degree and location of the venous insufficiency (e.g., superficial, perforator, and/or deep venous insufficiency).[1,2]

Generally speaking, CVI is not a limb-threatening condition. The typical treatment is graded compression therapy. A patient who fails to improve with graded compression therapy may benefit from minimally invasive procedures to treat the underlying venous valve incompetence.[3]

Suprainguinal related diagnoses fall outside the scope of these guidelines, and Infrainguinal related diagnoses are in scope.

The information contained herein gives a general overview of the pathway of this specific diagnosis, beginning with the initial presentation, recommended assessments, and treatment options as supported by the medical literature and existing guidelines. It should be noted that the care of patients can be complex. The information below is meant to support clinical decision-making in adult patients. It is not necessarily applicable to every case, as the entire clinical picture (including comorbidities, history, etc.) should be considered.

Key Information

- ➢ Patients typically present to their primary care provider with the typical symptoms and signs of peripheral venous insufficiency described above. Many patients, however, are asymptomatic.[4]
- ➢ The prevalence of suprainguinal-related venous insufficiency increases with age. Furthermore, lower extremity venous insufficiency is strongly heritable (see Causes and Risk Factors).
- ➢ All patients with suspected venous insufficiency should have a venous duplex scan (to assess for superficial or deep vein thrombosis) and a venous insufficiency study (to assess venous valve function). These venous tests 1) allow the clinician to identify pathology sites and 2) aid in treatment decisions.[5,6]
- ➢ In rare circumstances, the treating clinician may need magnetic resonance angiography (MRA), computed tomography angiography (CTA), or catheter-based angiography to diagnose venous insufficiency (e.g., May Thurner Syndrome).[5,7-8]

Definitions

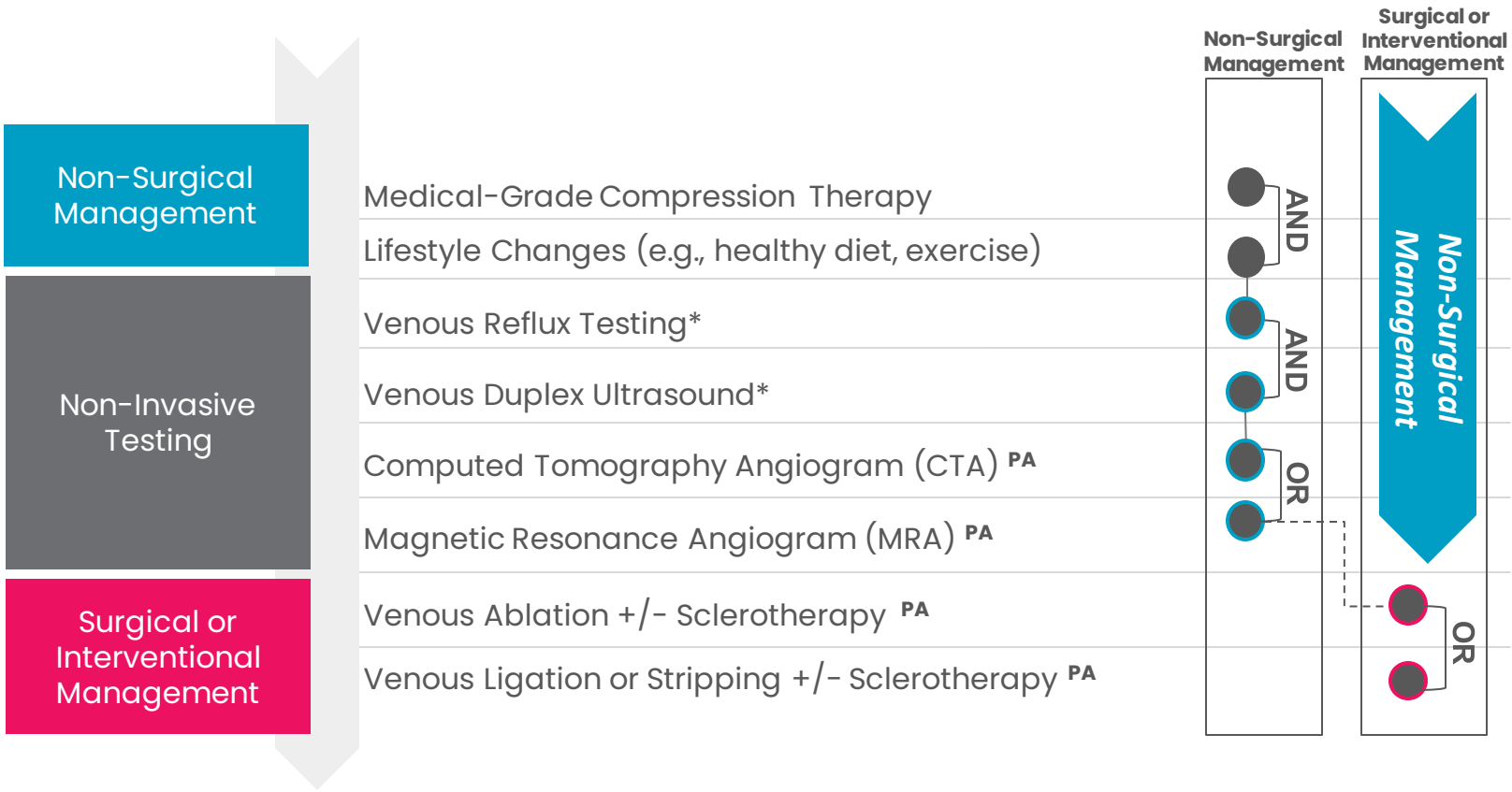
- **Superficial venous thrombophlebitis (SVT):** An inflammatory process that causes a blood clot to form and block one or more superficial veins (usually in the lower extremities). SVT is generally not considered a limb or life-threatening condition; however, SVT can occasionally progress to DVT.
- **Deep venous thrombophlebitis (DVT):** An inflammatory process that causes a blood clot to form and block one or more deep veins (usually in the lower extremities). Severe DVT is rare but can be limb-threatening (e.g., phlegmasia). DVT can also lead to pulmonary embolism (PE), which can be life-threatening.
- **Venous valve reflux/Venous valve closure time (superficial, perforator, deep):** Venous valve reflux can lead to retrograde flow in the venous system from delays in venous valve closure times. Generally speaking, an average superficial venous valve closure time is approximately 500 ms. The cutoff value for reflux in the superficial and deep calf veins is greater than 500 ms. The cutoff value for the femoropopliteal veins is generally greater than 1000 ms. Outward flow in the perforating veins should be considered abnormal if it is greater than 350 ms.[9,10]
- **Conservative care/best medical therapy:** Medical grade compression stocking therapy in conjunction with leg elevation and pharmacotherapy such as diosmiplex (if appropriate).

