

Median	I	NI	MADM	Rating	Agree	Disagree
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Upper Extremity Venous Evaluation

Table 1. Venous Duplex of the Upper Extremities for Patency and Indication

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Median	I	NI	MADM	Rating	Agree	Disagree	
Limb Swelling																							
1	·	Unilateral – acute	9	9	9	9	9	9	9	8	9	8	9	9	9	9	9	9	0.1	A	+		
2	·	Unilateral – chronic, persistent	7	7	7	6	7	6	7	9	7	7	8	7	8	7	8	7	0.5	A	+		
3	·	Bilateral – acute	9	9	7	8	7	6	9	8	8	9	5	9	9	7	6	8	8	8	1.1	A	+
3	·	Suspected central venous obstruction																					
3	·	Bilateral – chronic, persistent																					
3	·	No alternative diagnosis identified (e.g., no CHF or anasarca from hypoalbuminemia)	9	8	7	7	7	6	8	7	7	8	5	7	9	7	6	7	7	7	0.7	A	+
4	·	Suspected central venous obstruction																					
Limb Pain (Without Swelling)																							
5	·	Non-articular pain in the upper extremity (no indwelling upper extremity venous catheter)	5	6	6	8	8	6	4	7	5	6	2	5	4	4	2	5	6	4	1.4	U	
6	·	Non-articular pain in the upper extremity with indwelling upper extremity venous catheter	5	7	8	8	7	7	5	6	8	7	7	5	8	7	5	7	7	7	0.9	A	
7	·	Tender, palpable cord in the upper extremity	8	9	9	8	7	7	9	9	8	7	8	9	9	8	9	8	8.5	8	0.7	A	+
Shortness of Breath																							
8	·	Suspected pulmonary embolus (no indwelling upper extremity venous catheter)	5	4	5	4	3	3	7	5	3	7	2	9	3	4	2	4	4.5	3	1.5	U	
9	·	Suspected pulmonary embolus with indwelling upper extremity venous catheter	5	5	7	7	5	6	4	6	6	7	2	8	6	7	4	6	5.5	6	1.1	U	
10	·	Diagnosed pulmonary embolus (no indwelling upper extremity venous catheter)	5	6	3	4	2	5	1	3	4	7	2	9	2	4	2	4	3.5	4	1.7	U	
11	·	Diagnosed pulmonary embolus with indwelling upper extremity venous catheter	5	6	5	6	4	7	6	3	6	7	7	9	8	6	4	6	5.5	7	1.1	U	
Fever																							
12	·	Fever of unknown origin (no indwelling upper extremity venous catheter)	5	2	3	4	5	1	1	2	1	6	1	4	1	4	2	2	2.5	2	1.5	I	
13	·	Fever with indwelling upper extremity venous catheter	5	5	7	7	3	4	9	3	1	7	1	4	1	6	3	4	5	3	2.0	U	
Known Upper Extremity Venous Thrombosis																							
14	·	New upper extremity pain or swelling while on anticoagulation	7	8	7	7	4	7	7	7	3	7	8	7	9	9	8	7	7	8	0.9	A	+
15	·	New upper extremity pain or swelling, not on anticoagulation (i.e., contraindication to anticoagulation)	7	8	7	7	4	7	8	7	5	7	8	8	9	9	8	7	7	8	0.9	A	+
16	·	Before anticipated discontinuation of anticoagulation treatment	7	6	5	3	5	4	7	5	6	7	8	5	5	3	5	5	5	5	1.1	U	
17	·	Shortness of breath in a patient with known upper extremity DVT	3	7	3	3	3	3	1	3	3	7	3	9	3	3	2	3	3	3	1.1	I	+
18	·	Surveillance after diagnosis of upper extremity superficial phlebitis	3	3	7	7	5	4	4	6	8	7	3	6	9	6	2	6	4.5	6	1.7	U	
18	·	Not on anticoagulation, phlebitis location < 5 cms from deep vein																					
18	·	Surveillance after diagnosis of upper extremity superficial phlebitis	3	3	7	7	5	4	4	6	8	7	3	6	9	6	2	6	4.5	6	1.7	U	
19	·	Not on anticoagulation, phlebitis location > 5 cms from deep vein	3	5	5	6	2	1	3	3	8	6	3	5	7	4	2	4	3	5	1.7	U	
Vein Mapping Prior to Bypass Surgery (Coronary or Peripheral)																							
20	·	In the absence of adequate leg vein for harvest	9	8	7	8	8	8	8	8	8	7	7	5	9	9	7	8	8	7	0.7	A	+
21	·	In the presence of adequate leg vein for harvest	3	5	3	5	4	5	4	5	3	3	2	7	3	4	3	4	4.5	3	1.0	U	
Screening Examination for Upper Extremity DVT																							
22	·	Prior to pacemaker or implantable cardiac defibrillator placement	3	5	3	6	2	3	4	4	7	4	1	2	3	4	2	3	3.5	3	1.2	I	
22	·	Prolonged ICU stay (e.g., > 4 days)																					
23	·	No indwelling upper extremity venous catheter	1	4	3	5	2	1	1	3	2	3	1	2	3	1	2	2	2.5	2	0.9	I	+

