Blank Children's Hospital
UnityPoint Health

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

Obtain MRSA nasal PCR, respiratory film array, CBC with diff, CRP, blood culture, and CMP.
Start pulmonary toilet, antipyretics, analgesics, & supportive care

Chest ultrasound demonstrates an echogenic fluid collection without loculations

If effusion is large or if it is moderate sized & symptomatic, place 8-12F pigtail catheter. Send fluid for culture, cell counts, & protein.

Start Antibiotics (see below)

Effusion still present?

Yes → Repeat ultrasound to recharacterize fluid

No → Complete antibiotic course

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

Place 8-12F pigtail catheter within largest fluid collection. Send fluid for culture, cell counts, & protein.

Start Antibiotics (see below)
Start Fibrinolytic Therapy x 3 days
(see below)

Effusion still present?

No → Remove pigtail once drainage is < 1ml/kg/day → Complete antibiotic course

Yes → Consult Pediatric Surgery

Chest ultrasound demonstrates thickened rind, multiple echogenic loculations, or entrapped lung

Consider chest CT with IV contrast to better characterize

Place 8-12F pigtail catheter within largest fluid collection. Send fluid for culture, cell counts, & protein.

Start Antibiotics (see below)
Start Fibrinolytic Therapy x 3 days
(see below)

Effusion still present?

Yes → Consult Pediatric Surgery

No → Remove pigtail once drainage is < 1ml/kg/day → Complete antibiotic course

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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 and instill first dose of tPA if appropriate

Last revised 10/14/2022; Stephanie Kapfer, MD, David Magill, MD, Shelley Hancock, MD, Joel Waddell, DO