

AMSER Case of the Month

August 2026

56 y/o M presenting for SOB and cough

Austin Li

Case Western Reserve University School of Medicine

Pauravi Vasavada, MD

University Hospitals Department of Radiology



Patient Presentation

CC: 56 y/o M with history of ESRD s/p dual donor kidney transplant, T2DM and HTN, presenting to the ED for SOB and productive cough

HPI: Began having cough/SOB 2 weeks prior to presentation. Progressed and became productive of yellow/green-tinged sputum. Denied hemoptysis. No recorded fever but endorsed subjective chills at home. Denied rhinorrhea, diarrhea/constipation, and changes in urine output. No dizziness or lightheadedness but did feel overall fatigued and lethargic. No leg swelling.

Physical Exam:

Vitals: Within normal limits. O2 saturation was 92-96% on 3L supplemental oxygen

General: In NAD, Aox4, conversive.

Pulmonary: Some inspiratory crackles and wheezing on expiration. Wet cough. Otherwise breathing comfortably and unremarkable exam

Pertinent Labs

- Labs
 - CBC: WBC 14.3 with neutrophil predominance, otherwise normal
 - CMP: Consistent with stable CKD and DM
 - VBG: normal
 - Respiratory viral panel: Negative
 - Urinalysis: Negative for infection
 - Blood cultures: No growth

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

^ 1 Acute respiratory illness in immunocompromised patients. Cough, dyspnea, chest pain, or fever. Initial Imaging. 7

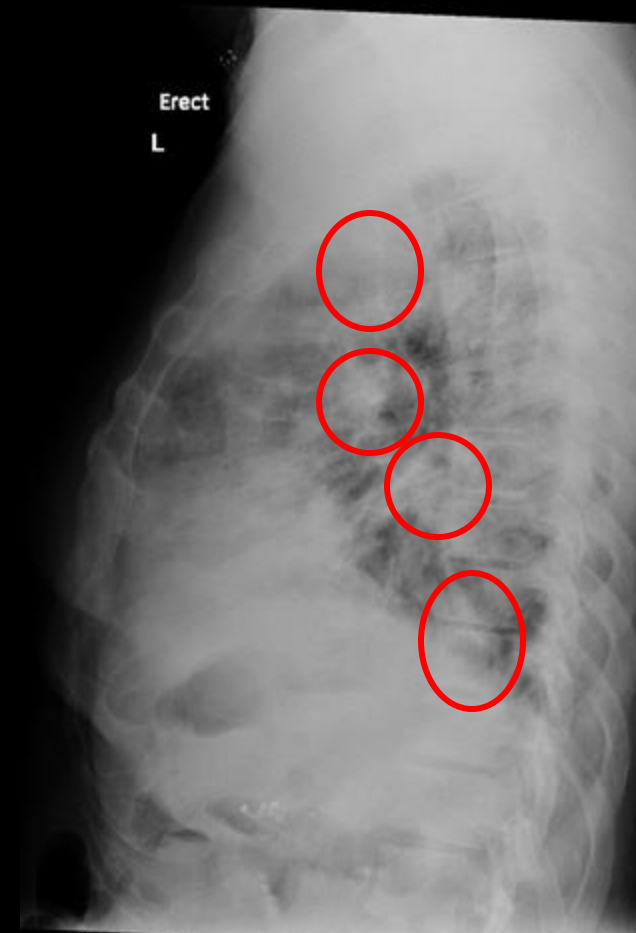
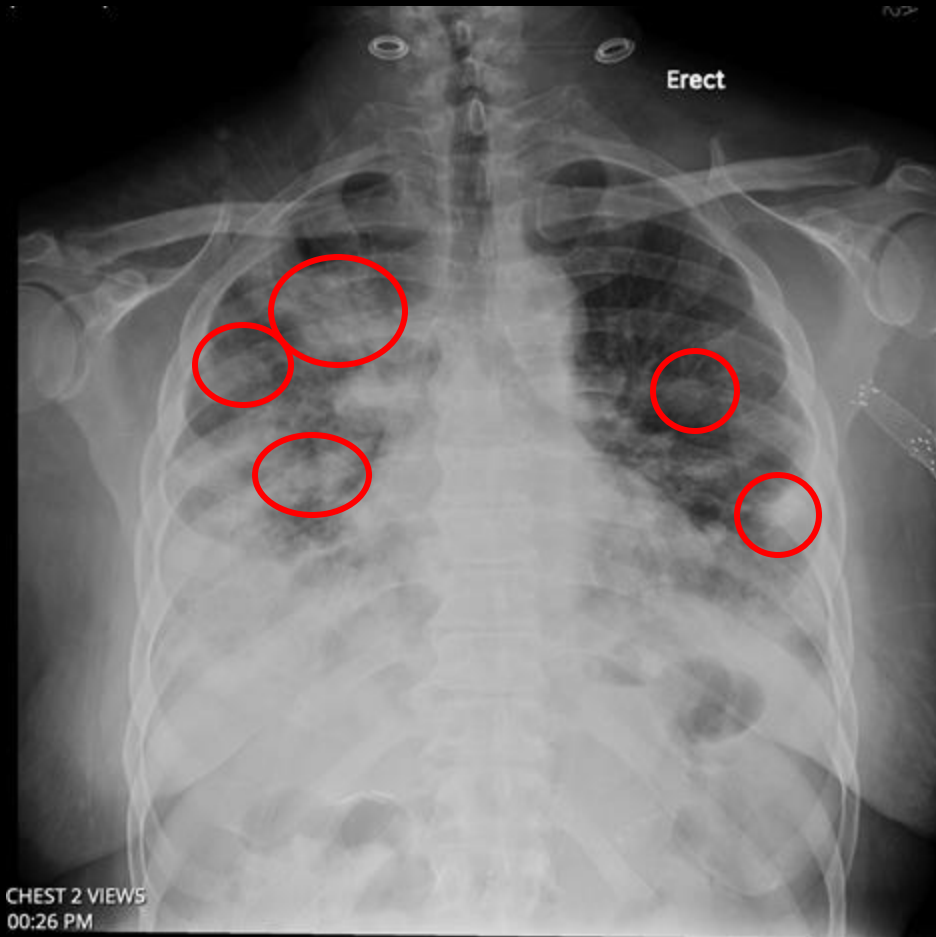
Name	Category	Adult RRL	Peds RRL
Radiography chest	Usually appropriate	☼ <0.1 mSv	☼ <0.03 mSv [ped]
CT chest with IV contrast	May be appropriate	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]
CT chest without IV contrast	May be appropriate	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]
MRI chest without and with IV contrast	Usually not appropriate	○ 0 mSv	○ 0 mSv [ped]
MRI chest without IV contrast	Usually not appropriate	○ 0 mSv	○ 0 mSv [ped]
CT chest without and with IV contrast	Usually not appropriate	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]