24	· Prolonged ICU stay (e.g., > 4 days)	3	4	3	5	3	3	3	4	3	4	1	2	6	2	2	3	3	2	0.9	I	
25	· Indwelling upper extremity venous catheter	1	3	3	2	2	1	1	3	3	3	1	2	2	2	1	2	2	2	0.7	I	+
26	· In those with high-risk: acquired, inherited or hypercoagulable	1	4	2	6	2	1	1	3	3	3	1	6	2	2	2	2	2	2	1.1	I	+
27	· Positive D-dimer test in a hospital inpatient	1	1	2	5	1	1	1	1	3	3	1	5	3	1	2	1	1	3	1.1	I	+

Lower Extremity Venous Evaluation

Table 2. Venous Duplex of the Lower Extremities for Patency and

Indication

Limb Swelling

28	· Unilateral – acute	9	9	9	9	9	9	9	9	8	9	9	8	9	9	9	9	9	9	0.1	A	+
29	· Unilateral – chronic, persistent	7	6	7	6	8	6	7	8	7	7	8	6	9	7	7	7	7	7	0.6	A	+
30	· Bilateral – acute	9	6	7	8	7	7	9	8	8	9	5	7	9	8	7	8	7.5	8	0.9	A	+
31	· No alternative diagnosis identified (e.g., no CHF or anasarca from hypoalbuminemia)	7	7	5	6	5	4	6	7	7	7	5	7	7	6	5	6	6	7	0.9	U	

Limb Pain (Without Swelling)

32	· Non-articular pain in the lower extremity (e.g. calf or thigh)	5	7	7	8	5	7	6	7	7	7	5	6	7	6	6	7	7	6	0.7	A	
33	· Knee pain	3	1	5	2	2	5	7	5	5	4	1	5	5	1	1	4	4	4	1.7	U	
34	· Tender, palpable cord in the lower extremity	9	8	8	8	4	7	9	8	8	7	8	8	9	8	9	8	8	8	0.7	A	+

Shortness of Breath

35	· Suspected pulmonary embolus	9	3	7	7	9	7	9	7	7	8	7	9	9	9	9	8	7	9	1.2	A	+
36	· Diagnosed pulmonary embolus	9	6	5	7	7	5	5	5	8	8	6	9	9	8	5	7	5.5	8	1.4	A	

Fever

37	· Fever of unknown origin (no indwelling lower extremity venous catheter)	3	1	5	7	6	5	1	2	1	5	1	5	2	7	5	5	4	5	1.9	U	
38	· Fever with indwelling lower extremity venous catheter	3	5	5	7	3	7	6	6	1	7	5	5	5	8	5	5	5.5	5	1.3	U	

