EPIDURAL ANALGESIA INFUSIONS
Dosing, Administration and Monitoring Guidelines

Protocol purpose and related documents

To provide guidance on the dosing, administration and monitoring of Epidural Analgesia Infusions, including Patient Controlled Epidural Analgesia (PCEA).

Current protocols, policies and guidelines that may relate include:

- Epidural Abscess protocol
- Special Analgesia Nursing Observations policy
- Epidural and Paravertebral Analgesia Protocols
- Management Of Antithrombotic Agents In The Perioperative Period guideline
- Clonidine medication management guideline

Prescribing requirements and restrictions

The order should be written by an Anaesthetist on the Analgesia Infusion Treatment Sheet (SV 754) specifying the background infusion rate, bolus volume, and lockout period and the pump will be programmed accordingly.

Indication

- Post-operative analgesia
- Pain conditions where the pain can be managed by central blockade (e.g. fractured ribs, complex regional pain syndrome, bony metastases)

Dosage and Administration

Medications used for epidural analgesia comprise a local anaesthetic e.g. ropivacaine/bupivacaine with or without an opioid analgesic e.g. fentanyl. Clonidine or adrenaline can be added to any of the above to improve the quality of analgesia (see Clonidine - for Pain Management medication management guideline).

These are administered NEAT (without dilution). The rate of infusion will be dictated by individual anaesthetic prescription as found on the Analgesia Infusion Treatment sheet (SV 754). Examples of usual rates for these infusions would be 5-15mL/hr and bolus doses 5-10mL with a lockout of 20-30minutes. Prescriptions are individualised according to the patient and surgical incision.

Commercially available solutions used at SVHM:

- Ropivacaine 0.2% (2 mg/mL), 200 mL Polybag
- Ropivacaine 0.2% (2 mg/mL) + Fentanyl 2 microg/mL (400 microg /200 mL), 200 mL Polybag
- Ropivacaine 0.2% (2 mg/mL) + Fentanyl 4 microg/mL (800 microg /200mL), 200mL Polybag
- Bupivacaine 0.125%, 200 mL Polybag – limited stock - Only to be used if ropivacaine is unsuitable.

Not commercially available but made by Pharmacy:

- Bupivacaine 0.2%, 0.25%, 200 mL ‘Plain’
- The Pharmacy Department will prepare any anaesthetic solutions that are not commercially available. This includes the addition of clonidine or adrenaline to epidural infusions ordered on the wards. Orders must be received during Pharmacy working hours otherwise contact the on-call anaesthetist who will prepare the infusion solution.
Additives are NOT permitted to an epidural analgesia infusion bag unless authorised by the Department of Anaesthesia and Acute Pain Medicine protocol. Additions will be made by the Pharmacy Department or the on-call anaesthetist (see above).

**Common dose ranges for additions:**
- Clonidine – 300 to 450 microg /200 mL epidural infusion.
- Adrenaline – 400 microg /200 mL epidural infusion.

**Transitional analgesia following catheter removal:**
- IM/IV opioids can be given 1 to 2 hours after ceasing epidural infusions containing fentanyl
- Oral opioids e.g. oxycodone, can be given at the same time the epidural is ceased /removed or as soon as patient has discomfort.
- Adjuvant analgesia such as paracetamol, tramadol and NSAID’s (e.g. celecoxib) – there is no restriction on when these can be administered. If there are no contraindications, these may be given in addition to the opioid patient controlled analgesia and oral opioids.
- The Acute Pain Service should be notified immediately if the transitional analgesia is inadequate.

**Administration**

- **Infusion Pump:** All epidural infusions must be given via a REM Bodyguard pump (with a locked box if contains opioid). On the pump, Select Epidural, and then select the correct epidural protocol from the pump menu as prescribed on the Analgesia Infusion Treatment Sheet (SV754). These pumps are used for all epidural and peripheral nerve infusions and will be primed and set up in PACU prior to the patient being transferred to the wards. If a patient is transferred to the ward with the REM Bodyguard pump the Acute Pain Service (APS) team will see the patient 2-3 times daily and the APS nurses will educate the ward nurses caring for the patient on how to use and alter the pump if required.
- **Tubing:** The tubing for epidural infusions must not contain any accessible injection ports and should be colour-coded (yellow stripe) or clearly labelled as ‘EPIDURAL INFUSION’.
- **PCEA (Patient Controlled Epidural Analgesia):** the patient must clearly understand how to use the button for ‘wound pain’ and to report numbness or tingling in the arms or hands. Orders will specify the background infusion rate, bolus volume, and lockout period and the pump will be programmed accordingly.

