Prescription and Management of Intravenous Patient Controlled Analgesia

December 2012
Introduction

Scope

This policy is intended for use in all Western Australian public hospitals and departments where intravenous patient controlled analgesia (PCA) is prescribed. It aims to ensure that prescription, administration and monitoring of PCA is safe and appropriate for most patients. High-risk patients (e.g. those with head injuries, pre-existing respiratory disease such as obstructive sleep apnoea, or renal/hepatic failure) will require more intensive monitoring or dose adjustment. This document describes minimum standards for the provision of routine PCA care, but therapy and monitoring should be adjusted for the individual patient’s condition.

Background

Patient controlled analgesia (PCA) refers to a method allowing a person in pain to deliver their own pain relief. The PCA pump is programmed by the prescriber or a competent Registered Nurse (RN); two RNs are required to program the PCA together. Prescription of a small bolus dose, use of “lockout” intervals and strictly patient use only contribute to the safety of the technique. It is used for the more continuous control of moderate to severe pain, where oral or intermittent analgesia would be less effective. Fentanyl and morphine are the most commonly used opioid in PCA regimens in Western Australia, although other opioids may be considered in selected cases.

In principle, PCA enables a patient to self-control the amount and timing of analgesia received, and may improve patient satisfaction, when compared with conventional parenteral opioid regimens (Acute Pain Management: Scientific Evidence, 3rd edition, available at www.anzca.edu.au). In principle, PCA enables a patient to self-control the amount and timing of analgesia received, and may improve patient satisfaction, when compared with conventional parenteral opioid regimens (Acute Pain Management: Scientific Evidence, 3rd edition, available at www.anzca.edu.au).1

It is important to educate patients in the correct usage of PCA devices. Although PCA may be administered by a variety of routes, this document focuses upon intravenous PCA using opioids, and the associated patient safety issues.

The routine use of a background infusion to the PCA does not improve the quality of pain relief, but increases the risk of respiratory depression. However, background infusions may be necessary in opioid-tolerant patients to provide for some of their background opioid requirements.

Definitions

Intravenous PCA is a treatment using a programmable pump that delivers a pre-set amount of intravenous analgesia (usually an opioid) when the patient presses the hand control.

Tolerance is a state of adaptation in which exposure to a drug induces changes that result in a lessening in the drug’s effects over time.
Multimodal analgesia refers to the use of different classes of analgesic drugs which act in a balanced and additive / synergistic way. The aim is to reduce opioid consumption and provide better total coverage of the patient’s pain.

Key Policy Considerations

1. No eligible patient should be denied PCA analgesia.

For patients without normal hand function, consider alternative sets such as chin or breath-activated devices, or a RN controlled opioid infusion are potential options.

1.1. Contraindications and special precautions

Development of written patient selection criteria is advisable. The following points should be considered by the prescriber and RN (administering the treatment) before commencing the PCA:

- physical or mental barriers, such as spinal cord injuries, cognitive impairment;
- concurrent sedative use;
- airway compromise
- acute alcohol intoxication;
- obstructive sleep apnoea / COPD / asthma which may increase risk of respiratory depression;
- morbid obesity;
- renal impairment; and
- previous allergy / sensitivity to a specific opioid.

2. PCA should be prescribed as part of a multimodal analgesic regimen where possible, which may include regular paracetamol and / or NSAIDs (non-selective or COX-2 selective) and / or other adjuvants, bearing in mind contraindications.

3. PCA should only be prescribed and administered by staff deemed competent to do so.

3.1. Persons authorised to prescribe:

PCA should only be prescribed by authorised staff. Depending on the hospital policy, a prescription should only be initiated and altered by:

- a medical member of an Acute Pain Service (APS) (this may include nurse practitioners qualified and authorised to prescribe opioids);
• an Anaesthetist or GP Anaesthetist; or

• an intensive care or emergency medicine practitioner on consultation with an APS medical practitioner on a hospital approved prescription chart.

There should be a clearly nominated primary team or prescriber that can be called by nursing staff for assistance with PCA. There should be at a minimum one daily medical review of patient and prescription.