- **Endovenous laser ablation (ELVT):** A minimally invasive treatment using catheters, lasers, and ultrasound to treat lower extremity superficial or perforator vein insufficiency. .
- **Radiofrequency ablation (RFA):** A minimally invasive treatment using catheters, radiofrequency waves, and ultrasound to treat lower extremity superficial or perforator vein insufficiency.
- **Cyanoacrylate:** A minimally invasive treatment using catheters, medical glue, and ultrasound to treat lower extremity superficial or perforator vein insufficiency.
- **Sclerotherapy:** A minimally invasive treatment using small needles (with or without ultrasound) and mild detergents to treat lower extremity superficial or perforator vein insufficiency.
- **Diosmiplex:** An FDA-approved medical food that improves chronic venous insufficiency symptoms by improving venous tone, promoting lymphatic drainage, and decreasing inflammation.

Peripheral Venous Disease

What is a "Cohere Care Path"?

These Care Paths organize the services typically considered most clinically optimal and likely to be automatically approved. These service recommendations also include the suggested sequencing and quantity or frequency determined clinically appropriate and medically necessary for the management of most patient care scenarios in this Care Path's diagnostic cohort.



Key

PA = Service may require prior authorization
★ = Denotes preferred service
AND = Services completed concurrently
OR = Services generally mutually exclusive

= Non-surgical management prior authorization group of services
= Surgical management prior authorization group of services
= Subsequent service
= Management path moves to a different management path

Care Path Diagnostic Criteria

Disease Classification and General Treatment Guidelines

Venous insufficiency (superficial, perforator and deep venous systems)

ICD-10 Codes Associated with Classification

ICD-10 Code	Code Description/Definition
I80	Phlebitis and thrombophlebitis
I80.0	Phlebitis and thrombophlebitis of superficial vessels of lower extremities
I80.00	Phlebitis and thrombophlebitis of superficial vessels of unspecified lower extremity
I80.01	Phlebitis and thrombophlebitis of superficial vessels of right lower extremity
I80.02	Phlebitis and thrombophlebitis of superficial vessels of left lower extremity
I80.03	Phlebitis and thrombophlebitis of superficial vessels of lower extremities, bilateral
I80.1	Phlebitis and thrombophlebitis of femoral vein
I80.10	Phlebitis and thrombophlebitis of unspecified femoral vein
I80.11	Phlebitis and thrombophlebitis of right femoral vein
I80.12	Phlebitis and thrombophlebitis of left femoral vein
I80.13	Phlebitis and thrombophlebitis of femoral vein, bilateral
I80.2	Phlebitis and thrombophlebitis of other and unspecified deep vessels of lower extremities
I80.20	Phlebitis and thrombophlebitis of unspecified deep vessels of lower extremities
I80.201	Phlebitis and thrombophlebitis of unspecified deep vessels of right lower extremity
I80.202	Phlebitis and thrombophlebitis of unspecified deep vessels of left lower extremity

I80.203	Phlebitis and thrombophlebitis of unspecified deep vessels of lower extremities, bilateral
I80.209	Phlebitis and thrombophlebitis of unspecified deep vessels of unspecified lower extremity
I80.21	Phlebitis and thrombophlebitis of iliac vein
I80.211	Phlebitis and thrombophlebitis of right iliac vein
I80.212	Phlebitis and thrombophlebitis of left iliac vein
I80.213	Phlebitis and thrombophlebitis of iliac vein, bilateral
I80.219	Phlebitis and thrombophlebitis of unspecified iliac vein
I80.22	Phlebitis and thrombophlebitis of popliteal vein
I80.221	Phlebitis and thrombophlebitis of right popliteal vein
I80.222	Phlebitis and thrombophlebitis of left popliteal vein
I80.223	Phlebitis and thrombophlebitis of popliteal vein, bilateral
I80.229	Phlebitis and thrombophlebitis of unspecified popliteal vein
I80.23	Phlebitis and thrombophlebitis of tibial vein
I80.231	Phlebitis and thrombophlebitis of right tibial vein
I80.232	Phlebitis and thrombophlebitis of left tibial vein
I80.233	Phlebitis and thrombophlebitis of tibial vein, bilateral
I80.239	Phlebitis and thrombophlebitis of unspecified tibial vein
I80.24	Phlebitis and thrombophlebitis of peroneal vein
I80.241	Phlebitis and thrombophlebitis of right peroneal vein
I80.242	Phlebitis and thrombophlebitis of left peroneal vein
I80.243	Phlebitis and thrombophlebitis of peroneal vein, bilateral
I80.249	Phlebitis and thrombophlebitis of unspecified peroneal vein
I80.25	Phlebitis and thrombophlebitis of calf muscular vein
I80.251	Phlebitis and thrombophlebitis of right calf muscular vein
I80.252	Phlebitis and thrombophlebitis of left calf muscular vein
I80.253	Phlebitis and thrombophlebitis of calf muscular vein, bilateral
I80.259	Phlebitis and thrombophlebitis of unspecified calf muscular

	vein
I80.29	Phlebitis and thrombophlebitis of other deep vessels of lower extremities
I80.291	Phlebitis and thrombophlebitis of other deep vessels of right lower extremity
I80.292	Phlebitis and thrombophlebitis of other deep vessels of left lower extremity
I80.293	Phlebitis and thrombophlebitis of other deep vessels of lower extremity, bilateral
I80.299	Phlebitis and thrombophlebitis of other deep vessels of unspecified lower extremity
I80.3	Phlebitis and thrombophlebitis of lower extremities, unspecified
I80.8	Phlebitis and thrombophlebitis of other sites
I80.9	Phlebitis and thrombophlebitis of unspecified site
I82.4	Acute embolism and thrombosis of deep veins of lower extremity
I82.40	Acute embolism and thrombosis of unspecified deep veins of lower extremity
I82.401	Acute embolism and thrombosis of unspecified deep veins of right lower extremity
I82.402	Acute embolism and thrombosis of unspecified deep veins of left lower extremity
I82.403	Acute embolism and thrombosis of unspecified deep veins of lower extremity, bilateral
I82.409	Acute embolism and thrombosis of unspecified deep veins of unspecified lower extremity
I82.41	Acute embolism and thrombosis of femoral vein
I82.411	Acute embolism and thrombosis of right femoral vein
I82.412	Acute embolism and thrombosis of left femoral vein
I82.413	Acute embolism and thrombosis of femoral vein, bilateral
I82.419	Acute embolism and thrombosis of unspecified femoral

