

## Management of Parapneumonic Effusions & Empyemas

New presentation of community-acquired pneumonia with clinical severity suggestive of parapneumonic effusion

Known community-acquired pneumonia not improving after 48-72 hours of appropriate antibiotic treatment

Obtain PA and lateral chest Xray

Pleural effusion present?

No

Off algorithm

Yes

Obtain a chest ultrasound  
(Estimate size of effusion, determine if the fluid is free or loculated, assess echogenicity of the fluid, & look for pleural thickening)

Concern for diagnosis other than pneumonia with parapneumonic effusion?

(e.g., chest mass, congenital pulmonary malformation, lung abscess, necrotizing pneumonia, aspirated foreign body, non-parapneumonic effusions)

No

Yes

Obtain MRSA nasal PCR, respiratory film array, CBC with diff, CRP, blood culture, and CMP.

Start pulmonary toilet, antipyretics, analgesics, & supportive care

Obtain chest CT with IV contrast to further characterize & additional studies as indicated

•Chest ultrasound demonstrates an echogenic fluid collection without loculations  
•Consult IR

•Chest ultrasound demonstrates fibrinous septations but no echogenic loculations or thickened pleural rind  
•Consult IR

•Chest ultrasound demonstrates thickened rind, multiple echogenic loculations, or entrapped lung  
•Consult IR  
•Consider Chest CT with IV contrast to better

•If effusion is large or moderate sized & symptomatic, place 8-12F pigtail catheter. IR to send fluid to lab.  
•Floor lab orders: Pleural fluid culture, cell count, protein, & Universal PCR for Bacteria (LAB1849)  
•Consult Pediatric Surgery

•Place 8-12F pigtail catheter within largest fluid collection. IR to send fluid to lab.  
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Start Antibiotics (see below)

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Start Fibrinolytic Therapy x 3 days (see below)

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Effusion still present?

Yes

Repeat ultrasound to recharacterize fluid

No

Effusion still present?

No

When chest tube drainage is <1ml/kg/day obtain US chest/mediastinum to evaluate if tube can be removed after consultation with IR and surgery

Complete antibiotic course

No

Effusion still present?

## Antibiotic Selection for Complicated Community-Acquired Pneumonia > 3 Months of Age

### Negative MRSA Nasal PCR

- Ampicillin-sulbactam 200 mg of ampicillin component/kg/day divided every 6 hours (max 2g of ampicillin/dose)

### Negative MRSA Nasal PCR & Mild to Moderate Penicillin Allergy (e.g., rash)

- Ceftriaxone 75 mg/kg once per day (max 2g/day)

### Positive MRSA Nasal PCR

- Ceftriaxone 75 mg/kg once per day (max 2g/day) PLUS
- Clindamycin 40 mg/kg/day divided every 8 hours (max 600 mg/dose)

### Septic Shock Present

- Ceftriaxone 75 mg/kg once per day (max 2g/day) PLUS
- Vancomycin 15 mg/kg/dose every 6 to 8 hours (max 2000 mg/day)
  - Can likely discontinue vancomycin if MRSA nasal PCR and all cultures are negative for MRSA

### Duration

- 7 days from chest tube removal/drainage of effusion or empyema

## Fibrinolytic Therapy for Parapneumonic Effusions & Empyemas

### Steps

- Ensure optimal positioning of pigtail catheter within the largest fluid collection.
- Instill tPA mixed in normal saline into the pleural space—use Epic order panel 01838592 “Pediatric tPA (alteplase) fibrinolytic therapy for chest tubes”
  - For patients < 10 kg: 1 mg tPA in 10 mL NS
  - For patients 10-20 kg: 2 mg tPA in 20 mL of NS
  - For patients 20-30 kg: 3 mg tPA in 30 mL of NS
  - For patients > 30 kg: 4 mg tPA in 40 mL of NS
- Clamp tube for one hour then return to suction
- Repeat at 24-hour intervals for two additional doses

### Personnel

- Interventional Radiology to place initial pigtail catheter
- TPA to be administered on the floor after tube placement