



|               |   |
|---------------|---|
| 9 (21030550)  | 2 |
| 10 (25758182) | 2 |
| 11 (22700780) | 3 |

|  |                         |                  |              |                     |   |   |    |   |   |   |   |   |   |   |   |
|--|-------------------------|------------------|--------------|---------------------|---|---|----|---|---|---|---|---|---|---|---|
| CT chest without and with IV contrast  | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 1 | 1 | 6  | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| MRI chest without IV contrast          | Usually not appropriate | Expert Consensus | ○ 0 mSv      | ○ 0 mSv [ped]       | 1 | 1 | 9  | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MRI chest without and with IV contrast | Usually not appropriate | Expert Consensus | ○ 0 mSv      | ○ 0 mSv [ped]       | 1 | 1 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Variant 2: Acute respiratory illnesses in immunocompetent patients with positive physical examination, abnormal vital signs, organic brain disease or other 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 |
| Radiography chest | Usually appropriate      | Moderate | ☼ <0.1 mSv | ☼ <0.03 mSv [ped] | 9      | 9      | 0                 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 7 |

| References    | Study Quality |
|---------------|---------------|
| 4 (17278083)  | 4             |
| 21 (7455106)  | 4             |
| 22 (3718128)  | 3             |
| 23 (16635092) | 4             |
| 24 (17412152) | 2             |
| 25 (25785179) | 2             |
| 29 (17099198) | 4             |
| 30 (15336579) | 4             |
| 31 (16837505) | 3             |

|          |                    |         |         |               |   |   |   |   |   |   |   |   |   |   |   |
|----------|--------------------|---------|---------|---------------|---|---|---|---|---|---|---|---|---|---|---|
| US chest | May be appropriate | Limited | ○ 0 mSv | ○ 0 mSv [ped] | 4 | 4 | 2 | 0 | 3 | 2 | 3 | 1 | 0 | 0 | 0 |
|----------|--------------------|---------|---------|---------------|---|---|---|---|---|---|---|---|---|---|---|

| References | Study Quality |
|------------|---------------|
|------------|---------------|

|  |                         |                  |               |                     |   |   |   |   |   |   |   |   |   |   |   |  |
|--|-------------------------|------------------|---------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|--|
|  |                         |                  | 8 (24184011)  |                     | 3 |   |   |   |   |   |   |   |   |   |   |  |
|  |                         |                  | 11 (22700780) |                     | 3 |   |   |   |   |   |   |   |   |   |   |  |
| CT chest without IV contrast           | Usually not appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv  | ⊕⊕⊕⊕ 3-10 mSv [ped] | 3 | 3 | 1 | 4 | 4 | 1 | 1 | 0 | 1 | 0 | 0 |  |
| CT chest with IV contrast              | Usually not appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv  | ⊕⊕⊕⊕ 3-10 mSv [ped] | 2 | 2 | 3 | 5 | 2 | 1 | 0 | 1 | 0 | 0 | 0 |  |
| CT chest without and with IV contrast  | Usually not appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv  | ⊕⊕⊕⊕ 3-10 mSv [ped] | 2 | 2 | 5 | 1 | 3 | 1 | 1 | 0 | 0 | 0 | 0 |  |
| MRI chest without IV contrast          | Usually not appropriate | Expert Consensus | ○ 0 mSv       | ○ 0 mSv [ped]       | 1 | 1 | 7 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |  |
| MRI chest without and with IV contrast | Usually not appropriate | Expert Consensus | ○ 0 mSv       | ○ 0 mSv [ped]       | 1 | 1 | 8 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |  |

**Variant 3: Acute respiratory illness in immunocompetent patients with positive physical examination, abnormal vital signs, organic brain disease, or other risk factors and negative or equivocal initial chest radiograph. Next Imaging Study.**

| Procedure                    | Appropriateness Category | SOE      | Adults RRL   | Peds RRL            | Rating | Median | Final Tabulations |   |   |   |   |   |   |   |   |
|------------------------------|--------------------------|----------|--------------|---------------------|--------|--------|-------------------|---|---|---|---|---|---|---|---|
|                              |                          |          |              |                     |        |        | 1                 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| CT chest without IV contrast | Usually appropriate      | Moderate | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕⊕ 3-10 mSv [ped] | 7      | 7      | 0                 | 0 | 0 | 0 | 2 | 2 | 2 | 1 | 4 |

| References    | Study Quality |
|---------------|---------------|
| 4 (17278083)  | 4             |
| 6 (26935360)  | 2             |
| 7 (26168322)  | 3             |
| 32 (18571356) | 4             |
| 33 (25083953) | 3             |
| 34 (2785179)  | 1             |
| 24 (17412152) | 2             |

