CONTINUOUS PERIPHERAL NERVE INFUSIONS

Guideline purpose and related documents
To provide advice on indications, dosing, administration, management and monitoring of patients receiving continuous peripheral nerve infusion for pain relief. Management of Peripheral Nerve Infusions is similar to standard epidural analgesia infusions, however peripheral nerve infusions:
- Do NOT contain an opioid
- Do not cause hypotension due to vasodilatation

Current protocols, policies and guidelines that may relate include:
- Epidural Analgesia Infusion protocol
- Epidural Abscess protocol
- Special Analgesia Nursing Observations policy
- Epidural and Paravertebral Analgesia Protocols
- Management Of Antithrombotic Agents In The Perioperative Period guideline
- Clonidine –for Pain Medication Management Guideline

Prescribing requirements
The order should be written by an Anaesthetist on the Analgesia Infusion Treatment Sheet (SV 754) specifying the type of block used, background infusion rate and bolus dose if appropriate.

Indications
- Continuous peripheral nerve blocks involve the injection of local anaesthetic into the area around a single nerve or nerve plexus that supplies a particular region of the body. Local anaesthetics exert their effect as analgesics by the blockade of sodium channels and hence impeding neural excitation and/or conduction (i.e. preventing the nerve from carrying any impulses to the brain). Following the injection a continuous infusion of local anaesthetic solution provides analgesia.
- Upper Limb Peripheral nerve infusions are indicated for post-operative pain management following surgery on the upper limb, forearm or hand, including major orthopaedic procedures and plastic surgery. They permit mobilisation of the limb and physiotherapy.
- Lower Limb Peripheral Nerve Infusions are indicated for postoperative pain management following surgery on the lower limbs. This includes surgery on the hips, knees, ankles or leg (including amputation) following major orthopaedic, plastics or vascular surgery.
- Thoracic Paravertebral Nerve Infusions are indicated for post-operative pain management following thoracic surgery, breast and axillary surgery or rib fractures (see Epidural and Paravertebral Analgesia Protocols).
- Transverse Abdominal Plane (TAP) Catheters are indicated for post-operative pain management following surgery on the abdominal wall including laparotomy, appendectomy, hernia repair or hysterectomy.
- LA Wound Catheters allow infiltration of Local Anaesthetic into the wound area indicated for post-operative pain management of hepatic, bowel and open nephrectomy.

Dosage and Administration
- Ropivacaine 0.2% 200 mL premade polybags are administered neat (without dilution)
  - Dose 5-15mL/hr depending on the perineural catheter placed
• **Bolus –** 5—10mL: Not always prescribed. Will be charted on the *Analgesic Infusion Treatment Sheet* (SV 754)

• **Additives** - Clonidine 150 to 450 microg /200 mL may also be added
  - Any anaesthetic with additives will be prepared by the Pharmacy Department during working hours. Outside Pharmacy Department hours, contact the on-call anaesthetist who will prepare the infusion.

• **All peripheral nerve infusions MUST be administered via a REM Bodyguard pump as per the order on the Analgesia Infusion Treatment sheet** (SV 754). On the pump, Select Regional, and then **Ropivacaine 0.2% 200mL OR Ropivacaine 0.2% 200mL with Clonidine** as prescribed. 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 this 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 peripheral nerve infusions must not contain any accessible injection ports and should be colour-coded (green stripe)

### Precautions

- **Anticoagulation:** (refer to the *Epidural and Paravertebral Analgesia Protocol* and the *Management of Antithrombotic Agents in the Perioperative Period* guideline).
  - **Heparin Infusion:** Peripheral nerve catheters should be removed prior to commencement - contact APS.
  - **Low Molecular Weight Heparin (LMWH):** Therapeutic LMWH: contact APS prior to removal of the catheter – they will determine whether or not the drug needs to be withheld. **LMWH for prophylaxis** - there is no need to withhold the LMWH, unless the patient has a lumbar plexus catheter in which case it should be treated like an epidural.
  - **Oral anticoagulants:** Regional catheters for a peripheral nerve infusion should not be inserted in patients on oral anticoagulants. These patients require the oral anticoagulant to be withheld for the appropriate number of days and bridging anticoagulation with LMWH/Heparin started prior to surgery and the insertion of a neuraxial catheter.

- Debilitated, elderly or acutely ill patients may have lower tolerance to elevated blood levels, dose adjustment recommended
- Increased risk of developing toxic plasma concentrations in severe hepatic disease
- Cardiac arrhythmia and cardiac arrest have occurred after unintended intravascular administration
- Pregnancy and Breastfeeding – medication dependent - consult Medicines Information on 4359/pharmacy department

### Monitoring and Management of Peripheral Nerve Infusions

- Refer to the *Special Analgesia Observation Chart* (SV 167) for monitoring.

Refer to the *Special Analgesia Nursing Observations policy for*

  - Management of perineural analgesic infusions
  - Checking Procedure for perineural Analgesia Infusions by Registered Nurses
  - Changing of perineural Analgesia Infusions by Registered Nurses
  - Nursing Management of perineuralCatheters, including nursing observations, rate changes and bolus ‘top up’ doses

### Contraindications

- Infection in proposed region
- Local haematoma
- Anticoagulant treatment (see precautions also)
- Distorted anatomy
- Further contraindications may apply to individual LA block techniques at the discretion of the inserting anaesthetist
- Allergy to amide local anaesthetics

### Adverse Effects and Overdose

- **Overdose:** Signs and Symptoms of local anaesthetic toxicity see Reportable Observations section on the *Special Analgesia observation chart* (SV 167)
**Adverse Effects**: See [Special Analgesia Nursing Observations Policy](#) under Standard Orders and Reportable observations
- Adverse reactions to ropivacaine are rare in the absence of overdose, exceptionally rapid absorption or inadvertent intravascular injection. They are generally dose-related and pertain mainly to the central nervous system and the cardiovascular system.
- Motor Deficit – If the patient develops a motor block (Bromage Score) > 1 for a prolonged period of time (> 2 hours) notify Acute Pain Service (APS)
- Motor block, tingling or numbness that persists after the perineural catheter has been removed – notify APS
- Pain redness or swelling at the insertion site – notify APS

**Clonidine** - see the [Clonidine Medication Management Guideline](#) for adverse effects

**Drug Interactions** (1, 2, 6)

**Ropivacaine**
- When using ropivacaine as a single dose or for <24 hours treatment, studies did not indicate any clinically relevant drug interactions (1). 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 antiarrhythmic drugs (e.g. amiodarone, mexiletine, lignocaine): consider ECG monitoring as cardiac effects may be additive (1,6)

**Clonidine** - see the [Clonidine for Pain Medication Management Guideline](#) for interactions

**Presentation and Storage** (1, 4)

- Ropivacaine (Ropivacaine Kabi®) 0.2% solution for injection 200mL (2mg/mL) – commercially available.
- Clonidine hydrochloride (Catapres®) 150 microg/mL ampoules. Stored below 30°C.
- Store Ropivacaine Kabi freeflex bag below 25°C. Do not refrigerate. Do not freeze.
- Ropivacaine and Clonidine prepared infusions are stable for 48hrs after preparation.

**REFERENCES**

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