PCIA ongoing management

Individual reportable observations

Patient observations within reportable parameters, suspected to be analgesic related:

- Ensure the contact anaesthetist listed on the medication pain control form (usually the on-call anaesthetic registrar ph.*280) is notified.

Practice Point

- Refer to clinical review parameters on the appropriate observation response chart (adult/paediatric/maternity) and the observation analgesic infusion form MR/ 590.

APS review process:

Patients receiving an intravenous analgesic /PCIA device will be reviewed by the prescribing medical officer or the APS within **each** twenty-four **(24)** hour period.

Practice Point

- Medical officer ceasing the analgesic device is responsible for prescribing step-down analgesia.
- Please ensure APS is contacted if review has not occurred within 24-hour period.
- If patient meet 'CEASED criteria" guidelines a parent medical team or competent nursing staff in collaboration with parent medical team, notify APS team accordingly refer **Appendix A**

Infection control:

- Analgesic infusions bags must be aseptically changed after a twenty-four (24) hour period from time of preparation.
- The analgesic device CLEAR administration sets are sterile and for SINGLE USE ONLY with anti-syphon valve,
    - Administration sets are changed when intravenous access is changed (in adults – at 72 hours or PRN).
- When disconnecting the administration set (i.e., removing air from the line) use aseptic technique.
- Clean all pump equipment after use.

Practice Point:

- Administration sets are changed when IV access is changed (in adults - third daily or PRN).

- Hand hygiene prior to line disconnection and use aseptic technique during line separation. Clamp patient side, prior to line separation.
- Refer to issues to consider for line disconnections.
- Routine cleaning of pump equipment wrist strap and handset - wiped with a combined detergent / disinfectant-based wipe before returning to PAR.

Intravenous disconnection:

- Grampians Health Ballarat acknowledges and supports, clinical best practice of minimization of the disconnection of all intravenous (access) closed systems.
- Intravenous disconnection requirement maybe risk assessed as necessary by the nurse (or clinician). In such circumstances the intravenous end point must be managed aseptically so as not to compromise reconnection.
- On reconnection of the intravenous system the connection point will be cleaned (using 70% alcohol/2%chlorhexidine swab) by scrubbing the hub for 15 seconds and allowing to air dry completely a further 15 seconds, then connected to a new line and infusion bag. (Reference: Australian guidelines for the Prevention and Control of Infection in Healthcare, National Health and Medical Research Council, 2019)

On the very rare circumstance where the intravenous analgesic line is temporarily disconnected from the patient (for example patient having an MR/I), consideration to the security of the detached drug line setup is required.

Co-Administration of Blood and Opioids (Narcotics):

1. Opioid analgesia and blood can be co-administered, when necessary, if the following conditions are observed:

a. The blood must be administered through a line with a non-return valve to prevent reflux of the narcotic solution into the blood line.

b. The opioid PCIA infusion is made up in sodium chloride 0.9%* (Normal Saline) and infused through the side arm with a luer lock.

2. Solutions other than sodium chloride 0.9% (Normal Saline) may cause haemolysis or aggregation of blood/blood products.

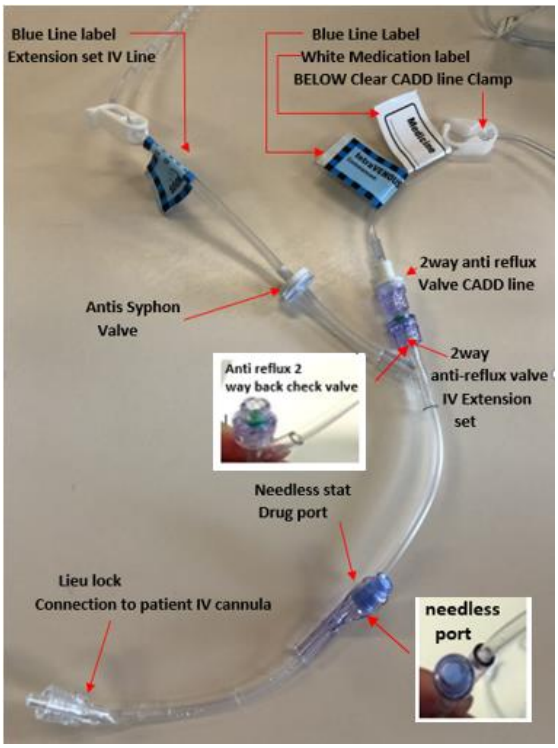
Equipment safety during operation:

1. **locked** pump/opioid security: Designated pump CADD Solis Grey must be **Key** in locked security shell whilst in use, lockable pole clamp if necessary and all program parameters are lockable. Device key kept within DD unit Safe, accounted for at the time of routine DD safe medication checking.

