American College of Radiology ACR Appropriateness Criteria®

Sepsis

Variant 1: Suspected or confirmed sepsis. Cough or dyspnea or chest pain. Initial imaging.

	Appropri	ateness	g o =							F	inal '	Гаbu	latio	ns		
Procedure	Categ		SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3		5	6	7	8	9
Radiography chest	Usua approp		Limited	 		9	9	0	0	0	1	0	0	1	4	15
			References		Study	Quality										
			8 (21215552)			2										
CT chest with IV contrast	May approp		Limited	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	6	6	0	0	0	0	5	8	5	5	0
			References		Study	Quality										
			6 (32971451)			2										
			7 (25468363)			4									_	
CT chest without IV contrast	May approp		Limited	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	6	6	0	1	0	1	8	10	1	1	1
			References		Study	Quality										
			6 (32971451)			2										
			7 (25468363)		_	4										
CT chest without and with IV contrast	Usually approp		Expert Consensus	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	1	1	12	3	3	0	1	0	1	1	0
MRI chest without IV contrast	Usually approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	1	1	2	0	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	16	1	1	1	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	19	2	0	0	0	0	0	0	0

Variant 2: Suspected or confirmed sepsis. Cough or dyspnea or chest pain. Normal or equivocal or nonspecific chest radiograph. Next imaging study.

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Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CT chest with IV contrast	Usually appropriate	Limited	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	8	8	0	0	0	0	2	0	4	6	9
		References		Study	Quality										
		6 (32971451)			2										
		7 (25468363)			4										
CT chest without IV contrast	Usually appropriate	Limited	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	8	8	0	0	1	0	2	3	1	9	5
		References		Study	Quality										
		6 (32971451)			2										
		7 (25468363)			4										
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Strong	���� 10-30 mSv	���� 3- 10 mSv [ped]	2	2	8	4	0	2	5	1	1	0	0
		References		Study	Quality										
		12 (33827655)			2										
		11 (30788532)			2										
		10 (22176803)			2										
		9 (23776621)			2										
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	1	1	12	2	3	0	2	0	0	1	1

MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	3	1	1	2	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	14	3	1	1	0	2	0	0	0

Variant 3: Suspected or confirmed sepsis. Acute abdominal pain. Initial imaging.

	Appropriater	ness							F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CT abdomen and pelvis with IV contrast	Usually appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	8	8	0	0	0	0	2	0	1	9	9
		References		Study	Quality										
		13 (6600545)			4										
		7 (25468363)			4										
		6 (32971451)			2										
US abdomen	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	1	4	6	8	1	1
		References		Study	Quality										
		18 (23422051)			4										
		17 (26441019)			4										
		16 (11307365)			4										
		15 (26754121)			4										
		13 (6600545)			4										
CT abdomen and pelvis without IV contrast	May be appropriate (Disagreement	Expert Opinion	��� 1-10 mSv	ଡେଡେଡେ 3- 10 mSv [ped]	5	5	0	2	0	2	6	7	3	3	0
		References		Study	Quality										
		6 (32971451)		·	2										
		7 (25468363)			4										

CT abdomen and pelvis without and with IV contrast	Usuall approp	Expert Consensus	ଫଫଫଫ 10-30 mSv	জ্জুজুজুজু) 10-30 mSv [ped]	2	2	11	10	2	0	0	0	0	0	0
MRI abdomen and pelvis without and with IV contrast	Usuall approp	Limited	O 0 mSv	O 0 mSv [ped]	2	2	6	6	3	2	1	2	0	0	0
		References		Study	Quality				•						
		14 (32072724)			4										
Radiography abdomen	Usuall approp	Limited	�� 0.1-1mS		2	2	4	11	4	4	0	0	0	0	0
		References		Study	Quality										
		15 (26754121)			4										
		16 (11307365)			4										
Fluoroscopy contrast enema	Usuall approp	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	16	2	2	0	1	0	0	0	0
Fluoroscopy upper GI series with small bowel follow-through	Usuall approp	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	16	2	1	1	1	0	0	0	0
MRI abdomen and pelvis without IV contrast	Usuall approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	6	0	2	1	0	0	0	0
Nuclear medicine scan gallbladder	Usuall approp	Expert Consensus	�� 0.1-1mS	v	1	1	14	4	1	0	1	1	0	0	0
FDG-PET/CT skull base to mid-thigh	Usuall approp	Expert Consensus	���� 10-30 mSv	0	1	1	17	3	1	0	0	0	0	0	0
WBC scan abdomen and pelvis	Usuall approp	Expert Consensus	≎≎≎≎ 10-30 mSv)	1	1	13	5	0	2	1	0	0	0	0

Variant 4: Suspected or confirmed sepsis. No specific symptoms suggestive of origin, or symptoms cannot be assessed. Initial imaging.

