PATIENT CONTROLLED ANALGESIA (PCA) – INTRAVENOUS

This LOP is developed to guide clinical practice at the Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this LOP.

1. AIM

To provide a framework for the safe and effective prescribing and delivery of opioids (Morphine, Fentanyl, HYDROmorphone and Oxycodone) and to guide in the management of women receiving intravenous opioid via a patient controlled analgesia (PCA) programmable pump for the control of acute pain.

2. PATIENT

- Surgical or non-surgical acute pain.

Precautions

- History of sleep apnoea
- Co-existing diseases e.g. obesity, diabetes, renal impairment
- >65 years old and opioid naïve
- Current opioid or sedative medications
- Inappropriately high opioid dose
- Previous sensitivity to opioids resulting in the patient having episodes of apnoea

3. STAFF

- Acute Pain Service
- Anaesthetists
- Medical Officers
- Registered Nurses and Midwives
- Pharmacists

4. EQUIPMENT

- Dedicated PCA pain management pump & PCA giving set
- Premixed opioid bag (Morphine or Fentanyl) or
- HYDROmorphone 2mg/1mL ampoules (5) and 100mL sodium chloride 0.9% infusion bag or
- Oxycodone 10mg/1mL ampoules (5) and 100mL sodium chloride 0.9% infusion bag
- Blue IV additive label blue and line label
- 5mL syringe & 5mL ampoule of sodium chloride 0.9%
- Blue ANTT Tray
- NSW Health Patient Controlled Analgesia PCA Adult chart

5. CLINICAL PRACTICE

Prescribe the PCA order on the NSW Health Patient Controlled Analgesia (PCA) Adult chart

Preparing the Solution

- Prepare the opioid solutions as per dosage chart (Appendix 1). The primary medications for PCA are morphine, fentanyl, HYDROmorphone or oxycodone
- Check the prescription, medication and woman with two RN/RMs and follow the S8 handling of medications policy.
- Complete an IV additive label and attach to the infusion bag. (Both premixed or prepared)
- Change bag and giving set and reprogram pump when changing solutions. (e.g. from Morphine to Fentanyl)

PATIENT CONTROLLED ANALGESIA (PCA) – INTRAVENOUS cont'd

Set up, programing and commencing the PCA

- Deliver all PCAs via a dedicated pain management pump. The pump must be contained in a lock box. The key must be kept with the Schedule 8 medication keys.
- Program the PCA pump according to the prescription. All PCA pumps are pre-programed with RHW protocols.
- DO NOT prescribe or program background opioid infusions whilst a patient is on a PCA. Any exceptions to this MUST be managed on the Acute Care Ward.
- Check the medication and program settings with two RNs/RMs before connecting the PCA to the patient.
- Ensure the woman is familiar with the principles of PCA and is able to activate the pump. The woman receiving the PCA is the only person who may press the PCA button.
- Check that naloxone for sedation has been prescribed on the PCA chart and is available in the clinical area.
- Administer oxygen therapy via mask or nasal prongs for the duration of the therapy.
- Record PCA bag administration on commencement of PCA.
- Do not administer other opioids or sedatives unless ordered by the APS or equivalent medical officer.
- Record PCA drug discard on completion of PCA.
- Call APS or Anaesthetist if there is any concern about the appropriateness of PCA analgesia for a woman.

Observations

- Refer to Appendix 2

Adverse Events and Their Management

- Refer to Appendix 3

5. DOCUMENTATION

- NSW Health Patient Controlled Analgesia (PCA) Adult chart (NH606622)
- Patient's Health Care Record - EMR
- Standardised Adult General Observation (SAGO) chart. (*State*)
- Standardised Maternity Observation Chart (SMOC) chart.(*State*)
- The PCA chart includes the coloured coded warning system (red and yellow zones) in line with Between the Flags (BTF) for early detection of patient deterioration.

6. EDUCATIONAL NOTES

General

- PCA is an opioid delivery system whereby the patient is able to deliver his/her own intermittent intravenous analgesia. This overcomes the wide variation in analgesic requirements and allows patients to adjust the level of analgesia to their own level of comfort and tolerance of side effects
- Patient preference for PCA is higher when compared with conventional parenteral opioid regimens
- In an adult patient, age rather than weight is a better predictor of opioid requirement
- Individual opioid requirements may vary widely between patients
- Small doses should be used for elderly or very sick patients

PATIENT CONTROLLED ANALGESIA (PCA) – INTRAVENOUS cont'd

Patient Education

- Women attending the preadmission clinic prior to surgery should be provided with verbal and written information on PCA. (*See Appendix 4 for patient information leaflet*.)
- Further education must be given when commencing a woman on a PCA e.g. post-surgery in Recovery.
- On return to the ward the RN/RM receiving the woman must determine the woman's level of understanding of the PCA principles and ability to activate the device.
- Ongoing PCA education (as needed) should be given to the woman by the clinicians on the ward and the APS team on their daily rounds.