Known Lower Extremity Venous Thrombosis

39	· Surveillance of calf vein thrombosis for proximal propagation in patient with contraindication to anticoagulation (within 2 weeks of)	5	7	8	7	7	7	7	9	8	8	7	7	9	7	7	7	7	7	0.6	A	+
40	· New lower extremity pain or swelling, while on anticoagulation	7	9	7	7	7	7	7	7	7	7	8	7	8	9	8	7	7	8	0.5	A	+
41	· New lower extremity pain or swelling, not on anticoagulation (i.e., contraindication to anticoagulation)	7	9	9	7	7	7	7	8	7	7	8	8	9	8	8	8	7	8	0.7	A	+
42	· Before anticipated discontinuation of anticoagulation treatment	3	6	7	2	5	4	4	3	7	6	7	5	6	3	5	5	4	6	1.3	U	
43	· Shortness of breath in a patient with known DVT	3	6	5	7	3	6	3	3	5	7	1	8	5	4	5	5	4	5	1.5	U	
44	· Surveillance after diagnosis of lower extremity superficial phlebitis	3	7	7	8	7	7	7	6	7	8	5	6	9	6	5	7	7	6	1.0	A	
45	· Not on anticoagulation, phlebitis location < 5 cms from deep vein	3	4	5	6	6	6	5	5	7	7	5	5	7	5	5	5	5	5	0.8	U	+
45	· Not on anticoagulation, phlebitis location . 5 cms from deep vein	3	4	5	6	6	6	5	5	7	7	5	5	7	5	5	5	5	5	0.8	U	+

Vein Mapping Prior to Bypass Surgery (Coronary or Peripheral)

46	· In the absence of prior lower extremity vein harvest or ablation	9	8	8	8	8	8	7	7	8	8	8	5	9	9	7	8	8	8	0.6	A	+
47	· In the presence of prior lower extremity vein harvest or ablation	9	8	7	6	9	9	7	8	8	8	8	6	9	8	8	8	8	8	0.7	A	+

Screening Examination for lower extremity DVT †

48	· After orthopedic surgery	3	3	4	7	2	6	3	3	1	5	2	6	7	2	3	3	3	3	1.5	I	
49	· Prolonged ICU stay (e.g., > 4 days)	3	5	3	7	2	6	3	3	1	5	1	5	6	2	2	3	3	2	1.5	I	
50	· In those with high-risk: acquired, inherited or hypercoagulable	3	3	3	7	3	3	1	4	1	5	1	7	7	2	2	3	3	2	1.5	I	
51	· Positive D-dimer test in a hospital inpatient	5	1	3	2	1	5	1	3	1	3	1	6	2	1	5	2	2.5	2	1.5	I	+

Post Endovenous (Great or Small) Saphenous Ablation

52	· Lower extremity swelling or pain	7	9	8	7	9	8	9	8	8	8	7	7	9	7	8	8	8	8	0.6	A	+
53	· Routine post procedure follow-up, no lower extremity pain or swelling	3	6	7	7	6	7	5	7	8	7	2	6	9	7	5	7	6.5	7	1.3	A	
	· Within 10 days post procedure																					

Other Symptoms of Vascular Disease

Indication

54	· Physiologic testing positive for venous obstruction	9	7	5	4	7	7	7	9	7	7	8	6	9	7	7	7	7	0.9	A	+
55	· Patent foramen ovale with suspected paradoxical embolism for patient without lower extremity pain or swelling obstruction	3	5	7	7	8	7	9	7	7	7	8	6	9	7	7	7	7	0.9	A	+

Table 3. Duplex Evaluation for Venous Incompetency

Indication

Venous Insufficiency (Venous Duplex with Provocative Maneuvers for Incompetency)

