

American College of Radiology ACR Appropriateness Criteria®

Hernia

Variant 1: Suspected abdominal wall hernia such as umbilical, ventral, incisional, lumbar, or spigelian. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations									
							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]	9	9	0	0	0	0	0	0	1	6	10	
		References	Study Quality													
		21 (26055000)	3													
		9 (23484989)	3													
		22 (22284309)	3													
CT abdomen and pelvis without IV contrast	Usually appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	7	7	1	0	0	0	1	2	5	5	3	
		References	Study Quality													
		21 (26055000)	3													
		9 (23484989)	3													
		22 (22284309)	3													
US abdomen	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	7	7	0	1	0	1	2	1	6	6	0	
		References	Study Quality													
		9 (23484989)	3													
		25 (23357727)	1													
		24 (16929022)	4													
MRI abdomen without IV contrast	May be appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	0	1	7	8	0	0	0	

MRI abdomen without and with IV contrast	May be appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	5	5	0	0	1	2	7	3	3	0	0
Fluoroscopy upper GI series with small bowel follow-through	Usually not appropriate	Limited	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	3	3	4	3	4	6	0	0	0	0	0

References	Study Quality
23 (16702448)	4

MRI pelvis without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	3	4	3	2	4	1	0	0	0
MRI pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	3	4	4	2	3	1	0	0	0
US pelvis	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	4	3	7	1	0	1	0	0	0
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Limited	⊗⊗⊗⊗ 10-30 mSv	⊗⊗⊗⊗⊗ 10-30 mSv [ped]	2	2	3	6	3	1	2	1	0	1	0

References	Study Quality
21 (26055000)	3
9 (23484989)	3
22 (22284309)	3

Fluoroscopy upper GI series	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	2	2	5	8	2	2	0	0	0	0	0
Radiography abdomen and pelvis (KUB)	Usually not appropriate	Expert Consensus	⊗⊗ 0.1-1mSv	⊗⊗ 0.03-0.3 mSv [ped]	2	2	3	6	2	5	1	0	0	0	0

Variant 2: Suspected groin hernia such as inguinal or femoral. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT abdomen and pelvis with IV	Usually	Limited	⊗⊗⊗ 1-10	⊗⊗⊗⊗ 3-	8	8	0	0	2	0	1	2	1	7	4

CT pelvis without IV contrast	Usually appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	7	7	0	1	0	0	1	4	4	7	0
		References	Study Quality												
		33 (31243553)	4												
MRI pelvis without and with IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	1	7	7	1	0
		References	Study Quality												
		26 (28856355)	3												
		32 (25141884)	3												
MRI pelvis without IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	6	6	0	0	1	1	2	5	6	1	1
		References	Study Quality												
		26 (28856355)	3												
		32 (25141884)	3												
Fluoroscopy small bowel follow-through	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	3	3	4	3	5	4	1	0	0	0	0
Radiography abdomen and pelvis (KUB)	Usually not appropriate	Limited	☼☼ 0.1-1mSv	☼☼ 0.03-0.3 mSv [ped]	3	3	4	2	5	5	1	0	0	0	0
		References	Study Quality												
		31 (22733195)	4												
		35 (21573998)	4												
		34 (18769870)	4												
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼☼ 10-30 mSv [ped]	2	2	2	8	3	1	1	2	0	0	0
		References	Study Quality												
		32 (25141884)	3												
		31 (22733195)	4												

CT pelvis without and with IV contrast	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	2	2	2	7	4	0	2	1	0	1	0
			References	Study Quality											
			33 (31243553)	4											

Variant 3: Suspected deep pelvic hernia including obturator, sciatic, or perineal. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							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	1	0	0	1	2	7	5
			References	Study Quality											
			47 (22138700)	4											
			51 (24078001)	4											
			53 (26985818)	4											
CT pelvis with IV contrast	Usually appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	8	8	0	0	0	0	0	1	5	7	3
			References	Study Quality											
			47 (22138700)	4											
			51 (24078001)	4											
			53 (26985818)	4											
CT abdomen and pelvis without IV contrast	Usually appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	7	7	0	0	0	0	1	4	7	4	0
			References	Study Quality											
			47 (22138700)	4											
			51 (24078001)	4											
			53 (26985818)	4											
CT pelvis without IV contrast	Usually appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	7	7	0	0	0	0	4	4	5	3	0

