



### Diagnoses That Can Be Established Definitively by Pleural Fluid Analysis

Conditions	Notes
Malignancy	Positive cytology; the diagnostic yield of thoracoscopy in malignant effusions is 95% compared to cytology (62%), needle biopsy (44%), or the combination of both (74%).
Tuberculosis	Positive acid-fast bacilli stain or culture; the combination of histology (80% sensitivity) and culture (56% sensitivity) of pleural biopsy tissue established the diagnosis in up to 90% of cases. Cultures of induced sputum may also be useful. When available, pleural fluid markers of tuberculosis (i.e., ADA or interferon- $\gamma$ ) can replace needle biopsy of the pleura in the diagnosis of tuberculous pleuritis.
Empyema	Pus, positive culture; about 30% of nonpurulent complicated parapneumonic effusions (i.e., chest tube drainage is required for their resolution) and 75% of empyemas (i.e., visible purulent fluids) are culture positive, respectively.
Hemothorax	Hematocrit pleural fluid or blood $\geq 0.5$ ; in many instances, a bloody pleural fluid (hematocrit $> 1\%$ ) is due to neoplasm rather than traumatic hemothorax.
Chylothorax	Milky fluid, triglycerides $> 110$ mg/dL, chylomicrons on lipoprotein electrophoresis; the commonest causes are lymphoma and trauma. Not all chylous pleural effusions appear milky white or whitish.
Pneumonia	Frank pus, positive Gram stain or culture, pH $< 7.2$ , glucose $< 60$ mg/dL, LDH $> 2$ to 3 times the upper normal limit for serum; Pleural fluid characteristics that are indicators for early chest tube drainage (poor prognostic factors).

ADA = adenosine deaminase; LDH = lactate dehydrogenase.