

**American College of Radiology**  
**ACR Appropriateness Criteria®**

## Tracheobronchial Disease

**Variant 1: Adult. Clinically suspected tracheal or bronchial stenosis. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT chest without IV contrast	Usually appropriate	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	8	8	0	0	0	0	1	0	3	8	2
		References		Study Quality											
		23 (22013293)		4											
		22 (11752944)		2											
		21 (17430592)		2											
		20 (14605057)		2											
		19 (33992979)		2											
CT chest with IV contrast	Usually appropriate	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	7	7	0	0	0	0	5	1	4	1	3
		References		Study Quality											
		23 (22013293)		4											
		22 (11752944)		2											
		21 (17430592)		2											
		20 (14605057)		2											
		19 (33992979)		2											
Radiography chest	Usually appropriate	Limited	☢ <0.1 mSv	☢ <0.03 mSv [ped]	7	7	0	0	0	0	2	1	5	4	1
		References		Study Quality											

		22 (11752944)			2											
CTA chest with IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	5	5	1	1	2	0	8	2	0	0	0	
CT neck and chest with IV contrast	May be appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		5	5	0	0	0	1	9	1	2	0	0	
CT neck and chest without IV contrast	May be appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		5	5	0	0	0	0	8	1	4	0	0	
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	○ ○ 0 mSv	○ ○ 0 mSv [ped]	3	3	4	3	4	0	2	1	0	0	0	
CT neck with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	2	2	3	5	1	1	2	0	1	0	0	
CT neck without IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	2	2	3	5	1	1	3	0	0	0	0	
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	○ ○ 0 mSv	○ ○ 0 mSv [ped]	2	2	6	2	3	0	3	0	0	0	0	
Radiography neck	Usually not appropriate	Expert Consensus	☼☼ 0.1-1mSv		2	2	4	6	2	1	0	0	0	0	0	
CT neck and chest without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		2	2	6	6	1	0	0	0	0	0	0	
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	7	5	1	0	0	0	0	0	0	
CT neck without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	8	1	1	1	1	1	1	0	0	
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	9	1	2	1	0	0	1	0	0	

**Variant 2: Adult. Tracheal or bronchial stenosis. Pre- or posttreatment assessment.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT chest without IV contrast	Usually appropriate	Strong	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	8	8	0	0	0	1	0	0	4	7	2
		References		Study Quality											
		26 (11776117)		2											
		25 (23168655)		4											
		24 (25384279)		4											
		13 (19002699)		2											
		12 (26332466)		4											
		11 (8784012)		4											
CT chest with IV contrast	Usually appropriate	Strong	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	7	7	0	0	1	0	4	1	3	2	3
		References		Study Quality											
		26 (11776117)		2											
		25 (23168655)		4											
		24 (25384279)		4											
		19 (33992979)		2											
		13 (19002699)		2											
		12 (26332466)		4											
		11 (8784012)		4											
Radiography chest	Usually appropriate	Expert Consensus	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	7	7	1	0	0	0	4	0	3	3	2
CT neck and chest without IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕⊕ 10-30 mSv		6	6	0	1	0	1	4	2	2	3	1
CTA chest with IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	0	0	0	1	11	1	0	0	0



Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT chest without IV contrast	Usually appropriate	Strong	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	9	9	0	0	0	0	1	0	1	3	9
		References		Study Quality											
		31 (24361144)		3											
		30 (11419175)		2											
		29 (15798155)		2											
		17 (19420322)		2											
Radiography chest	May be appropriate (Disagreement)	Expert Opinion	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	5	5	0	4	1	2	0	0	3	2	1
CT neck and chest without IV contrast	May be appropriate (Disagreement)	Expert Opinion	⊕⊕⊕⊕ 10-30 mSv		5	5	0	1	2	1	5	2	2	0	0
CT chest with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	3	3	3	1	5	0	3	1	1	0	0
CTA chest with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	2	2	5	3	0	1	4	1	0	0	0
CT neck with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	2	2	3	5	2	0	3	1	0	0	0
CT neck without IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	2	2	4	6	3	0	0	0	0	0	0
MRI chest without IV contrast	Usually not appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	2	2	5	7	1	0	0	0	0	0	0
		References		Study Quality											
		32 (28796542)		2											
		33 (15517280)		2											
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	6	6	1	0	0	0	0	0	0

Radiography neck	Usually not appropriate	Expert Consensus	☼☼ 0.1-1mSv		2	2	7	2	2	1	2	0	0	0	0
CT neck and chest with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		2	2	3	5	1	1	3	0	0	0	1
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	9	1	1	0	2	1	0	0	0
CT neck without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	8	3	1	0	1	1	0	0	0
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	11	1	1	0	0	1	0	0	0
CT neck and chest without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	7	5	1	0	0	0	0	0	0

**Variant 4: Adult. Tracheomalacia or bronchomalacia. Pre- or posttreatment assessment.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT chest without IV contrast	Usually appropriate	Strong	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	8	8	0	0	0	0	1	2	3	4	4
		References		Study Quality											
		8 (29957676)		2											
		30 (11419175)		2											
		36 (18520570)		2											
		35 (15855094)		4											
CTA chest with IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	5	5	0	2	0	1	8	1	1	0	0
CT chest with IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	5	5	0	0	0	0	8	4	1	0	0