2. **Medication/fluid back flow and syphoning protection**: Administration set has an in-line anti-syphon valve to prevent drug backflow. IV maintenance line system is also required to includes an anti-syphon /reflux (one- way) valve, extension line attached to the end of the IV line provide this.

Practice point:

- Note only recommended to have one such extension line attached at any given time.
- Analgesic line(s) are attached to the side arm/ port on the extension set below the anti-syphon valve, use a three-way tap enable both ketamine and an opioid analgesic to be connected to the correct location (refer to photo)
- The closest "needless port" to the patient is preserved for "stat", intermittent drug administration only. Do not connect an infusion to this port.
- Ensure clamps are closed if removing pump from security shell or removing administration set from pump.



3. **Correct Labelling**: ONE white medication label; ONE blue route labels; additive label Intravenous BLUE, attached only if nurses made up solution bag.

4. **Handset care**, only patient or nursing staff caring for patient can administer from the handset, instruct all visitors accordingly as required.

Practice point:

- All handsets have a maintenance test tag.
- Inspect handset for any exposed wiring prior to connection and during use.

- Care inserting handset into device to minimise damage to internal connection prongs.
    - DO NOT wind handsets around cot sides or monkey bars; use the wrist strap or tape to patient ID wrist strap to attach to the patient.
    - **Power source** 4 AA batteries, when not in use they can be stored in security shell do NOT leave in pump to avoid possible battery leakages into pump.

Altering prescription parameters on the CADD pumps

1. Program parameters can only be altered according to medical orders.
2. Program parameters must be independently double checked by two nurse, nurse and doctor, one of whom is device competent each time.
    - A new infusion is commenced,
    - Whenever settings are altered according to medical orders,
        - Prescribed analgesia dose adjustments, as per APS medical staff review in response to EITHER inadequate analgesia or signs of opioid excess.
3. When patients are transferred from one department to another.

Practice Point

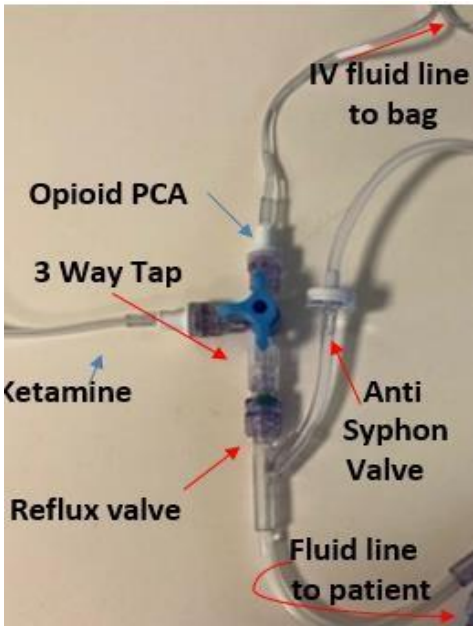
Appendix F provides a guide to analgesic device pump programming is available in all ward areas.

Additional adjunctive analgesics

1. Other analgesics, e.g., Paracetamol, Non-steroidal anti-inflammatory drugs, prn Tramadol and low dose Ketamine infusion, may be used concurrently according to prescribed medical orders

Practice point

- No supplementary immediate release opioids by other routes or new sedative drugs are to be administered during PCIA or opioid infusion use, without the knowledge of the anaesthetist. refer below for more detail "**Adjunctive prn Opioid Medication considerations".**



Analgesic Solution management, disposal of unused/discarded opioid drug

1. Analgesic solution **changed at 24hrs** or earlier as required. When changing opioid / ketamine solution or ceasing PCIA / opioid infusion, independently double check, document and sign any drug volume that is discarded, method of discard, and location of patient on the Medication Pain Control form.
2. At change of solution, the programmable device reservoir volume is reset and handset delivery and demands totals are cleared as they relate to the bag completed. This can be noted on MR 590.

