

American College of Radiology
ACR Appropriateness Criteria®

Lower Extremity Chronic Venous Disease

Variant 1: Varicose veins. Initial diagnosis.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US duplex Doppler lower extremity	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	1	0	0	0	0	0	4	11
		References		Study Quality											
		1 (28447881)		4											
		17 (27430666)		2											
		14 (26556703)		4											
		9 (23482555)		4											
		15 (28411707)		4											
		16 (-3194752)		4											
Catheter venography iliac veins	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv		3	3	1	7	3	2	1	2	0	0	0
Catheter venography lower extremity	Usually not appropriate	Limited	☢☢ 0.1-1mSv		2	2	2	8	2	2	1	1	0	0	0
		References		Study Quality											
		9 (23482555)		4											
CTV lower extremity with IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv		2	2	4	5	4	2	0	0	0	1	0
		References		Study Quality											
		11 (27565630)		4											
		10 (23929418)		4											

		2 (24840962)			4											
Ligation and stripping	May be appropriate	Strong	N/A		N/A	6	6	0	0	0	0	4	8	3	1	0
		References			Study Quality											
		38 (26319476)			1											
		39 (21931012)			1											
		37 (20801608)			1											
		24 (23390218)			Inadequate											
		40 (23768792)			1											

Variant 3: Venous leg ulcer. Initial diagnosis.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations									
							1	2	3	4	5	6	7	8	9	
US duplex Doppler lower extremity	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	2	1	13	
		References		Study Quality												
		20 (28063094)		4												
		1 (28447881)		4												
		14 (26556703)		4												
		8 (26358310)		4												
		19 (26094638)		4												
		9 (23482555)		4												
		43 (17497654)		3												
US duplex Doppler IVC and iliac veins	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	2	1	9	3	1	
		References		Study Quality												
		44 (26992969)		4												
		46 (26946891)		1												
		45 (17540535)		2												

CTV abdomen and pelvis with IV contrast	May be appropriate	Limited	⊕⊕⊕⊕ 10-30 mSv		6	6	0	0	4	2	2	8	0	0	0
		References	Study Quality												
		11 (27565630)	4												
		10 (23929418)	4												
		9 (23482555)	4												
		12 (25075589)	4												
		13 (26946904)	4												
MRV abdomen and pelvis without and with IV contrast	May be appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	6	6	0	0	4	2	2	8	0	0	0
		References	Study Quality												
		11 (27565630)	4												
		10 (23929418)	4												
		9 (23482555)	4												
		12 (25075589)	4												
		13 (26946904)	4												
CTV lower extremity with IV contrast	May be appropriate (Disagreement)	Expert Opinion	⊕⊕⊕⊕ 10-30 mSv		5	5	2	0	5	2	4	3	0	0	0
		References	Study Quality												
		11 (27565630)	4												
		8 (26358310)	4												
		10 (23929418)	4												
		12 (25075589)	4												
		13 (26946904)	4												
MRV lower extremity without and with IV contrast	May be appropriate (Disagreement)	Expert Opinion	○ ○ mSv	○ ○ mSv [ped]	5	5	1	1	5	2	3	2	2	0	0
		References	Study Quality												
		10 (23929418)	4												
		9 (23482555)	4												

US intravascular iliac veins	May be appropriate (Disagreement)	Expert Opinion	0 0 mSv	0 0 mSv [ped]	5	5	0	1	4	1	1	0	6	3	0
		References		Study Quality											
		8 (26358310)		4											
		41 (28818221)		3											
		42 (29033314)		3											
Catheter venography iliac veins	May be appropriate	Limited	☼☼☼☼ 10-30 mSv		5	5	0	2	2	3	8	1	0	0	0
		References		Study Quality											
		8 (26358310)		4											
		9 (23482555)		4											
		41 (28818221)		3											
Catheter venography lower extremity	May be appropriate	Limited	☼☼ 0.1-1mSv		4	4	0	4	2	5	4	1	0	0	0
		References		Study Quality											
		9 (23482555)		4											

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Wound care	Usually appropriate	Limited	N/A	N/A	9	9	0	0	0	0	1	0	1	2	12
		References		Study Quality											
		6 (26358306)		4											
		21 (24974070)		4											
Compression therapy	Usually appropriate	Strong	N/A	N/A	8	8	0	0	0	1	0	1	2	6	6
		References		Study Quality											
		20 (28063094)		4											

