PCA (Patient Controlled Analgesia): Patient Care

Site Applicability:

Acute care units at St. Paul's Hospital, Mount Saint Joseph Hospital

Skill Level:

Registered Nurses (RN) who have completed PCA pump education and training and maintain Q2 yearly competency review

Quick Links – General

1. Assessment and monitoring parameters
2. Sedation assessment using Pasero Opioid Sedation Scale (POSS)
3. Managing Side effects

Need to Know:

- Intravenous Patient Controlled Analgesia (PCA) allows a patient to administer a preset intravenous (IV) opioid dose via an approved programmed Smartpump and attached PCA module. The patient can administer the IV opioid dose by pressing a button on the patient request cord connected to the Smartpump PCA module. The pump is programmed to deliver a preset dose of medication at a specific frequency.
- All changes in programming (including bolus doses) will be independently checked by a second PCA pump competency assessed RN or other qualified clinician (i.e. anesthesiologist) (See B-00-07-10044 Independent Double Check and Double Check of Medication)
- When a patient with a PCA is transferred from a critical care unit (ICU/CSICU/CICU/PACU) to an acute care unit, it is the responsibility of the nurse in the critical care unit to change the drug library from the critical care library to the adult-general library (pump settings). The nurse on the acute care unit is responsible for ensuring the correct pump settings and drug library are selected.
- When a patient is transferred between critical care units, a hand-over report will occur between the 'sending nurse' and the 'receiving nurse' ensuring the appropriate drug library is selected upon transfer and admission to the new unit.

- Sedation precedes opioid induced respiratory depression. Over sedation, if left untreated, can lead to opioid induced respiratory depression. Patient safety can be enhanced by systematic and thorough sedation assessments, close monitoring and careful management of the PCA pump. It is necessary to include patient and family education to ensure that only the patient presses the PCA control button.
- IV patient controlled analgesia must be ordered by the Acute Pain Service (APS) or by a member of the Department of Anesthesia using a PCA Powerplan in Cerner. Nursing care of the patient with IV PCA is a specialized nursing skill and as such can only be carried out by nurses who are skill checked and qualified to do so.
- The registered nurse will provide and reinforce patient and family education regarding PCA safety. The RN will initiate and manage the IV PCA pump, monitor and document the patient's response to PCA therapy, including but not limited to sedation assessment/scale, pain assessment/scale and side effects. The RN will verify all initial and changes to pump programming, and changes to the infusion system with an independent double check with a second RN.
- Patients receiving PCA therapy will be admitted to areas that are adequately staffed with RNs who have demonstrated PCA infusion pump competency.

Equipment & Supplies

1. Alaris® PC CareFusion Pump
2. Alaris® Syringe or PCA Pump Module
3. Alaris PCA tubing set
4. Cerner WOW
5. Medication syringe for intravenous infusion

Infusion System Safety

- PCA therapy will only be provided through an approved PCA Smartpump, utilizing the PCA drug library and approved orders.
- The PCA request cord will have a label that states "Patient use only".
- PCA tubing, with no additional ports or access points will be used for all IV PCA therapy.
- PCA tubing will be directly connected to the IV cannula with/without saline lock or directly to the central line port.
- All PCA syringes will be prepared by Pharmacy (or commercially obtained by pharmacy). No additional medications can be added to PCA syringes outside of pharmacy.

- All initial programming and changes to the pump programming or infusion system will be completed by a competency assessed Registered Nurse and verified by an independent double check completed by another qualified clinician (i.e. Anesthesiologist or Registered Nurse).
- The PCA pump will be locked and access to programming or medication will be secured throughout patient use.
- The PCA keys are to be kept in a secure location such as a lock box or locked drawer.
- All PCA medication wastage should be documented, recorded and witnessed in the ADC (Omnicell), see B-00-07-10061 Automated Dispending Cabinets (ADC): Omnicell.

Protocol

Assessment and Monitoring

- At the start of each shift the RN will visually check the following:
    - Cerner PCA PowerPlan e.g. APS/ANES PCA Hydromorphone (initiated)
    - Cerner APS/ANES Multi-Modal Pain Management Powerplan (initiated by ward nurse on admission)
    - Drug and concentration of the PCA syringe
    - Pump programming
    - Shift total cleared from previous shift
    - Ensure that a label indicating “patient use only” is attached to the PCA request cord
- Change the PCA tubing Q96 hours and/or more frequently PRN
- Ensure that the following equipment is in working order and readily available:
    - Resuscitation bag and mask
    - Oxygen equipment
    - Suction

Monitoring Parameters:

