American College of Radiology ACR Appropriateness Criteria®

Chronic Dyspnea-Noncardiovascular Origin

Variant 1: Adult. Chronic dyspnea. Unclear etiology. Initial imaging.

D 1	Appropri	ateness	COL	4 1 14 PPT	D 1 DE7	D //	36.11			F	inal '	Tabu	latior	ıs		
Procedure	Categ	gory	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography chest	Usua approp		Limited	� <0.1 mSv	v <0.03 mSv [ped]	9	9	1	0	0	0	0	0	0	1	16
			References		Study	y Quality										
			29 (2802893)			3										
			28 (21215608)			2										
			3 (22962929)			4										
			2 (15864893)			4										
CT chest without IV contrast	May approp	be riate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	5	5	0	0	0	6	8	4	0	0	0
			References		Study	y Quality										
			27 (14872104)			4										
			28 (21215608)			2										
,			26 (25447621)			3										
CT chest with IV contrast	Usually approp		Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	2	2	8	3	4	2	0	1	0	0	0
			References		Study	y Quality										
			3 (22962929)			4										
			2 (15864893)			4										
			6 (36436973)			4										

CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	≎≎≎≎ 3- 10 mSv [ped]	2	2	9	6	2	1	0	0	0	0	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	3	1	0	1	1	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	3	1	1	0	0	1	0	0
FDG-PET/CT skull base to mid- thigh	Usually not appropriate	Expert Consensus	���� 10-30 mSv	0	1	1	15	2	0	0	1	0	0	0	0
US chest	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	13	5	0	0	0	0	0	0	0
		References		Study	Quality										
		32 (26687671)			4										
		30 (31927551)			4										
		31 (36740691)			2										
Fluoroscopy chest	Usually not appropriate	Expert Consensus	��� 1-10 mSv		1	1	12	3	0	1	1	0	0	1	0

Variant 2: Adult. Chronic dyspnea. Suspected chronic obstructive pulmonary disease (COPD). Initial imaging.

D 1	Appropriateness	COE	A L L DDI	n i nnr	D 4	34.11			F	inal [Гabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography chest	Usually appropriate	Limited	ଡ <0.1 mSv		9	9	1	0	0	0	0	0	1	2	14

References	Study Quality
62 (19631518)	4
61 (11194777)	4
39 (36907372)	4
19 (26333307)	4

CT chest without IV contrast	Usually appropriate	Strong	≎≎≎ 1-10 mSv	≎≎≎≎ 3- 10 mSv [ped]	8	8	1	0	0	1	2	2	3	3	6
		References		Study	Quality					•	•			•	
		57 (16537852)			3										
		42 (1535900)			4										
		46 (18351420)			3										
		53 (19938970)			3										
		34 (25961632)			4										
		37 (26098755)			2										
		43 (23220894)			2										
		44 (25442794)			3										
		45 (24710855)			3										
		47 (25474145)			3										
		48 (24703520)			3										
		49 (24334816)			2										
		50 (22514236)			3										
		51 (27776670)			3										
		55 (25844673)			3										
		56 (22016483)			2										
		38 (27168432)			2										
		41 (35866756)			2										
		36 (37210745)			1										
		39 (36907372)			4										
		52 (30256767)			2										
		54 (29458372)			1										
		40 (30759006)			4										
		35 (32017932)			1										
CT chest with IV contrast	Usually not appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	2	2	8	5	3	2	0	0	0	0	0
		References		Study	Quality										

		33 (27865580)			4				_						
MRI chest without IV contrast	Usuall approp	Strong	O 0 mSv	O 0 mSv [ped]	2	2	8	4	2	1	2	1	0	0	0
		References		Study	Quality			•						•	
		58 (26744928)			3										
		59 (21392914)			2										
		60 (25575114)			3										
		16 (27882425)			2										
		19 (26333307)			4										
US chest	Usuall approp	Limited	O 0 mSv	O 0 mSv [ped]	2	2	9	4	3	0	0	0	1	0	1
		References		Study	Quality										
		63 (32614240)			1										
CT chest without and with IV contrast	Usuall approp	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	10	4	3	1	0	0	0	0	0
MRI chest without and with IV contrast	Usuall approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	2	1	1	2	0	0	0	0
V/Q scan lung	Usuall approp	Expert Consensus	≎ ⊕⊕ 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	12	3	1	1	0	0	0	0	1
FDG-PET/CT skull base to mid-thigh	Usuall approp	Expert Consensus	���� 10-30 mSv	���� 3- 10 mSv [ped]	1	1	15	1	1	0	0	0	1	0	0
Fluoroscopy chest	Usuall approp	Expert Consensus	≎≎≎ 1-10 mSv		1	1	10	3	1	1	1	1	0	1	0

Variant 3: Adult. Chronic dyspnea. Suspected small airways disease. Initial imaging.

