

Evidence Discussion (CH 19.1)

Pneumothorax/Hemothorax evidence summary

The majority of pneumothorax cases can be confirmed by upright PA chest radiography (CR), which remains the standard initial exam (4,5).

While CT is more sensitive than CR in detecting pneumothorax, it is generally not required for diagnosis and should be avoided due to excess radiation (4). CT may be necessary for diagnosing a very small pneumothorax or differentiating between a pneumothorax and a giant bulla in bullous emphysema (5). Although CT is the best method to measure the size of a pneumothorax, current evidence does not support basing treatment decisions solely on size (2).

The 2001 ACCP guidelines advise against routine CT use for a first-time primary spontaneous pneumothorax (PSP). However, CT may be indicated to evaluate suspected pulmonary disorders not apparent on CR. For secondary spontaneous pneumothorax (SSP), CT is acceptable for managing recurrent pneumothorax, persistent air leak, and surgical planning.

In contrast, the 2023 British Thoracic Society recommends CT chest for individuals with symptoms and high-risk characteristics. These include hemodynamic compromise, significant hypoxia, bilateral pneumothorax, underlying lung disease, hemopneumothorax, or age over 49 with a significant smoking history. This recommendation applies if the pneumothorax size on CR is insufficient for safe needle aspiration or chest tube intervention. The European Respiratory Society suggests that CT may be useful in complicated cases, when chest tube misalignment is suspected, when underlying lung disease is suspected, and in patients requiring surgery (4).

High-resolution CT (HRCT) has better sensitivity than routine CT in the pre-operative detection of blebs and bullae (2). However, it is unclear whether HRCT can predict the risk of recurrence or identify which patients may benefit from surgical intervention. It may help to identify those at lower risk: the positive predictive value of CT bleb scores for ipsilateral recurrence is relatively low at 68%, while the negative predictive value is high at 94% (3)

Some experts advise considering a CT scan after a first time PSP if there are factors such as a family history of pneumothorax, presence of blebs, cysts, or bullae; female sex; or a family or personal history and/or physical examination findings suggestive of a pneumothorax-associated syndrome. (3,7)

Although they have low specificity, the most sensitive tests for detecting pneumothorax and hemothorax are CR and CT. For detecting diaphragmatic endometriosis, Magnetic Resonance Imaging (MRI) of the chest is preferable. (8)

References

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