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Procedure	Catego		SOE	Adults RRI	L	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography chest	Usual appropr	lly riate	Limited	⊕ <0.1 mS	Sv		7	7	0	1	0	1	0	0	13	4	4
			References			Study	Quality										
			8 (21215552)				2										
CT abdomen and pelvis with IV contrast	May t		Limited	��� 1-10 mSv)	���� 3- 10 mSv [ped]	6	6	0	1	0	2	7	5	3	5	0
			References			Study	Quality										
			6 (32971451)				2										
			7 (25468363)				4										
CT chest with IV contrast	May bappropr		Limited	��� 1-10 mSv		���� 3- 10 mSv [ped]	6	6	0	1	0	1	7	7	5	2	0
			References		•	Study	Quality		•								
			6 (32971451)				2										
			7 (25468363)				4		_								
CT chest without IV contrast	May t		Limited	��� 1-10 mSv)	���� 3- 10 mSv [ped]	6	6	0	0	1	5	2	4	7	2	0
			References			Study	Quality										
			6 (32971451)				2										
			7 (25468363)				4				_						
CT chest abdomen pelvis with IV contrast	May t appropr		Limited	���� 10-3 mSv	30	���� 3- 10 mSv [ped]	6	6	0	1	0	0	5	9	0	7	1
			References			Study	Quality										
			6 (32971451)				2										
			7 (25468363)				4										
US abdomen	May tappropr		Limited	O 0 mSv		O 0 mSv [ped]	6	6	0	2	0	0	8	11	2	0	0
			References			Study	Quality										

			18 (23422051)				4										
			17 (26441019)				4										
			16 (11307365)				4										
			15 (26754121)				4										
			13 (6600545)				4										
CT chest abdomen pelvis without IV contrast	May be appropria (Disagreen	ate	Expert Opinion	≎≎≎≎ 10- mSv	30	ଡେଡେଡ 3- 10 mSv [ped]	5	5	4	6	7	0	2	3	1	0	0
			References			Study	Quality										
			6 (32971451)				2										
			7 (25468363)				4										
CT abdomen and pelvis without IV contrast	Usually r appropria		Limited	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	3	3	2	7	5	1	6	1	1	0	0
			References			Study	Quality										
			6 (32971451)				2										
			7 (25468363)				4										
CT abdomen and pelvis without and with IV contrast	Usually r appropria		Expert Consensus	���� 10- mSv	30	\$\$\$\$\$ 10-30 mSv [ped]	2	2	7	5	4	3	0	0	1	0	1
CT chest abdomen pelvis without and with IV contrast	Usually r appropria		Expert Consensus	≎≎≎≎ 10- mSv	30	����� 10-30 mSv [ped]	2	2	10	10	3	0	0	0	0	0	0
MRI abdomen and pelvis without IV contrast	Usually r appropria		Expert Consensus	O 0 mSv	/	O 0 mSv [ped]	2	2	9	6	2	3	0	0	1	0	0
MRI abdomen and pelvis without and with IV contrast	Usually r appropria		Limited	O 0 mSv	/	O 0 mSv [ped]	2	2	9	4	3	2	1	1	0	1	0
			References			Study	Quality										
			14 (32072724)			-	4										
Radiography abdomen	Usually r appropria		Limited	≎≎ 0.1-1m	nSv	�� 0.03- 0.3 mSv [ped]	2	2	7	7	4	5	0	0	0	0	0

References	Study Quality
15 (26754121)	4
16 (11307365)	Δ

CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	11	3	2	3	0	0	0	1	1
Fluoroscopy contrast enema	Usually not appropriate	Expert Consensus	��� 1-10 mSv	≎≎≎≎ 3- 10 mSv [ped]	1	1	17	2	2	0	0	0	0	0	0
Fluoroscopy upper GI series with small bowel follow-through	Usually not appropriate	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	17	2	1	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	16	2	0	2	0	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	15	3	0	1	0	1	1	0	0
Nuclear medicine scan gallbladder	Usually not appropriate	Expert Consensus	�� 0.1-1mSv		1	1	14	2	3	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	15	3	2	0	1	0	0	0	0
WBC scan abdomen and pelvis	Usually not appropriate	Expert Consensus	���� 10-30 mSv		1	1	15	1	3	2	0	0	0	0	0

Variant 5: Suspected or confirmed sepsis. No specific symptoms suggestive of origin, or symptoms cannot be assessed. Normal or equivocal or nonspecific chest radiograph. Next imaging study.