D 1	Appropriateness	gor.	A L L DDI	D 1 DD1	D 4	3.6.31			F	inal '	Гаbu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CT chest without IV contrast	Usually	Limited	��� 1-10	♦♦♦ 3-	8	8	0	0	1	0	1	1	2	6	7

Procedure	Appropri		SOE	Adults RRL	Peds RRL	Rating	Median				inal T					
	Categ	ory	202		1 000 11112	21002119	112001011	1	2	3	4	5	6	7	8	9
	approp	riate		mSv	10 mSv [ped]											
			References		Study	Quality										
			14 (23764129)			4										
			15 (27296816)			4										
			64 (32885932)			4										
			65 (32005432)			4			,							
Radiography chest	Usua approp		Expert Consensus	⊕ <0.1 mSv		8	8	0	0	1	1	2	1	4	3	6
CT chest with IV contrast	Usually approp		Expert Consensus	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	2	2	8	5	3	1	1	0	0	0	0
CT chest without and with IV contrast	Usually approp		Expert Consensus	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	1	1	11	4	2	1	0	0	0	0	0
MRI chest without IV contrast	Usually approp	y not riate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	15	2	1	0	0	0	0	0	0
			References		Study	Quality										
			18 (31036773)			2		_	1				1			
MRI chest without and with IV contrast	Usually approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	1	1	0	1	1	0	0	0
FDG-PET/CT skull base to mid-thigh	Usually approp		Expert Consensus	���� 10-30 mSv	���� 3- 10 mSv [ped]	1	1	16	1	0	0	0	0	1	0	0
US chest	Usually approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	1	2	0	0	0	0	0	1
Fluoroscopy chest	Usually approp		Expert Consensus	��� 1-10 mSv		1	1	13	2	2	0	0	0	0	1	0

Variant 4: Adult. Chronic dyspnea. Known or suspected prior COVID-19 infection. Initial imaging.

	Appropriat	teness	967				- ·	3.5			F	inal '	Tabu l	latior	ns		
Procedure	Categor	ry	SOE	Adults RR	L Peo	ds RRL	Rating	Median	1	2	3					8	9
CT chest without IV contrast	Usually appropri	y ate	Strong	��� 1-10 mSv	10	€	9	9	0	0	0	1	0	0	3	4	10
			References			Study	Quality										
			7 (34794591)				4										
			66 (33175876)				2										
			81 (33901788)				2										
			73 (34032292)				2										
			11 (34374591)				4										
			78 (33497317)				1										
			77 (34284567)				2										
			75 (34536697)				1										
			68 (37216955)				4										
			74 (33964245)				2										
			13 (35226158)				2										
			71 (33419891)				2										
			76 (33798931)				4										
			79 (34148855)				4										
			70 (34957743)				2										
			12 (36427055)				1										
			69 (37404150)			C	lood										
			72 (36782191)				2										
			67 (32474479)				2										
			80 (32734297)				2				ı						
Radiography chest	Usually appropri	y ate	Strong	≎ <0.1 mS	Sv	<0.03 mSv [ped]	9	9	1	0	0	0	0	0	2	3	12

		References		Study	Quality										
		85 (33172844)			4										
		78 (33497317)			1										
		84 (34473811)		1	2					ı	1	1	1		
MRI chest without IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	3	3	8	1	4	2	1	2	0	0	0
		References		Study	/ Quality										
		83 (34251585)			1										
		82 (36253228)			2										
		21 (36596692)			2										
		20 (36749209)			2										
		22 (35762891)		2											
US chest	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	3	3	6	2	2	5	1	1	0	0	1
		References		Study	Quality										
		90 (36103083)			1										
		88 (36564240)			2										
		89 (34091869)			2										
		86 (35906952)			4										
		87 (35429016)			2										
CT chest with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	2	2	9	3	4	1	0	1	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	13	1	3	1	0	0	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	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	17	0	0	0	1	0	0	0	0

Fluoroscopy chest	Usually not appropriate	Expert Consensus	��� 1-10 mSv		1	1	15	1	1	0	0	0	0	1	0	
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Variant 5: Adult. Chronic dyspnea. Suspected disease of the pleura or chest wall. Initial imaging.