			References		Study Quality													
			47 (22138700)		4													
			51 (24078001)		4													
			53 (26985818)		4													
MRI pelvis without and with IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	1	4	2	7	1	1			
			References		Study Quality													
			54 (31501395)		4													
MRI pelvis without IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	6	6	0	0	0	0	4	5	4	1	2			
			References		Study Quality													
			54 (31501395)		4													
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼☼ 10-30 mSv [ped]	3	3	2	5	3	3	1	1	0	1	0			
			References		Study Quality													
			47 (22138700)		4													
			51 (24078001)		4													
			53 (26985818)		4													
CT pelvis without and with IV contrast	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼☼ 3-10 mSv [ped]	3	3	1	6	9	0	0	0	0	0	0			
			References		Study Quality													
			47 (22138700)		4													
			51 (24078001)		4													
			53 (26985818)		4													
Fluoroscopy small bowel follow-through	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼☼ 3-10 mSv [ped]	3	3	3	5	3	4	1	0	0	0	0			
US pelvis	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	3	3	1	4	7	1	2	1	0	0	0			

Radiography abdomen and pelvis (KUB)	Usually not appropriate	Expert Consensus	☼☼ 0.1-1mSv	☼☼☼ 0.03-0.3 mSv [ped]	3	3	4	4	4	4	0	0	0	0	0
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Variant 4: Suspected diaphragmatic hernia including traumatic, Bochdalek, or Morgagni. 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 and abdomen with IV contrast	Usually appropriate	Limited	☼☼☼☼ 10-30 mSv		9	9	0	0	0	0	0	0	1	6	9

References	Study Quality
62 (30157820)	4
61 (28135794)	4
63 (26705205)	4
68 (26303737)	4
69 (21951119)	4
59 (20039230)	4
60 (19242298)	4
67 (15899350)	4
65 (26105131)	3
66 (26100355)	3
64 (30539157)	4

CT chest and abdomen without IV contrast	Usually appropriate	Limited	☼☼☼☼ 10-30 mSv		7	7	0	0	1	0	2	2	4	5	2
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References	Study Quality
62 (30157820)	4
61 (28135794)	4
63 (26705205)	4
68 (26303737)	4
69 (21951119)	4
59 (20039230)	4

60 (19242298)	4
67 (15899350)	4
65 (26105131)	3
66 (26100355)	3
64 (30539157)	4

Radiography chest	May be appropriate	Limited	☼ <0.1 mSv	☼ <0.03 mSv [ped]	5	5	0	0	0	1	9	3	3	0	0
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References	Study Quality
62 (30157820)	4
61 (28135794)	4
63 (26705205)	4
68 (26303737)	4
60 (19242298)	4
67 (15899350)	4
72 (22936226)	3
71 (29052830)	4

MRI chest and abdomen without IV contrast	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	5	5	0	0	1	4	4	3	2	2	0
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References	Study Quality
69 (21951119)	4
67 (15899350)	4
70 (22090330)	4

MRI chest and abdomen without and with IV contrast	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	5	5	0	0	1	3	6	2	3	1	0
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References	Study Quality
69 (21951119)	4
67 (15899350)	4
70 (22090330)	4

Fluoroscopy upper GI series	May be appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	4	4	1	2	5	4	2	1	1	0	0
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References	Study Quality
61 (28135794)	4
63 (26705205)	4

Fluoroscopy upper GI series with small bowel follow-through	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	3	3	3	2	4	4	1	1	1	0	0
US abdomen	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	3	3	2	2	6	3	2	0	1	0	0

References	Study Quality
67 (15899350)	4

Radiography abdomen and pelvis (KUB)	Usually not appropriate	Expert Consensus	☼☼ 0.1-1mSv	☼☼ 0.03-0.3 mSv [ped]	3	3	2	2	5	3	3	0	1	0	0
CT chest and abdomen without and with IV contrast	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv		2	2	2	8	6	0	0	0	0	0	0

References	Study Quality
62 (30157820)	4
61 (28135794)	4
63 (26705205)	4
68 (26303737)	4
69 (21951119)	4
59 (20039230)	4
60 (19242298)	4
67 (15899350)	4
65 (26105131)	3
66 (26100355)	3
64 (30539157)	4

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.