63-year-old male presents to clinic with chronic cough, shortness of breath, and decreased endurance.

Courtney J. Burns, MS4
University of Michigan

Elizabeth Lee, MD
University of Michigan
Patient Presentation

- 63-year-old male with a past medical history of hypertension, cervical spine spontaneous epidural hematoma, and H1N1 viral pneumonia complicated by sepsis, ARDS requiring 8 weeks of mechanical ventilation, and critical illness neuropathy
- Presented to ICU follow-up clinic 8 months after hospital discharge with chronic cough, shortness of breath, and decreased endurance
- Vitals: BP 123/75, HR 90, SpO2 96% on RA, Temp 96.6F
- Physical exam: Lungs clear to auscultation bilaterally
What Imaging Should We Order?
Select the applicable ACR Appropriateness Criteria

<table>
<thead>
<tr>
<th>Scenario Id</th>
<th>Procedure</th>
<th>Adult RRL</th>
<th>Peds RRL</th>
<th>Appropriateness Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>3194244</td>
<td>CT chest without IV contrast</td>
<td>1-10 mSv</td>
<td>3-10 mSv [ped].</td>
<td>Usually appropriate</td>
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<tr>
<td></td>
<td>Radiography chest</td>
<td>&lt;0.1 mSv</td>
<td>&lt;0.03 mSv [ped].</td>
<td>May be appropriate</td>
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<td></td>
<td>CT chest with IV contrast</td>
<td>1-10 mSv</td>
<td>3-10 mSv [ped].</td>
<td>May be appropriate</td>
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<tr>
<td></td>
<td>MRI chest without IV contrast</td>
<td>0 mSv [O]</td>
<td>0 mSv [ped] [O]</td>
<td>Usually not appropriate</td>
</tr>
<tr>
<td></td>
<td>MRI chest without and with IV contrast</td>
<td>0 mSv [O]</td>
<td>0 mSv [ped] [O]</td>
<td>Usually not appropriate</td>
</tr>
<tr>
<td></td>
<td>CT chest without and with IV contrast</td>
<td>1-10 mSv [O]</td>
<td>3-10 mSv [ped].</td>
<td>Usually not appropriate</td>
</tr>
<tr>
<td></td>
<td>FDG-PET/CT skull base to mid-thigh</td>
<td>10-30 mSv [O]</td>
<td>3-10 mSv [ped].</td>
<td>Usually not appropriate</td>
</tr>
</tbody>
</table>

This imaging modality was ordered by the intensivist.
Findings (unlabeled)
Findings (labeled)

Ground-glass opacities and reticulations

Traction bronchiectasis

Notice the anterior distribution of findings
Final Dx:

Mechanical Ventilation-Associated Pulmonary Fibrosis in ARDS
Case Discussion

The location and associated lung findings can help identify a cause of bronchiectasis

- **Lower lung**: Ciliary dyskinesia, infection/impaired immunity, aspiration
- **Upper lung**: Cystic Fibrosis, Sarcoidosis, Allergic pulmonary aspergillosis
- **Anterior with tree in bud**: Mycobacterial infection
Case Discussion

• Pulmonary fibrosis/bronchiectasis due to ARDS
  • 3 phases of ARDS: Acute (exudative) → Intermediate (Proliferative) → Late (Fibrotic)
  • In mechanical ventilation, alveoli are recruited along craniocaudal and ventrodorsal axes
    • The ventral and cranial areas often experiencing overdistension/barotrauma leading to anterior predominance of fibrosis

Progression of patient’s radiographs from the acute phase (A) to intermediate (B) and late (C) phases over an 8 month period.