56	· Active venous ulcer	9	9	9	9	9	6	9	7	9	8	8	6	9	7	7	9	9	8	0.9	A	+
57	· Healed venous ulcer	3	7	7	7	9	7	7	7	9	6	7	5	9	6	5	7	7	6	1.1	A	
58	· Spider veins (telangiectasias)	3	3	3	3	2	2	3	6	6	2	2	5	5	4	2	3	3	4	1.1	I	
59	· Varicose veins, entirely asymptomatic	3	5	5	6	2	3	1	5	5	3	1	5	9	7	3	5	4	5	1.7	U	
60	· Varicose veins with lower extremity pain or heaviness	7	7	7	7	9	5	8	7	7	7	7	6	9	7	5	7	7	7	0.7	A	+
61	· Visible varicose veins with chronic lower extremity swelling or skin changes of chronic venous insufficiency (e.g., hyperpigmentation,	7	7	7	8	9	7	9	9	9	8	7	7	9	7	7	7	7.5	7	0.8	A	+
62	· Skin changes of chronic venous insufficiency without visible varicose veins (e.g., hyperpigmentation, lipodermatosclerosis)	7	7	5	8	9	7	7	9	9	8	4	6	8	6	4	7	7	6	1.3	A	
63	· Lower extremity pain or heaviness without signs of venous disease	3	6	5	6	7	5	6	6	5	4	8	6	5	5	5	5	6	5	0.9	U	+
64	· Mapping prior to venous ablation procedure	5	7	8	8	8	8	8	8	9	8	8	8	9	7	7	8	8	8	0.5	A	+
65	· Prior endovenous (great or small) saphenous ablation procedure with new or worsening varicose veins in the ipsilateral limb	7	7	8	8	9	8	6	8	9	8	8	7	9	8	7	8	8	8	0.6	A	+
66	· Prior endovenous (great or small) saphenous ablation procedure with no residual symptoms.	1	5	5	3	3	2	3	7	3	2	2	4	5	4	5	3	3	4	1.3	I	

Table 4. Venous Physiological Testing (Plethysmography) With Provocative Maneuvers to Assess for Patency and/or Incompetency

Indication

Limb Pain, Swelling or Other Signs of Venous Disease

67	· Active venous ulcer	9	7	7	8	7	6	4	7	9	6	7	5	7	8	6	7	7	7	0.9	A	
68	· Varicose veins, entirely asymptomatic	1	5	5	7	2	3	3	5	9	5	2	4	5	7	2	5	4	5	1.7	U	
69	· Varicose veins with lower extremity pain or heaviness	7	5	7	7	4	7	4	7	9	7	8	6	5	8	5	7	7	7	1.1	A	
70	· Varicose veins with chronic lower extremity swelling or skin changes of chronic venous insufficiency (e.g., hyperpigmentation or	7	5	7	7	4	8	4	8	9	7	7	7	7	7	2	7	7	7	1.1	A	+
71	· Skin changes of chronic venous insufficiency without visible varicose veins (e.g., hyperpigmentation or lipodermatosclerosis)	7	5	7	7	8	8	4	8	9	8	3	7	4	7	2	7	7	7	1.5	A	
72	· Lower extremity pain or heaviness without signs of venous disease	7	4	3	7	8	5	2	7	9	6	2	6	1	7	2	6	6	6	2.1	U	-
73	· Limb swelling: unilateral – acute	9	3	3	7	2	1	2	7	9	5	2	7	2	3	4	3	3	4	2.2	I	-
	· Suspected acute venous thrombosis																					

Shortness of Breath

74	· Suspected pulmonary embolus	9	1	3	6	2	1	1	6	1	3	1	8	1	3	2	2	2.5	2	2.0	I	+
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Duplex Evaluation of the Inferior Vena Cava (IVC) and Iliac Veins

Table 5. Duplex of the IVC and Iliac Veins for Patency and Thrombosis)

Indication

Prior to IVC filter placement

75	· Prior to IVC filter placement	9	7	7	7	6	4	3	8	3	7	3	7	3	6	5	6	7	5	1.7	U	
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Evaluation for suspected deep vein thrombosis

76	· Lower extremity swelling - unilateral or bilateral – as a “stand alone test” without a venous duplex of the lower extremities	3	1	3	2	3	1	1	3	3	3	1	7	1	3	1	3	2.5	3	1.1	I	+
77	· Lower extremity swelling – unilateral or bilateral – combined routinely with a venous duplex of the lower extremities	9	1	5	2	5	2	1	5	1	3	1	7	5	4	5	4	3.5	4	2.0	U	