**Special Precautions and Contraindications**

- **Anticoagulation:** *Epidural needle placement is contraindicated in therapeutically anticoagulated patients.*
  Patients receiving Heparin sodium or Low Molecular Weight Heparins (LMWH) require short-term medication discontinuation prior to epidural needle insertion. Patients receiving oral anticoagulants require the anticoagulant to be withheld for the appropriate number of days and bridging anticoagulation with LMWH/Heparin sodium to be started prior to surgery/the epidural needle insertion - See the **Epidural and Paravertebral Analgesia Protocol**, and the **Management of Antithrombotic Agents in the Perioperative Period** guideline.
  - Manipulation of epidural catheter can ONLY be done by an Anaesthetic trainee or Anaesthetic Consultant
  - Caution in patients with renal impairment – prolongs effect of LMWH
  - Acute Pain Service must be notified before commencing IV unfractionated heparin in patients with an epidural catheter
  - For removal of epidural catheter - see Epidural and Paravertebral policy
- **Pregnancy and Breastfeeding** - Medication dependent. Contact medicines information pharmacist for advice (4359).

**Removal of epidural catheter**

Removal of epidural catheter: Can ONLY be performed on written order of an anaesthetist. See **the Epidural and Paravertebral Analgesia Protocol** and the **Management of Antithrombotic Agents in the Perioperative Period** guideline.
Monitoring

- Refer to Special Analgesia Nursing Observation Policy,
- Special Analgesia Chart (SV 167), and
- Epidural and Paravertebral Analgesia Policy
- PCEA – the patient must clearly understand how to use the button for ‘wound pain’ and to report numbness or tingling in the arms or hands.

Adverse Effects and Overdose

- **Overdose:** Signs and Symptoms of local anaesthetic or opioid toxicity see Reportable Observations section on the Special Analgesia observation chart (SV 167) and Epidural and Paravertebral Analgesia Policy
- **Adverse Effects:** See Special Analgesia Nursing Observations Policy and Special Analgesia Observation chart (SV167) under Standard Orders and Reportable observations.

Drug Interactions (1, 2, 3, 4, 5)

**Ropivacaine & Bupivacaine**

- When using ropivacaine as a single dose or for <24 hours treatment, studies did not indicate any clinically relevant drug interactions. If repeated administration or a long-term infusion is given, avoid potent CYP1A2 and CYP3A4 inhibitors such as fluvoxamine and ketoconazole, as these may increase ropivacaine levels.
- Other local anaesthetics and amide type Class III antiarrythmic drugs (e.g., amiodarone, mexiletine, lignocaine: consider ECG monitoring as cardiac effects may be additive

**Clonidine** - see the Clonidine medication management guideline for interactions

**Adrenaline**

- Beta –blockers: (especially non-selective e.g., propanolol) may result in severe hypertension followed by reflex bradycardia (even when used with a LA).
- MAOIs: may inhibit the metabolism of adrenaline, increasing the risk of arrhythmias, hypertension and vasoconstriction. Use combinations cautiously, monitoring ECG, BP and haemodynamic parameters.
- TCAs: may also inhibit the metabolism of adrenaline (see above), however this is less likely to occur when used with LA.

Presentation and Storage

Commercially available solutions used at SVHM:

- Ropivacaine 0.2% (2 mg/mL) (Ropivacaine Kabi®) Polybag 200mL
- Ropivacaine 0.2% (2 mg/mL) + Fentanyl 2 microg/mL (400 microg/200 mL) Naropin® with Fentanyl Polybag
- Ropivacaine 0.2% (2 mg/mL) + Fentanyl 4 microg/mL (800 microg/200mL) Naropin® with Fentanyl Polybag
  - Store Ropivacaine Polybags below 25°C. Do not refrigerate. Do not freeze.
- Bupivacaine 0.125%, 200 mL Polybag – limited stock - Only to be used if ropivacaine is unsuitable.

Not commercially available but made by Pharmacy if necessary:

- Bupivacaine 0.2%, 0.25%, 200 mL ‘Plain’. Expires 48 hours after preparation.
- Any local anaesthetic infusion preparation with addition of adrenaline or clonidine added expires 48 hours after preparation

REFERENCES


Authorship and Contributor Details  

<table>
<thead>
<tr>
<th>Primary Policy Author(s):</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Andrew Stewart</td>
<td>Consultant Anaesthetist, Anaesthetics Department</td>
</tr>
<tr>
<td>Wendy McDonald</td>
<td>Acute Pain Nurse, Anaesthetics Department</td>
</tr>
<tr>
<td>Kim Choate</td>
<td>Acute Pain Nurse, Anaesthetics Department</td>
</tr>
<tr>
<td>Noni Oborne</td>
<td>Medicines Information Pharmacist, Pharmacy Department (July 2015)</td>
</tr>
<tr>
<td>Gedal Basman</td>
<td>Medicines Information Pharmacist, Pharmacy Department (July 2010)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Others Consulted, including Committees:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication Guideline Review Group</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Head of Department Responsible for policy:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Andrew Cording</td>
<td>Chief Pharmacist, Pharmacy Department</td>
</tr>
</tbody>
</table>