CT neck and chest with IV contrast	May be appropriate	Expert Consensus	⚠⚠⚠⚠ 10-30 mSv		5	5	0	0	1	0	10	1	1	0	0
CT neck and chest without IV contrast	May be appropriate	Expert Consensus	⚠⚠⚠⚠ 10-30 mSv		5	5	0	0	0	1	11	0	1	0	0
Radiography chest	Usually not appropriate	Expert Consensus	⚠ <0.1 mSv	⚠ <0.03 mSv [ped]	3	3	3	2	3	1	3	1	1	0	0
CT neck with IV contrast	Usually not appropriate	Expert Consensus	⚠⚠⚠ 1-10 mSv	⚠⚠⚠ 0.3-3 mSv [ped]	2	2	4	4	2	0	3	0	1	0	0
CT neck without IV contrast	Usually not appropriate	Expert Consensus	⚠⚠⚠ 1-10 mSv	⚠⚠⚠ 0.3-3 mSv [ped]	2	2	5	5	2	1	0	0	0	0	0
MRI chest without IV contrast	Usually not appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	2	2	5	6	2	0	0	0	0	0	0

References	Study Quality
32 (28796542)	2
33 (15517280)	2

MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	6	6	1	0	0	0	0	0	0
Radiography neck	Usually not appropriate	Expert Consensus	⚠⚠ 0.1-1mSv		2	2	6	2	4	0	2	0	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	⚠⚠⚠ 1-10 mSv	⚠⚠⚠⚠ 3-10 mSv [ped]	1	1	9	0	2	0	2	0	1	0	0
CT neck without and with IV contrast	Usually not appropriate	Expert Consensus	⚠⚠⚠ 1-10 mSv	⚠⚠⚠⚠ 3-10 mSv [ped]	1	1	9	2	1	0	1	0	1	0	0
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Expert Consensus	⚠⚠⚠⚠ 10-30 mSv	⚠⚠⚠⚠ 3-10 mSv [ped]	1	1	10	1	2	0	1	0	0	0	0
CT neck and chest without and with IV contrast	Usually not appropriate	Expert Consensus	⚠⚠⚠⚠ 10-30 mSv		1	1	7	5	1	0	0	0	0	0	0

**Variant 5: Adult. Clinically suspected bronchiectasis. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT chest without IV contrast	Usually appropriate	Strong	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	9	9	0	0	0	0	0	0	1	4	9
		References		Study Quality											
		46 (27296814)		2											
		45 (10397099)		2											
		44 (24328736)		2											
		43 (32843159)		4											
		42 (34292274)		2											
		41 (7618537)		2											
		40 (20627931)		4											
		39 (8536394)		2											
		38 (10397098)		2											
		37 (18195376)		4											
Radiography chest	Usually appropriate	Limited	☼ <0.1 mSv	☼ <0.03 mSv [ped]	7	7	1	0	0	0	3	1	6	2	1
		References		Study Quality											
		9 (30442957)		4											
		10 (26024063)		4											
		40 (20627931)		4											
CTA chest with IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	5	5	0	2	1	0	8	1	1	0	0
MRI chest without IV contrast	May be appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	4	4	5	0	2	3	2	1	1	0	0
		References		Study Quality											



		47 (26707785)			2										
CT chest with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	2	2	2	5	3	0	2	0	0	1	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	7	4	2	0	0	0	0	0	0
CT neck with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	10	1	2	1	0	0	0	0	0
CT neck without IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	10	0	4	0	0	0	0	0	0
CT neck without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	11	0	2	1	0	0	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	8	1	2	1	2	0	0	0	0
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	12	0	2	0	0	0	0	0	0
Radiography neck	Usually not appropriate	Expert Consensus	☼☼ 0.1-1mSv		1	1	11	1	1	0	0	1	0	0	0
CT neck and chest with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	8	2	2	0	1	1	0	0	0
CT neck and chest without IV contrast	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	9	1	3	0	1	0	0	0	0
CT neck and chest without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	10	0	2	0	1	1	0	0	0

**Variant 6: Adult. Bronchiectasis. Assessment of complications or treatment response.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT chest without IV contrast	Usually appropriate	Strong	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	8	8	0	0	0	0	1	0	3	4	6
		References		Study Quality											
		56 (34380092)		2											
		55 (33172424)		2											
		54 (28427555)		2											
		53 (24059365)		2											
		52 (28968457)		2											
		51 (28275170)		2											
		50 (30531034)		2											
		49 (28150579)		2											
		43 (32843159)		4											
		42 (34292274)		2											
		40 (20627931)		4											
Radiography chest	Usually appropriate	Limited	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	7	7	0	0	0	0	3	1	3	2	2
		References		Study Quality											
		40 (20627931)		4											
CTA chest with IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	0	1	0	1	8	2	1	0	0
CT chest with IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	0	1	0	2	9	1	0	0	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	6	4	3	0	0	0	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	1	1	8	4	1	0	0	0	0	0	0

CT neck with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	9	1	3	0	0	1	0	0	0
CT neck without IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	10	1	3	0	0	0	0	0	0
CT neck without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	11	0	3	0	0	0	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	9	0	2	0	2	0	1	0	0
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	11	2	1	0	0	0	0	0	0
Radiography neck	Usually not appropriate	Expert Consensus	☼☼ 0.1-1mSv		1	1	11	1	2	0	0	0	0	0	0
CT neck and chest with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	8	2	2	0	1	0	0	1	0
CT neck and chest without IV contrast	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	8	1	4	0	0	0	1	0	0
CT neck and chest without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	10	0	3	0	0	0	0	1	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](http://www.acr.org/ac).