	vein
I82.42	Acute embolism and thrombosis of iliac vein
I82.421	Acute embolism and thrombosis of right iliac vein
I82.422	Acute embolism and thrombosis of left iliac vein
I82.423	Acute embolism and thrombosis of iliac vein, bilateral
I82.429	Acute embolism and thrombosis of unspecified iliac vein
I82.43	Acute embolism and thrombosis of popliteal vein
I82.431	Acute embolism and thrombosis of right popliteal vein
I82.432	Acute embolism and thrombosis of left popliteal vein
I82.433	Acute embolism and thrombosis of popliteal vein, bilateral
I82.439	Acute embolism and thrombosis of unspecified popliteal vein
I82.44	Acute embolism and thrombosis of tibial vein
I82.441	Acute embolism and thrombosis of right tibial vein
I82.442	Acute embolism and thrombosis of left tibial vein
I82.443	Acute embolism and thrombosis of tibial vein, bilateral
I82.449	Acute embolism and thrombosis of unspecified tibial vein
I82.45	Acute embolism and thrombosis of peroneal vein
I82.451	Acute embolism and thrombosis of right peroneal vein
I82.452	Acute embolism and thrombosis of left peroneal vein
I82.453	Acute embolism and thrombosis of peroneal vein, bilateral
I82.459	Acute embolism and thrombosis of unspecified peroneal vein
I82.46	Acute embolism and thrombosis of calf muscular vein
I82.461	Acute embolism and thrombosis of right calf muscular vein
I82.462	Acute embolism and thrombosis of left calf muscular vein
I82.463	Acute embolism and thrombosis of calf muscular vein, bilateral
I82.469	Acute embolism and thrombosis of unspecified calf muscular vein

I82.49	Acute embolism and thrombosis of other specified deep vein of lower extremity
I82.491	Acute embolism and thrombosis of other specified deep vein of right lower extremity
I82.492	Acute embolism and thrombosis of other specified deep vein of left lower extremity
I82.493	Acute embolism and thrombosis of other specified deep vein of lower extremity, bilateral
I82.499	Acute embolism and thrombosis of other specified deep vein of unspecified lower extremity
I82.4Y	Acute embolism and thrombosis of unspecified deep veins of proximal lower extremity
I82.4Y1	Acute embolism and thrombosis of unspecified deep veins of right proximal lower extremity
I82.4Y2	Acute embolism and thrombosis of unspecified deep veins of left proximal lower extremity
I82.4Y3	Acute embolism and thrombosis of unspecified deep veins of proximal lower extremity, bilateral
I82.4Y9	Acute embolism and thrombosis of unspecified deep veins of unspecified proximal lower extremity
I82.4Z	Acute embolism and thrombosis of unspecified deep veins of distal lower extremity
I82.4Z1	Acute embolism and thrombosis of unspecified deep veins of right distal lower extremity
I82.4Z2	Acute embolism and thrombosis of unspecified deep veins of left distal lower extremity
I82.4Z3	Acute embolism and thrombosis of unspecified deep veins of distal lower extremity, bilateral
I82.4Z9	Acute embolism and thrombosis of unspecified deep veins of unspecified distal lower extremity
I82.5	Chronic embolism and thrombosis of deep veins of lower extremity
I82.50	Chronic embolism and thrombosis of unspecified deep

	veins of lower extremity
I82.501	Chronic embolism and thrombosis of unspecified deep veins of right lower extremity
I82.502	Chronic embolism and thrombosis of unspecified deep veins of left lower extremity
I82.503	Chronic embolism and thrombosis of unspecified deep veins of lower extremity, bilateral
I82.509	Chronic embolism and thrombosis of unspecified deep veins of unspecified lower extremity
I82.51	Chronic embolism and thrombosis of femoral vein
I82.511	Chronic embolism and thrombosis of right femoral vein
I82.512	Chronic embolism and thrombosis of left femoral vein
I82.513	Chronic embolism and thrombosis of femoral vein, bilateral
I82.519	Chronic embolism and thrombosis of unspecified femoral vein
I82.52	Chronic embolism and thrombosis of iliac vein
I82.521	Chronic embolism and thrombosis of right iliac vein
I82.522	Chronic embolism and thrombosis of left iliac vein
I82.523	Chronic embolism and thrombosis of iliac vein, bilateral
I82.529	Chronic embolism and thrombosis of unspecified iliac vein
I82.53	Chronic embolism and thrombosis of popliteal vein
I82.531	Chronic embolism and thrombosis of right popliteal vein
I82.532	Chronic embolism and thrombosis of left popliteal vein
I82.533	Chronic embolism and thrombosis of popliteal vein, bilateral
I82.539	Chronic embolism and thrombosis of unspecified popliteal vein
I82.54	Chronic embolism and thrombosis of tibial vein
I82.541	Chronic embolism and thrombosis of right tibial vein
I82.542	Chronic embolism and thrombosis of left tibial vein
I82.543	Chronic embolism and thrombosis of tibial vein, bilateral

I82.549	Chronic embolism and thrombosis of unspecified tibial vein
I82.55	Chronic embolism and thrombosis of peroneal vein
I82.551	Chronic embolism and thrombosis of right peroneal vein
I82.552	Chronic embolism and thrombosis of left peroneal vein
I82.553	Chronic embolism and thrombosis of peroneal vein, bilateral
I82.559	Chronic embolism and thrombosis of unspecified peroneal vein
I82.56	Chronic embolism and thrombosis of calf muscular vein
I82.561	Chronic embolism and thrombosis of right calf muscular vein
I82.562	Chronic embolism and thrombosis of left calf muscular vein
I82.563	Chronic embolism and thrombosis of calf muscular vein, bilateral
I82.569	Chronic embolism and thrombosis of unspecified calf muscular vein
I82.59	Chronic embolism and thrombosis of other specified deep vein of lower extremity
I82.591	Chronic embolism and thrombosis of other specified deep vein of right lower extremity
I82.592	Chronic embolism and thrombosis of other specified deep vein of left lower extremity
I82.593	Chronic embolism and thrombosis of other specified deep vein of lower extremity, bilateral
I82.599	Chronic embolism and thrombosis of other specified deep vein of unspecified lower extremity
I82.5Y	Chronic embolism and thrombosis of unspecified deep veins of proximal lower extremity
I82.5Y1	Chronic embolism and thrombosis of unspecified deep veins of right proximal lower extremity
I82.5Y2	Chronic embolism and thrombosis of unspecified deep

	veins of left proximal lower extremity
I82.5Y3	Chronic embolism and thrombosis of unspecified deep veins of proximal lower extremity, bilateral
I82.5Y9	Chronic embolism and thrombosis of unspecified deep veins of unspecified proximal lower extremity
I82.5Z	Chronic embolism and thrombosis of unspecified deep veins of distal lower extremity
I82.5Z1	Chronic embolism and thrombosis of unspecified deep veins of right distal lower extremity
I82.5Z2	Chronic embolism and thrombosis of unspecified deep veins of left distal lower extremity
I82.5Z3	Chronic embolism and thrombosis of unspecified deep veins of distal lower extremity, bilateral
I82.5Z9	Chronic embolism and thrombosis of unspecified deep veins of unspecified distal lower extremity
I82.8	Embolism and thrombosis of other specified veins
I82.81	Embolism and thrombosis of superficial veins of lower extremities
I82.811	Embolism and thrombosis of superficial veins of right lower extremity
I82.812	Embolism and thrombosis of superficial veins of left lower extremity
I82.813	Embolism and thrombosis of superficial veins of lower extremities, bilateral
I82.819	Embolism and thrombosis of superficial veins of unspecified lower extremity
I82.89	Embolism and thrombosis of other specified veins
I82.890	Acute embolism and thrombosis of other specified veins
I82.891	Chronic embolism and thrombosis of other specified veins
I82.9	Embolism and thrombosis of unspecified vein
I82.90	Acute embolism and thrombosis of unspecified vein
I82.91	Chronic embolism and thrombosis of unspecified vein