This imaging modality was ordered by the ER physician

Findings (unlabeled)



Findings: (labeled)



Extensive multifocal airspace opacities (red circles) throughout both lungs, right greater than left. Could represent multifocal pneumonia as well as extensive edema. No large effusion or pneumothorax.

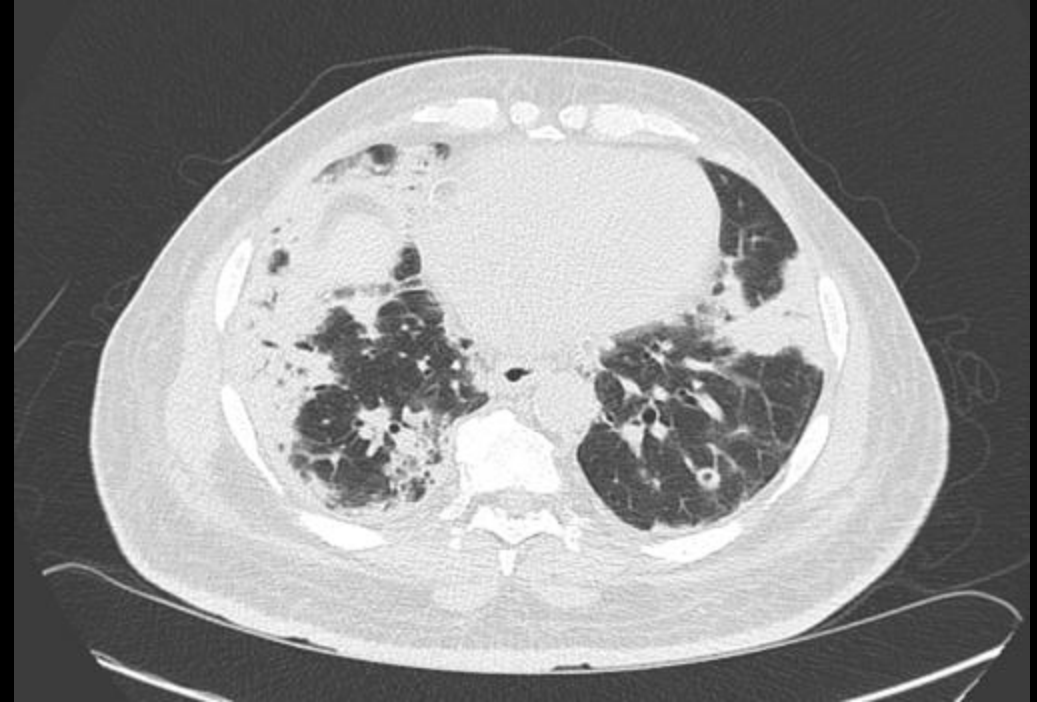
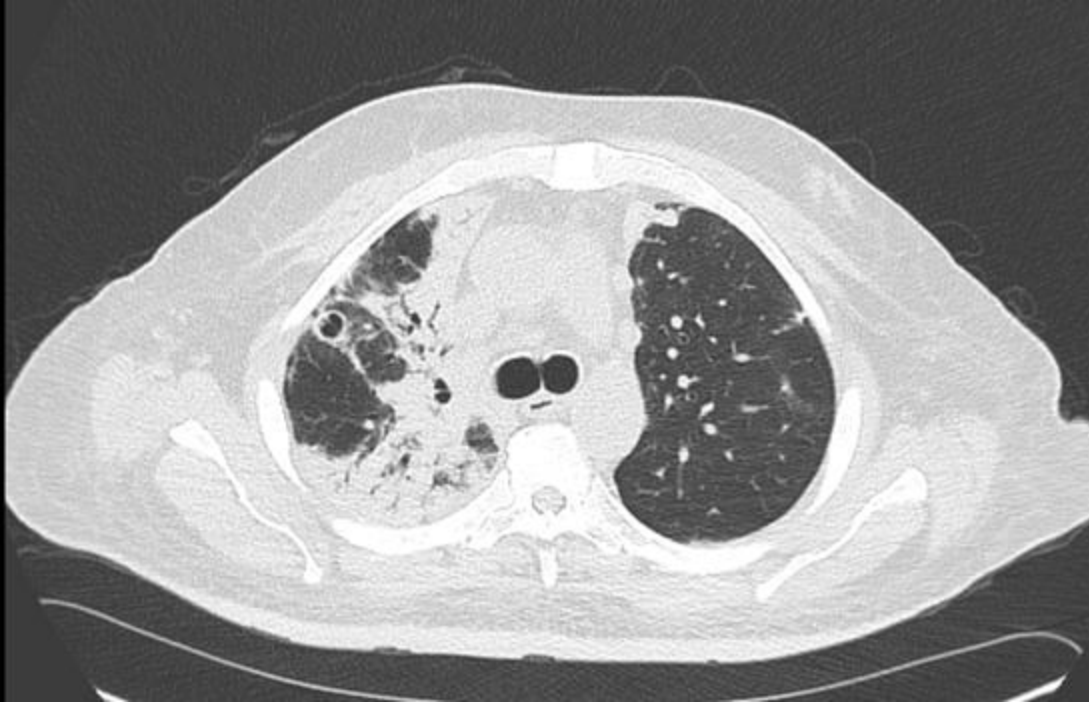
Select the applicable ACR Appropriateness Criteria

^ 2 Acute respiratory illness in immunocompromised patients. Normal, equivocal, or nonspecific chest radiograph. Next imaging study. 6