PCA prescriptions should be written on a hospital approved PCA prescription form. The order should include:

- date and time;
- drug concentration (mg/ml or mcg/ml);
- PCA bolus dose (mg or mcg);
- loading dose (mg or mcg);
- continuous (background) rate (mg/hr or mcg/hr);
- maximum hourly dose (mg or mcg);
- lockout (min); and
- desired oxygen saturation parameters.2

Any changes to a PCA prescription need to be authorised by the primary team prescribing (APS, Anaesthetist, GP anaesthetist).

3.2. Persons authorised to administer PCA:

Registered Nursing or Midwifery staff caring for the patient must be deemed competent in managing patients with an IV PCA device and work within the Australian Nursing and Midwifery Council (ANMC) scope of practice decision making framework (DMF).3

Nursing staff are responsible for maintaining their PCA competency (in line with their hospital policy and their scope of professional practice).

4. Only the patient may press the PCA bolus button (note this document does not refer to PCA pumps that are nurse-controlled).

Relatives must be advised not to press the button on behalf of the patient.

5. Equipment

PCA giving set with anti-siphon and anti-reflux valves must be used.
Infusion line should be clearly labelled with IV opioid labels and colour coded according to recognised standards.  

Syringes and lines should be changed every 72 hours or more frequently depending on local policy and/or patient status.

PCA pumps must be locked to avoid reprogramming or tampering.

The pump should be checked at the beginning of each shift change and whenever the PCA pump is opened (two nurses are required if the prescription is being changed). Once completed this should be documented on the PCA chart.

6. Patient Observations

Observations should be recorded, and medical intervention sought, in line with the parameters detailed on the WA observation charts. Patient observations must be performed following initiation of PCA. It is recommended that observations specific to the use of PCA pumps are performed at the following intervals:

<table>
<thead>
<tr>
<th>Time since commencement</th>
<th>Observation frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 hours</td>
<td>Every 30 minutes</td>
</tr>
<tr>
<td>2-8 hours</td>
<td>1 hourly</td>
</tr>
<tr>
<td>8-24 hours</td>
<td>2 hourly</td>
</tr>
<tr>
<td>&gt; 24 hours</td>
<td>As warrants but at least 4 hourly</td>
</tr>
</tbody>
</table>

Intravenous infusion observation charts should include the following PCA specific parameters:

- date and time;
- sedation score;
- pain score at rest and movement;
- nausea score;
- respiratory rate;
- oxygen saturation; and
- cumulative dose (measurement in mg / mcg).

Observation charts should include a description of sedation, nausea and pain scores with instructions on intervention points. Suggested scoring systems are described below.
<table>
<thead>
<tr>
<th>Observation</th>
<th>Score Range</th>
<th>Meaning</th>
</tr>
</thead>
</table>
| Sedation    | 0 – 3       | 0 – wide awake  
1 – easy to rouse  
2 – easy to rouse but constantly drowsy  
3 – somnolent and difficult to rouse |
| Pain        | 0 – 10      | 0 – no pain  
10 – worst pain imaginable |
| Nausea      | 0 – 4       | 0 – no nausea  
1 – mild nausea  
2 – severe nausea  
3 – dry retching  
4 – vomiting |

Care must be taken to distinguish the over-sedated patient from one in normal sleep as the former highlights a risk of impending respiratory depression.

PCA orders must include clear guidance regarding the triggers for seeking medical advice (see section 9). In sites where there is no dedicated pain service, contact numbers of those who hold clinical responsibility for the patient should be clearly documented for those seeking medical advice.

7. Oxygen and Pulse Oximetry

Oxygen (5L/min via mask or 2L/min via nasal prongs) should be prescribed for the duration of therapy or as otherwise directed by the prescribing medical practitioner.

In line with the Operation Directive Guidelines for Acute Oxygen Therapy for Western Australian Hospitals,\(^2\) clause 3; the prescribing medical practitioner must specify the target saturation percentage for each patient.

Clinical indications for **spot** pulse oximetry may include:

- tachypnoea / bradypnoea;
- hypotension;
- cyanosis / pallor; or
- confusion or agitation.

Clinical indications for **continuous** pulse oximetry (which may only be a very late indicator of respiratory depression in patients on high oxygen concentrations) include:
sedation Score > 2 (increased sedation can be one of the earliest signs of potential respiratory depression);

- known cardio-respiratory impairment;
- known sleep apnoea/airway obstruction/morbid obesity/COPD;
- spot oximetry less than 90%; or
- concurrent sedative medication.

Other documented parameters include respiratory rate and cumulative dose on the opioid prescription chart.