		17 (27430666)			2												
		19 (26094638)			4												
		18 (22819741)			2												
		47 (30554745)			4												
		15 (28411707)			4												
		21 (24974070)			4												
		16 (-3194752)			4												
	Saphenous vein ablation	Usually appropriate	Strong	N/A		N/A	8	8	0	0	0	0	1	2	3	7	3
		References		Study Quality													
		12 (25075589)		4													
		27 (26564912)		4													
		28 (29895399)		Good													
		25 (27898181)		4													
		26 (17600655)		1													
		29 (20638231)		1													
		24 (23390218)		Inadequate													
		30 (29292115)		Good													
		31 (28119106)		Good													
		48 (29688123)		1													
	Compression sclerotherapy	Usually appropriate	Strong	N/A		N/A	7	7	0	0	1	0	1	2	10	1	1
		References		Study Quality													
		7 (27878794)		4													
		14 (26556703)		4													
		36 (27561823)		1													
		35 (26132315)		1													
		33 (23769603)		1													
		34 (29652081)		1													
		32 (29037363)		Good													

Iliac vein stenting	May be appropriate	Limited	N/A	N/A	6	6	0	0	0	0	6	9	1	0	0
		References		Study Quality											
		8 (26358310)		4											
		49 (29292114)		1											
		15 (28411707)		4											
Ligation and stripping	May be appropriate	Strong	N/A	N/A	5	5	0	0	1	2	6	5	2	0	0
		References		Study Quality											
		38 (26319476)		1											
		39 (21931012)		1											
		37 (20801608)		1											
		24 (23390218)		Inadequate											
		40 (23768792)		1											
Microphlebectomy	May be appropriate	Expert Consensus	N/A	N/A	4	4	0	0	8	2	4	1	0	1	0

Variant 5: Suspected pelvic-origin lower extremity varicose veins in females. Initial diagnosis.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US duplex Doppler lower extremity	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	0	1	2	8	5
		References		Study Quality											
		20 (28063094)		4											
		1 (28447881)		4											
		14 (26556703)		4											
		9 (23482555)		4											
		51 (23019985)		4											
		52 (30857986)		4											

			46 (26946891)		1											
			45 (17540535)		2											
Catheter venography pelvis	May be appropriate	Limited	☢☢☢ 0.1-1mSv		6	6	0	0	1	0	4	8	2	1	0	
		References	Study Quality													
		8 (26358310)	4													
		9 (23482555)	4													
US intravascular iliac veins	May be appropriate (Disagreement)	Expert Opinion	○ ○ mSv	○ ○ mSv [ped]	5	5	0	0	3	1	2	7	1	0	2	
		References	Study Quality													
		8 (26358310)	4													
		42 (29033314)	3													
US intravascular renal veins	Usually not appropriate	Expert Consensus	○ ○ mSv	○ ○ mSv [ped]	3	3	0	0	10	1	3	2	0	0	0	

Variant 6: Pelvic-origin lower extremity varicose veins in females. Treatment.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Conservative management	Usually appropriate	Limited	N/A	N/A	7	7	0	0	1	1	4	2	4	3	1
		References		Study Quality											
		72 (28277860)		4											
Compression sclerotherapy	May be appropriate	Limited	N/A	N/A	6	6	0	0	1	2	4	6	1	2	0
		References		Study Quality											
		59 (27397619)		4											
		57 (26404449)		4											
		60 (25729073)		4											
		58 (24190634)		2											

Microphlebectomy	May be appropriate	Expert Consensus	N/A	N/A	5	5	0	0	0	4	7	3	0	1	0
Saphenous vein ablation	May be appropriate (Disagreement)	Expert Opinion	N/A	N/A	5	5	1	2	0	2	7	4	0	0	0
		References	Study Quality												
		56 (25804635)	4												
Iliac vein embolization	May be appropriate	Limited	N/A	N/A	4	4	0	0	2	7	7	0	0	0	0
		References	Study Quality												
		61 (24840963)	4												
Iliac vein stenting	Usually not appropriate	Expert Consensus	N/A	N/A	3	3	0	4	5	3	3	0	0	1	0
Left renal vein stenting	Usually not appropriate	Limited	N/A	N/A	3	3	1	5	3	6	0	1	0	0	0
		References	Study Quality												
		63 (26993690)	4												
		62 (22312068)	4												
Left renal vein surgery	Usually not appropriate	Limited	N/A	N/A	3	3	0	2	7	1	5	1	0	0	0
		References	Study Quality												
		63 (26993690)	4												
		62 (22312068)	4												
		64 (6529137)	4												
		65 (14738638)	4												
		66 (22312071)	4												
Ovarian vein embolization	Usually not appropriate	Limited	N/A	N/A	3	3	1	4	4	4	2	0	0	0	0
		References	Study Quality												
		71 (26769721)	4												
		68 (28791845)	4												

