

American College of Radiology
ACR Appropriateness Criteria®

Hematuria

Variant 1: Microhematuria. No risk factors, or history of recent vigorous exercise, or presence of infection, or viral illness, or present or recent menstruation. 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 without IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	0	0	1	13	3	0	0	0	0
		References		Study Quality											
		8 (28213826)		3											
US kidneys and bladder retroperitoneal	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	3	3	3	3	8	0	2	0	1	0	0
CT abdomen and pelvis with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	6	6	2	0	2	0	0	0	0
		References		Study Quality											
		8 (28213826)		3											
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	2	2	6	8	1	1	0	0	1	0	0
		References		Study Quality											
		8 (28213826)		3											
CTU without and with IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	2	2	3	6	4	0	2	0	0	0	1
		References		Study Quality											

		7 (25148165)			3											
MRI abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	7	5	1	1	2	0	0	0	0	
MRI abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	7	3	4	1	0	1	0	0	0	
MRU without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	6	5	2	1	1	1	0	0	0	
		References			Study Quality											
		15 (18203929)			4											
		16 (15128983)			4											
Radiography intravenous urography	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	12	1	2	1	0	0	0	0	1	
Arteriography kidney	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	16	0	0	0	0	0	0	0	1	
Radiography abdomen and pelvis	Usually not appropriate		☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0	

Variant 2: Microhematuria. Patients with risk factors, without any of the following: history of recent vigorous exercise, or presence of infection or viral illness, or present or recent menstruation, or renal parenchymal disease. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CTU without and with IV contrast	Usually appropriate	Strong	⊕⊕⊕⊕ 10-30 mSv	⊕⊕⊕⊕⊕ 10-30 mSv [ped]	9	9	0	0	1	0	1	0	1	4	9
		References		Study Quality											
		1 (24364522)		4											
		9 (17222650)		3											
		14 (23801402)		2											

			10 (19058939)		M											
			11 (18796677)		3											
			13 (17951346)		2											
			2 (23098784)		4											
			12 (19913253)		2											
MRU without and with IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	1	2	3	5	3	2	0	
		References		Study Quality												
		15 (18203929)		4												
		16 (15128983)		4												
CT abdomen and pelvis without IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	5	5	0	0	0	3	12	2	0	0	0	
CT abdomen and pelvis without and with IV contrast	May be appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	☼☼☼☼☼ 10-30 mSv [ped]	5	5	0	0	2	6	8	1	0	0	0	
US kidneys and bladder retroperitoneal	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	1	0	0	4	7	3	2	1	0	
		References		Study Quality												
		17 (19931351)		2												
		18 (29702097)		3												
CT abdomen and pelvis with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	3	3	1	0	10	0	3	2	0	0	0	
MRI abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	3	3	5	3	2	0	0	0	0	
MRI abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	1	5	6	2	3	0	0	0	0	
Radiography abdomen and pelvis	Usually not appropriate		☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	2	n/a	0	0	0	0	0	0	0	0	0	

Variant 4: Gross hematuria. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CTU without and with IV contrast	Usually appropriate	Strong	⊗⊗⊗⊗ 10-30 mSv	⊗⊗⊗⊗⊗ 10-30 mSv [ped]	8	8	0	0	1	1	0	0	4	4	6
		References		Study Quality											
		23 (16879676)		3											
		22 (25793362)		3											
		21 (25438986)		2											
		11 (18796677)		3											
		13 (17951346)		2											
		20 (22122739)		3											
		18 (29702097)		3											
MRU without and with IV contrast	Usually appropriate	Expert Consensus	○ ○ mSv	○ ○ mSv [ped]	7	7	1	0	1	0	1	4	7	2	0
CT abdomen and pelvis without and with IV contrast	May be appropriate	Expert Consensus	⊗⊗⊗⊗ 10-30 mSv	⊗⊗⊗⊗⊗ 10-30 mSv [ped]	5	5	0	0	0	5	9	2	1	0	0
MRI abdomen and pelvis without IV contrast	May be appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	5	5	1	0	2	5	5	3	0	0	0
		References		Study Quality											
		24 (19304915)		2											
MRI abdomen and pelvis without and with IV contrast	May be appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	5	5	0	0	0	4	10	3	0	0	0
		References		Study Quality											
		24 (19304915)		2											

US kidneys and bladder retroperitoneal	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	5	5	0	1	0	2	8	4	2	1	0
		References		Study Quality											
		27 (22040789)		3											
		25 (24316140)		3											
		18 (29702097)		3											
		26 (20449795)		2											
CT abdomen and pelvis with IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	4	4	1	2	4	3	5	1	0	0	0
CT abdomen and pelvis without IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	4	4	0	1	6	2	5	1	1	0	0
Radiography abdomen and pelvis	Usually not appropriate		☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	2	n/a	0	0	0	0	0	0	0	0	0
Radiography intravenous urography	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	11	4	1	0	1	0	0	0	0
Arteriography kidney	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	15	1	0	1	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.