

Practical Procedures: Pleural Aspiration

All pleural procedures should be performed under real-time ultrasound guidance

Indications for pleural aspiration:

- To aid the diagnosis of a unilateral, suspected exudative pleural effusion
- To exclude empyema as this requires urgent intercostal drainage

Equipment required for pleural aspiration:

- Ultrasound machine and an operator who is at least level one competent at pleural ultrasound
- Sterile ultrasound probe cover
- Sterile gloves
- Sterile field and dressing
- Chlorhexidine cleaning solution
- Lignocaine
 - Remember 3mg/kg is the maximum safe dose
 - 5mls of 2% preparation contains 100mg lignocaine. The max dose for a 70kg person is therefore approximately 10mls 2% lignocaine.
- 50ml syringe and green needle

Contraindications to pleural aspiration:

- Coagulopathy
- Lack of ultrasound support
- Local infection
- Very small fluid volume

Pre-procedure:

- Consent the patient
 - Ideally written consent should be gained
 - Consent for pain, bleeding, infection, damage to surrounding structures (including pneumothorax with subsequent drain) and failure.
- Review chest x-ray and examine patient to confirm side of insertion
- Set up an aseptic trolley with equipment
- Perform a provisional ultrasound

Procedure for pleural aspiration:

- Don sterile gloves
- Clean the area identified for aspiration and apply a sterile field
- Further ultrasound can be conducted with the probe in a sterile sheath
- Infiltrate 5-10ml of lignocaine initially under the skin and then into the subcutaneous tissue and then pleural space
 - Start with an orange needle, then a blue needle and then green.
- You should be able to access the pleural space with the green needle
- Allow time for lignocaine to act
- Using a green needle and 50ml syringe insert the needle along the tract used for the local anaesthetic. Aspirate as you insert the needle until fluid is aspirated.
- Aspirate 10-30ml of fluid
- Withdraw needle
- Dress insertion area with a sterile dressing

Post-procedure care:

- Analgesia if required.
- Send fluid for:
 - Cytology, MC&S, LDH, Protein
 - pH (put some fluid in an ABG syringe and run through the ANG machine if necessary)
 - Consider TB culture (acid-fast bacilli) if clinically indicated
 - Consider glucose or cholesterol (if concerned about chylothorax)
- Send serum blood samples for LDH and protein.
- Post procedure chest x-ray to ensure no pneumothorax.
- Ensure nursing staff are aware procedure has occurred so they can monitor more regularly.

In the event of failure:

- Stop procedure.
- Seek senior help.
- Re-review imaging and patient with a senior colleague to ensure presence of fluid.
- Consider further imaging or aspiration in radiology.

Top Tips:

- Send the largest sample to cytology
 - The more fluid that the lab receive the higher the diagnostic yield.
- Explain that if a pneumothorax does occur that the patient will then require a chest drain.
- If you diagnose an empyema on fluid PH (PH < 7.2) you must arrange for an intercostal chest drain to be inserted immediately.