78	· Lower extremity swelling – unilateral or bilateral –performed selectively – when the lower extremity venous duplex is normal	9	6	5	7	7	2	4	7	1	7	2	6	1	7	5	6	6.5	5	2.0	U	
79	· Lower extremity swelling – unilateral or bilateral –performed selectively – when the lower extremity venous duplex is positive for	9	9	7	8	7	7	7	7	9	5	7	8	9	7	6	7	7	7	0.9	A	+
80	· Selectively - When the flow pattern in one or both common femoral veins is abnormal	9	9	9	8	8	8	8	8	7	7	7	7	7	8	7	8	8	7	0.6	A	+
Evaluation for suspected pulmonary embolus																						
81	· Pulmonary symptoms (suspected pulmonary embolus) - as a “stand alone test” without a venous duplex of the lower extremities	3	1	3	2	2	1	1	2	1	3	1	8	2	3	1	2	2	2	1.1	I	+
82	· Pulmonary symptoms (suspected pulmonary embolus) – combined routinely with a venous duplex of the lower extremities	9	1	5	2	4	5	3	6	1	3	1	8	8	4	4	4	4.5	4	2.0	U	
Evaluation of Other Symptoms or Signs of Abdominal Vascular Disease																						
83	· Abdominal pain	3	3	3	4	4	2	1	3	1	3	1	5	4	2	3	3	3	3	0.9	I	+
84	· Abdominal bruit	3	3	3	3	4	2	1	3	1	1	1	5	4	2	3	3	3	2	0.9	I	+
85	· Fever of unknown origin	3	1	3	5	1	1	1	3	1	3	1	5	3	4	3	3	2	3	1.1	I	+

Table 6. Duplex of the Hepatoportal System (portal vein, hepatic veins, splenic vein, superior mesenteric vein, inferior vena cava) for Patency, Thrombosis, and Flow Direction †

Indication

Evaluation of Hepatic Dysfunction or Portal Hypertension

· Abnormal liver function tests																						
86	· No alternative diagnosis identified (e.g. medication related or infectious hepatitis)	7	5	9	7	6	4	6	7	5	6	6	6	4	7	5	6	6.5	6	0.9	U	
87	· Cirrhosis with or without ascites	7	6	8	8	2	7	7	7	1	6	7	5	5	7	7	7	7	6	1.3	A	
· Jaundice																						
88	· As an initial diagnostic test	7	4	5	2	2	2	3	6	1	6	2	2	3	4	1	3	3.5	2	1.5	I	
· Jaundice																						
89	· No alternative diagnosis identified (e.g. biliary obstruction)	7	5	5	7	4	6	5	7	1	5	6	6	2	7	7	6	5.5	6	1.3	U	
90	· Hepatomegaly and/or splenomegaly	7	7	7	7	7	7	6	7	1	5	3	6	7	7	7	7	7	6	0.9	A	
91	· Portal hypertension	7	7	9	7	9	8	9	7	5	5	7	6	9	8	8	7	7.5	7	1.1	A	+

Surveillance following Portal Decompression Procedure

92	· Follow-up of a TIPS	7	7	9	9	9	8	9	7	9	7	7	6	9	8	7	8	8.5	7	0.9	A	+
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Evaluation of Symptoms or Signs of Abdominal Vascular Disease

93	· Abdominal pain	3	3	7	7	4	2	6	7	1	3	1	4	4	5	4	4	5	4	1.5	U	
94	· Fever of unknown origin	3	3	5	5	2	2	1	5	1	3	1	5	3	4	2	3	3	3	1.2	I	

Evaluation of Cardiac and/or Pulmonary Symptoms

95	· Pulmonary symptoms (suspected pulmonary embolus)	5	1	3	6	1	2	1	3	1	3	1	8	3	2	3	3	2.5	3	1.5	I	+
96	· Cor pulmonale	5	1	5	5	2	2	1	3	5	3	1	7	3	3	4	3	2.5	3	1.4	I	