ASSESSMENT	FREQUENCY
Sedation scale **Respiratory** rate, rhythm, and quality **Pain assessment** *Respiratory Rate: Should be counted for 30 seconds and if respiratory rate is less than 12/minute, then it should be counted for a full minute.*	**Initiation:** • Q15 min X 30 min, • Q1h X 4h • Q2H x for total 24 hours, then Q4H for duration of therapy **Post bolus dose:** • Q15 min X 30 min then PRN **Post increase in PCA dose OR decrease in lock out interval**: • Q1H X 2 hours then PRN **Change in patient status (increasing sedation):** • Consider decreasing dose / removing PCA cord • Q30 minutes until Pasero Opioid-Induced Sedation Scale (POSS) score 2 or less ***If patient is asleep*** *assess respiratory rate, rhythm, quality prior to waking them*
SpO_2, BP & pulse	• Q15 min X 30 min then Q1H X 4H then • Q4H for duration of therapy
Pump history: • **Number of doses attempted (demands)** • **Number of doses delivered**	• Q4h – 1000h, 1400h, 1800, 2200h, 0200h, 0600h o Press **Channel Select** on PCA module o **Options** (blue button, on left side of main infusion pump screen) o **Patient history** o **Zoom** to 24 hours o Document: ▪ Number of doses attempted (demands)- cumulative- record exactly as displayed ▪ Number of doses delivered–cumulative – record exactly as displayed
Clear Pump history at end of shift	• Q12h- 0600h & 1800h o Press **Channel Select** on PCA module o **Options** o **Patient history** o **Zoom** to 24 hours o Document: ▪ Total Drug ▪ Total number of doses attempted (demands) ▪ Total number of doses delivered o Press **Clear History**

Other Assessments	• Maintain IV access for duration of therapy • Assess system integrity Q shift • **Remind** patient and families that only the patient can press the patient dose request cord button

Sedation Assessment using Pasero Opioid Sedation Scale (POSS):

- The Pasero Opioid-Induced Sedation Scale (POSS) is the standard scale used for assessing and documenting opioid induced sedation Appendix A
- Patients who are initiated on PCA, have their dose increased, or have their PCA opioid changed (i.e. from morphine to HYDROmorphone) **will be woken** during the first 24 hours for sedation assessments
- All patients switched from IV PCA to oral opioid analgesics will be woken for sedation assessments during the first 24 hours of oral opioid therapy

Procedure for Sedation Assessment:

1. Enter room and approach patient. Note the depth and rate of breathing. Count for a full 30 seconds (*if respiratory rate is less than 12/minute, then it should be counted for a full minute)*
2. Ask a simple question e.g. “What did you have for breakfast?”
3. Note how/when the patient wakes up

POSS Scale with Interventions:

1	Patient is awake when you enter or wakes before you speak
2	Patient wakes when you speak and is able to answer your question
3	Patient falls asleep mid-sentence or falls asleep while you are talking with them **Intervention Required** • Stop any ongoing opioid infusion or PCA • NOTIFY APS team/anesthesiology • Increase monitoring Q30min until patient 2 or less on the POSS
4	Patient is somnolent with minimal to no response to verbal and/or physical stimulation **Intervention Required** • Call a Code Blue • Administer naloxone as ordered and notify APS team/ anesthesiology STAT • Continue to monitor respiratory status and sedation level closely until sedation level is 2 or less on the POSS and respiratory rate is greater than 10/min • DO NOT re-start PCA therapy prior to assessment by the APS team/anesthesiology

Potential Complications and Side Effects of PCA:

Side Effect	Prevention and Management	Notes
Nausea and vomiting	• Administer antiemetics as ordered PRN • If attempts to control nausea and vomiting are unresolved, contact APS or anesthesia	• Nausea can be as distressing as pain
Pruritus	• Administer diphenhydramine as ordered	• Pruritus does not always require treatment • Assess your patient for itching and if it is disturbing, initiate treatment
Urinary retention	• Manage urinary retention as per B-00-13-10121 Urinary Retention: Management for the Prevention of UTI	
Decreased gastric motility (constipation)	• Assess and record bowel movements in Cerner system assessment: Gastrointestinal • Assess for flatus and bowel sounds	• Most common opioid side effect • Can progress to severe GI dysfunction including ileus, fecal impaction or obstruction