Nursing/Midwifery Information and Education

- Women on a PCA should be managed in wards/areas where the nursing staff have received appropriate education and accreditation in PCA management.
- Each relevant ward/area should aim to have at least 80% of RN/RMs accredited in PCA management.
- An RN/RM who has received education or has had previous experience in the management of patients receiving this form of analgesia may perform PCA related observations and must take appropriate action when opioid-related side effects or complications present.
- Only an RN/RM who has been accredited as competent in PCA may:
  - ➢ Set up, program and operate the PCA pain management pump.
- Steps to attain PCA competency:
  - ✓ Step 1 – read the PCA LOP.
  - ✓ Step 2 – completion of HETI Patient Controlled Analgesia (PCA) eLearning module (course code 430 610 23) Print course certificate as evidence of eLearning completion.
  - ✓ Step 3 – attendance of practical "hands-on" PCA session with APRS CNC.
  - ✓ Step 4 – Successful completion of Category 2 for PCA competency assessment.
- Compliance will be measured by:
- 80% of RNs assessed/accredited as competent in managing patients with PCA.
- Regular audits of LOP & PCA Chart and via IIMS incidents relating to PCA.

7. RELATED LOPS

- Use of Naloxone for the treatment of opioid induced over sedation, respiratory depression, pruritus and nausea.
- Accreditation of staff to give drugs in specific units
- NSW Health PD2013_043 Medication Handling in NSW Public Health Facilitates. http://www0.health.nsw.gov.au/policies/pd/2013/pdf/PD2013_043.pdf
- NSW Health PD2010_058Hand Hygiene (2010) http://www0.health.nsw.gov.au/policies/pd/2010/pdf/PD2010_058.pdf
- NSWHealthPD2015_029HighRiskMedicationManagement. (2015) http://www0.health.nsw.gov.au/policies/pd/2015/pdf/PD2015_029.pdf
- NSW Health PD2013_013. Peripheral Intravenous Cannula Insertion and post Insertion Care; Adults (2013) http://www0.health.nsw.gov.au/policies/gl/2013/pdf/GL2013_013.pdf
- National Standard for User-Applied Labelling of Injectable Medicines, Fluids and Lines (2015) http://www.safetyandquality.gov.au/wp-content/uploads/2015/09/National-Standard-for-User-Applied-Labelling-August-2015-web-optimised.pdf
- Prescribing Protocol – SESLHDPR/584 Safe Use of HYDROmorphone
- HYDROmorphone RHW Local Operating Procedure
- Medication – Accountable Drugs (Schedule 4D and Schedule 8)

PATIENT CONTROLLED ANALGESIA (PCA) – INTRAVENOUS cont'd

9. RISK RATING

- High

10. NATIONAL STANDARD

- **Standard 4 – Medication Safety**

11. EXTERNAL REFERENCES

1	NSW Ministry of Health. PD2013_043. Medication Handling in NSW Public Health Facilities. November 20113
2	Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine. 2010, Acute Pain Management: Scientific Evidence. Third Edition. Approved by NHMRC
3	Macintyre P.E., Schug S. A. 2015, Acute Pain Management. A Practical Guide. Fourth Edition. CRC Press, Taylor & Francis Group.
4	POWH PCA Clinical Business Rule - January 2017
5	Agency for Clinical Innovation, 2017. PCA (Patient controlled analgesia) Chart (adult) EXPLANATORY NOTES. Accessed 17th May 2017 https://www.aci.health.nsw.gov.au/resources/pain-management/acute-sub-acute-pain/acute-pain-forms

REVISION & APPROVAL HISTORY

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Reviewed and endorsed Therapeutic & Drug Utilisation Committee 16/6/09
Approved Quality Council 15/3/04

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APPENDIX 1

STANDARD CONCENTRATIONS AND PCA BOLUS DOSES

DRUG & PRESCRIPTION	CONCENTRATION	PCA Bolus Dose	Lockout Time
Morphine 100mg in 100mL of sodium chloride 0.9%. *Select pre-mix morphine bag*	1mg per 1mL	0.5mg to 2mg = **0.5mLto 2mL**	5 Minutes
Fentanyl 1000 mcg in 100mL of sodium chloride 0.9%. *Select pre-mix fentanyl bag*	10microg per 1mL	10microg to 20microg = **1mL to 2mL**	5 Minutes
HYDROmorphone 10mg in 100mL of sodium chloride 0.9% *NOT available in premix* Take five x 2mg ampoules and add to a bag of 100mL sodium chloride 0.9%. **NB. HYDROMORPHONE IS 5-7 TIMES MORE POTENT THAN MORPHINE**	0.1mg (100 microgram) per 1mL	0.1mg to 0.4 mg **= 1mLto 4mL**	5 Minutes
Oxycodone **100mg in 100mL of sodium chloride 0.9%**	1mg per 1mL	0.5mg to 2mg = **0.5mL to 2mL**	5 Minutes

APPENDIX 2

OBSERVATIONS

Observations to be recorded on the NSW State PCA (Patent Controlled Analgesia) Prescription and Observation Chart (adult)