|  |                                   |                |               |                     |   |   |   |   |   |   |   |   |   |   |   |
|--|-----------------------------------|----------------|---------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|
| CT chest with IV contrast              | May be appropriate (Disagreement) | Expert Opinion | ☼☼☼ 1-10 mSv  | ☼☼☼☼ 3-10 mSv [ped] | 5 | 6 | 0 | 0 | 4 | 0 | 1 | 2 | 3 | 2 | 0 |
|  |                                   | References     | Study Quality |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 4 (17278083)   | 4             |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 6 (26935360)   | 2             |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 7 (26168322)   | 3             |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 24 (17412152)  | 2             |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 32 (18571356)  | 4             |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 33 (25083953)  | 3             |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 34 (2785179)   | 1             |                     |   |   |   |   |   |   |   |   |   |   |   |
| US chest                               | May be appropriate                | Limited        | ○ 0 mSv       | ○ 0 mSv [ped]       | 4 | 4 | 1 | 0 | 4 | 3 | 2 | 0 | 1 | 0 | 0 |
|  |                                   | References     | Study Quality |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 8 (24184011)   | 3             |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 10 (25758182)  | 2             |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 11 (22700780)  | 3             |                     |   |   |   |   |   |   |   |   |   |   |   |
| MRI chest without IV contrast          | Usually not appropriate           | Limited        | ○ 0 mSv       | ○ 0 mSv [ped]       | 2 | 2 | 3 | 6 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
|  |                                   | References     | Study Quality |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 14 (27811069)  | 1             |                     |   |   |   |   |   |   |   |   |   |   |   |
| MRI chest without and with IV contrast | Usually not appropriate           | Limited        | ○ 0 mSv       | ○ 0 mSv [ped]       | 2 | 2 | 5 | 3 | 1 | 2 | 0 | 1 | 0 | 0 | 0 |
|  |                                   | References     | Study Quality |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 14 (27811069)  | 1             |                     |   |   |   |   |   |   |   |   |   |   |   |
| CT chest without and with IV contrast  | Usually not appropriate           | Limited        | ☼☼☼ 1-10 mSv  | ☼☼☼☼ 3-10 mSv [ped] | 1 | 1 | 7 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
|  |                                   | References     | Study Quality |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 4 (17278083)   | 4             |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 6 (26935360)   | 2             |                     |   |   |   |   |   |   |   |   |   |   |   |
|  |                                   | 7 (26168322)   | 3             |                     |   |   |   |   |   |   |   |   |   |   |   |

|               |   |
|---------------|---|
| 32 (18571356) | 4 |
| 33 (25083953) | 3 |
| 34 (2785179)  | 1 |
| 24 (17412152) | 2 |

**Variant 4: Acute respiratory illnesses in immunocompetent patients with pneumonia complicated by suspected parapneumonic effusion or abscess on initial chest radiograph. Next Imaging study.**

| Procedure                              | Appropriateness Category          | SOE            | Adults RRL    | Peds RRL            | Rating | Median | Final Tabulations |   |   |   |   |   |   |   |   |
|--|-----------------------------------|----------------|---------------|---------------------|--------|--------|-------------------|---|---|---|---|---|---|---|---|
|  |                                   |                |               |                     |        |        | 1                 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| CT chest with IV contrast              | Usually appropriate               | Limited        | ⊕⊕⊕ 1-10 mSv  | ⊕⊕⊕⊕ 3-10 mSv [ped] | 8      | 8      | 0                 | 0 | 0 | 0 | 2 | 2 | 0 | 3 | 4 |
|  |                                   | References     | Study Quality |                     |        |        |                   |   |   |   |   |   |   |   |   |
|  |                                   | 6 (26935360)   | 2             |                     |        |        |                   |   |   |   |   |   |   |   |   |
|  |                                   | 35 (7384467)   | 4             |                     |        |        |                   |   |   |   |   |   |   |   |   |
| CT chest without IV contrast           | Usually appropriate               | Limited        | ⊕⊕⊕ 1-10 mSv  | ⊕⊕⊕⊕ 3-10 mSv [ped] | 7      | 7      | 0                 | 0 | 0 | 0 | 1 | 3 | 3 | 2 | 2 |
|  |                                   | References     | Study Quality |                     |        |        |                   |   |   |   |   |   |   |   |   |
|  |                                   | 6 (26935360)   | 2             |                     |        |        |                   |   |   |   |   |   |   |   |   |
|  |                                   | 35 (7384467)   | 4             |                     |        |        |                   |   |   |   |   |   |   |   |   |
| MRI chest without IV contrast          | May be appropriate (Disagreement) | Expert Opinion | ○ 0 mSv       | ○ 0 mSv [ped]       | 5      | 4      | 3                 | 0 | 0 | 5 | 2 | 2 | 0 | 0 | 0 |
|  |                                   | References     | Study Quality |                     |        |        |                   |   |   |   |   |   |   |   |   |
|  |                                   | 14 (27811069)  | 1             |                     |        |        |                   |   |   |   |   |   |   |   |   |
|  |                                   | 16 (27641778)  | 2             |                     |        |        |                   |   |   |   |   |   |   |   |   |
| MRI chest without and with IV contrast | May be appropriate (Disagreement) | Expert Opinion | ○ 0 mSv       | ○ 0 mSv [ped]       | 5      | 4      | 3                 | 0 | 0 | 4 | 2 | 3 | 0 | 0 | 0 |
|  |                                   | References     | Study Quality |                     |        |        |                   |   |   |   |   |   |   |   |   |
|  |                                   | 14 (27811069)  | 1             |                     |        |        |                   |   |   |   |   |   |   |   |   |