Potential Problem	Interventions
Managing Unrelieved Pain	• Assess PCA / IV tubing and IV site to rule out any mechanical problems such as IV infiltration, dislodgement, disconnection etc. • Ensure patient has understanding of how PCA works and is using it appropriately Assess sedation using POSS, assess what the possible issue is and provide bolus dose if ordered: o Is it that the patient is sleeping and not using the PCA and then waking in pain? • Is it that the dose is too low and seems ineffective? – consider increasing the PCA dose as ordered. Reassess pain, sedation (POSS) and respirations q15 min x 2 post bolus dose. If pain is still not controlled, repeat bolus dose and assessment. If pain still not controlled, call APS/ anesthesiologist. • Other things to consider: o Is the pain neuropathic in nature (burning, shooting, pins and needles)? Reassess for analgesic appropriate for neuropathic pain. o Is the patient receiving multimodal analgesia? Consider adding acetaminophen or a non-steroidal anti-inflammatory drug if appropriate o Did the patient have a laparoscopic procedure and is having gas pain? o Encourage ambulation, position changes and consider a warm blanket. Is there a cause for increased pain? • Assess for bladder distension, ileus (bowel sounds, abdominal distention). If pain continues despite increased analgesia and in consultation with APS, notify surgeon to assess.

Documentation:

See Appendix B for details regarding documentation

Pain Management after PCA Discontinued:

- Once patient is ready to have PCA discontinued, follow ANES/Transfer Pain Management Powerplan.
- If pain is not acceptable, contact MRP for assessment and new orders or to re-contact APS.

Patient/Family Education:

1. Assess the patient's understanding of how and when to use IV PCA for pain management.
2. Provide patient/family with an educational pamphlet from the preadmission clinic or Acute Pain Service/Anesthetist (where appropriate).
3. Teach the patient and family about pain control via IV PCA according to their learning needs:
    - **Only the patient can press the "patient control analgesia button". Reinforce that this is a main safety feature of the pump**
    - Frequency of assessments
    - Possible side effects and when to notify nurse
    - Pain assessment scale and realistic comfort goal

Related Documents and Resources:

1. B-00-12-10007 - Alaris® PC CareFusion Edition Infusion Pump with Guardrails
2. Directions for Use: Alaris® System Model 8015
3. B-00-07-10061 - Automated Dispensing Cabinets (ADC): Omnicell
4. B-00-12-10004 - Alaris (IVAC) Signature Edition Volumetric Infusion Pump, (7130 and 7230)

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6. Jungquist, C, Quinlan-Colwell, A, Vallerand, A, Sullivan, D., Watson, C., Polomano et al. (2020). American Society for Pain management Nursing guidelines on Monitoring for Opioid-Induced Advancing Sedation and Respiratory Depression: Revisions. Pain Management Nursing, 21, 7-25

7. Wuhrman, E.; Cooney, M.F.; Dunwoody, C.J.; Eksterowicz, N.; Merkel, S. & Oakes, L. (2006).

8. Patient controlled analgesia. Pain Management Nursing, 7(4), 134-147.

9. Fraser Health: CLINICAL PROTOCOL: Adult Intravenous Patient Controlled Analgesia for Surgical/Trauma Patients (date/2016)

10. Fraser Health: CLINICAL PROTOCOL: Assessment and Management of Sedation and Respiration During Opioid Therapy for Adult Patients in Acute Care (Non Palliative) (1 October 2013)

11. San Diego Patient Safety Task Force. (2014). *Tool kit: Patient controlled analgesia (PCA) guidelines of care; Respiratory Monitoring of Patients outside the ICU.*

Persons/Groups Consulted:

Pharmacy Supervisor, Parenteral Services

APS Anesthesia, SPH

Developed By:

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Appendix A **Pasero Opioid Induced Sedation Scale**

Pasero Opioid-Induced Sedation Scale (POSS)		
Score	**Meaning of Score**	
S**	Sleep, easy to rouse Do not document 'S' in the first 24 hours	**Acceptable**; no action necessary; may increase opioid dose if needed ****NOTE**: During the first 24 hours after surgery and/or after initiation of an opioid, an opioid increase, a change in opioid, or a change in route the patient must be woken. Documenting **'S' score is not acceptable during this time period**
1	Awake and alert	**Acceptable**; no action necessary; may increase opioid dose if needed
2	Slightly drowsy, easily roused	**Acceptable**; no action necessary; may increase opioid dose if needed
3	Frequently drowsy, rousable, drifts off to sleep during conversation	**Unacceptable;** • remove PCA button if in use, hold next oral dose of opioid **and** NOTIFY prescriber for adjustment of opioid orders • monitor respiratory status and sedation level closely until sedation level is 2 or better and respiratory status is satisfactory • consider administering a non-sedating, non-opioid analgesic for pain i.e. acetaminophen or NSAID
4	Somnolent, minimal or no response to verbal and physical stimulation (use trapezius muscle squeeze for physical stimulation - do not use sternal rub)	**Unacceptable;** • **Call a code blue** • stop opioid and administer naloxone as per order • oxygen by mask 10 L/min and monitor vital signs • IMMEDIATELY page APS/ Prescribing Service physician STAT • **DO NOT restart opioid therapy, patient will require new orders by APS**