OBSERVATION	FREQUENCY
Pain Score	Hourly for 6 Hours Then every TWO hours for duration of PCA
Sedation	
Respiratory Rate	
Oxygen	
Nausea, vomiting, pruritus	
PCA Delivery (History)	

APPENDIX 3

POSSIBLE ADVERSE EVENTS AND THEIR MANAGEMENT

Adverse Event	Management
Poor Comprehension	Women unable to comply with PCA instructions will require alternative analgesia.
Inadequate Analgesia	**Education:** ensure adequate comprehension of the use of the PCA **Review dose:** Any woman requiring more than 6 bolus doses per hour should be reviewed by APS. **Additional medication:** Other medications may be administered concurrently with a PCA e.g. ketamine.
Increased Sedation	**Sedation Score 2 (Constantly drowsy, unable to stay awake)** • Cease administration of all opioids. • Give oxygen • Check respiratory rate frequently • **YELLOW ZONE - Activate a Clinical Review** **Sedation Score 3 (Difficult to rouse)** • Cease administration of all opioids. • Give oxygen • Check respiratory rate • **RED ZONE - Activate a Rapid Response** • Give naloxone as prescribed OR as per naloxone LOP **Sedation Score 3 (Unresponsive)** • Cease administration of all opioids. • Give oxygen • Check respiratory rate • **RED ZONE - Activate a CODE BLUE** • Give naloxone as prescribed OR as per naloxone LOP
Respiratory Depression	**If Respiratory Rate is between 6-10 rpm** • Cease administration of all opioids. • Give oxygen via mask and support airway if necessary • Assess sedation level and if possible encourage patient to breathe deeply • **YELLOW ZONE - Activate a Clinical Review** **If Respiratory Rate ≤ 5** • Cease administration of all opioids including PCA • Give oxygen at 10L/min via Hudson mask and support airway if necessary • **RED ZONE - Activate a Rapid Response or CODE BLUE** • Give IV naloxone as prescribed on PCA chart OR as per naloxone LOP
Nausea or Vomiting	• Ensure antiemetic's are prescribed and offered as frequently as the PRN order permits. • If one antiemetic does not work proceed to alternative or page APS for advice. • Anti-emetics should be ordered and recorded on eMEDS and on the pain chart in the observation comments section. • Any patient requiring more than 2 doses of antiemetic may need a regular dose ordered on their medication chart. • Identify if the woman is hypotensive and check their fluid balance
Pruritus (itch)	• Low dose naloxone as per LOP • Antihistamines may be effective but will increase the risk of respiratory depression due to their sedative effect. • Refer to APS if treatment ineffective.
Urinary Retention	• Contact the woman's primary care team
Constipation	• Prophylactic aperients therapy is beneficial. Contact primary care team

Ketamine Infusion	Ketamine may be added to the analgesia plan and if IV access is limited the following should apply: 1. PCA Infusion connected to cannula without 3 way or multi-port tap 2. Ketamine connected to back check valve of PCA without 3 way or multiport tap 3. Maintenance fluid connected to back check valve of Ketamine. ➢ A back check valve is required to prevent the inadvertent pooling and accumulation of drug in a maintenance line with the potential for overdose of medication ➢ Ketamine may run by a separate IV and does not require a maintenance fluid as it is an infusion.

APPENDIX 4

PATIENT CONTROLLED ANALGESIA (PCA)

What is a PCA?

PCA stands for **P**atient-**C**ontrolled **A**nalgesia. It means that you have control over your own pain relief using pain medicines such as morphine or fentanyl. When you start to feel uncomfortable, you press a button attached to an automatic pump. The pump will inject a small dose of the medicine into an intravenous (IV) cannula in your vein.

Your doctor (often your anaesthetist) will order the amount of pain medicine to be delivered by the PCA pump each time you press the button. By programming the right amount for you, the risk of severe side effects is very low.

You should press the PCA button when the pain starts to become uncomfortable. You should not wait for the pain to become very severe.

You, the patient, are the ONLY person who should press the PCA button. This is for safety reasons.

Advantages:

- A PCA will allow you to rest comfortably
- You may not need as much medicine from a PCA as when you receive injections for pain
- A PCA may control your pain effectively and keep you alert and awake
- You may be able to start moving around sooner. This may help prevent blood clots from forming, and help you get better faster

Rare complications:

- The pain medicine given in the PCA may cause nausea, itchy skin, or trouble urinating
- Increased risk of infection from the intravenous drip
- Under dosing or over dosing of the pain medication

Whilst you are receiving the PCA you will be closely monitored by a registered nurse/midwife to ensure that you are receiving adequate pain relief and are being observed for any complications.

Let your nurse know if:

- You feel very sleepy
- You feel sick or have vomited
- Your pain is not at a manageable level
- Your skin, where the IV is placed is painful, warm, red, swollen or bleeding
- You see blood in the tube going to the pump
- Your pump has no more medicine in it
- Your pump alarm goes off