MRV abdomen and pelvis without and with IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	7	7	0	0	1	0	1	2	8	4	0
	References	Study Quality													
	11 (27565630)	4													
	6 (26358306)	4													
	10 (23929418)	4													
	9 (23482555)	4													
	12 (25075589)	4													
	13 (26946904)	4													
US duplex Doppler IVC and iliac veins	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	0	2	7	5	2
	References	Study Quality													
	75 (17592051)	3													
	74 (27247480)	4													
Catheter venography lower extremity	May be appropriate	Expert Consensus	☼☼ 0.1-1mSv		5	5	0	1	2	0	10	2	1	0	0
CTV lower extremity with IV contrast	May be appropriate (Disagreement)	Expert Opinion	☼☼☼☼ 10-30 mSv		5	5	0	2	1	1	2	5	3	2	0
	References	Study Quality													
	11 (27565630)	4													
	8 (26358310)	4													
	10 (23929418)	4													
	12 (25075589)	4													
	13 (26946904)	4													
MRV lower extremity without and with IV contrast	May be appropriate (Disagreement)	Expert Opinion	0 0 mSv	0 0 mSv [ped]	5	5	0	2	1	1	1	6	3	2	0
	References	Study Quality													
	11 (27565630)	4													
	9 (23482555)	4													
	12 (25075589)	4													

		13 (26946904)				4													
US intravascular iliac veins	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv		O 0 mSv [ped]		5	5		1	0	2	0	2	3	6	2	0	
		References				Study Quality													
		8 (26358310)				4													
		6 (26358306)				4													
Catheter venography iliac veins	May be appropriate	Limited	⊕⊕⊕⊕ 10-30 mSv				5	5		0	1	0	2	7	5	1	0	0	
		References				Study Quality													
		6 (26358306)				4													
		9 (23482555)				4													

Variant 8: Iliocaval or lower extremity disease with severe post-thrombotic changes. Treatment.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Anticoagulation	Usually appropriate	Limited	N/A	N/A	8	8	0	0	0	0	0	1	5	8	2
		References		Study Quality											
		76 (27618329)		4											
		77 (22315268)		4											
Compression therapy	Usually appropriate	Limited	N/A	N/A	8	8	0	0	1	0	0	0	6	3	6
		References		Study Quality											
		18 (22819741)		2											
		15 (28411707)		4											
		21 (24974070)		4											
Endovascular stenting	Usually appropriate	Limited	N/A	N/A	7	7	0	0	0	0	2	3	6	5	0
		References		Study Quality											

		49 (29292114)		1											
		15 (28411707)		4											
Catheter-directed thrombolysis with or without thrombectomy lower extremity	May be appropriate	Strong	N/A	N/A	6	6	0	1	1	0	4	8	2	0	0
		References		Study Quality											
		79 (31983322)		2											
		78 (-3194750)		2											
Venous angioplasty	May be appropriate	Limited	N/A	N/A	6	6	0	0	0	1	3	6	3	3	0
		References		Study Quality											
		81 (3631389)		4											
		80 (9129623)		4											
Saphenous vein ablation	May be appropriate (Disagreement)	Expert Opinion	N/A	N/A	5	5	0	7	3	1	2	2	0	1	0
Venous bypass procedure	May be appropriate	Limited	N/A	N/A	5	5	0	0	1	3	11	1	0	0	0
		References		Study Quality											
		82 (26101920)		4											
Compression sclerotherapy	Usually not appropriate	Expert Consensus	N/A	N/A	3	3	1	3	7	2	3	0	0	0	0

Appendix Key

A more complete discussion of the items presented below can be found by accessing the supporting documents at the designated hyperlinks.

Appropriateness Category: The panel's recommendation for a procedure based on the assessment of the risks and benefits of performing the procedure for the specified clinical scenario.

SOE: Strength of Evidence. The assessment of the amount and quality of evidence found in the peer reviewed medical literature for an appropriateness recommendation.

- **References:** The citation number and PMID for the reference(s) associated with the recommendation.
- **Study Quality:** The assessment of the quality of an individual reference based on the number of study quality elements described in the reference.

RRL: Relative Radiation Level. A population based assessment of the amount of radiation a typical patient may be exposed to during the specified procedure.

Rating: The final rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

Median: The median rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

Final tabulations: A histogram showing the number of panel members who rated the procedure as noted in the column heading (ie, 1, 2, 3, etc.).

Additional supporting documents about the AC methodology and processes can be found at www.acr.org/ac.