|  |                         |                  |         |               |   |   |    |   |   |   |   |   |   |   |   |
|--|-------------------------|------------------|---------|---------------|---|---|----|---|---|---|---|---|---|---|---|
| MRI chest without IV contrast          | Usually not appropriate | Expert Consensus | ○ 0 mSv | ○ 0 mSv [ped] | 1 | 1 | 10 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| MRI chest without and with IV contrast | Usually not appropriate | Expert Consensus | ○ 0 mSv | ○ 0 mSv [ped] | 1 | 1 | 9  | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

**Variant 6: Acute asthma exacerbation in immunocompetent patients, complicated (suspected pneumonia or pneumothorax). Initial imaging.**

| Procedure         | Appropriateness Category | SOE     | Adults RRL | Peds RRL          | Rating | Median | Final Tabulations |   |   |   |   |   |   |   |   |
|-------------------|--------------------------|---------|------------|-------------------|--------|--------|-------------------|---|---|---|---|---|---|---|---|
|                   |                          |         |            |                   |        |        | 1                 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Radiography chest | Usually appropriate      | Limited | ⊕ <0.1 mSv | ⊕ <0.03 mSv [ped] | 9      | 9      | 0                 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 6 |

| References   | Study Quality |
|--------------|---------------|
| 22 (3718128) | 3             |
| 37 (7297142) | 4             |
| 38 (7237908) | 3             |
| 39 (2060333) | 4             |

|                              |                    |                  |              |                     |   |   |   |   |   |   |   |   |   |   |   |
|------------------------------|--------------------|------------------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|
| CT chest with IV contrast    | May be appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕⊕ 3-10 mSv [ped] | 5 | 5 | 0 | 1 | 3 | 1 | 4 | 1 | 1 | 0 | 0 |
| CT chest without IV contrast | May be appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕⊕ 3-10 mSv [ped] | 5 | 5 | 0 | 0 | 0 | 0 | 7 | 3 | 1 | 0 | 1 |
| US chest                     | May be appropriate | Strong           | ○ 0 mSv      | ○ 0 mSv [ped]       | 4 | 4 | 3 | 0 | 2 | 3 | 2 | 1 | 0 | 0 | 0 |

| References    | Study Quality |
|---------------|---------------|
| 8 (24184011)  | 3             |
| 9 (21030550)  | 2             |
| 10 (25758182) | 2             |
| 11 (22700780) | 3             |
| 12 (20731700) | 2             |
| 13 (17316468) | 4             |

|  |                         |                  |              |                     |   |   |   |   |   |   |   |   |   |   |   |
|--|-------------------------|------------------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|
| CT chest without and with IV contrast  | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 3 | 3 | 4 | 1 | 4 | 2 | 0 | 0 | 0 | 0 | 0 |
| MRI chest without IV contrast          | Usually not appropriate | Expert Consensus | ○ 0 mSv      | ○ 0 mSv [ped]       | 2 | 2 | 6 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| MRI chest without and with IV contrast | Usually not appropriate | Expert Consensus | ○ 0 mSv      | ○ 0 mSv [ped]       | 2 | 2 | 6 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |

