American College of Radiology
ACR Appropriateness Criteria®

Recurrent Lower Urinary Tract Infections in Females

Variant 1: Adult. Recurrent lower urinary tract infections in a female. Uncomplicated with no underlying risk factors. 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 not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	5	5	0	1	1	0	0	0	0
CT abdomen and pelvis without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	5	5	1	0	1	0	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	5	5	0	0	0	1	1	0	0
CT pelvis with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	6	5	1	0	0	0	0	0	0
CT pelvis without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	6	2	2	0	1	1	0	0	0
CTU without and with IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	2	2	3	5	1	1	1	0	1	0	0
MRI pelvis without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	6	3	0	1	1	0	1	0	0

References	Study Quality
65 (30466913)	4

MRU without IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	6	4	0	0	0	1	1	0	0
MRU without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	6	3	1	0	0	1	1	0	0
US kidneys and bladder retroperitoneal	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	5	3	4	0	0	0	0	0	0
US pelvis (bladder)	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	5	4	1	0	1	0	0	1	0

References	Study Quality
26 (29470628)	4

CT pelvis with bladder contrast (CT cystography)	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	8	2	1	0	1	0	0	0	0
CT pelvis without and with IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	9	2	1	0	0	0	0	0	0
Fluoroscopy cystography	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	7	2	2	0	0	1	0	0	0
Radiography intravenous urography	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	8	1	1	0	1	1	0	0	0
Fluoroscopy voiding cystourethrography	Usually not appropriate	Limited	☢☢ 0.1-1mSv	☢☢ 0.03-0.3 mSv [ped]	1	1	7	1	3	0	0	1	0	0	0
MRI abdomen and pelvis without IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	7	3	0	1	0	0	1	0	0

References	Study Quality
65 (30466913)	4

MRI abdomen and pelvis without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	7	3	0	1	0	0	1	0	0

References	Study Quality
65 (30466913)	4

MRI pelvis without IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	7	2	0	1	1	0	1	0	0
		References		Study Quality											
		65 (30466913)		4											
Radiography abdomen	Usually not appropriate	Limited	☢☢ 0.1-1mSv	☢☢ 0.03-0.3 mSv [ped]	1	1	8	1	0	1	1	1	0	0	0

Variant 2: Adult. Recurrent lower urinary tract infections in a female. Complicated patient. 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	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	7	0	0	0	0	2	2	4	3	1
US kidneys and bladder retroperitoneal	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	2	3	5	2	0
CT abdomen and pelvis with IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	6	1	0	0	0	3	4	4	0	0
MRU without and with IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	1	0	0	1	2	3	5	0	0
CT abdomen and pelvis without IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	1	0	1	9	0	1	0	0
MRI pelvis without and with IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	1	3	2	5	1	0	0	0
		References		Study Quality											
		65 (30466913)		4											
US pelvis (bladder)	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	2	3	2	2	1	1	1	0	0

		References		Study Quality											
		26 (29470628)		4											
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	3	3	3	2	4	1	2	0	0	0	0
CT pelvis with bladder contrast (CT cystography)	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	0	2	5	4	1	0	0	0	0
CT pelvis with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	0	4	4	2	2	0	0	0	0
CT pelvis without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	0	5	5	1	1	0	0	0	0
CT pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	1	5	4	1	1	0	0	0	0
Fluoroscopy voiding cystourethrography	Usually not appropriate	Limited	☢☢ 0.1-1mSv	☢☢ 0.03-0.3 mSv [ped]	3	3	2	2	5	1	2	0	0	0	0
MRI abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	0	2	7	2	1	0	0	0	0
		References		Study Quality											
		65 (30466913)		4											
MRI abdomen and pelvis without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	0	2	6	1	3	0	0	0	0
		References		Study Quality											
		65 (30466913)		4											
MRI pelvis without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	1	2	5	2	1	0	1	0	0
		References		Study Quality											
		65 (30466913)		4											

MRU without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	0	2	6	1	3	0	0	0	0
Fluoroscopy urethrography double-balloon	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		2	2	3	5	1	1	2	0	0	0	0
Fluoroscopy cystography	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		2	2	4	3	4	1	0	0	0	0	0
Radiography abdomen	Usually not appropriate	Limited	☢☢ 0.1-1mSv	☢☢ 0.03-0.3 mSv [ped]	2	2	3	6	1	1	0	0	1	0	0
Radiography intravenous urography	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	7	4	0	0	0	1	0	0	0

Variant 3: Pregnant patient. Recurrent lower urinary tract infections in a female. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US kidneys and bladder retroperitoneal	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	1	0	0	0	1	6	3	1
MRI pelvis without IV contrast	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	1	3	0	4	2	2	0	0	0
MRU without IV contrast	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	1	1	0	1	1	1	5	2	0
MRI abdomen and pelvis without IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	1	3	4	2	2	0	0	0	0
US pelvis (bladder)	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	0	1	7	1	2	0	1	0	0

References	Study Quality
26 (29470628)	4

CT pelvis with bladder contrast (CT cystography)	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	6	6	0	0	0	0	0	0	0
MRI abdomen and pelvis without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	6	4	1	0	0	1	0	0	0
MRI pelvis without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	6	3	1	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	4	1	0	0	1	0	0	0
CT abdomen and pelvis with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	7	3	2	0	0	0	0	0	0
CT abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	7	3	1	0	1	0	0	0	0
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	1	1	7	3	2	0	0	0	0	0	0
CT pelvis with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	7	4	1	0	0	0	0	0	0
CT pelvis without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	7	4	0	0	1	0	0	0	0
CT pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	7	4	1	0	0	0	0	0	0
CTU without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	1	1	7	4	1	0	0	0	0	0	0
Fluoroscopy cystography	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	8	4	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	9	2	1	0	0	0	0	0	0
Fluoroscopy voiding cystourethrography	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv	☢☢ 0.03-0.3 mSv [ped]	1	1	8	4	0	0	0	0	0	0	0
Radiography abdomen	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv	☢☢ 0.03-0.3 mSv [ped]	1	1	7	3	1	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.**