



Supportive Clinical Information: Parapneumonic Effusion

See Page 2 for Alteplase Protocol

ON ADMISSION

- All children with significant parapneumonic effusions should be admitted to hospital
- Patients admitted with pneumonia who develop a pleural effusion should be switched to Parapneumonic Effusion Protocol
- Consult Respiriology, Infectious Diseases (for antibiotic guidance), PICC team (for PICC insertion) and Interventional Radiology or PICU or General Surgery (for chest tube insertion)

CHEST TUBE

- Normally inserted by Interventional Radiology. PICU or General Surgery ARE ALTERNATE OPTIONS. **PICC line should be inserted during same procedural sedation/anesthetic**
- Tube size is radiologist/intensivist/surgeon preference; classically, a 14 to 18 French is used, but some prefer smaller "pigtail" catheters
- See Chest Tube Care and Maintenance IWK Policy 750

ONGOING INVESTIGATIONS/TREATMENT

- Watch clinically for edema (due to albumin loss in chest tube drainage)
- Assess fluid status regularly given risk of SIADH in children with parapneumonic effusions
- Early mobilization should be encouraged, but chest physiotherapy is *not* recommended

CHEST TUBE OUTPUT

- If chest-tube output slows AND if loculation was present on the U/S, consider **alteplase** treatment.
- If chest-tube output slows and there was *no* loculation of the effusion on U/S, the issue is more likely due to blockage or position of the chest tube

CLINICAL ENDPOINTS

- If there is failure of chest tube drainage, antibiotics and fibrinolytics, consider abscess or other complications; discuss with General Surgery and Infectious Disease teams
- IV antibiotics are normally given until patient is afebrile and clinically improving
- The timing of elective removal of the chest tube is a clinical decision, but typically, when output is less than 50 mL per 24 hours
- Chest X-rays are taken before and after removal of chest tube
- Patients are usually discharged after 24 hours of oral antibiotics and satisfactory PO intake

DISCHARGE PLANNING

- After in-hospital IV antibiotic course, oral antibiotics are usually given for 1 to 3 weeks at home (clinical decision)
- If no pathogen is isolated and immunizations are up to date, amoxicillin is the oral antibiotic of choice
- Children should be followed up after discharge by their family doctor until they have recovered completely clinically
- Chest radiographs should be repeated in 6 weeks. Requisition should be provided to the family at discharge by general pediatrics.
- Underlying diagnoses (e.g. Immunodeficiency) are rare, but may need to be considered



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INDICATIONS

- Empyema (rare)
- Loculation of effusion seen on U/S and slowing of chest tube output

RELATIVE CONTRAINDICATIONS

- Patients with a bleeding disorder
- Patients with necrotizing pneumonias
- Patients with air in the pleural space (bronchopleural fistula), or chest tubes that are bubbling (suggesting possible air leak), because **alteplase** could be injected into lung tissue, and clamping the chest tube (after **alteplase** injection) could result in tension pneumothorax

ADMINISTRATION

1. When indicated, give **alteplase** into the chest tube BID for 3 days
2. Dosing:
 - a. Children less than 10 kg: 2 mg of **alteplase**, followed by 10 mL NaCl 0.9%
 - b. Children equal or more than 10 kg: 4 mg of **alteplase**, followed by 10 mL NaCl 0.9%
3. Administration (Physician):
 - a. Most patients require a morphine bolus 20 to 30 minutes prior to an **alteplase** dose
 - b. Use clean technique, including sterile gloves
 - c. Place green sterile towel underneath soft large diameter portion of chest tube
 - d. Wash portion of chest tube with 2 chlorhexidine brushes; allow to dry
 - e. Clamp chest tube distal to cleaned area
 - f. Flush
 - i. Attempt to flush 5 to 10 mL of NaCl 0.9%
 - ii. Slowly administer **alteplase** dose
 - iii. Flush with 10mL NaCl 0.9%
 - g. Following administration:
 - i. Clamp chest tube for 1 hour, then straight drainage for 30 minutes, then back on suction. If 10 mL/kg of fluid has drained in the first 15 minutes: Clamp chest tube for 1 hour, then straight drainage for 30 minutes, then back on suction
 - ii. Monitor pleural fluid output. Replace pleural fluid output 1:1 with IV NaCl 0.9% once per shift