

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

Indeterminate Renal Mass

Variant 1: Indeterminate renal mass. No contraindication to either iodinated CT contrast or gadolinium-based MR intravenous contrast. 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 without and with IV contrast	Usually appropriate	Strong	⊕⊕⊕⊕ 10-30 mSv	⊕⊕⊕⊕⊕ 10-30 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0	0

References	Study Quality
32 (25905961)	2
31 (22106359)	3
15 (28705069)	3
24 (27729042)	3
13 (27043480)	3
35 (26587925)	2
36 (25799334)	4
25 (25681121)	2
30 (24766033)	4
26 (24450674)	3
38 (23382290)	2
14 (23352763)	2
29 (15128983)	4
2 (22528901)	4
28 (16040900)	4
1 (17456870)	4
34 (14990834)	3

37 (21940539)	3
27 (19559352)	2
33 (21555349)	3

MRI abdomen without and with IV contrast	Usually appropriate	Strong	0 mSv	0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0	0
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References	Study Quality
44 (28651987)	4
54 (27845847)	3
63 (28095036)	2
53 (26919441)	2
24 (27729042)	3
60 (26486936)	3
61 (27275530)	3
49 (26797358)	2
25 (25681121)	2
58 (24359883)	2
50 (23883215)	4
29 (15128983)	4
51 (12202701)	3
52 (15215544)	2
59 (22344404)	3
56 (19276322)	3
57 (21877173)	3
55 (20160001)	2
62 (19244046)	3
64 (29390196)	2
7 (31210616)	4

US abdomen with IV contrast	Usually appropriate	Strong	0 mSv	0 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0	0
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References	Study Quality
18 (28429490)	3

68 (26971426)	2
66 (25919803)	2
17 (25209216)	2
67 (24768490)	3
65 (18806171)	2
16 (24475802)	3
19 (17097844)	3

US kidneys retroperitoneal	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
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References	Study Quality
69 (28678573)	2
70 (28609114)	4

CT abdomen with IV contrast	May be appropriate	Strong	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0
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References	Study Quality
32 (25905961)	2
31 (22106359)	3
15 (28705069)	3
24 (27729042)	3
13 (27043480)	3
35 (26587925)	2
36 (25799334)	4
25 (25681121)	2
30 (24766033)	4
26 (24450674)	3
38 (23382290)	2
14 (23352763)	2
29 (15128983)	4
2 (22528901)	4
28 (16040900)	4
1 (17456870)	4

34 (14990834)	3
37 (21940539)	3
27 (19559352)	2
33 (21555349)	3

MRI abdomen without IV contrast	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0
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References	Study Quality
44 (28651987)	4
54 (27845847)	3
63 (28095036)	2
53 (26919441)	2
24 (27729042)	3
60 (26486936)	3
61 (27275530)	3
49 (26797358)	2
25 (25681121)	2
58 (24359883)	2
50 (23883215)	4
29 (15128983)	4
51 (12202701)	3
52 (15215544)	2
59 (22344404)	3
56 (19276322)	3
57 (21877173)	3
55 (20160001)	2
62 (19244046)	3
64 (29390196)	2
7 (31210616)	4

CT abdomen without IV contrast	May be appropriate	Strong	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	4	n/a	0	0	0	0	0	0	0	0	0
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References	Study Quality
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32 (25905961)	2
31 (22106359)	3
15 (28705069)	3
24 (27729042)	3
13 (27043480)	3
35 (26587925)	2
36 (25799334)	4
25 (25681121)	2
30 (24766033)	4
26 (24450674)	3
38 (23382290)	2
14 (23352763)	2
29 (15128983)	4
2 (22528901)	4
28 (16040900)	4
1 (17456870)	4
34 (14990834)	3
37 (21940539)	3
27 (19559352)	2
33 (21555349)	3

CTU without and with IV contrast	May be appropriate	Moderate	☢☢☢☢ 10-30 mSv		4	n/a	0	0	0	0	0	0	0	0	0	0
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References	Study Quality
39 (22451550)	2

MRU without and with IV contrast	Usually not appropriate	Expert Consensus	0 mSv	0 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0
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Image-guided biopsy renal mass	Usually not appropriate	Limited	Varies		3	n/a	0	0	0	0	0	0	0	0	0
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References	Study Quality
42 (21992727)	4
48 (21704449)	4

44 (28651987)	4
43 (27112777)	4
40 (22633318)	4
47 (18707712)	3
41 (16643475)	3
45 (22088331)	4
46 (20720070)	4

