

# Evidence Discussion Pleural Effusion (CH 18.1)

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The most common initial diagnostic test suggesting a pleural effusion is often chest radiography (CR).(1) CR remains the most accessible form of chest imaging and will often be the initial study for suspected pleural disease.(2,3,4) Lateral decubitus CR has higher sensitivity and specificity for pleural effusion than other positions.(5) However, complicated effusions are often loculated and may not layer dependently. Lower lobe consolidation may mask the presence of an effusion. The American Association for Thoracic Surgery (AATS) states that CR, although useful as a first step, should be combined with additional imaging if pleural space infection is suspected.(3) The American College of Radiology (ACR) states that consensus recommendations endorse CR as the initial imaging modality for suspected parapneumonic or malignant effusion, but there are limited empiric data to support this.(6)

Ultrasound (US) is at least as effective as lateral decubitus views for the detection of pleural fluid and provides a better estimation of fluid volume.(2,3,5) When standard CR cannot rule out a pleural effusion, US has largely replaced decubitus views due to its speed, portability and greater sensitivity.(4) Identification of a pleural effusion for possible US-guided thoracentesis is the primary reason for chest US.(6) The AATS guidelines state that CR and US are class 1 recommendations (should be done) for suspected pleural space infection.(3)

Although diagnostic imaging plays an important role in the evaluation of pleural effusions, thoracentesis with pleural fluid analysis remains the necessary first invasive step.(1) Pleural fluid analysis is considered mandatory unless the clinical presentation suggests a high pretest probability of a transudative effusion.(2,7) Initial evaluation should include an ultrasound (US)-guided thoracentesis to categorize the effusion as a transudate or exudate and obtain specimens for microbiology and cytology.(7,8,9) If a parapneumonic effusion is suspected, diagnostic aspiration must be performed to identify patients with a complicated effusion that requires drainage.(3,8)

CT is not used routinely as the initial imaging study for pleural effusion unless there is suspicion for loculated fluid in an interlobar fissure or paramediastinal location, or CR demonstrates parenchymal lesions suggestive of cancer, septic emboli or cavitation.(4) CT can better distinguish between a loculated empyema and subpleural lung abscess. CT with IV contrast optimizes imaging of the pleura. CT chest with contrast is a class 2a recommendation (reasonable) for suspected pleural space infection in the AATS guidelines.(3) If the etiology of an exudative effusion cannot be identified, or if it is not safe to perform a thoracentesis, a CT chest with contrast is appropriate.(8,9) The American College of Radiology (ACR) states that CR or CT chest with IV contrast is usually appropriate as initial imaging for people with recent pneumonia and suspected parapneumonic effusion or for people with dyspnea, cough or chest pain with a

suspected malignant pleural effusion.(6) Thoracentesis and chest CT cannot rule out malignancy or tuberculosis. Pleural biopsy is indicated for a recurrent undiagnosed exudative effusion.(2,8,9) When a diagnosis cannot be made, monitoring with interval CT scans for up to 2 years is appropriate.(9) CT is used in the diagnosis and management of late-stage empyema and malignant pleural effusion and can be used to check the position of drains and plan for surgical intervention.(2)

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