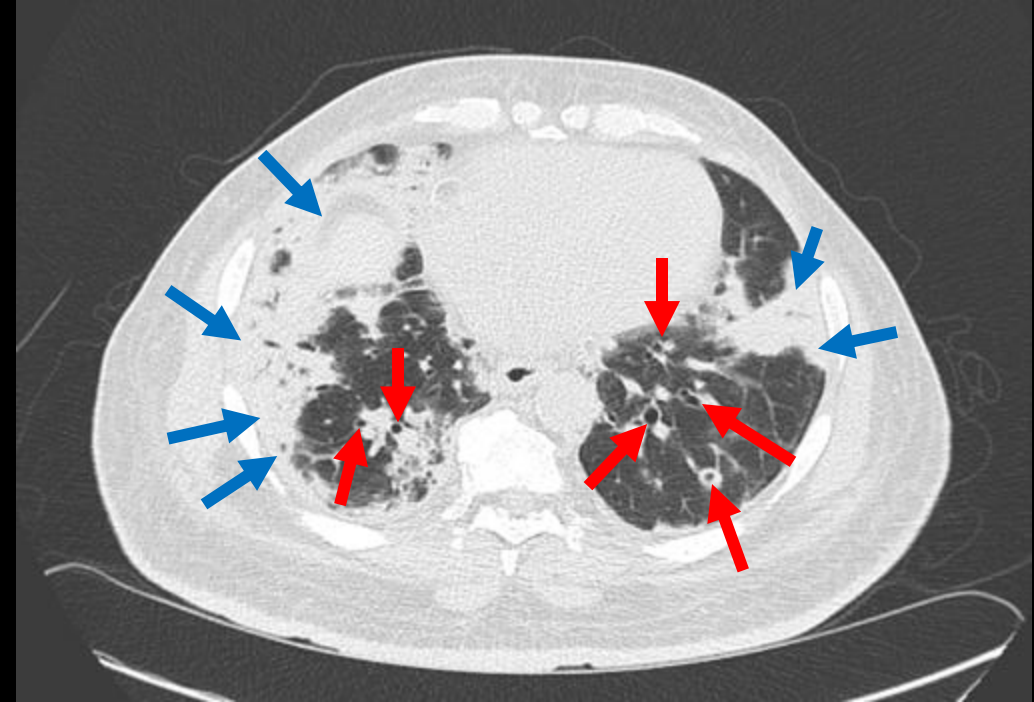
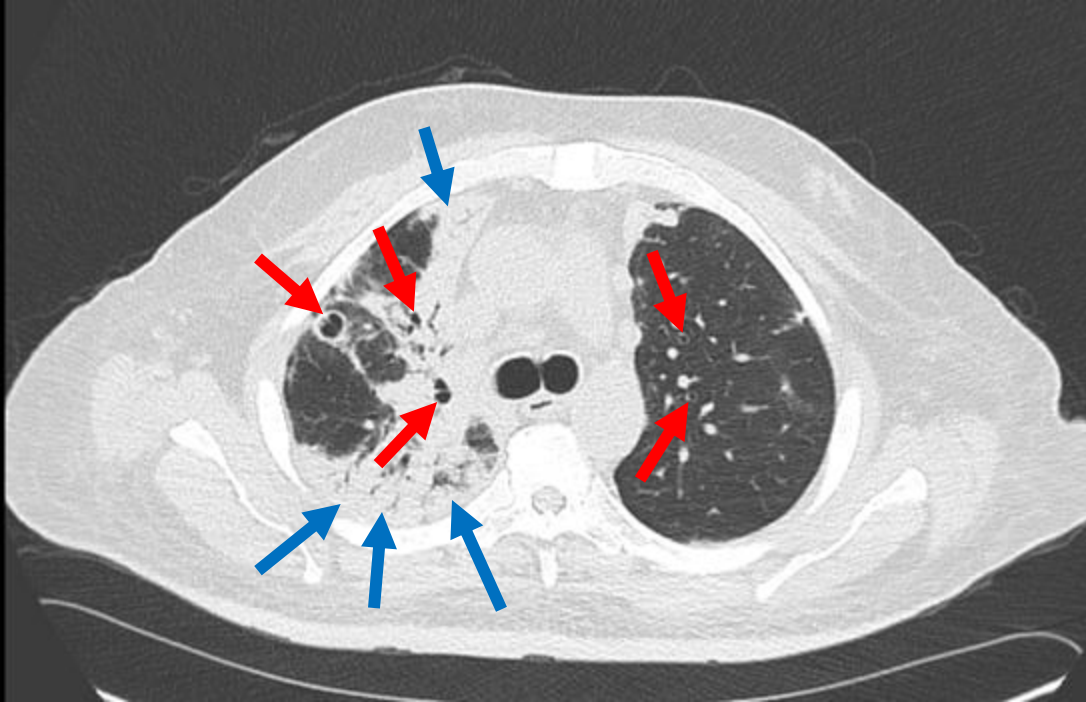
Name	Category	Adult RRL	Peds RRL
CT chest without IV contrast	Usually appropriate	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]
CT chest with IV contrast	May be appropriate	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]
MRI chest without and with IV contrast	Usually not appropriate	0 0 mSv	0 0 mSv [ped]
MRI chest without IV contrast	Usually not appropriate	0 0 mSv	0 0 mSv [ped]
CT chest without and with IV contrast	Usually not appropriate	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]

This imaging modality was ordered by the inpatient team

Findings (unlabeled)



Findings: (labeled)



Extensive bilateral pulmonary multifocal consolidation (blue arrows), right worse than left. Numerous cavitary pulmonary nodules (red arrows).

