## Syncope

**Variant 1:** Presyncope or syncope. Clinical suspicion for cardiovascular etiology based on history, physical examination, and ECG findings. Initial imaging.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL [ped]</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>US echocardiography transthoracic resting</td>
<td>Usually appropriate</td>
<td>Limited</td>
<td>0 0 mSv</td>
<td>0 0 mSv</td>
<td>7</td>
<td>7</td>
<td>1 0 0 0 3 2 7 2 7</td>
</tr>
</tbody>
</table>

**References**

<table>
<thead>
<tr>
<th>Study Quality</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>68 (27838041)</td>
<td>3</td>
</tr>
<tr>
<td>3 (28286222)</td>
<td>4</td>
</tr>
<tr>
<td>8 (29562304)</td>
<td>4</td>
</tr>
<tr>
<td>69 (26881172)</td>
<td>3</td>
</tr>
<tr>
<td>67 (12231593)</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL [ped]</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTA chest with IV contrast</td>
<td>May be appropriate</td>
<td>Moderate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢☢ 3-10 mSv[ped]</td>
<td>5</td>
<td>5</td>
<td>0 1 0 3 14 1 2 0 0</td>
</tr>
</tbody>
</table>

**References**

<table>
<thead>
<tr>
<th>Study Quality</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>43 (27797317)</td>
<td>3</td>
</tr>
<tr>
<td>46 (12427495)</td>
<td>3</td>
</tr>
<tr>
<td>47 (8350637)</td>
<td>4</td>
</tr>
<tr>
<td>45 (29655808)</td>
<td>4</td>
</tr>
<tr>
<td>44 (31395124)</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL [ped]</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiography chest</td>
<td>May be appropriate</td>
<td>Moderate</td>
<td>☀️ &lt;0.1 mSv</td>
<td>☀️ &lt;0.03 mSv[ped]</td>
<td>5</td>
<td>5</td>
<td>0 0 2 2 14 3 0 0 0</td>
</tr>
</tbody>
</table>

**References**

<table>
<thead>
<tr>
<th>Study Quality</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>62 (27833675)</td>
<td>3</td>
</tr>
<tr>
<td>Study Type</td>
<td>May be Appropriate</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td><strong>CTA coronary arteries with IV contrast</strong></td>
<td>Limited</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MRI heart function and morphology without IV contrast</strong></td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MRI heart function and morphology without and with IV contrast</strong></td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Radiation Dosage**

- **Low** 1-10 mSv
- **Moderate** 3-10 mSv
- **High** 0 mSv [ped]
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Usual Appropriateness</th>
<th>Expert Consensus</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT heart function and morphology with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢☢ 10-30 mSv</td>
<td>3</td>
</tr>
<tr>
<td>US echocardiography transesophageal</td>
<td>Usually not appropriate</td>
<td>O 0 mSv</td>
<td>3</td>
</tr>
<tr>
<td>CT head with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>2</td>
</tr>
<tr>
<td>CT head without IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>2</td>
</tr>
<tr>
<td>US echocardiography transthoracic stress</td>
<td>Usually not appropriate</td>
<td>O 0 mSv</td>
<td>2</td>
</tr>
<tr>
<td>SPECT or SPECT/CT MPI rest and stress</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 10-30 mSv [ped]</td>
<td>2</td>
</tr>
<tr>
<td>CT head without IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>1</td>
</tr>
</tbody>
</table>

**References**

- CT heart function and morphology with IV contrast: 15 (25763568), 19 (25539233), 18 (17551685), 17 (17111790), 16 (16292675)
- US echocardiography transesophageal: 15 (25763568), 19 (25539233)
- CT head with IV contrast: 15 (25763568), 19 (25539233)
- US echocardiography transthoracic stress: 70 (15894976), 71 (28501918)
- SPECT or SPECT/CT MPI rest and stress: 63 (23418293)
- CT head without IV contrast: 15 (25763568), 19 (25539233)
CT head without and with IV contrast | Usually not appropriate | Limited | 1-10 mSv | 3-10 mSv [ped] | 1 | 1 | 14 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0

<table>
<thead>
<tr>
<th>References</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 (17551685)</td>
<td>3</td>
</tr>
<tr>
<td>17 (17111790)</td>
<td>4</td>
</tr>
<tr>
<td>16 (16292675)</td>
<td>4</td>
</tr>
</tbody>
</table>

MRI head without IV contrast | Usually not appropriate | Expert Consensus | O 0 mSv | O 0 mSv [ped] | 1 | 1 | 14 | 2 | 0 | 3 | 1 | 0 | 1 | 1 | 0

<table>
<thead>
<tr>
<th>References</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 (25763568)</td>
<td>1</td>
</tr>
<tr>
<td>19 (25539233)</td>
<td>3</td>
</tr>
<tr>
<td>18 (17551685)</td>
<td>3</td>
</tr>
<tr>
<td>17 (17111790)</td>
<td>4</td>
</tr>
<tr>
<td>16 (16292675)</td>
<td>4</td>
</tr>
</tbody>
</table>

MRI head without and with IV contrast | Usually not appropriate | Expert Opinion | O 0 mSv | O 0 mSv [ped] | 1 | 1 | 19 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0

<table>
<thead>
<tr>
<th>References</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>66 (25669837)</td>
<td>3</td>
</tr>
<tr>
<td>64 (25122665)</td>
<td>4</td>
</tr>
<tr>
<td>20 (19636031)</td>
<td>4</td>
</tr>
<tr>
<td>65 (15819284)</td>
<td>3</td>
</tr>
</tbody>
</table>