I83	Varicose veins of lower extremities
I83.0	Varicose veins of lower extremities with ulcer
I83.00	Varicose veins of unspecified lower extremity with ulcer
I83.001	Varicose veins of unspecified lower extremity with ulcer of thigh
I83.002	Varicose veins of unspecified lower extremity with ulcer of calf
I83.003	Varicose veins of unspecified lower extremity with ulcer of ankle
I83.004	Varicose veins of unspecified lower extremity with ulcer of heel and midfoot
I83.005	Varicose veins of unspecified lower extremity with ulcer other part of foot
I83.008	Varicose veins of unspecified lower extremity with ulcer other part of lower leg
I83.009	Varicose veins of unspecified lower extremity with ulcer of unspecified site
I83.01	Varicose veins of right lower extremity with ulcer
I83.011	Varicose veins of right lower extremity with ulcer of thigh
I83.012	Varicose veins of right lower extremity with ulcer of calf
I83.013	Varicose veins of right lower extremity with ulcer of ankle
I83.014	Varicose veins of right lower extremity with ulcer of heel and midfoot
I83.015	Varicose veins of right lower extremity with ulcer other part of foot
I83.018	Varicose veins of right lower extremity with ulcer other part of lower leg
I83.019	Varicose veins of right lower extremity with ulcer of unspecified site
I83.02	Varicose veins of left lower extremity with ulcer
I83.021	Varicose veins of left lower extremity with ulcer of thigh
I83.022	Varicose veins of left lower extremity with ulcer of calf

I83.023	Varicose veins of left lower extremity with ulcer of ankle
I83.024	Varicose veins of left lower extremity with ulcer of heel and midfoot
I83.025	Varicose veins of left lower extremity with ulcer other part of foot
I83.028	Varicose veins of left lower extremity with ulcer other part of lower leg
I83.029	Varicose veins of left lower extremity with ulcer of unspecified site
I83.1	Varicose veins of lower extremities with inflammation
I83.10	Varicose veins of unspecified lower extremity with inflammation
I83.11	Varicose veins of right lower extremity with inflammation
I83.12	Varicose veins of left lower extremity with inflammation
I83.2	Varicose veins of lower extremities with both ulcer and inflammation
I83.20	Varicose veins of unspecified lower extremity with both ulcer and inflammation
I83.201	Varicose veins of unspecified lower extremity with both ulcer of thigh and inflammation
I83.202	Varicose veins of unspecified lower extremity with both ulcer of calf and inflammation
I83.203	Varicose veins of unspecified lower extremity with both ulcer of ankle and inflammation
I83.204	Varicose veins of unspecified lower extremity with both ulcer of heel and midfoot and inflammation
I83.205	Varicose veins of unspecified lower extremity with both ulcer other part of foot and inflammation
I83.208	Varicose veins of unspecified lower extremity with both ulcer of other part of lower extremity and inflammation
I83.209	Varicose veins of unspecified lower extremity with both ulcer of unspecified site and inflammation
I83.21	Varicose veins of right lower extremity with both ulcer and

	inflammation
I83.211	Varicose veins of right lower extremity with both ulcer of thigh and inflammation
I83.212	Varicose veins of right lower extremity with both ulcer of calf and inflammation
I83.213	Varicose veins of right lower extremity with both ulcer of ankle and inflammation
I83.214	Varicose veins of right lower extremity with both ulcer of heel and midfoot and inflammation
I83.215	Varicose veins of right lower extremity with both ulcer other part of foot and inflammation
I83.218	Varicose veins of right lower extremity with both ulcer of other part of lower extremity and inflammation
I83.219	Varicose veins of right lower extremity with both ulcer of unspecified site and inflammation
I83.22	Varicose veins of left lower extremity with both ulcer and inflammation
I83.221	Varicose veins of left lower extremity with both ulcer of thigh and inflammation
I83.222	Varicose veins of left lower extremity with both ulcer of calf and inflammation
I83.223	Varicose veins of left lower extremity with both ulcer of ankle and inflammation
I83.224	Varicose veins of left lower extremity with both ulcer of heel and midfoot and inflammation
I83.225	Varicose veins of left lower extremity with both ulcer other part of foot and inflammation
I83.228	Varicose veins of left lower extremity with both ulcer of other part of lower extremity and inflammation
I83.229	Varicose veins of left lower extremity with both ulcer of unspecified site and inflammation
I83.8	Varicose veins of lower extremities with other complications

I83.81	Varicose veins of lower extremities with pain
I83.811	Varicose veins, pain, right
I83.812	Varicose veins, pain, left
I83.813	Varicose veins, pain, bilateral
I83.819	Varicose veins, pain, unspecified lower extremity
I83.89	Varicose veins of lower extremities with other complications
I83.891	Varicose veins of right lower extremity with other complications
I83.892	Varicose veins of left lower extremity with other complications
I83.893	Varicose veins of bilateral lower extremities with other complications
I83.899	Varicose veins of unspecified lower extremity with other complications
I83.9	Asymptomatic varicose veins of lower extremities
I83.90	Asymptomatic varicose veins of unspecified lower extremity
I83.91	Asymptomatic varicose veins of right lower extremity
I83.92	Asymptomatic varicose veins of left lower extremity
I83.93	Asymptomatic varicose veins of bilateral lower extremities
I86	Varicose veins of other sites
I86.8	Varicose veins of other specified sites
I87	Other disorders of veins
I87.0	Postthrombotic syndrome
I87.00	Postthrombotic syndrome without complications
I87.001	Postthrombotic syndrome without complications of right lower extremity
I87.002	Postthrombotic syndrome without complications of left lower extremity
I87.003	Postthrombotic syndrome without complications of

	bilateral lower extremity
I87.009	Postthrombotic syndrome without complications of unspecified extremity
I87.01	Postthrombotic syndrome with ulcer
I87.011	Postthrombotic syndrome with ulcer of right lower extremity
I87.012	Postthrombotic syndrome with ulcer of left lower extremity
I87.013	Postthrombotic syndrome with ulcer of bilateral lower extremity
I87.019	Postthrombotic syndrome with ulcer of unspecified lower extremity
I87.02	Postthrombotic syndrome with inflammation
I87.021	Postthrombotic syndrome with inflammation of right lower extremity
I87.022	Postthrombotic syndrome with inflammation of left lower extremity
I87.023	Postthrombotic syndrome with inflammation of bilateral lower extremity
I87.029	Postthrombotic syndrome with inflammation of unspecified lower extremity
I87.03	Postthrombotic syndrome with ulcer and inflammation
I87.031	Postthrombotic syndrome with ulcer and inflammation of right lower extremity
I87.032	Postthrombotic syndrome with ulcer and inflammation of left lower extremity
I87.033	Postthrombotic syndrome with ulcer and inflammation of bilateral lower extremity
I87.039	Postthrombotic syndrome with ulcer and inflammation of unspecified lower extremity
I87.09	Postthrombotic syndrome with other complications
I87.091	Postthrombotic syndrome with other complications of right lower extremity