Radiography intravenous urography	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
Arteriography kidney	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv		1	n/a	0	0	0	0	0	0	0	0	0

Variant 2: Indeterminate renal mass. Contraindication to both iodinated CT and gadolinium-based MR intravenous contrast. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US abdomen with IV contrast	Usually appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0

References	Study Quality
18 (28429490)	3
68 (26971426)	2
66 (25919803)	2
17 (25209216)	2
67 (24768490)	3
65 (18806171)	2
16 (24475802)	3
19 (17097844)	3

MRI abdomen without IV contrast	Usually appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
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References	Study Quality
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54 (27845847)	3
53 (26919441)	2
71 (-3132600)	4
72 (16431890)	4
56 (19276322)	3
57 (21877173)	3
55 (20160001)	2

US kidneys retroperitoneal	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0	0
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References	Study Quality
69 (28678573)	2
70 (28609114)	4

CT abdomen without IV contrast	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0	0
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References	Study Quality
71 (-3132600)	4
2 (22528901)	4
1 (17456870)	4

Image-guided biopsy renal mass	Usually not appropriate	Limited	Varies		3	n/a	0	0	0	0	0	0	0	0	0	0
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References	Study Quality
42 (21992727)	4
48 (21704449)	4
44 (28651987)	4
43 (27112777)	4
40 (22633318)	4
47 (18707712)	3
41 (16643475)	3
45 (22088331)	4
46 (20720070)	4

MRU without and with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
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Variant 3: Indeterminate renal mass. Contraindication only to iodinated CT intravenous contrast. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI abdomen without and with IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	9	9	0	0	0	0	0	0	3	2	12

References	Study Quality
44 (28651987)	4
54 (27845847)	3
63 (28095036)	2
53 (26919441)	2
24 (27729042)	3
60 (26486936)	3
61 (27275530)	3
25 (25681121)	2
58 (24359883)	2
29 (15128983)	4
51 (12202701)	3
52 (15215544)	2
59 (22344404)	3
56 (19276322)	3
57 (21877173)	3
55 (20160001)	2
62 (19244046)	3
64 (29390196)	2

US abdomen with IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	8	8	0	0	0	0	0	1	6	8	2
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References	Study Quality
18 (28429490)	3
68 (26971426)	2
66 (25919803)	2
17 (25209216)	2
67 (24768490)	3
16 (24475802)	3

US kidneys retroperitoneal	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	6	6	0	0	0	1	3	7	5	1	0
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References	Study Quality
69 (28678573)	2
70 (28609114)	4

CT abdomen without IV contrast	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	1	0	0	2	9	3	2	0	0
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References	Study Quality
71 (-3132600)	4
2 (22528901)	4
1 (17456870)	4

MRI abdomen without IV contrast	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	5	5	0	1	4	2	4	4	0	0	0
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References	Study Quality
44 (28651987)	4
54 (27845847)	3
63 (28095036)	2
53 (26919441)	2
24 (27729042)	3
60 (26486936)	3
61 (27275530)	3
25 (25681121)	2
58 (24359883)	2
29 (15128983)	4

51 (12202701)	3
52 (15215544)	2
59 (22344404)	3
56 (19276322)	3
57 (21877173)	3
55 (20160001)	2
62 (19244046)	3
64 (29390196)	2

MRU without and with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	3	3	2	3	8	1	0	0	0	1	0
Image-guided biopsy renal mass	Usually not appropriate	Limited	Varies		2	2	4	4	4	2	0	0	0	1	0

References	Study Quality
42 (21992727)	4
48 (21704449)	4
44 (28651987)	4
43 (27112777)	4
40 (22633318)	4
47 (18707712)	3
41 (16643475)	3
45 (22088331)	4
46 (20720070)	4

CT abdomen with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	14	1	2	0	0	0	0	0	0
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References	Study Quality
71 (-3132600)	4
2 (22528901)	4
1 (17456870)	4

CT abdomen without and with IV contrast	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼☼ 10-30 mSv [ped]	1	1	14	1	2	0	0	0	0	0	0
		References	Study Quality												
		71 (-3132600)	4												
		2 (22528901)	4												
		1 (17456870)	4												
CTU without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	15	1	1	0	0	0	0	0	0
Radiography intravenous urography	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	15	0	2	0	0	0	0	0	0
Arteriography kidney	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	15	1	1	0	0	0	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.