D 1	Appropriateness	COF	A L L DDI	D I DDI	D 4	34 11			F	inal	Tabu	latio	ıs		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography chest	Usually appropriate	Limited	⊕ <0.1 mSv		9	9	0	0	0	1	0	0	2	6	9
		References		Study	Quality										
		97 (8796649)			3										
CT chest with IV contrast	Usually appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	8	8	1	0	0	0	1	2	5	3	6
		References		Study	Quality										
		91 (25077699)			4										
		92 (26076488)			2										
CT chest without IV contrast	Usually appropriate	Limited	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	7	7	0	0	1	0	2	2	6	2	5
		References		Study	Quality										
		93 (9017800)			4										
		91 (25077699)			4										
		92 (26076488)			2										
MRI chest without IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	7	1	6	2	2	0	0	0	0
		References		Study	Quality										
		94 (2028857)			4										
		95 (26502346)			2										
		96 (26214770)		·	3										

MRI chest without and with IV contrast	Usually not appropriate		Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	6	1	7	2	2	0	0	0	0
US chest	Usually not appropriate		Limited	O 0 mSv	O 0 mSv [ped]	3	3	7	2	4	0	5	0	0	0	0
	Refer		References		Stud	y Quality										
	99 (-3197610)															
FDG-PET/CT skull base to mid-thigh	Usually not appropriate		Expert Consensus	���� 10∹ mSv	30	2	2	8	3	4	1	1	0	1	0	0
CT chest without and with IV contrast	Usually not appropriate		Expert Consensus	≎≎≎ 1-10 mSv	99993- 10 mSv [ped]	1	1	10	4	2	1	1	0	0	0	0
Fluoroscopy chest			Expert Consensus	≎≎≎ 1-10 mSv)	1	1	13	2	1	0	1	0	0	1	0

Variant 6: Adult. Chronic dyspnea. Suspected diaphragm dysfunction. Initial imaging.

D 1	Appropriate	teness	SOE	Adults RRI	RL Peds	Peds RRL	D 41	Median	Final Tabulations									
Procedure	Categor						Rating		1	2	3	4	5	6	7	8	9	
Radiography chest	Usually appropria		Limited	⊕ <0.1 mS	Sv		9	9	1	0	0	0	0	0	1	5	11	
			References			Study												
		106 (17368210)				2					•							
CT chest without IV contrast	May be appropria		Limited	��� 1-10 mSv)	���� 3- 10 mSv [ped]	5	5	0	0	0	3	12	2	1	0	0	
			References			Study	Quality											
		References 100 (28549021)		2				_										
CT chest with IV contrast	May be appropria	e ate	Expert Consensus	��� 1-10 mSv)	���� 3- 10 mSv [ped]	4	4	0	0	3	11	4	0	0	0	0	

MRI chest without and with IV contrast	Usually appropr			O 0 mSv	O 0 mSv [ped]	3	3	6	3	3	1	3	1	1	0	0
		References			Study											
			103 (35273448)													
US chest	Usually appropr	not	Strong	O 0 mSv	O 0 mSv [ped]	3	3	6	2	4	4	2	0	0	0	0
			References		Study	Quality										
		108 (23382111)														
			107 (24211983)		3											
			109 (25165390)													
	110 (26994409) 2															
			111 (23110443)													
			112 (27701744)													
			113 (24700122)													
			114 (26620221)													
			115 (26357011)													
			116 (25971723)													
			117 (27167428)		1											
Fluoroscopy chest	Usually appropr		Limited	≎≎≎ 1-10 mSv		2	2	9	0	4	1	2	1	0	1	0
			References		Study											
			101 (22411950)		4											
	,		102 (23778774)		2											
CT chest without and with IV contrast	Usually appropr	y not Expert		��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	10	3	3	2	0	0	0	0	0
MRI chest without IV contrast	Usually appropr	not	Limited	O 0 mSv	O 0 mSv [ped]	1	1	11	2	2	1	2	0	0	0	0
		References			Study Quality											
		104 (17145404)				3										
		105 (27391236)														

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.