Practice Point

- Disposal /discarding of unused S8 drugs solution must be witnessed and documented as per NCG0032 and CPP0496 Medication Security.
- Both staff members involved with discarding the unused drug to sign the medication pain control form
- Unused solution is expelled into the red pharmaceutical waste bin. NCG0032 - Waste Management Manual
- Patient handset delivery and demand totals are cleared for each particular bag. If required the reports screens on the device can be accessed to indicate the solution usage for a given period of time.

Patient Observations

Recorded on the observation and response chart, and Analgesia Infusion observation MR//590 with additional comments made in the progress notes.

- Both charts have clinical review and medical emergency team review criteria.

Practice Point

Frequency of observations are listed on page 1 of the Analgesia observation form.

Pulse and blood Pressure:

- **1/2** hourly for **2** hours,
- **Then1** hourly for **2** hours,
- Then **4**-hourly, if stable.

Practice point

- R.P.A.O - Routine post anaesthetic observation regime.

Respiration rate (RR)

Recorded **hourly** throughout the infusion and **hourly** for **4 hours post** completion of the infusion.

Practice point:

- A slowed RR (<10 within clinical review range) is an early sign of opioid excess.
- Patient with obstructive sleep apnoea (OSA) are more susceptible to obstruction and should ideally have CPAP.
- Respiratory depression is a late sign of opioid excess hence post infusion observation.
- Patients to use their CPAP machine during sleep periods.

Sedation Score Assessment

- Recorded **hourly** throughout the infusion.

Practice point:

- Report sedation **score of 2** (moderate sedation unable to remain awake) or higher and contact APS anaesthetist *280.
- A patient who is deeply sedated must be distinguished from a patient who is asleep. A normal sleep means that the patient is asleep but can be roused. For e.g., the patient responds while the pumps and IDC are being checked. This is recorded as 1S on the sedation score.

Pain and Functional Activity score assessment (refer to CPP0197 specific pain score tools)

- **Hourly first 8** hours, then **2-hourly.**
- During night shift assessment if awake.

Practice point:

- Provide regular adjunctive co-analgesics e.g., regular paracetamol, NSAID in addition to opioid. Aim of PCIA analgesia is to enable the patient to undertake recovery activities comfortably. Report ineffective analgesia, functional activity score of “C” with adjunctive analgesia insufficient contact anaesthetist *280.

Pulse oximetry

Recorded **4 hourly**, also document nature of oxygen therapy if in use and the underlying reason for same.

Practice point:

- Supplemental oxygen in the postoperative period improves oxygen saturation while reducing episodes of hypoxaemia, delirium, tachycardia and myocardial ischemia.

However supplemental oxygen is only indicated for SpO2 falls below 94% when baseline SpO2 within normal parameters. The suspected reason for the decreased SpO2 should be documented prior to applying oxygen.

- *Recommendation is to maintain oxygen therapy while the patient is on intravenous opioid therapy if they have a sedation score of 1 or greater and during sleep periods if SpO2 <93%. But it is utilised with caution and SpO2 must be monitored with an aim SpO2>95% (elderly consideration).*
- CAUTION, lower normal SpO2 levels may be seen in patients who have COPD, who maybe CO2 retainers. Use supplemental oxygen therapy with care in such patients.
- Patients diagnosed with obstructive sleep apnoea - Supplemental oxygen via INC or Mask does not splint the airway and prevent hypoxic obstructive episodes hence patients need to use their CPAP machine.

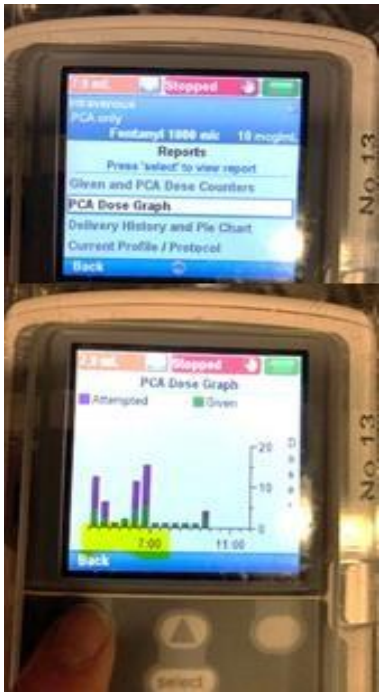
Temperature

- Initially and then **4-hourly**.

