This guideline has been prepared with reference to the following:

Roberts ME, Rahman NM, Maskell NA et al. British Thoracic Society Guideline for pleural disease. Thorax 2023;78:s1-s42

https://thorax.bmj.com/content/78/Suppl_3/s1.long

Bedawi EO, Ricciardi S, Hassan M et al. ERS/ESTS statement on the management of pleural infection in adults. Eur Respir J. 2023;61:2201062

https://erj.ersjournals.com/content/61/2/2201062.long

Davies HE, Davies RJO, Davies CWH et al. Management of pleural infection in adults: British Thoracic Society Pleural Disease Guideline 2010 Thorax. 2010;65:ii41-53

https://thorax.bmj.com/content/65/Suppl_2/ii41.long

Antibiotics alone are insufficient treatment for empyema, and should be used in addition to clearing the infected fluid?
An evidence-based guideline from the American College of Chest Physicians (Colice, 2000) categorised patients into four separate risk levels for poor outcome: 1 (very low), 2 (low), 3 (moderate) and 4 (high). Drainage in addition to antibiotics was recommended for categories 3 and 4, but not for 1 and 2.
A Cochrane review (Coote, 2005), states that “Drainage is usually necessary unless antibiotics are started early enough. However, once there is pus in the pleural space, drainage is imperative”. As of 2009, this review has been withdrawn, due to the authors having insufficient time for updating.
The optimal approach to the management of complicated pleural infection is unclear, due to the paucity of prospective randomised trials (Heffner, 2005; Sahn, 1998).
“Unfortunately, limited evidence exists to guide clinicians in selecting the ideal drainage intervention for a specific patient because of the broad variation that exists in the intrapleural extent of infection, presence of locules, comorbid features, respiratory status, and virulence of the underlying pathogen” (Heffner, 2009).

Colice GL, Curtis A, Deslauriers J, et al. Medical and surgical treatment of parapneumonic effusions: an evidence-based guideline. Chest 2000;118:1158-71
http://journal.publications.chestnet.org/article.aspx?articleid=1079227

Coote N, Kay E. Surgical versus non-surgical management of pleural empyema. The Cochrane Database of Systematic Reviews 2005, Issue 4. Art. No.: CD001956
http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001956.pub2/full

Heffner JE. Multicenter trials of treatment for empyema: after all these years. N Engl J Med 2005;352:926-8

Heffner JE, Klein JS, Hampson C. Interventional management of pleural infections. Chest, 2009;136:1148-59
http://journal.publications.chestnet.org/article.aspx?articleid=1090103

Sahn SA. Use of fibrinolytic agents in the management of complicated parapneumonic effusions and empyemas. Thorax 1998;53(Suppl 2):S65-S72
http://thorax.bmj.com/content/53/suppl_2/S65.long

Evidence Level: V

Should intrapleural fibrinolytics be considered in patients who fail to improve with intercostal tube drainage plus antibiotics?
A Cochrane systematic review on this question (Cameron, 2008) identified 7 small RCTs in a total of 761 patients. The evidence from these trials indicate that flushing the pleural space with a fibrinolytic agent such as streptokinase or urokinase may help to break down the fibrinous bands or loculations that prevent total drainage of infected pleural fluid and therefore may significantly increase the amount of pus drained. Meta-analysis of these RCTs indicates that intrapleural fibrinolytic therapy confers a

benefit in reducing the requirement for surgical intervention for patients in some studies but not in others . The safety profile of intrapleural fibrinolytics remains uncertain.
An earlier meta-analysis of 5 RCTs in 575 patients (Tokuda, 2006) found a non-significant reduction in death and the need for surgery in the treatment group (27.6% vs 32.8%). The authors did, however, concede that “selected patients might benefit from the treatment”.
Current BTS guidelines (Davies, 2010) recommend the use of streptokinase (250,000 IU twice daily for 3 days) or urokinase (100,000 IU once daily for 3 days) in the following situations: “On occasions, such treatment may be indicated for the physical decompression of multiloculated (and so tube drainage resistant) pleural fluid collections that are responsible for dyspnoea or respiratory failure if discussion with a thoracic surgeon identifies that either surgery is not immediately possible due to additional patient co-morbidity, the feasibility of transfer to a surgical unit or other clinical or logistical reasons”.

Cameron R, Davies HR. Intra-pleural fibrinolytic therapy versus conservative management in the treatment of parapneumonic effusions and empyema. Cochrane Database of Systematic Reviews 2008. : CD002312 http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD002312.pub3/full

Davies HE, Davies RJ, Davies WH. Management of pleural infection in adults: British Thoracic Society pleural disease guideline 2010. Thorax 2010;65(Suppl 2):ii41-ii53

Tokuda Y, Matsushima D, Stein GH, et al. Intrapleural fibrinolytic agents for empyema and complicated parapneumonic effusions: a meta-analysis. Chest 2006;129:783-90

Evidence Level: I

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