I87.092	Postthrombotic syndrome with other complications of left lower extremity
I87.093	Postthrombotic syndrome with other complications of bilateral lower extremity
I87.099	Postthrombotic syndrome with other complications of unspecified lower extremity
I87.1	Compression of vein
I87.2	Venous insufficiency (chronic) (peripheral)
I87.3	Chronic venous hypertension (idiopathic)
I87.30	Chronic venous hypertension (idiopathic) without complications
I87.301	Chronic venous hypertension (idiopathic) without complications of right lower extremity
I87.302	Chronic venous hypertension (idiopathic) without complications of left lower extremity
I87.303	Chronic venous hypertension (idiopathic) without complications of bilateral lower extremity
I87.309	Chronic venous hypertension (idiopathic) without complications of unspecified lower extremity
I87.31	Chronic venous hypertension (idiopathic) with ulcer
I87.311	Chronic venous hypertension (idiopathic) with ulcer of right lower extremity
I87.312	Chronic venous hypertension (idiopathic) with ulcer of left lower extremity
I87.313	Chronic venous hypertension (idiopathic) with ulcer of bilateral lower extremity
I87.319	Chronic venous hypertension (idiopathic) with ulcer of unspecified lower extremity
I87.32	Chronic venous hypertension (idiopathic) with inflammation
I87.321	Chronic venous hypertension (idiopathic) with inflammation of right lower extremity
I87.322	Chronic venous hypertension (idiopathic) with

	inflammation of left lower extremity
I87.323	Chronic venous hypertension (idiopathic) with inflammation of bilateral lower extremity
I87.329	Chronic venous hypertension (idiopathic) with inflammation of unspecified lower extremity
I87.33	Chronic venous hypertension (idiopathic) with ulcer and inflammation
I87.331	Chronic venous hypertension (idiopathic) with ulcer and inflammation of right lower extremity
I87.332	Chronic venous hypertension (idiopathic) with ulcer and inflammation of left lower extremity
I87.333	Chronic venous hypertension (idiopathic) with ulcer and inflammation of bilateral lower extremity
I87.339	Chronic venous hypertension (idiopathic) with ulcer and inflammation of unspecified lower extremity
I87.39	Chronic venous hypertension (idiopathic) with other complications
I87.391	Chronic venous hypertension (idiopathic) with other complications of right lower extremity
I87.392	Chronic venous hypertension (idiopathic) with other complications of left lower extremity
I87.393	Chronic venous hypertension (idiopathic) with other complications of bilateral lower extremity
I87.399	Chronic venous hypertension (idiopathic) with other complications of unspecified lower extremity
I87.8	Other specified disorders of veins
I87.9	Disorder of vein, unspecified

Peripheral venous disease can typically be diagnosed with a careful history and physical exam. Non-invasive venous testing is a cost-effective and straightforward way to diagnose peripheral venous disease. More detailed non-invasive imaging (computed tomography angiogram, magnetic resonance angiogram) or invasive imaging (venography) is generally only needed when a more proximal disease is suspected (i.e., abdominopelvic).[5,8]

Daytime use of medical-grade compression stocking therapy (minimum 20-30 mm Hg) is the 1st line of treatment for patients with symptomatic venous insufficiency of the lower extremities. Compression stockings can reduce venous insufficiency signs and symptoms by improving venous valve function and enhancing venous blood flow from the feet toward the heart. Patients generally experience an improvement in their venous symptoms over 6-12 weeks of compression therapy.[11]

Pharmacotherapeutics (i.e., diosmiplex) can also be used to reduce vein wall inflammation in patients with venous insufficiency.

Causes and Risk Factors

- Family history of this condition (e.g., history of lower extremity vein disease, deep vein thrombosis, superficial thrombophlebitis, or lower extremity varicose veins)[1,2]
- Hormone therapy (i.e., oral contraceptive therapy, HRT)[1,2,6]
- Prior history of malignancy (i.e., solid tumors)[1,2]
- History of deep vein thrombosis in the legs[1,2]
- Morbid obesity[1,2,6]
- Pregnancy (past or present)[1,2,6]
- Prolonged immobility (i.e., sitting or standing for long periods of time)

Clinical Presentation

- History including Risk Factors
- Symptoms (lower extremity):[1,2]
    - Heaviness
    - Aching
    - Itching
    - Throbbing
    - Swelling
    - Pain

Typical Physical Exam Findings (lower extremity)

- Skin discoloration[1,2]
- Hair loss[1,2]
- Dry skin[1,2]
- Varicose veins[1,2]
- Edema[1,2]
- Superficial thrombophlebitis[1,2]
- Skin ulcers[12]

Typical Diagnostic Findings

- Duplex ultrasound[5,8]
    - Superficial thrombophlebitis (acute or chronic)
    - Deep vein thrombosis (acute or chronic)
    - Obstructive flow patterns (e.g., continuous flow in the femoral vein or failure of augmentation)
- Venous reflux testing[9,10]
    - Superficial venous reflux
        - Great saphenous vein
        - Anterior accessory saphenous vein
        - Vein of Giacomini
        - Small saphenous vein
    - Deep venous reflux
        - Femoral-popliteal veins
        - Calf veins
    - Perforator vein reflux

Care Path Services & Medical Necessity Criteria

Workup and Symptom Monitoring

Service: Genetic Testing, Coagulation Factor II and V variants

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** Complete testing for a specific genetic disease only once unless new capabilities for detecting additional mutations develop.
- **Recommended Clinical Approach:** Venous thromboembolism and pulmonary embolism account for approximately 1% of hospital admissions in the USA.[13] Thrombophilia (the enhanced propensity to form blood clots) can be inherited (primary) or acquired (secondary).[14] Secondary risk factors include Advanced age (>65), Immobilization, Inflammation, Pregnancy, Oral contraceptive use, Obesity (BMI >30 kg/m^2), Diabetes mellitus, Hormone replacement therapy, Cancer (especially adenocarcinoma), and Antiphospholipid syndrome.[15] Gene analysis for Coagulation Factor II (prothrombin, G20210A) and Factor V (Leiden) variants is reasonable for patients with risk factors for inherited thrombophilia.[13,16]
- **Exclusions:** None.

