

## Paravertebral infusions of local anaesthetic for post-operative analgesia

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## **1. Introduction**

A continuous paravertebral infusion can provide high quality pain relief after unilateral surgery to the thorax and/or upper abdomen. Within Bradford Teaching Hospitals NHS Foundation Trust (BTHFT) paravertebral infusions are most commonly used after open nephrectomy or following unilateral chest trauma. The catheter is usually sited during the procedure and the infusion may be commenced in theatre recovery or on the ward.

It is common practice to prescribe a patient controlled analgesia system (PCAS) at the same time as a paravertebral infusion. Please see the PCAS guideline for further information.

## **2. Purpose/Scope**

To aid with the prescribing, administration and monitoring of patients receiving analgesia via continuous paravertebral infusion

## **3. Responsibilities**

Those responsible for the prescribing, administration and monitoring of patients receiving analgesia via continuous paravertebral infusion should read and understand this guideline.

## **4. Guideline/Procedure**

### **I. Indications**

Continuous infusions of local analgesia via a paravertebral catheter are used for the following indications:

- Unilateral surgery to the thorax or upper abdomen
- Unilateral chest trauma, particularly rib fractures

### **II. Contraindications**

- local sepsis (cutaneous or intrathoracic);
- tumours in the paravertebral space at the level of injection;
- allergy to local anesthetic drugs;
- patient refusal.

### **III. Cautions**

Care should be taken if there is:

- significant coagulopathy;
- significant respiratory disease (where the patient depends on intercostal muscle function for ventilation);
- ipsilateral diaphragmatic paresis;
- severe spinal deformities (kyphosis or scoliosis). If the anatomy is abnormal, the difficulty and risks increase.

### **IV. Adverse effects**

Paravertebral infusions have a low incidence of adverse effects. However the following can occur at the time of the performance of the block:

- Vascular puncture
- Pleural puncture, which can result in pneumothorax

Local anaesthetic injection or infusion into the paravertebral space can produce the following adverse effects:

- Hypotension – epidural spread or bilateral spread
- Horner's syndrome (characterised by droopy eyelid, pupil constriction and sunken eye) Usually on one side, but can be bilateral
- Bupivacaine toxicity causing confusion or delirium (unlikely at doses stated in this guideline)

### **V. Catheter insertion**

A paravertebral catheter will normally be inserted in the operating theatre by an appropriately trained anaesthetist. Occasionally one will be placed during a thoracotomy, or under thoracoscopic control, by the operating surgeon.

- A 16G epidural needle and catheter is used for insertion. (An epidural pack will be available in the operating theatre)
- Full asepsis must be maintained
- An inline bacterial filter (0.22 micron) must be used.
- If required, use a small amount of surgical topical skin adhesive (Liquiband) at the point of entry to ensure fixation. Apply a sterile dressing to the entry site
  
- Clearly label all catheters/lines and pumps

### **VI. Catheter care**

- The skin entry site should be checked regularly by inspection through the clear plastic dressing. Try to avoid disturbing the dressing, or redressing the catheter as this is likely to result

in dislodgment of the catheter. At least daily checking is suggested.

- If the site appears infected (marked redness, pus or significant tenderness) it should be removed and the tip sent for microbiological investigation. If in doubt please contact the acute pain service (APS).

## VII. Prescribing and review

- The Paravertebral infusion will be prescribed on the Acute Pain Management Chart (APMC) and the main drug chart, usually by the anaesthetist inserting the paravertebral catheter. Occasionally the infusion might be prescribed by the Acute Pain Service (APS). The infusion rate is not variable.
- Bupivacaine 0.25% at a rate of 0.1ml/kg/hour (max 10ml/hour)
- Patients with paravertebral infusions must be reviewed daily by the APS.

## VIII. Monitoring

The following monitoring must be recorded **one hourly for the first 24 hours and then four hourly** thereafter (see APMC for details).

- Pain score
- Conscious level
- Nausea and vomiting score
- Intravenous site inspection
- Opiate use via the PCAS (if used)
- Blood pressure
- Respiratory rate
- Oxygen saturation
- Paravertebral catheter site inspection (daily)

## IX. Equipment

The infusion is administered via a CME Medical BodyGuard 595 nerve block infusion pump and using a CME nerve block infusion catheter (reference: 100-160XSMG90EK)

- Supplies in nucleus recovery and theatres 7&8

Bupivacaine 0.25% 250ml bags must be used.

- Note: The bags will be labelled 'For Epidural Use Only' as this is the only preparation available.

The paravertebral infusion bag, filter and line must be labelled 'For Paravertebral Use'

#### **X. Stopping the paravertebral infusion**

- If the paravertebral catheter becomes disconnected at the 'patient' side of the filter the infusion must be stopped and the catheter removed. Otherwise it is removed at the discretion of the APS.
- Please ensure that appropriate analgesia is prescribed for any pain that remains.

#### **XI. Removing the paravertebral catheter**

- The analgesic requirements of the patients should be assessed before the infusion is discontinued.
- A paravertebral catheter should not be difficult to remove. A gentle tug should be enough to remove it.
- A sterile dressing should be applied to the site for 24hrs.

#### **XII. Supply**

Stock is held in theatres 7&8 and Nucleus theatres recovery.

Further stock if required is ordered on a named patient basis from pharmacy.