Paediatric Clinical Practice Guideline

Pleural effusion and complicated pneumonia

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Suspected or confirmed pleural effusion on CXR

Ward / HDU / CED

Outside referring hospital

1. Inform COW / on call Consultant
2. Transfer all images via PACS link
3. Arrange admission to ward / HDU via bleep holder 8651

Start I.V co-amoxiclav on admission*

48 hours treatment

No improvement in:
- Fever pattern
- Respiratory distress or oxygen requirement
- Oral intake

*Consider adding clindamycin if:
- Complex patient
- Delay ≥ 48 hours before chest drain insertion
- Suspected loculated pneumonia

CXR and USS thorax
- Refer Paediatric Surgery and Respiratory teams for consideration of chest drain
- Consider adding clindamycin

Stable or improved

See pages 2 – 3 for chest drain management

Continue I.V co-amoxiclav +/- clindamycin until at least 48 hours fever free

Initial investigations:
- FBC, U&E, LFT, CRP
- ASOT, blood culture
- Sputum culture

No further CXR required if clinical improvement with or w/out drain

Penicillin allergy (See BNFc for doses)

IgE e.g. anaphylaxis: IV clindamycin. Oral switch on respiratory team advice (e.g. clarithromycin +/- clindamycin).

Non-IgE: IV cefuroxime. Add IV clindamycin if deterioration. Oral switch on respiratory team advice (e.g. clarithromycin +/- clindamycin).

On discharge:
- Complete 3 weeks oral co-amoxiclav
- Arrange Respiratory clinic follow up at 8 – 12 weeks
- Repeat CXR in clinic (give form to parents)
- Re-attend CED if fever / respiratory distress recurs
Conservative treatment principles:

- Change antibiotic only if resistant organism or after discussion with microbiology.
- Oxygen for SpO2 < 92%.
- Intravenous fluid if child dehydrated or unable to drink – 2/3rds maintenance.

Chest drain management

**Surgical Unit policy – RACH is not a primary VATS centre**

Timing of chest drains

Optimal timing of chest drain is up to day 5 of admission. If > 5 days, respiratory / HDU / surgical MDT discussion regarding optimal procedure necessary.

Type of drain

The agreed Surgical unit policy is to use a **Softer Portex catheter** (comes with three-way tap) as standard first line chest drain. Use of pigtail catheters may reduce the incidence of tube displacement; need for post-operative opioid infusions; length of patient immobility.

Important points if any intervention undertaken

1. Any coagulopathy or platelet defect should be corrected prior to theatre.

2. Ensure sufficient pleural fluid is taken in theatre. Send to lab for:
   - **Gram stain and culture**
   - **Cell differential count**: Please include a cytology request form and state that if lymphocytosis identified by micro then specimen must be sent to cytology. *(lymphocyte predominance raises the possibility of tuberculosis or malignancy)*
   - **Pneumococcal PCR** (lab to send this off for all culture-negative specimens).

3. **Discuss long-line insertion**: consider early in course of illness (it may be the best time to insert it when the patient is taken to theatre for the procedure). Identify person to consent and insert long-line e.g. Anaesthetist, I.V. team or Paediatric Registrar. Ensure contingency plan if long-line insertion unsuccessful e.g. neck line, femoral line or peripheral line.

4. Chest radiograph must be checked after procedure to confirm drain position.
Urokinase

All children with chest drain in-situ to have urokinase.

Twice a day for at least 3 days:
Age < 1yr: urokinase 10 000 units in 10ml 0.9% saline
Age > 1yr: urokinase 40 000 units in 40ml 0.9% saline
Once infused the drain should be clamped for 4 hrs.

NB. Urokinase may be out of stock. Please discuss with pharmacy before starting treatment.

Alternative treatment is with Alteplase

Dose 0.1mg/kg (max 4mg) via the chest drain daily for 3 days

- in 10ml sodium chloride 0.9% for patients <1 year of age
- in 40ml sodium chloride 0.9% for patients ≥ 1 year of age (smaller volumes may be used at the discretion of the clinical team)

Once infused the drain should be clamped for 4 hrs.”

If the response is incomplete after 3 days, further doses can be considered.
Drain should be clamped for 1 hour if > 10ml/kg of pleural fluid is drained at one time.

Improvement?

If the patient is afebrile for 24 hours and < 50mls/day is draining then consider drain removal.
CXR to be done after drain removed to rule out air leak.

No improvement?

If fever not settling > 48 hours with drain → repeat chest ultrasound
If no improvement after 7 days of treatment following chest drain insertion, surgical options (mini-thoracotomy or VATS) should be considered.
A CT scan also may be considered.

Notes

**Immune evaluation:** should be undertaken only when there is a history of recurrent infections, failure to thrive (pre-illness) a family history of immune dysfunction, a poor response to treatment or an unusual organism is isolated.