

American College of Radiology ACR Appropriateness Criteria®

Thoracic Outlet Syndrome

Variant 1: Neurogenic thoracic outlet syndrome. Initial imaging and follow-up imaging after surgery or intervention.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI chest without IV contrast	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	7	7	1	0	0	1	4	0	13	3	0
		References		Study Quality											
		16 (22782291)		4											
MRI chest without and with IV contrast	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	7	7	0	0	0	0	3	1	11	6	1
		References		Study Quality											
		16 (22782291)		4											
Radiography chest	Usually appropriate	Limited	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	7	7	0	0	0	0	0	1	14	7	0
		References		Study Quality											
		26 (21129894)		4											
		20 (22140211)		4											
		25 (22544354)		4											
		27 (19010280)		4											
		23 (23446121)		4											
		24 (22542345)		4											
CTA chest with IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	0	0	0	7	14	1	0	0	0

CTV chest with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕⊕ 10-30 mSv		3	3	6	4	3	3	6	0	0	0	0
MRA chest without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	6	3	13	0	0	0	0	0	0
MRA chest without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	4	3	9	3	2	1	0	0	0
MRV chest without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	9	4	7	0	1	0	1	0	0
MRV chest without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	8	4	7	0	2	0	1	0	0
Catheter venography upper extremity	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv		2	2	11	4	5	1	0	0	0	1	0
Arteriography upper extremity	Usually not appropriate	Expert Consensus	⊕ <0.1 mSv	Varies	1	1	12	3	3	3	0	0	0	1	0

Variant 2: Venous thoracic outlet syndrome. Initial imaging and follow-up imaging after surgery or intervention.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US duplex Doppler subclavian artery and vein	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	8	8	0	1	0	0	2	0	5	6	8

References	Study Quality
5 (11221942)	4
37 (11707008)	3
38 (17928256)	4
28 (16439785)	3
39 (19161749)	3
40 (11444739)	4

MRA chest without and with IV contrast	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	5	5	0	0	2	5	10	4	1	0	0
		References		Study Quality											
		19 (22528911)		3											
MRI chest without IV contrast	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	5	5	0	1	1	6	8	5	1	0	0
		References		Study Quality											
		17 (12637678)		3											
MRV chest without IV contrast	May be appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	5	5	0	1	3	1	10	6	1	0	0
CT chest without IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	4	4	5	1	3	3	8	2	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	3	3	7	3	9	2	0	0	1	0	0
CTA chest with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	2	2	7	7	8	0	0	0	0	0	0
Arteriography upper extremity	Usually not appropriate	Expert Consensus	⊕ <0.1 mSv	Varies	2	2	10	3	5	1	2	1	0	0	0

Variant 3: Arterial thoracic outlet syndrome. Initial imaging and follow-up imaging after surgery or intervention.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CTA chest with IV contrast	Usually appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	8	8	0	0	1	1	0	1	8	7	4
		References		Study Quality											
		12 (10864068)		3											
		13 (10845503)		3											

			41 (17704334)			4												
			1 (17102047)			4												
MRA chest without and with IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	8	8	0	1	0	1	0	2	7	4	7			
			References		Study Quality													
			42 (22127993)		4													
			36 (15208064)		3													
			35 (24840478)		2													
			34 (25348136)		3													
Radiography chest	Usually appropriate	Limited	☼ <0.1 mSv	☼ <0.03 mSv [ped]	8	8	0	0	0	0	2	0	7	12	1			
			References		Study Quality													
			26 (21129894)		4													
			20 (22140211)		4													
			25 (22544354)		4													
			23 (23446121)		4													
			24 (22542345)		4													
US duplex Doppler subclavian artery and vein	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	8	8	0	0	0	0	0	0	5	13	4			
			References		Study Quality													
			28 (16439785)		3													
Arteriography upper extremity	Usually appropriate	Expert Consensus	☼ <0.1 mSv	Varies	7	7	1	0	0	0	2	5	7	7	0			
CT chest with IV contrast	May be appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	6	6	1	0	1	4	5	1	9	1	0			
			References		Study Quality													
			13 (10845503)		3													
MRI chest without and with IV contrast	May be appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	6	6	0	0	0	1	10	4	4	3	0			

MRA chest without IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	5	5	1	0	1	2	12	4	1	0	1
		References	Study Quality												
		42 (22127993)	4												
		36 (15208064)	3												
		35 (24840478)	2												
		34 (25348136)	3												
MRI chest without IV contrast	May be appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	5	5	0	1	2	5	9	3	2	0	0
CT chest without IV contrast	May be appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	4	4	2	2	5	6	6	1	0	0	0
		References	Study Quality												
		13 (10845503)	3												
CT chest without and with IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	3	3	6	3	7	4	2	0	0	0	0
		References	Study Quality												
		13 (10845503)	3												
CTV chest with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		2	2	7	5	7	0	2	0	0	0	0
MRV chest without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	2	2	10	4	5	1	2	0	0	0	0
MRV chest without and with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	2	2	9	4	5	2	2	0	0	0	0
Catheter venography upper extremity	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		2	2	9	4	5	3	0	0	0	0	1

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.