

# Empiric management of Empyema / Complicated Parapneumonic Effusion

CONSULT  
THORACIC  
SURGERY

Empyema (collection of pus in the pleural cavity) is usually associated with pneumonia but may develop after thoracic trauma or surgery.  
Drainage (chest tube or surgical) is indicated for definitive management.

## INITIAL CONSIDERATIONS:

Obtain blood, sputum and pleural fluid cultures (*to increase yield of pleural fluid culture, inoculate both orange-top (sterile) container and blood culture bottle with pleural fluid*)

## MOST COMMON BACTERIAL ORGANISMS

<b>Community-acquired</b>	Gram Positive cocci (60%) <i>S. pneumoniae</i> , <i>S. viridans</i> group (anginosus/milleri), <i>Streptococcus sp</i> (Group A), <i>Staphylococcus aureus</i> Gram negative organisms (10%) Anaerobes in 20% of cases (alone or with other pathogens) Legionella and other atypicals are rare
<b>Hospital-acquired</b>	MSSA (10-25%), MRSA (10%), Gram negative bacilli (25%), <i>Streptococcus spp</i> (20%)
Specific context	<i>M. tuberculosis</i> , non-infectious

## EMPIRIC TREATMENT

<b>Community-Acquired</b>	<b>Ceftriaxone 2 g iv q24h + Metronidazole 500 mg iv/po q8h</b>
	<b>Severe <math>\beta</math>-lactam allergy:</b> Moxifloxacin 400 mg po/iv q24h
<b>Hospital-Acquired</b>	<b>Piperacillin-tazobactam 4.5 g iv q8h (extended infusion over 4h)</b>
	Consider adding vancomycin IV 15 mg/kg IV q12h If MRSA screen positive (consult pharmacy for specific dosing) <b>Severe <math>\beta</math>-lactam allergy:</b> Consult ID and allergy services

**Re-assess antimicrobial therapy within 24-48 hours depending on clinical status and culture results**

## ADDITIONAL COMMENTS

- There is no role for intrapleural administration of antibiotics.
- Avoid aminoglycosides due to poor pleural penetration
- **Consult ID if:**
  - If unusual pathogen is suspected/ confirmed
  - Antibiotic susceptibility shows resistance to common agents
  - Sepsis fails to improve with empiric therapy

## PO Step Down Considerations

When effusion and signs of sepsis have improved, consider switching to oral **amoxicillin-clavulanate** 875 mg po BID if isolated organism susceptible

## DURATION OF TREATMENT

Most patients will require at least **2 weeks** of therapy

Duration of antibiotic therapy for bacterial empyema is influenced by the organism, adequacy of source control, and clinical response/resolution of effusion on CXR/CT

## REFERENCES

K. Robert Shen, Alejandro Bribriesco, Traves Crabtree, Chad Denlinger, Joshua Eby, Patrick Eiken, David R. Jones, Shaf Keshavjee, Fabien Maldonado, Subroto Paul, Benjamin Kozower: "The American Association for Thoracic Surgery consensus guidelines for the management of empyema" The Journal of Thoracic and Cardiovascular Surgery, Volume 153, Issue 6, June 2017, Pages e129-e146

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