D 1	Appropriateness	COF	A L LA DDI	D I DDI	D 4	3.6 11			F	inal '	Гаbи	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CT abdomen and pelvis with IV contrast	Usually appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	8	8	0	0	0	0	2	5	3	9	2
		References		Study	Quality										

		6 (32971451)			2										
		7 (25468363)			4										
		13 (6600545)		1	4		_								
CT chest with IV contrast	May be appropriate	Limited	��� 1-10 mSv	♀♀♀ 3- 10 mSv [ped]	6	6	1	1	0	0	5	8	7	1	0
		References		Study	y Quality										
		6 (32971451)			2										
		7 (25468363)			4										
CT chest without IV contrast	May be appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	6	6	1	0	1	1	3	5	8	1	1
		References		Study	y Quality										
		6 (32971451)			2										
		7 (25468363)			4										
CT abdomen and pelvis without IV contrast	May be appropriate (Disagreement)	Expert Opinion	��� 1-10 mSv	���� 3- 10 mSv [ped]	5	5	4	6	5	0	3	5	0	0	0
		References		Study	y Quality										
		6 (32971451)			2										
		7 (25468363)			4										
CT chest abdomen pelvis with IV contrast	May be appropriate (Disagreement)	Expert Opinion	���� 10-30 mSv	���� 3- 10 mSv [ped]	5	5	1	2	0	0	3	9	2	5	1
		References		Study	y Quality										
		6 (32971451)			2										
		7 (25468363)			4										
CT chest abdomen pelvis without IV contrast	May be appropriate (Disagreement)	Expert Opinion	��� 10-30 mSv	���� 3- 10 mSv [ped]	5	5	3	7	6	1	1	5	0	0	0
		References		Study	y Quality										
		6 (32971451)			2										
		7 (25468363)			4										

US abdomen	May approp	be oriate	Limited	O 0 mSv	,	O 0 mSv [ped]	5	5	1	2	0	3	9	6	2	0	0
		References				Study Quality											
	18 (23422051)				4												
		17 (26441019)			4												
		16 (11307365)				4											
		15 (26754121)			4												
		13 (6600545)			4												
MRI abdomen and pelvis without IV contrast	Usually approp		Expert Consensus	O 0 mSv	,	O 0 mSv [ped]	2	2	5	7	6	2	0	0	0	1	0
MRI abdomen and pelvis without and with IV contrast	Usually approp		Expert Consensus	O 0 mSv		O 0 mSv [ped]	2	2	4	7	6	1	1	1	1	0	0
MRI chest without IV contrast	Usually approp		Expert Consensus	O 0 mSv		O 0 mSv [ped]	2	2	10	7	1	2	0	0	1	0	0
MRI chest without and with IV contrast	Usually approp		Expert Consensus	O 0 mSv		O 0 mSv [ped]	2	2	10	7	1	1	0	1	0	1	0
FDG-PET/CT skull base to mid- thigh	Usually approp		Strong	���� 10-30 mSv		���� 3- 10 mSv [ped]	2	2	7	5	6	4	0	0	1	0	0
			References		Study Quality												
		12 (33827655)			2												
		11 (30788532)			2												
		10 (22176803)			2												
		9 (23776621)				2											
Radiography abdomen	Usually approp		Limited	�� 0.1-1m	ıSv	�� 0.03- 0.3 mSv [ped]	2	2	8	8	6	1	0	0	0	0	0
		References			Study Quality												
		15 (26754121) 16 (11307365)			4												
						4											
WBC scan abdomen and pelvis	Usually approp	I imited		≎≎≎≎ 10- mSv	30		2	2	7	7	4	4	1	0	0	0	0

References	Study Quality
22 (16404232)	2
21 (2112472)	4
20 (8583440)	4
19 (-3196415)	4

CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	୫୫୫୫ 10-30 mSv	≎≎≎≎≎ 10-30 mSv [ped]	1	1	13	9	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	11	3	3	1	1	0	0	0	2
CT chest abdomen pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	���� 10-30 mSv	≎≎≎≎≎ 10-30 mSv [ped]	1	1	12	11	0	0	0	0	0	0	0
Fluoroscopy contrast enema	Usually not appropriate	Expert Consensus	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	1	1	17	2	2	0	0	0	0	0	0
Fluoroscopy upper GI series with small bowel follow-through	Usually not appropriate	Expert Consensus	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	1	1	17	2	1	1	0	0	0	0	0
Nuclear medicine scan gallbladder	Usually not appropriate	Expert Consensus	�� 0.1-1mSv		1	1	14	3	1	1	0	2	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.