8. Concurrent Sedative Medications

The risk of inadvertent overdose or respiratory depression from concurrent prescription of other sedative drugs must be considered.

No additional opioids / sedatives should be given by any route unless ordered by the authorised prescriber (as noted in section 1). ‘Not to be given with PCA’ should be written against any other opioid or sedative prescription, as indicated, for clarity.

Where multiple drugs are prescribed for analgesia, it is recommended that either these are charted on the same order / medication chart; or documented in a manner which allows co-administered drugs to be easily reviewed. Where standard medication charts are used in conjunction with the PCA chart, a notice alerting users to the PCA prescription should be inserted e.g. “PCA chart in use” alert in the standard drug chart, or “other drug” alert on the PCA chart. This may include notification that the prescribing medical member of an APS / Anaesthetist / GP Anaesthetist should be consulted if analgesic prescriptions are to be altered.

Where other drugs with sedative potential are prescribed, these should be readily apparent upon review of the medication chart.

9. Triggers for Early Clinical Intervention

The management of problems, in particular the threshold for obtaining medical assistance, must be outlined on the PCA order form.

<table>
<thead>
<tr>
<th>Patient sign / symptom</th>
<th>Management</th>
</tr>
</thead>
</table>
| Apnoeic or pulseless   | Call an MET (dial 55 / code blue). Cease PCA, institute basic life support, and if instructed, administer naloxone iv. Urgent medical advice should be sought and arrangements made for ongoing monitoring and care as the patient may require a naloxone infusion (as the duration of a naloxone injection may be less than that of
<table>
<thead>
<tr>
<th>Event</th>
<th>Action 1</th>
<th>Action 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory depression (significant sedation and / or respiratory rate &lt; 8 per minute)</td>
<td>Cease PCA and give oxygen (5L / min by mask).</td>
<td>Attempt to wake patient with both verbal and / or physical stimulation.</td>
</tr>
<tr>
<td></td>
<td>Call the prescribing medical service / practitioner.</td>
<td></td>
</tr>
<tr>
<td>Confusion</td>
<td>Cease PCA.</td>
<td>Call the prescribing medical service / practitioner.</td>
</tr>
<tr>
<td>Persistent pain / Inadequate analgesia</td>
<td>Administer adjunctive pain medications if charted.</td>
<td>Contact the prescribing medical service / practitioner.</td>
</tr>
<tr>
<td>Nausea and Vomiting</td>
<td>Administer anti-emetics as charted.</td>
<td>If charted anti-emetics are not effective, contact the prescribing medical service / practitioner.</td>
</tr>
</tbody>
</table>

PCA order forms must clearly state the contact details for the prescribing medical service/practitioner.

For all other parameters please call for assistance in accordance with the WA adult or paediatric observation chart, or other relevant observation chart e.g. maternal.

10. Additional Drug Requirements

PCA prescription forms should also include the following:

- Naloxone 400mcg must be available on the resuscitation trolley in any environment where a PCA is utilised.

- If naloxone is required, dilute 400 mcg to 10mls and administer 1ml (40mcg) every 2-3 minutes (or as medically directed) to effect (titrating in this manner will avoid reversal of analgesia, as well as the potential cardiovascular effects of high dose naloxone).

11. Discontinuation of PCA

Most patients self-wean off PCA as their pain decreases.

Aim to discontinue PCA during daytime hours.

Patient should already have started alternative delivery (e.g. oral) analgesia e.g. paracetamol / NSAIDs / oral opioid.

Any remaining opioid must be disposed of according to hospital policy and in line with the Poisons Regulations 1965.
Return the PCA pump and demand button to designated location.

Manage equipment according to hospital policy.

**Summary of key points**

- All patients have a right to adequate analgesia.
- PCA should be prescribed as part of a multimodal analgesic regimen which may include regular paracetamol and/or NSAIDs/Cox-2 Inhibitors, bearing in mind contraindications.
- PCA should only be prescribed and administered by staff deemed competent to do so.
- Patient and PCA device delivery observations must be regularly performed during administration of PCA.
- A minimum daily medical review of patient and prescription.
- The risk of inadvertent overdose or respiratory depression from concurrent prescription of other sedative drugs must be considered.
- The management of problems, in particular the escalation process for obtaining medical assistance, must be outlined on the PCA order form.
References


