### American College of Radiology

**ACR Appropriateness Criteria®**

**Acute Pyelonephritis**

**Variant 1:** Acute pyelonephritis. Uncomplicated patient (eg, no history of diabetes or immune compromise or history of stones or obstruction or prior renal surgery or lack of response to therapy). Initial imaging.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT abdomen and pelvis with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 3-10 mSv [ped]</td>
<td>1 n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT abdomen and pelvis without IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 3-10 mSv [ped]</td>
<td>1 n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT abdomen and pelvis without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 10-30 mSv</td>
<td>☢☢☢ 10-30 mSv [ped]</td>
<td>1 n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiography intravenous urography</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>1 n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluoroscopy voiding cystourethrography</td>
<td>Usually not appropriate</td>
<td>☢☢ 0.1-1mSv</td>
<td>☢☢ 0.03-0.3 mSv [ped]</td>
<td>1 n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRI abdomen without IV contrast</td>
<td>Usually not appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
<td>1 1</td>
<td>15 1 0 0 0 0 0 0 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRI abdomen without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
<td>1 1</td>
<td>15 1 0 0 0 0 0 0 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRI abdomen and pelvis without IV contrast</td>
<td>Usually not appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
<td>1 n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procedure</td>
<td>Appropriateness Category</td>
<td>SOE</td>
<td>Adults RRL</td>
<td>Peds RRL</td>
<td>Rating</td>
<td>Median</td>
<td>Final Tabulations</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>--------------------------</td>
<td>-----</td>
<td>--------------------------------</td>
<td>-----------------------------</td>
<td>--------</td>
<td>--------</td>
<td>-------------------</td>
</tr>
<tr>
<td>CT abdomen and pelvis with IV contrast</td>
<td>Usually appropriate</td>
<td></td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 3-10 mSv [ped]</td>
<td>8</td>
<td>8</td>
<td>1 1 0 3 7 4</td>
</tr>
<tr>
<td>CT abdomen and pelvis without and with IV contrast</td>
<td>Usually appropriate</td>
<td></td>
<td>☢☢☢ 10-30 mSv</td>
<td>☢☢☢ 10-30 mSv [ped]</td>
<td>8</td>
<td>8</td>
<td>0 0 0 1 2 0 7 6</td>
</tr>
<tr>
<td>MRI abdomen without and with IV contrast</td>
<td>May be appropriate</td>
<td></td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
<td>6</td>
<td>6</td>
<td>1 0 1 2 6 5 1 0</td>
</tr>
<tr>
<td>CT abdomen and pelvis without IV contrast</td>
<td>May be appropriate</td>
<td></td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 3-10 mSv [ped]</td>
<td>5</td>
<td>5</td>
<td>0 0 2 7 6 0 1 0</td>
</tr>
<tr>
<td>MRI abdomen without IV contrast</td>
<td>May be appropriate</td>
<td></td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
<td>5</td>
<td>5</td>
<td>1 1 3 5 6 0 0 0</td>
</tr>
<tr>
<td>MRI abdomen and pelvis without IV contrast</td>
<td>May be appropriate</td>
<td></td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
<td>5</td>
<td>5</td>
<td>0 1 1 4 7 3 0 0</td>
</tr>
</tbody>
</table>

Variant 2: Acute pyelonephritis. Complicated patient (e.g., diabetes or immunocompromised or history of stones or prior renal surgery or not responding to therapy). Initial imaging.
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness</th>
<th>Radiation Dose (Gy)</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRI abdomen and pelvis without and with IV contrast</td>
<td>May be appropriate (Disagreement)</td>
<td>0.0 mSv [ped]</td>
<td>5</td>
</tr>
<tr>
<td>US color Doppler kidneys and bladder retroperitoneal</td>
<td>May be appropriate</td>
<td>0.0 mSv [ped]</td>
<td>5</td>
</tr>
<tr>
<td>Tc-99m DMSA scan kidney</td>
<td>May be appropriate</td>
<td>1-10 mSv</td>
<td>4</td>
</tr>
<tr>
<td>Radiography abdomen and pelvis (KUB)</td>
<td>Usually not appropriate</td>
<td>0.1-1 mSv</td>
<td>2</td>
</tr>
<tr>
<td>Radiography intravenous urography</td>
<td>Usually not appropriate</td>
<td>1-10 mSv</td>
<td>1</td>
</tr>
<tr>
<td>Fluoroscopy voiding cystourethrography</td>
<td>Usually not appropriate</td>
<td>0.1-1 mSv</td>
<td>1</td>
</tr>
<tr>
<td>Fluoroscopy antegrade pyelography</td>
<td>Usually not appropriate</td>
<td>1-10 mSv</td>
<td>1</td>
</tr>
</tbody>
</table>
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](http://www.acr.org/ac).