Appendix B Documentation

1. Sedation Assessment:

Location in Cerner	What to Document	Frequency
Interactive View and I&O; Pain Management; Sedation Scale; Sedation Scale Used	Pasero Opioid Sedation Scale	
Pasero Opioid Sedation Scale	1 = Awake and Alert 2 = Slightly drowsy, easily roused 3 = Frequently drowsy, rousable, drifts off to sleep during conversation 4 = Somnolent S = Sleep, easy to rouse	**Initiation:** • Q15 min X 30 min, • Q1h X 4h • Q2H x for total 24 hours, then Q4H and PRN
		Post-bolus: Q15 min X 30 min then PRN **Pump Changes:** Q1H X 2 hours then PRN

2. Pain Management – Vital Signs:

Location in Cerner	What to Document	Frequency
Interactive View and I&O; Pain Management; Vital Signs	Temperature Pulse SBP/DBP	• Q15 min X 30 min, • Q1h X 4h, then Q4h and PRN
	Respiratory Rate	**Initiation:** • Q15 min X 30 min, • Q1h X 4h • Q2H x for total 24 hours, then Q4H and PRN
		Post-bolus: Q15 min X 30 min then PRN **Pump Changes:** Q1H X 2 hours then PRN
	Oxygen Therapy: Oxygen flow rate $SpO_{2,}$ / SpO_2 site	• Q15 min X 30 min then Q1H X 4H then Q4H and PRN

3. Pain Assessment:

Location in Cerner	What to Document	Frequency
Interactive View and I&O; Pain Management; Pain Assessment		• Q15 min X 30 min, • Q1h X 4h • Q2H x for total 24 hours, then Q4H and PRN
• Pain Present	Pain present	
• Resp Rate	Same as VS above	Same as VS above
• Location	Location of pain	• Q15 min X 30 min, • Q1h X 4h • Q2H x for total 24 hours, then Q4H and PRN
• Pain Tool Used	Numeric Pain Scale	
• Numeric Pain Scale o Numeric Pain Score o Acceptable Pain Numeric o Numeric Pain Score with Activity o Numeric Pain Score at Rest	0 to 10	

4. Pain Education:

Location in Cerner	**What to Document**	**Frequency**
Interactive View and I&O; Pain Management; Pain Education		
Pain Management	Verbalizes understanding Demonstrates Needs further teaching Needs practice/supervision Other	Initial set up and PRN

5. PCA Documentation in Pain Modalities:

Location in Cerner	**What to Document**	**Frequency**
Interactive View and I&O; Pain Management; Pain Modalities	Create Dynamic Group: i. Intravenous ii. IV Modality Drug Name (fentanyl, HYDROmorphone, morphine) iii. IV Infusion location iv. IV PCA type: Standard, Tolerant, Opioid Extreme	Initial set up

• Infusion Type	Patient Controlled, Continuous Infusion	Every assessment and /or change
• Verification Type	Change new syringe Change in Caregiver Change in concentration or medication Change in pump programming Initial set up	As applicable
• IDC Completed		When applicable (i.e. any pump programming change, bolus dose, syringe change)
• Pump Related Activity	Pump change Pump cleared Pump labelled Pump stopped Removal, other	When applicable
• Verified Pump Settings With Orders • Adverse Effects • Patient Controlled Dose • Patient Controlled Dose Unit of Measure • Lockout Time (minutes)		Every assessment and /or change
• Continuous Rate • Continuous Rate Unit of Measure • Clinical Bolus Given		When applicable
• Pump Cleared Total • Pump Cleared Total Unit of Measure		At end of each shift (0600 & 1800h)
• Number of Doses Attempted • Number of Doses Delivered	(Zoom to 24 hours- Record the number exactly as displayed- cumulative)	Every 4 hours (1000, 1400, 1800, 2200, 0200, 0600h)

6. Potential Complications:

Location in Cerner	**What to Document**	**Frequency**
Interactive View and I&O; Gastrointestinal	• Flatus • Bowel sounds • Bowel movements	On assessment and /or change

Interactive View and I&O; Genitourinary	• Urinary retention	Q6h and PRN
Pain Management; Pain modalities; IV or Subcutaneous Infusions; Adverse Effects	• Pruritus • Urinary retention • Nausea and vomiting	On assessment and /or change

7. Once PCA discontinued, click on PCA dynamic group, right click and inactivate.