Bradford Teaching Hospitals NHS
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The use of Patient Controlled Analgesia Systems (PCAS) for the delivery of intravenous opioid analgesia

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1. Introduction

Opioids remain the mainstay of postoperative analgesia. However, dose requirements can vary considerably between patients due to pharmacokinetic and pharmocodynamic variability. A Patient Controlled Analgesia System (PCAS) allows the patient to self-administer small boluses of analgesics on demand. The intravenous route is usual for PCAS.

2. Purpose/Scope

To aid with the prescribing, administration and monitoring of patients receiving intravenous opioid analgesia via a PCAS.

3. Responsibilities

Those responsible for the prescribing, administration and monitoring of patients receiving analgesia via PCAS should read and understand this guideline. Only staff trained in how to operate the PCAS system should do so.

4. Guideline/Procedure

I. Indications

- In patients requiring opioid analgesia for the control of moderate to severe pain when the oral route is unavailable. (e.g. when NBM)

I. Contraindications

- Allergy to any drugs used in the PCAS
- Patients who do not understand how to use the PCAS
- Patients without the dexterity to use the PCAS
- Lack of adequately trained nursing staff on the ward

II. Cautions

- Renal impairment – consider the use of oxycodone

III. Prescribing and review

- The PCAS will be prescribed by an anaesthetist responsible for the patient's care. This will usually happen in the operating theatre, but a PCAS may be initiated on the ward.
- The PCAS must be prescribed on the (Acute Pain Management Chart) APMC and on the main drug chart
- A PCAS will usually be set up and checked in theatre recovery by a theatre nurse and checked by an anaesthetist
- On occasion a PCAS may be prescribed and set up in a ward environment

- Oxygen via nasal cannula must be prescribed by the anaesthetist. This continues for the first 24 hours and at night while using the PCAS
- Any patient with a PCAS in place should be reviewed daily by the acute pain service (APS)

IV. Standard PCAS regimens

Morphine (standard PCAS)

- Morphine sulphate 50mg in 50ml sodium chloride 0.9%. (Concentration 1mg/ml)
- Bolus dose: 1mg
- Lockout time: 5 minutes
- Background rate: off

Oxycodone

- Oxycodone 50mg in 50ml sodium chloride 0.9% (Concentration 1mg/ml)
- Bolus dose: 1mg
- Lockout time: 5 minutes
- Background rate: off

The APS may adjust PCAS settings as appropriate. Any changes must be documented on the APMC.

V. 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
- Blood pressure
- Respiratory rate
- Oxygen saturations

VI. Adverse effects

Drowsiness

- Stop the PCAS and inform ward medical staff if conscious level recorded at level 3 (see APMC)
- Treat respiratory depression if present

Nausea and vomiting

- Prescribe appropriate antiemetic therapy.

Pruritus

- This is a common adverse effect of opioids
- Antihistamines such as chlorphenamine, or ondansetron may be effective

Respiratory depression

- If respiratory rate is <10bpm, stop the PCAS, contact ward medical staff and administer oxygen via nasal cannula. Review regularly until rate improves. If in any doubt please contact he APS
- If respiratory rate is <8bpm, stop the PCAS, contact ward medical staff, administer oxygen via face mask and administer naloxone 50 micrograms intravenously every 5 minutes as required (max 200 micrograms). **In this case an ICU anaesthetist must be contacted via switchboard.**

VII. Equipment

1. The APS uses Carefusion PCAM pumps

2. The infusion set should be a CareFusion Extension set (ref 30852)

3. The infusion pump should be no more than 80cm (30inches) above the infusion site

4. The PCAS should be linked to the patient's intravenous cannula using a line containing a check valve and anti-siphon valve

5. The patient should have a dedicated cannula for the PCAS infusion. Compatibility of the prescribed PCAS with other intravenous drugs must be checked if using the same cannula.

6. Blood should not be infused via the infusion sets used for PCAS – a dedicated cannula should be inserted for this purpose

7. The PCAS syringe should be changed every 24 hrs to reduce the risk of contamination and infection

8. The infusion set for the PCAS should be changed every 72 hours as per trust policy.

   'The Luer lock cannula connection must be cleaned with chlorhexidine 2% in 70% alcohol (Clinell wipes) prior to fitting or changing and infusion administration set'.

   (See 'The Protocol for the Prevention of Infections Associated with Peripheral Intravenous Cannulae' 2013)

9. Ensure that the PCAS pumps are plugged in whenever possible to allow the battery to recharge.

VIII. Stopping the PCAS

The PCAS is normally stopped when:

- Pain control is adequate
- Analgesia requirements can be met with oral analgesia
- The patient can take oral medication
- (See Section VI for other situations where the PCAS may be stopped)

Patients with a PCAS *in situ* must not leave the hospital. if analgesia is required during a transfer an appropriate clinician must accompany the patient.

IX. Supply

Morphine sulphate 50mg in 50ml sodium chloride 0.9% vials

Supplied by Pharmacy Dispensary (working hours (Monday- Friday 9:00- 17:30; Saturday- Sunday 9:30- 13:30)

- Within working hours: order in the controlled drug (CD) order book with the red bag as ward stock items if on ward stock list. (Follow procedure for 'Other PCAS' for of not on ward stock list)
- Out of hours contact the on call pharmacist

Other PCAS (i.e. oxycodone or morphine with droperidol)

Supplied by Pharmacy DSU only (working hours (Monday- Friday 9:00- 17:15; Saturday 9:30- 13:30)

- Within working hours order the PCAS in the CD order book with the red bag.
- The drug chart with the APMC must be clinically checked by a pharmacist (either on the ward or on pharmacy reception).
- Out of hours:
    - Oxycodone PCAS syringes will have to be drawn up on the wards outside of working hours. Please try to ensure requests for further syringes are sent to pharmacy during working hours so that syringes can be prepared in pharmacy.