Medical Necessity Criteria

Indications

➔ **Genetic testing** is considered appropriate if **ALL** of the following is **TRUE**:
- ◆ The patient has one or more of the following[13,16-17]:
  - Recurrent venous thromboembolic episodes
  - Idiopathic first event (i.e., no obvious risk factors)
  - Venous thromboembolism at a young age (i.e., less than 50 years old)
  - A family history of venous thromboembolism (1st-degree relative)
  - Venous thrombosis in an unusual or uncommon site (e.g., cerebral, mesenteric, portal, or hepatic veins)
- ◆ The patient has not had prior genetic testing for Factor II or V.

Non-Indications

➔ **Genetic testing** is not considered appropriate if **ANY** of the following is **TRUE**:

- ◆ Genetic testing for Factor II and Factor V has already been performed.

Site of Service Criteria

Outpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
81240	F2 (prothrombin, coagulation factor II) (eg, hereditary hypercoagulability) gene analysis, 20210G>A variant
81241	F5 (coagulation factor V) (eg, hereditary hypercoagulability) gene analysis, Leiden variant

Non-Interventional Management

Service: Venous Duplex Ultrasound/Venous Reflux Testing

General Guidelines

- **Units, Frequency, & Duration:** Once (or as appropriate if there has been a documented clinically significant clinical change).[18]
- **Criteria for Subsequent Requests:** Repeat imaging may be appropriate if there is a significant clinical change since the time of the initial imaging study.[18] Repeat imaging is also appropriate to assess the response to intervention (e.g., ablation, ligation). Repeat testing is generally recommended within 2 weeks of intervention.[5,19]
- **Recommended Clinical Approach:** Venous duplex scanning is the most appropriate initial imaging study in most infrainguinal venous insufficiency patients.[18] A venous duplex scan delineates the degree of venous obstruction. For patients with suprainguinal venous pathology, the treating physician may also need a magnetic resonance angiogram (MRA) or computed tomography angiogram (CTA)to delineate the proximal venous anatomy.[5,8]

  Venous reflux testing is the most appropriate initial or additional imaging study in most patients with suspected infrainguinal venous insufficiency. Venous reflux testing allows the clinician to quantify the degree of venous valve dysfunction (i.e., venous insufficiency).[9,10,19]
- **Exclusions:** Venous reflux testing is not generally recommended in patients with acute conditions (i.e., acute superficial or acute deep vein thrombophlebitis).[9,10]

Medical Necessity Criteria

Indications

➔ **Venous Duplex Ultrasound/Venous reflux testing** is considered appropriate if **ANY** of the following is **TRUE**:

- ◆ If the service is venous duplex ultrasound and **ALL** of the following is **TRUE**:
  - Deep venous thrombosis is suspected
  - The patient has **at least two** positive findings from the clinical presentation list, the typical physical exam findings list, or at least one from each list.
- ◆ If the service is venous reflux testing and **ALL** of the following are **TRUE**:
  - Venous insufficiency is suspected

- The patient has **at least two** positive findings from the clinical presentation list OR typical physical exam findings list.

Non-Indications

➔ **Venous Duplex Ultrasound** is not considered appropriate if **ANY** of the following is **TRUE.**
- ◆ None. Venous duplex ultrasound generally has no contraindications.

➔ **Venous reflux testing** is not considered appropriate if **ANY** of the following is **TRUE** [9,10]:
- ◆ The patient can not stand for the study duration (i.e., patients must stand for venous reflux testing).[19]
- ◆ The patient has skin ulcers, but no suspected venous insufficiency.[15]

➔ **Venous reflux testing** may not be considered appropriate if **ANY** of the following is **TRUE**[19]:
- ◆ The patient is not a candidate for interventions that reflux testing would reveal (i.e., morbid obesity, pregnancy).
- ◆ The patient has acute, severe swelling or pain in the lower extremity.

Site of Service Criteria

Outpatient

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
93970	Duplex scan of extremity veins incl. responses to compression and other maneuvers; complete bilateral study
93971	Duplex scan of extremity veins incl. responses to compression and other maneuvers; unilateral or limited study
93998	Unlisted noninvasive vascular diagnostic study

Service: Magnetic Resonance Angiogram (MRA), Lower Extremity Veins

General Guidelines

- **Units, Frequency, & Duration:** Once or as appropriate per significant clinical change.
- **Criteria for Subsequent Requests:** Repeat imaging may be appropriate if there is a significant clinical change since the initial imaging study. Repeat imaging may also be appropriate to assess the response to intervention (e.g., ablation, ligation).[20-22] Considerations of additional phase, dynamic sequences, positioning of the patient, and use of markers at the discretion of the protocoling radiologist.
- **Recommended Clinical Approach:** Venous magnetic resonance angiogram (MRA) can help diagnose proximal venous obstruction or insufficiency when proximal venous disease is suspected (e.g., patients with vaginal varicosities).[19] The ordering clinician should provide appropriate clinical documentation to justify the MRA (i.e., clinical evidence of suprainguinal venous pathology).[5,20-22]
- **Exclusions:** MRI/MRA of the upper extremity, head and neck, and heart are excluded from this document. Exclusions include contraindications of MRI (e.g., retained metal, incompatible width to bore size, claustrophobia), incompatibility with following directions (i.e., breath-hold), and renal insufficiency (eGFR less than 30 mL/min) if gadolinium is requested.

Medical Necessity Criteria

Indications

➔ **MRA** is considered appropriate if **ALL** of the following are **TRUE**:
- ◆ The patient has **at least two** positive findings from the clinical presentation list
- ◆ The patient has **at least two** positive findings from the typical physical exam findings list
- ◆ The patient has ANY of the following:
  - Evidence suggests a suprainguinal or iliocaval venous obstruction or insufficiency, including[5]:
    - Suprainguinal venous thrombosis (deep vein thrombosis).[22]
    - Venous compression (e.g., tumor, lymphadenopathy).[23]
    - Venous malformations.[24]
    - Suspected pelvic pathology (e.g., uterine fibroid, lymphadenopathy)[23]

- The venous duplex scan was inadequate for diagnosis or suggested the presence of suprainguinal pathology
- MRA is needed to delineate the venous anatomy for pre-procedure planning or post-procedure follow-up.[5,8]

Non-Indications

➔ **MRA** is not appropriate if the patient has **ANY** of the following:

- ◆ Non-compatible metallic implanted devices.
- ◆ Metallic intraocular foreign bodies.
- ◆ Acute or emergent venous conditions that fall outside of this care path's scope (i.e., acute superficial or deep thrombophlebitis).

➔ **MRA** may not be appropriate if the patient has **ANY** of the following:

- ◆ There is a potential for adverse reactions to contrast media.
- ◆ If the patient has renal insufficiency (eGFR less than 30 mL/min per 1.73 m2) and if gadolinium contrast is requested, an MRI/MRA may not be considered appropriate.
- ◆ Severe claustrophobia.
- ◆ The patient is pregnant.