US duplex Doppler carotid artery | Usually not appropriate | Limited | O 0 mSv | O 0 mSv [ped] | 1 | 1 | 12 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0

<table>
<thead>
<tr>
<th>References</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>66 (25669837)</td>
<td>3</td>
</tr>
<tr>
<td>64 (25122665)</td>
<td>4</td>
</tr>
<tr>
<td>20 (19636031)</td>
<td>4</td>
</tr>
<tr>
<td>65 (15819284)</td>
<td>3</td>
</tr>
</tbody>
</table>

SPECT or SPECT/CT MPI stress only | Usually not appropriate | Expert Consensus | 1-10 mSv | 3-10 mSv | 1 | 1 | 14 | 4 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0

<table>
<thead>
<tr>
<th>References</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>66 (25669837)</td>
<td>3</td>
</tr>
<tr>
<td>64 (25122665)</td>
<td>4</td>
</tr>
<tr>
<td>20 (19636031)</td>
<td>4</td>
</tr>
<tr>
<td>65 (15819284)</td>
<td>3</td>
</tr>
</tbody>
</table>

SPECT or SPECT/CT MPI rest only | Usually not appropriate | Expert Consensus | 1-10 mSv | 3-10 mSv | 1 | 1 | 15 | 3 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0

<table>
<thead>
<tr>
<th>References</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>66 (25669837)</td>
<td>3</td>
</tr>
<tr>
<td>64 (25122665)</td>
<td>4</td>
</tr>
<tr>
<td>20 (19636031)</td>
<td>4</td>
</tr>
<tr>
<td>65 (15819284)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Variant 2:** Presyncope or syncope. Low probability of cardiovascular etiology based on history, physical examination, and ECG findings. 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>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiography chest</td>
<td>May be appropriate</td>
<td>Moderate</td>
<td>☢ &lt;0.1 mSv</td>
<td>☢ &lt;0.03 mSv [ped]</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>7</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CTA chest with IV contrast</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 3-10 mSv [ped]</td>
<td>1</td>
<td>1</td>
<td>12</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CTA coronary arteries with IV contrast</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 3-10 mSv [ped]</td>
<td>1</td>
<td>1</td>
<td>14</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CT heart function and morphology with IV contrast</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>☢☢☢ 10-30 mSv</td>
<td>☢☢☢ 3-10 mSv [ped]</td>
<td>1</td>
<td>1</td>
<td>14</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CT head with IV contrast</td>
<td>Usually not appropriate</td>
<td>Limited</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>1</td>
<td>1</td>
<td>13</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CT head without IV contrast</td>
<td>Usually not appropriate</td>
<td>Limited</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>1</td>
<td>1</td>
<td>18</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

References

<table>
<thead>
<tr>
<th>Study Quality</th>
<th>15 (25763568)</th>
<th>19 (25539233)</th>
<th>18 (17551685)</th>
<th>17 (17111790)</th>
<th>16 (16292675)</th>
<th>15 (25763568)</th>
<th>19 (25539233)</th>
<th>18 (17551685)</th>
<th>17 (17111790)</th>
<th>16 (16292675)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Procedure</td>
<td>Acceptability</td>
<td>Radiation Dose</td>
<td>References</td>
<td>Study Quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>------------------------</td>
<td>----------------</td>
<td>-----------------</td>
<td>---------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CT head without and with IV contrast</strong></td>
<td>Usually not appropriate</td>
<td>Limited</td>
<td>1-10 mSv</td>
<td>1 1 13 5 2 0 0 1 1 0 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MRI head without IV contrast</strong></td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>O 0 mSv [ped]</td>
<td>1 1 14 3 4 1 0 0 0 0 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MRI head without and with IV contrast</strong></td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>O 0 mSv [ped]</td>
<td>1 1 14 5 1 0 0 1 0 1 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MRI heart function and morphology without IV contrast</strong></td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>O 0 mSv [ped]</td>
<td>1 1 14 4 2 0 0 1 0 0 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MRI heart function and morphology without and with IV contrast</strong></td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>O 0 mSv [ped]</td>
<td>1 1 18 3 0 0 0 0 0 0 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>US duplex Doppler carotid artery</strong></td>
<td>Usually not appropriate</td>
<td>Limited</td>
<td>O 0 mSv [ped]</td>
<td>1 1 14 3 3 0 0 0 0 0 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>US echocardiography transthoracic resting</strong></td>
<td>Usually not appropriate</td>
<td>Moderate</td>
<td>0 0 mSv [ped]</td>
<td>1 1 14 3 0 0 0 0 0 0 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References: 15 (25763568), 19 (25539233), 18 (17551685), 17 (17111790), 16 (16292675), 66 (25669837), 64 (25122665), 20 (19636031), 65 (15819284), 72 (29073313), 66 (25669837), 69 (26881172), 73 (30255862)
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness</th>
<th>Expert Consensus</th>
<th>Radiation Dose</th>
<th>References</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>US echocardiography transthoracic stress</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>0.0 mSv</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US echocardiography transesophageal</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>0.0 mSv</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPECT or SPECT/CT MPI stress only</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>1-10 mSv</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPECT or SPECT/CT MPI rest and stress</td>
<td>Usually not appropriate</td>
<td>Limited</td>
<td>10-30 mSv</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPECT or SPECT/CT MPI rest only</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>1-10 mSv</td>
<td></td>
<td></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).