PCIA handset activity.

1. The **total** number of PCIA **"attempts"** at initiating a bolus dose and the number of PCIA **"given"** - effective drug dose deliveries.
2. Following commencement handset activity is to be documented **hourly** for the **first 8 hours**.
3. If patient demonstrates a good understanding, same is documented on the Observation Analgesic Infusion Chart. Document handset **activity 4 hourly**.

4. Document more frequently if patient requires regular prompting to use this device effectively.



Practice point:

- Utilise report: (refer to photo)
    - Delivery dose attempts and given useful in determining the patient's understanding of the PCIA system or ineffectiveness of analgesic choice or dosing regime, patient anxiety, confusion, inappropriate use, or faulty handset.
    - Delivery graph highlights time sequencing of handset activation while delivery graph provides quick information of decreased analgesic requirement in response to potential adjunctive use of situational improvement.
- It is normal to provide regular instruction on handset use.

Drug total delivered (mg / microg or mL)

- Drug total amount recorded hourly as a progressive total amount read from screen on pump.
- If a continuous infusion is in progress, record hourly the continuous infusion rate setting - read from screen on pump.

Practice Point

- Analgesic observation chart, MR/590 can document analgesic pump observations from three analgesic pump devices. For example
    - Pump 1 Parenteral analgesia, identified as opioid and,
    - Pump 2 identified as ketamine.
    - Pump 3 regional analgesia.

Intravenous insertion site.

- Observe site at handover, once per shift and PRN for signs of infection, leakage and symptoms of discomfort including recording VIPS score.
- In adults the recommendation is to change peripheral intravenous sites every 72 hours. This includes priming new lines to the new IV access.
- CADD Solis analgesic pump see appendix for reference card.
- Intravenous Clinician bolus to be programmed by nursing staff who have completed the organisational requirement for intravenous analgesia.

The PCIA drug orders MR/675 and settings of the PCIA pump should be verified:

1. At each change of shift.
2. Whenever solution bag changes occur i.e. at completion of bag or at 24hours solutions change.

Adjunctive prn Opioid Medication considerations

Do NOT give additional opioids/narcotics unless ordered by the Acute Pain Service or unit registrar.

- **IR Tramadol "Ok with PCIA"** can be given prn if ordered. (oral tramadol 50mg = oral morphine 10mg),
- **IR Tapentadol** 50mg = Morphine 15mg or **IR Oxycodone** 10mg. BOTH if charted must have **"Not with PCIA"**
    - **Unless specifically specified** otherwise by **Anaesthetic Medical staff "OK with PCIA"**

Intravenous Clinician bolus:

1. **Analgesic device competent** nursing staff can **program and deliver** such doses **checking procedure as documented above.**
2. **ALL unlocking and locking use the CADD Solis key.**

Complications

Notify the Acute Pain Service Ph *280 Anaesthetic Registrar if any of the following occurs:

Patient complains of persistent pain:

- Persistent severe pain while patient at rest:
    - consecutive scores of 8-10/10 and/or,
    - 2 consecutive FAS of C (severe limitation) despite use of available adjunctive equals inadequate analgesia.

Management of persistent pain

1. Perform a pain assessment and document at rest and on activity:
    - Assess patients conscious state and vital signs.
    - Check equipment and connections, including patency of IV line.
2. Notify APS / anaesthetic registrar.

Analgesic Device reached 4-hour dose limit:

Management:

1. Notify APS / anaesthetic registrar, post notification reset 4-hour dose limit document medical instruction.
2. Commence or increase oxygen to match SpO2 >95%.

Sedation: (clinical review /MET criteria)

1. If respiration rate <8 breaths per minute.
2.  Patient is unable to stay awake.
3. Sedation Score 3 (moderate sedation unable to remain awake) and depressed respiration rate or pattern (refer to reportable level) OR patient is difficult to rouse or unrousable.
4. Initiate MET call.

Management of sedation

1. Sedation score of 3 and respiration rate 8 proceed as for respiratory depression. (See section below).
2. If sedation score 2-3 and respiration rate 8>-10, clinical review, notify Acute Pain Service or Anaesthetic Registrar.
3. Apply continuous pulse oximetry and supplemental oxygen e.g. nasal prongs oxygen at 2 lire/minute.
4. Remove PCIA control button away from patient until sedation score improves to 1-2 and respiration rate >10.
5. Consider reducing bolus dose for PCIA or infusion rate as per APS.