Site of Service Criteria

Outpatient

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
73725	Magnetic Resonance Angiogram (MRA) lower extremity veins; with or w/o contrast
74185	Magnetic Resonance Angiogram (MRA) abdominal veins; with or w/o contrast
72198	Magnetic Resonance Angiogram (MRA) pelvic veins; with or w/o contrast

Service: Computed Tomography Angiogram (CTA), Lower Extremity Veins

General Guidelines

- **Units, Frequency, & Duration:** Once or as appropriate per significant clinical change
- **Criteria for Subsequent Requests:** Repeat imaging may be appropriate if there is a significant clinical change since the time of the initial imaging study. Repeat imaging may also be appropriate to assess the response to intervention (e.g., ablation, ligation).[5,8,25]
- **Recommended Clinical Approach:** Venous computed tomography angiogram (CTA) can help diagnose proximal venous obstruction or insufficiency when proximal venous disease is suspected (e.g., patients with vaginal varicosities).[19] The ordering clinician should provide appropriate clinical documentation to justify the CTA (i.e., clinical evidence of suprainguinal venous pathology).[5,8,25]
- **Exclusions:** CT/CTA of the upper extremity, head and neck, and heart are excluded from this document and addressed separately.

Medical Necessity Criteria

Indications

➔ **CTA** is considered appropriate if **ALL** of the following are **TRUE**:
- The patient has **at least two** positive findings from the clinical presentation list
- The patient has **at least two** positive findings from the typical physical exam findings list
- The patient has ANY of the following:
  - Evidence suggests a suprainguinal or iliocaval venous obstruction or insufficiency, including[5,8,25]:
    - Suprainguinal venous thrombosis (deep vein thrombosis).
    - Venous compression (e.g., tumor, lymphadenopathy).[23]
    - Venous malformations.
    - Suspected pelvic pathology (e.g., uterine fibroid, lymphadenopathy, enlarged lymph nodes).[23]
  - The venous duplex scan was inadequate for diagnosis or suggested the presence of suprainguinal pathology
  - CTA is needed to delineate the venous anatomy for pre-procedure planning or post-procedure follow-up.[5,8,25-26]

Non-Indications

➔ **CTA** may not be appropriate if the patient has **ANY** of the following:

- A history or suspicion of a reaction to contrast agents.
- The patient has impaired renal function because angiographic contrast is utilized for the study.
- The patient is pregnant.
- The patient takes metformin.
- The patient has acute or emergent venous conditions that fall outside of this care path's scope (i.e., acute superficial or deep thrombophlebitis).

Site of Service Criteria

Outpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
73706	Computed tomographic angiogram, lower extremity veins, with contrast material(s), including noncontrast images, if performed, and image postprocessing.
72191	Computed tomographic angiogram (CTA) pelvic veins, with contrast material(s)
75635	Computed tomographic venogram (CTA) abdominal aorta & bilateral iliofemoral lower extremity runoff veins, with contrast material(s)

Surgical or Interventional Management

Service: Venous Ablation

General Guidelines

- **Units, Frequency, & Duration:** Once per each instance of symptomatic superficial venous incompetence.
- **Criteria for Subsequent Requests:** Repeat intervention in the same superficial venous segment is rarely needed, given the procedure's overall effectiveness. However, patients who fail to respond to the initial ablative procedure or who develop recurrent venous incompetence may be candidates for repeat intervention with appropriate clinical documentation.
- **Recommended Clinical Approach:** Catheter-based venous ablation (i.e., radiofrequency ablation/RFA, endovenous ablation/EVLT) and chemical ablation (i.e., cyanoacrylate) are effective treatments for patients with symptomatic superficial venous incompetence who fail to improve with compression therapy.[19,27-29] The ordering clinician should provide appropriate clinical documentation to justify the performance of the ablation procedure (i.e., symptoms of venous insufficiency which have failed to respond to compression therapy in conjunction with a venous duplex scan that demonstrates significant superficial venous reflux).
- **Exclusions:** Venous ablation may not be appropriate for patients in poor general health or patients with 1) a compromised deep venous vascular system, 2) acute DVT, or 3) acute superficial thrombophlebitis. Ablation is not appropriate for patients with aneurysmal venous reflux.[30] *Suprainguinal-related ablations fall out of the scope of this document.*

Medical Necessity Criteria

Indications

➔ **Venous ablation** is considered appropriate if **ALL** of the following are **TRUE**[27-30]:

- The patient has **at least two** positive findings from the clinical presentation list.
- The patient has **at least two** positive findings from the typical physical exam findings list.
- The patient has significant superficial venous reflux demonstrated by duplex scanning in the upright position.

- The patient fails to show significant clinical improvement despite conservative care for greater than 6 weeks (i.e., compression therapy, leg elevation, pharmacotherapy).

Non-Indications

➔ **Venous ablation** is **NOT** considered appropriate if **ANY** of the following is **TRUE** [19,27-30]:

- The patient has limited life expectancy due to co-morbid conditions.
- The patient is non-ambulatory.
- The patient has any absolute contraindications to intervention (e.g., cardiopulmonary risk factors, bleeding diathesis).
- There is evidence of occlusion but no accompanying symptoms.
- There is a significant vascular anomaly (e.g., AV fistula) at or adjacent to the planned intervention site.
- The patient has acute conditions outside of this care path's scope (i.e., solid compressive malignancy, superficial or deep thrombophlebitis).
- The patient is pregnant.
- The patient is allergic to injectable compounds or sclerosants (if undergoing ablative procedures that use sodium tetradecyl sulfate compounds).

Site of Service Criteria

Outpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
36473	Endovenous ablation therapy of incompetent vein, extremity, inclusive of all imaging guidance and monitoring, percutaneous, mechanochemical; first vein treated
36474	Endovenous ablation therapy of incompetent vein, extremity, inclusive of all imaging guidance and monitoring, percutaneous, mechanochemical; subsequent vein(s) treated in a single extremity, each through separate access sites (List separately in addition to code for primary procedure)
36475	Endovenous ablation therapy of incompetent vein, extremity, inclusive of all imaging guidance and monitoring, percutaneous, radiofrequency; first vein

	treated
36476	Endovenous ablation therapy of incompetent vein, extremity, inclusive of all imaging guidance and monitoring, percutaneous, radiofrequency; subsequent vein(s) treated in a single extremity, each through separate access sites (List separately in addition to code for primary procedure)
36478	Endovenous ablation therapy of incompetent vein, extremity, inclusive of all imaging guidance and monitoring, percutaneous, laser; first vein treated
36479	Endovenous ablation therapy of incompetent vein, extremity, inclusive of all imaging guidance and monitoring, percutaneous, laser; subsequent vein(s) treated in a single extremity, each through separate access sites (List separately in addition to code for primary procedure)
36482	Endovenous ablation therapy of incompetent vein, extremity, by transcatheter delivery of a chemical adhesive (e.g., cyanoacrylate) remote from the access site, inclusive of all imaging guidance and monitoring, percutaneous; first vein treated
36483	Endovenous ablation therapy of incompetent vein, extremity, by transcatheter delivery of a chemical adhesive (e.g., cyanoacrylate) remote from the access site, inclusive of all imaging guidance and monitoring, percutaneous; subsequent vein(s) treated in a single extremity, each through separate access sites (List separately in addition to code for primary procedure)