Table 7. Duplex of the Renal Veins for Patency and Thrombosis*

Indication

Evaluation for Suspected Renal Vein Thrombosis – Potential Signs and/or Symptoms

97	· Gross hematuria	9	2	7	3	5	2	1	5	5	4	1	6	2	2	3	3	4	3	1.9	I	
98	· Acute renal failure	9	5	3	7	7	3	4	5	1	6	1	6	8	2	4	5	5	4	2.0	U	
99	· Acute flank pain	9	4	3	6	7	5	3	5	5	5	1	6	3	2	3	5	5	3	1.6	U	

Evaluation of Cardiac and/or Pulmonary Symptoms

100	· Pulmonary symptoms (suspected pulmonary embolus)	3	2	3	5	1	2	1	3	1	3	1	8	7	2	3	3	2.5	3	1.5	I	+
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Evaluation of Other Symptoms or Signs of Abdominal Vascular Disease

101	· Drug-resistant hypertension (suspected renal artery stenosis)	3	2	3	2	2	2	5	3	1	3	1	5	2	3	3	3	2.5	3	0.9	I	+
102	· Microscopic hematuria (prior to urological evaluation)	3	4	5	3	2	2	1	3	1	3	1	4	2	2	2	2	3	2	0.9	I	+

103	· Fever of unknown origin	3	4	5	7	1	2	1	4	1	3	1	4	1	2	2	2	3.5	2	1.4	I	
104	· Epigastric bruit	3	4	2	3	3	2	1	3	1	3	1	3	2	2	2	2	3	2	0.7	I	+
Hemodialysis Vascular Access Duplex Ultrasound																						
Table 8. Preoperative Planning and Postoperative Assessment of a Vascular Access Site*																						
Indication																						
Assessment Prior to Access Site Placement																						
105	· Preoperative Mapping Study (Upper extremity arterial and venous duplex) ≥3 months prior to access placement	5	5	3	5	3	1	3	4	1	3	1	7	1	6	5	3	3.5	3	1.6	I	
106	· Preoperative Mapping Study (Upper extremity arterial and venous duplex) ≤3 months prior to access placement	9	8	8	8	9	9	9	7	9	7	8	7	9	8	8	8	8.5	8	0.6	A	+
“Failure to Mature”																						
107	· “Failure to Mature” on basis of physical examination 0-6 weeks after placement	5	6	8	4	9	9	7	6	7	5	1	6	5	4	8	6	6.5	5	1.6	U	
108	· “Failure to Mature” on basis of physical examination >6 weeks after placement	9	8	9	7	5	9	9	8	7	8	8	6	8	8	7	8	8.5	8	0.8	A	+
Symptoms and Signs of Disease*																						
109	· Signs of access site malfunction during dialysis (e.g., low blood flows, kt/V, recirculation times or increased venous pressure)	9	8	9	7	5	8	7	8	9	8	8	7	9	7	7	8	8	8	0.8	A	+
110	· Mass associated with an AVF/AVG	9	6	9	9	5	8	9	8	9	8	8	7	1	8	7	8	8.5	8	1.3	A	+
111	· Loss of palpable thrill of AVF/AVG	9	7	9	9	8	8	2	8	9	7	8	7	8	8	8	8	8	8	0.9	A	+
112	· Arm swelling	9	7	8	8	8	5	9	8	9	7	8	7	8	8	8	8	8	8	0.6	A	+
113	· Hand pain, pallor, and/or digital ulceration (i.e., evaluation for suspected arterial steal syndrome)	9	8	9	8	4	1	9	8	9	8	8	7	8	8	9	8	8	8	1.1	A	+
114	· Cool extremity	9	5	3	6	2	1	3	4	7	2	2	6	3	3	3	3	3.5	3	1.6	I	
115	· Without pain, pallor, or ulceration	9	8	8	6	6	8	9	6	8	7	8	7	8	8	7	8	8	8	0.7	A	+
115	· Difficult cannulation by multiple personnel on multiple attempts	9	8	8	6	6	8	9	6	8	7	8	7	8	8	7	8	8	8	0.7	A	+
Asymptomatic†																						
116	· Routine surveillance of a functioning AVF or AVG	3	3	5	5	5	1	1	3	1	3	1	6	7	3	3	3	3	3	1.4	I	+