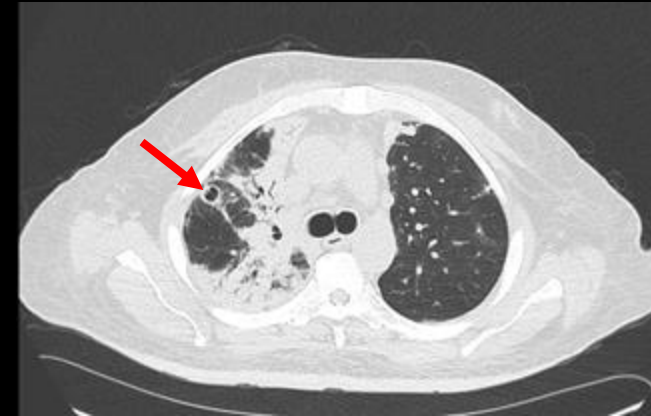
Cavitary nodules were suggestive of multifocal infectious process. A bronchoalveolar lavage was performed to establish the diagnosis.

Final Dx:

Cryptococcal pneumonia in the setting of solid organ transplantation

Cryptococcal Pneumonia

- Immunosuppression is a major risk factor (e.g. HIV, solid organ transplantation, malignancy), but can present in immunocompetent patients as well
- CT can be suggestive of cryptococcal pneumonia but is not diagnostic
- Nonetheless, CT plays an important role in detection, especially in immunocompromised patients, for whom symptoms can progress from mild cough to ARDS with a high mortality rate if not caught early¹
- Typical CT findings differ dramatically based on host immunity:²
 - Immunocompetent: most commonly presents as solitary or few well-defined nodules with diameter <10 mm.^{3, 4} Cavitary lesions only present in 10% of cases.⁵
 - Immunocompromised: Cavitary lesions are significantly more common (40%).⁵ More likely to see consolidation, ground-glass opacities, lymphadenopathy, and pleural effusion.⁶
- Radiological mimics include lung cancer, tuberculosis, bacterial pneumonia, and septic emboli



Cavitary lesions (red arrows), consolidation, and lymphadenopathy, as seen in this case, are much more common in immunocompromised vs. immunocompetent patients.



Cryptococcal PNA vs. Malignancy

- Can be challenging to distinguish between cryptococcal PNA and malignancy, especially in immunocompetent patients who may be asymptomatic
- Has clinical significance if considering surgical resection for malignancy

Factors Favoring Cryptococcal PNA vs. Malignancy on Chest CT

Cryptococcal PNA	Malignancy
• Halo sign (ground-glass opacity surrounding a nodule) – reported in 91% of cases in one review⁷ • Absence of calcification • Clustered nodules • Clinical history: Young age and lack of smoking history	• Spiculated margins without halo sign • Pleural retraction • Upper-lobe predominance⁷ • Clinical factors: older age, smoking history



Example of spiculated mass suggestive of malignancy.

Image Source:
<https://introductiontoradiology.net/courses/rad/cxr/pathology19chest.html>



Example of masses with halo sign (red arrows), favoring infectious process over malignancy

Image Source:
<https://radiopaedia.org/articles/halo-sign-chest-3>

References:

1. Henao-Martínez AF, Beckham JD. Cryptococcosis in solid organ transplant recipients. *Curr Opin Infect Dis*. 2015;28(4):300-307. doi:10.1097/QCO.0000000000000171
2. Li M, Hao D, Feng H, Lu Y, Wang D, Ye H. Pulmonary cryptococcosis beyond human immunodeficiency virus: a five-year cohort study of diagnostic challenges, radiologic mimics, and clinical predictors. *J Thorac Dis*. 2026;18(2):101. doi:10.21037/jtd-2025-914
3. Lindell RM, Hartman TE, Nadrous HF, Ryu JH. Pulmonary cryptococcosis: CT findings in immunocompetent patients. *Radiology*. 2005;236(1):326-331. doi:10.1148/radiol.2361040460
4. Fox DL, Müller NL. Pulmonary cryptococcosis in immunocompetent patients: CT findings in 12 patients. *AJR Am J Roentgenol*. 2005;185(3):622-626. doi:10.2214/ajr.185.3.01850622
5. Xiong C, Lu J, Chen T, Xu R. Comparison of the clinical manifestations and chest CT findings of pulmonary cryptococcosis in immunocompetent and immunocompromised patients: a systematic review and meta-analysis. *BMC Pulm Med*. 2022;22(1):415. Published 2022 Nov 11. doi:10.1186/s12890-022-02175-9
6. Xie LX, Chen YS, Liu SY, Shi YX. Pulmonary cryptococcosis: comparison of CT findings in immunocompetent and immunocompromised patients. *Acta Radiol*. 2015;56(4):447-453. doi:10.1177/0284185114529105
7. Xinqiang G, Hongxia Z, Wenmin H, Hui W. Pulmonary cryptococcosis in non-HIV-infected individuals: HRCT characteristics in 58 patients. *Medicine (Baltimore)*. 2024;103(26):e38671. doi:10.1097/MD.00000000000038671