Service: Venous Ligation/Stripping

General Guidelines

- **Units, Frequency, & Duration:** Once per each instance of symptomatic superficial venous incompetence.
- **Criteria for Subsequent Requests:** None.
- **Recommended Clinical Approach:** Vein ligation/stripping is an effective treatment for patients with symptomatic superficial venous incompetence who fail to improve with compression therapy **AND** are not candidates for a catheter-based or chemical venous ablation (e.g., venous tortuosity, inadequate vein length for treatment of less than 10 cm).[19] The ordering clinician should provide appropriate clinical documentation to justify the performance of the ligation/stripping procedure (i.e., symptoms of venous insufficiency which fail to respond to compression therapy and a duplex scan that demonstrates significant superficial venous reflux) **AND** the pertinent clinical factors favoring ligation/stripping over a catheter-based or chemical ablation procedure.[28,30]
- **Exclusions:** Venous ligation/stripping may not be appropriate for patients in poor general health or patients with 1) a compromised deep venous vascular system; 2) acute DVT; or 3) acute superficial thrombophlebitis.[30]

Medical Necessity Criteria

Indications

➔ **Venous ligation/stripping** is considered appropriate if **ALL** of the following are **TRUE** [28,30]:

- The patient has **at least two** positive findings from the clinical presentation list.
- The patient has **at least two** positive findings from the typical physical exam findings list.
- The patient has significant superficial venous reflux demonstrated by duplex scanning in the upright position.
- The patient fails to show significant clinical improvement despite conservative care for greater than 6 weeks (i.e., compression therapy, leg elevation, pharmacotherapy).
- The patient is not a candidate for a catheter-based or chemical venous ablation (e.g., venous tortuosity, inadequate vein length for treatment of less than 10 cm).

Non-Indications

➔ **Venous ligation/stripping** is **NOT** considered appropriate if **ANY** of the following is **TRUE**[30]:

- The patient has a limited life expectancy due to co-morbid conditions.
- The patient is non-ambulatory.
- The patient has any absolute contraindications to intervention (e.g., cardiopulmonary risk factors, bleeding diathesis).
- There is evidence of occlusion but no accompanying symptoms.
- There is a significant vascular anomaly (e.g., AV fistula) at or adjacent to the planned intervention site.
- The patient has acute conditions outside of this care path's scope (i.e., solid compressive malignancy, superficial or deep thrombophlebitis).
- The patient is pregnant.

Site of Service Criteria

Outpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
37700	Ligation and division of long saphenous vein at saphenofemoral junction, or distal interruptions
37718	Ligation, division, and stripping, short saphenous vein
37722	Ligation, division, and stripping, long (greater) saphenous veins from saphenofemoral junction to knee or below
37780	Ligation and division of short saphenous vein at saphenopopliteal junction (separate procedure)
37799	Unlisted procedure, vascular surgery
37765	Stab phlebectomy varicose veins, 1 extremity, 10-20 incisions
37766	Stab phlebectomy varicose veins, 1 extremity, >20 incisions

Surgical Risk Factors

Patient Medical Risk Stratification

Patient Risk Score	Patient Characteristic	Min Range	Max Range	Guidance
1- Very Low Risk	No known medical problems			
2- Low Risk	Hypertension		180/110 mm Hg	
2- Low Risk	Asthma	peak flow >80% of predicted or personal best value		
2- Low Risk	Prior history of alcohol abuse			Screen for liver disease and malnutrition
2- Low Risk	Prior history of tobacco use			
3- Intermediate Risk	Asthma	peak flow <80% of predicted or personal best value		
3- Intermediate Risk	Active alcohol abuse			
3- Intermediate Risk	Age	65	75	
3- Intermediate Risk	History of treated, stable coronary artery disease (CAD)			
3- Intermediate Risk	Stable atrial fibrillation			
3- Intermediate Risk	Diabetes mellitus	HbA1C >7%		
3- Intermediate Risk	Morbid obesity	BMI 30	BMI 40	
3- Intermediate Risk	Anemia	hemoglobin <11 (females), <12 (males)		Workup to identify etiology
3- Intermediate Risk	HIV	CD4 <200 cells/mm3		Get clearance from HIV specialist
3- Intermediate Risk	Rheumatologic disease			Preoperative consultation with rheumatologist re: perioperative medication management
3- Intermediate Risk	Peripheral vascular disease or history of peripheral vascular bypass	ankle-brachial pressure index (ABPI) <0.9		Preoperative consultation with vascular surgeon
3- Intermediate Risk	History of venous thromboembolism (VTE)			

3- Intermediate Risk	Well-controlled obstructive sleep apnea			
3- Intermediate Risk	Malnutrition	transferrin <200 mg/dL albumin <3.5 g/dL prealbumin <22.5 mg/dL total lymphocyte count <1200-1500 cell/mm3 BMI <18		Preoperative consultation with nutritionist
3- Intermediate Risk	Active tobacco Use			Enroll patient in smoking cessation program
3- Intermediate Risk	Known allergy or hypersensitivity to medication needed for procedure			
4- High Risk	Advanced Renal Disease (Creatinine > 2)			
4- High Risk	Diabetes mellitus with complications	HbA1c >8%		
4- High Risk	Age	76	85	
4- High Risk	Oxygen dependent pulmonary disease			
4- High Risk	Sickle cell anemia			
4- High Risk	Obesity	BMI 40		
4- High Risk	Cirrhosis, history of hepatic decompensation or variceal bleeding			
4- High Risk	Impaired cognition; dementia			
4- High Risk	Compensated CHF			
4- High Risk	Cerebrovascular disease			
4- High Risk	Uncontrolled or suspected obstructive sleep apnea (OSA)			
4- High Risk	Renal insufficiency	serum creatinine >1.5 mg/dL or creatinine clearance <100 mL/min		
4- High Risk	Opioid dependence			
5- Very High Risk	Percutaneous Coronary Intervention (PCI) within 1 month			

5- Very High Risk	Cardiovascular: unstable angina, recent myocardial infarction (60 days), uncontrolled atrial fibrillation or other high-grade abnormal rhythm, severe valvular disease, decompensated heart failure			
5- Very High Risk	Primary pulmonary hypertension			Preoperative consultation with pulmonologist warranted
5- Very High Risk	Cirrhosis or severe liver disease, history of hepatic decompensation or variceal bleeding			
5- Very High Risk	Severe frailty, dependence for ADLs, or history of 3 or more falls in last 6 mos			
5- Very High Risk	Obesity		BMI >50	
5- Very High Risk	Age		>85	
5- Very High Risk	History of VTE with CI to anticoagulation, failure of anticoagulation, cessation of anticoagulation therapy secondary to bleeding			Preoperative consultation with hematologist or internist
5- Very High Risk	Renal failure requiring dialysis			
5- Very High Risk	Immunosuppression			
5- Very High Risk	Chronic Pain			

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