## 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.

D 1	Appropri	iateness	COL	411, 55		D 1 DD7	D ()	3.6.11			F	inal '	Tabu	latio	ns		
Procedure	Categ	gory	SOE	Adults RR	KL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CT abdomen and pelvis without IV contrast	May approp		Limited	��� 1-1 mSv	0	���� 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	Usuall approp		Expert Consensus	O 0 mSv	,	O 0 mSv [ped]	3	3	3	3	8	0	2	0	1	0	0
CT abdomen and pelvis with IV contrast	Usuall approp		Limited	��� 1-1 mSv	0	���� 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	Usuall approp		Limited	<b>發發發</b> 10- mSv	-30	<b>99999</b> 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	Usuall approp		Limited	<b>����</b> 10- mSv	-30	����� 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	Usuall approp	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	Usuall approp			O 0 mSv [ped]	2	2	7	3	4	1	0	1	0	0	0
MRU without and with IV contrast	Usuall approp	Limited O 0 mSv		O 0 mSv [ped]	2	2	6	5	2	1	1	1	0	0	0
		References		Stuc	ly Quality						•	•			
		15 (18203929)			4										
		16 (15128983)			4										
Radiography intravenous urography	Usuall approp	Expert Consensus	Expert <b>���</b> 1-10		1	1	12	1	2	1	0	0	0	0	1
Arteriography kidney	Usuall approp	Expert Consensus mSv		0	1	1	16	0	0	0	0	0	0	0	1
Radiography abdomen and pelvis	Usuall approp	≎≎≎ 1-10 mSv		0	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.

n 1	Appropriateness	COF	A L L 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	
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 (10059020)			M										
		10 (19058939)			3										
		11 (18796677)													
		13 (17951346)			2										
		2 (23098784)			4										
		12 (19913253)			2			1		1	1	1			
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

Radiography intravenous urography	Usually approp	-	Limited	<b>≎≎≎</b> 1-10 mSv	9	1	1	10	1	3	2	0	0	0	0	1
			References		Study	Quality										
			9 (17222650)			3										
			10 (19058939)			M										
Arteriography kidney	Usually approp		Expert Consensus	��� 1-10 mSv	)	1	1	16	0	0	0	0	1	0	0	0

## Variant 3: Microhematuria. Pregnant patient. Initial imaging.

n 1	Appropri	iateness	COL	4 1 14 DDI	dults RRL Peds RRL Rating Median					F	inal '	Tabu	latio	ns		
Procedure	Categ		SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
US kidneys and bladder retroperitoneal	Usua approp		Limited	O 0 mSv	O 0 mSv [ped]	7	7	1	0	0	1	1	2	7	2	3
			References		Study	Quality										
			2 (23098784)			4										
			19 (15806469)			3			_							
MRU without IV contrast	May approp		Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	1	1	6	6	2	1	0
			References		Study	Quality										
			2 (23098784)			4										
MRI abdomen and pelvis without IV contrast	Usually approp		Limited	O 0 mSv	O 0 mSv [ped]	3	3	3	3	6	2	3	0	0	0	0
			References		Study	Quality										
			2 (23098784)			4										
CT abdomen and pelvis with IV contrast	Usually approp		Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	2	2	8	7	0	1	0	0	0	0	0
			References	Study	Quality			•								
			2 (23098784)			4										

CT abdomen and pelvis without IV contrast	Usually appropr	Limited	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	2	2	6	6	1	3	0	0	0	0	0
		References			Study	Quality		•				•			•	
		2 (23098784)				4										
CT abdomen and pelvis without and with IV contrast	Usually appropr	Limited	���� 10- mSv	-30	����� 10-30 mSv [ped]	2	2	8	7	0	1	0	0	0	0	0
		References			Study	Quality										
		2 (23098784)				4										
CTU without and with IV contrast	Usually appropr	Limited	���� 10- mSv	-30	����� 10-30 mSv [ped]	2	2	6	5	5	0	0	0	0	0	0
		References	References			Quality										
		2 (23098784)	2 (23098784)			4										
Radiography intravenous urography	Usually appropr	Expert Consensus	��� 1-1 mSv	0	<b>***</b> 0.3- 3 mSv [ped]	1	1	16	0	0	0	0	0	0	0	1
Arteriography kidney	Usually appropr	Expert Consensus	��� 1-1 mSv	0		1	1	16	0	0	0	0	0	0	0	1
MRI abdomen and pelvis without and with IV contrast	Usually appropr	Limited	O 0 mSv	/	O 0 mSv [ped]	1	1	14	3	0	0	0	0	0	0	0
		References			Study	Quality										
		2 (23098784)				4										
MRU without and with IV contrast	Usually appropr	Limited	O 0 mSv	/	O 0 mSv [ped]	1	1	15	0	2	0	0	0	0	0	0
		 References			Study	Quality					•	•				
		 2 (23098784)				4										
Radiography abdomen and pelvis	Usually appropr		��� 1-1 mSv	0	<b>\$\$\$</b> 0.3- 3 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0

Variant 4: Gross hematuria. Initial imaging.

	Appropriateness	COF		D 1 DD1	- ·	3.5 31			F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CTU without and with IV contrast	Usually appropriate	Strong	ଡେଡେଡ 10-30 mSv		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	O 0 mSv	O 0 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	ଡେଡେଡ 10-30 mSv		5	5	0	0	0	5	9	2	1	0	0
MRI abdomen and pelvis without IV contrast	May be appropriate	Limited	O 0 mSv	O 0 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	O 0 mSv	O 0 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 approp	iate		O 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 approp	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 approp	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	4	4	0	1	6	2	5	1	1	0	0
Radiography abdomen and pelvis	Usuall approp		��� 1-10 mSv	��� 0.3- 3 mSv [ped]	2	n/a	0	0	0	0	0	0	0	0	0
Radiography intravenous urography	Usuall approp	Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	11	4	1	0	1	0	0	0	0
Arteriography kidney	Usuall approp	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.