**Variant 7: Acute COPD exacerbation in immunocompetent patients, uncomplicated (no chest pain, fever, or leukocytosis, no history of coronary artery disease, or heart failure). Initial imaging.**

| Procedure         | Appropriateness Category | SOE     | Adults RRL | Peds RRL          | Rating | Median | Final Tabulations |   |   |   |   |   |   |   |   |
|-------------------|--------------------------|---------|------------|-------------------|--------|--------|-------------------|---|---|---|---|---|---|---|---|
|                   |                          |         |            |                   |        |        | 1                 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Radiography chest | Usually appropriate      | Limited | ☼ <0.1 mSv | ☼ <0.03 mSv [ped] | 8      | 8      | 0                 | 0 | 0 | 1 | 2 | 0 | 2 | 2 | 4 |

|              |               |
|--------------|---------------|
| References   | Study Quality |
| 40 (2818109) | 4             |

|  |                         |                  |              |                     |   |   |   |   |   |   |   |   |   |   |   |
|--|-------------------------|------------------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|
| CT chest with IV contrast              | May be appropriate      | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 4 | 4 | 3 | 1 | 1 | 2 | 3 | 1 | 0 | 0 | 0 |
| CT chest without IV contrast           | May be appropriate      | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 4 | 4 | 2 | 1 | 3 | 4 | 1 | 1 | 0 | 0 | 0 |
| CT chest without and with IV contrast  | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 2 | 2 | 5 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| MRI chest without IV contrast          | Usually not appropriate | Expert Consensus | ○ 0 mSv      | ○ 0 mSv [ped]       | 1 | 1 | 8 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| MRI chest without and with IV contrast | Usually not appropriate | Expert Consensus | ○ 0 mSv      | ○ 0 mSv [ped]       | 1 | 1 | 8 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| US chest                               | Usually not appropriate | Expert Consensus | ○ 0 mSv      | ○ 0 mSv [ped]       | 1 | 1 | 6 | 1 | 3 | 0 | 0 | 1 | 0 | 0 | 0 |



**Variant 8: Acute COPD exacerbation in immunocompetent patients with accompanying chest pain, fever, or leukocytosis, or a history of coronary artery disease, or heart failure. Initial imaging.**

| Procedure                              | Appropriateness Category | SOE              | Adults RRL   | Peds RRL            | Rating | Median | Final Tabulations |   |   |   |   |   |   |   |   |
|--|--------------------------|------------------|--------------|---------------------|--------|--------|-------------------|---|---|---|---|---|---|---|---|
|  |                          |                  |              |                     |        |        | 1                 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Radiography chest                      | Usually appropriate      | Limited          | ⊕ <0.1 mSv   | ⊕ <0.03 mSv [ped]   | 9      | 9      | 0                 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 7 |
|  |                          | References       |              | Study Quality       |        |        |                   |   |   |   |   |   |   |   |   |
|  |                          | 40 (2818109)     |              | 4                   |        |        |                   |   |   |   |   |   |   |   |   |
| CT chest without IV contrast           | May be appropriate       | Expert Consensus | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕⊕ 3-10 mSv [ped] | 6      | 6      | 0                 | 0 | 1 | 0 | 2 | 4 | 2 | 1 | 1 |
| CT chest with IV contrast              | May be appropriate       | Expert Consensus | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕⊕ 3-10 mSv [ped] | 5      | 5      | 0                 | 0 | 1 | 0 | 7 | 1 | 3 | 0 | 0 |
| US chest                               | May be appropriate       | Limited          | ○ 0 mSv      | ○ 0 mSv [ped]       | 5      | 5      | 0                 | 1 | 2 | 3 | 5 | 1 | 0 | 0 | 0 |
|  |                          | References       |              | Study Quality       |        |        |                   |   |   |   |   |   |   |   |   |
|  |                          | 10 (25758182)    |              | 2                   |        |        |                   |   |   |   |   |   |   |   |   |
|  |                          | 11 (22700780)    |              | 3                   |        |        |                   |   |   |   |   |   |   |   |   |
| CT chest without and with IV contrast  | Usually not appropriate  | Expert Consensus | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕⊕ 3-10 mSv [ped] | 3      | 3      | 4                 | 0 | 3 | 0 | 3 | 1 | 0 | 0 | 0 |
| MRI chest without IV contrast          | Usually not appropriate  | Expert Consensus | ○ 0 mSv      | ○ 0 mSv [ped]       | 1      | 1      | 7                 | 2 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| MRI chest without and with IV contrast | Usually not appropriate  | Expert Consensus | ○ 0 mSv      | ○ 0 mSv [ped]       | 1      | 1      | 7                 | 2 | 1 | 1 | 0 | 1 | 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](http://www.acr.org/ac).