Respiratory Depression (clinical review /MET criteria)

1. If respiration rate <8 breaths per minute.
2.  and sedation score of 3, initiate MET call.

Management of respiratory depression:

1. Stop infusion/PCIA, remove PCIA control button away from patient.
2. Check BP, HR, RR, SpO2.
3. Commence or increase oxygen to match SpO2 >95%. In addition, the patient may require a Guedel airway and assisted breathing with a Laerdal resuscitator (bag valve mask).

4. Apply continuous pulse oximetry.
5. Prepare Naloxone 400 microg to 3ml with sodium chloride 0.9% (total 4ml= 100mcg/ml).
6. Contact parent team and APS *280.
7. CAUTION in the amount of oxygen therapy used for patients who are a CO2 retainer.

Practice point:

- Assessment of sedation level is a more reliable way of detecting early opioid excess than a decreased respiratory rate (often a late sign).
- Monitor sedation and respiratory rate closely. Refer to frequency of observations. If opioid excess is undetected early, respiratory depression might progress to Cheyne stokes respiration and a respiratory arrest, especially when background infusions are in progress. Increase the frequency of observations.
    - Sedation and respiratory depressant effect are exaggerated if central nervous system drugs like benzodiazepines (diazepam or Temazepam), phenothiazines (e.g., prochlorperazine or promethazine, antihistamine, MAO inhibitors, tricyclic antidepressants or any other centrally acting depressants are administered when opioid infusions are in progress.
    - **Naloxone** (stock strength 400microg:1ml Amp) may not be required in all cases. Cessation of opioid for a period may be sufficient.
        - Naloxone is usually given to adults as a **100mirog IV** dose and titrated as required.
        - Naloxone is **short acting (20 minutes)** and may need to be repeated. Naloxone is prescribed by a medical officer.
        - **The reversal effect of Naloxone is dose dependent**.
        - Naloxone will reverse analgesia, sedation respiratory compromise and pruritus' attributed to any opioid.
        - Naloxone is found in the drug room or arrives with the MET team. It is NOT stocked on the ward resuscitation trolley.

Urinary Retention:

Bladder sensation and function may be altered. Perform a bladder ultrasound if decreased urinary output or voiding difficulty.

Pruritus (itchy):

Report significant opioid induced Pruritus to medical home team.

Practice point:

- Not a histamine response, thus not histamine responsive.

- Management:1st line Ondansetron 8mg, if ineffective 2nd line naloxone 400microg in 10ml sodium chloride given as ordered at 40microg/1ml) aliquots.

Nausea and vomiting

Report if persistent nausea and vomiting is unrelieved with prescribed anti-emetic.

Management

1. Treat with prescribed antiemetic.
2. First line treatment 4 mg ondansetron IV.
3. Please refer to Post-Operative Nausea and Vomiting (PONV) Guideline for prescribing details.
4. If nausea and vomiting persist despite use of appropriate antiemetic, notify Acute Pain Service or Anaesthetic Registrar.

Procedural Pain management does not equal PCIA requirement.

Following a thorough pain assessment to determine whether if there is a new mechanism of pain responsible for the incident pain. Whether the incident pain is amenable to disease modifying therapy (treat infection, orthopaedic fixation for fractures, etc.); nursing staff and /or parent medical teams, can contact APS for further instructions / assistance regarding procedural pain management strategies.

Effectively managing severe incident pain refractory to increasing doses of usual analgesics with short acting opioids, or where increasing doses of usual analgesics results in unacceptable adverse effects.

Incident pain is defined as exacerbation of pain as a result of a predictable action or activity. Situations in which the use of fentanyl citrate maybe considered are as follows:

- Planned turns,
- Dressing changes,
- Transfers, ambulation,
- Bathing,
- Changing clothes,
- Disimpaction.

Note: Background persistent pain maybe be managed with controlled release opioids from community, such regime should continue unless otherwise directed by the APS medical staff.

Troubleshooting pump alarms:

1. Air in line, low battery, downstream occlusion upstream occlusion, delivery limit reached etc.
2. Refer to ward reference guides for CADD Solis pump Appendix F.