PATIENT CONTROLLED ANALGESIA (PCA)

PURPOSE: To outline the nursing management of patients receiving self-administered analgesia via infusion.

SUPPORTIVE DATA: PCA is a method of delivering intravenous pain medication at a prescribed continuous rate via a specialized PCA infusion pump. Additionally, the patient may self-administer prescribed bolus infusions intermittently to manage breakthrough pain. Examples of medications to be administered via a PCA pump: hydromorphone, morphine, and fentanyl.

All patients receiving PCA must have End Tidal Carbon Dioxide (EtCO2) monitoring unless otherwise indicated (or unless contraindicated – See End Tidal Carbon Dioxide (EtCO2) Monitoring (Use With PCA) Standard).

If a patient requires a continuous morphine sulfate infusion of 10mg/hr or greater, a PCA may not be used. Instead, a high dose continuous morphine sulfate infusion (via a standard infusion pump) may be used as ordered (See Pain Management Nursing Clinical Standard).

SCREENING:

1. Validate that the patient is an appropriate candidate for PCA utilizing the following criteria:
   - Patient is alert, oriented, and able to learn how to use the PCA device
   - Short-term analgesia is consistent with patient's pain origin and need (e.g., post-operative/diagnostic procedure) ***or***
   - The patient is chronically/terminally ill and unable to manage pain with conventional methods
   - Pediatrics:
     - PCA is appropriate for 5 years and older (a 4-year-old can be considered depending on developmental status)

PRIOR TO ADMINISTRATION:

2. Verify that ordered basal rate dose for morphine sulfate is less than 10 mg/hr.
3. Obtain Provider order for PCA and ensure the following:
   - Provider order is on an Adult or Pediatric PCA power plan/order set. Any change must be on a new order
   - Order is complete and signed by the physician.
     Note: Verbal orders are NOT acceptable
   - Order verified by pharmacy before administration
4. Verify Provider order and PCA pump settings with second RN prior to administration, with any change in syringe/concentration/dosage/setting with the following steps:
   - Verify Provider order at the bedside where the patient and pump are located
   - Program the pump using the Provider order
   - Verify correct pump settings prior to administration including:
     - Name of medication
     - Medication concentration
     - Dosage of medication, including if medication falls within **normal range** as noted on Provider order
     - If dosage falls outside of the normal range, call Provider, clarify orders, and document plan of care

ONGOING ADMINISTRATION:

5. Verify Provider order and PCA pump settings with second RN within 1 hour of the beginning of every shift and upon transfer to a new patient care area with the transferring RN and receiving RN, with the following steps:
   - Verify Provider order at the bedside where the patient and pump are located
   - Verify correct pump settings:
     - Name of medication
     - Medication concentration
     - Dosage of medication, including if medication falls within **normal range** as noted on order
     - If dosage falls outside of the normal range, call Provider, clarify orders, and document plan of care
     - In addition, verify the amount of medication in the syringe upon transfer

INITIAL ASSESSMENT:

6. Assess the following **within 30 minutes** prior to initiating PCA therapy:
   - Level of consciousness
   - IV site and patency
   - Vital Signs (VS)
   - Depth of respirations (depth of respirations is documented under "Respirations")

7. Verify that the alarm settings of the EtCO2 module are as follows:
   - EtCO2 value: 20-50 mmHg
   - Respiratory Rate: 8 - 30 breaths per minute
   - No breath (apnea) period: 15 seconds
   - Presence of EtCO2 waveform
   - Pause Rate (the PCA will stop): Respiratory rate of less than 6
   - Note: Alarm limits may be changed per provider' order only
   - Pain severity
   - History of allergic reaction to opioid medications
   - Oxygen saturation via pulse oximetry

ONGOING ASSESSMENT:

8. Assess the following between 15-30 minutes into infusion, after dose changes, then a minimum of every 2 hours (ICU), every 4 hours (Acute Care Units):
   - Level of consciousness (Acute Care Units)/ Richmond Agitation Sedation Scale (RASS) ICUs
   - VS, including depth of respirations (Comfort Care Patients, every 8 hours)
   - Allergic reactions
   - Pain severity
   - Oxygen saturation via pulse oximetry (except Comfort Care Patients)
   - ETCO2 value (Acute Care Units)
   - Assess EtCO2 alarm limits and presence of waveform settings within one hour of the beginning of each shift (Acute Care Units)

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9. Assess for and document accuracy of pump settings, frequency of patient use of PCA, and clear pump every 4 hours.
10. Assess for side effects:
    - Confusion
    - Constipation
    - Itching Nausea /Vomiting
    - Tingling in legs
    - Urinary retention
11. Evaluate patient's ongoing ability to use PCA effectively a minimum of every day.
12. Assess for effectiveness of pain relief within one hour after any pump setting change.

ADMINISTRATION:

13. Administer PCA per order.
14. Maintain primary IV at 10 mL/hr to keep vein open.
15. Use pre-loaded syringes provided by Pharmacy Services.

SAFETY:

16. Ensure two RNs verify Provider order, PCA pump settings, changes in syringe/concentration/dosages and document on applicable record.
17. Ensure that naloxone is available on the unit.
    - Post patient's calculated dosage at bedside (Pediatrics).
18. Avoid interruption of IV analgesia.
19. Discontinue and waste PCA medication for patients requiring procedures where PCAs are not appropriate (i.e. OR, diagnostic procedures/tests). A new PCA order is required upon patient's return to unit.
20. Cap Y-port.
21. Infuse only compatible continuous drips into the primary PCA line.
    - Continuous PCA line should not be use for intermittent boluses/IVPB.
22. Use only tubing recommended by pump manufacturer for administration of PCA.

COLLABORATION:

23. Collaborate with Providers, Pharmacy Services, Palliative Care and Pain Management Services as needed.

PATIENT/CAREGIVER EDUCATION:

24. Instruct on the following:
    - Purpose and function of continuous infusion and/or PCA
    - PCA only to be administered by patient
    - How to use PCA
    - Action and anticipated side effects of medication
    - Notify nurse immediately for the following:
      - Dizziness or loss of consciousness
      - Respiratory distress
      - Seizure activity
      - Persistent pain
      - Vomiting
      - Allergic reactions

REPORTABLE CONDITIONS:

25. Discontinue infusion, administer supplemental oxygen and naloxone as ordered, and notify Provider immediately for the following:
    - Deterioration in mental status lethargy
    - Respiratory rate < 6 per minute
26. Discontinue infusion and notify Provider for:
    - Seizure activity
    - Shallow respirations
    - Respiratory distress
    - Allergic reaction/anaphylaxis other than itching (e.g. edema, stridor)
    - Deterioration in VS, oxygen saturation
    - Excessive sedation
    - Nausea & vomiting for greater than 1 hour (not responsive to ordered medications)
27. Notify Provider for the following:
    - Inadequate pain relief after IV line has been checked for patency
    - Loss of ability to use PCA
    - Itching (not responsive to ordered medications)
    - Urine retention
    - Constipation
28. In a significant event in relation to the PCA pump immediately do the following :
    - Discontinue pump from patient, but **leave plugged in and turned on**
    - Notify Supervisor
    - Complete Safety Intelligence (SI) Event Report
    - Send PCA pump to Bio-Med
        - During off-shifts or when Bio Med is not available the charge nurse and Supervisor will sequestor the PCA pump in a secure location
    - Hand deliver medication, and all clamped tubing placed in a zip-lock bag to pharmacy

ADDITIONAL STANDARDS:

29. Implement the following:
    - End Tidal Carbon Dioxide (EtCO2) Monitoring (Used with PCA)
    - Falls/Injury Prevention
    - Intravenous Therapy
    - Pain Management

DOCUMENTATION:

30. Document in accordance with “documentation standards”.
31. Both RNs document on:
    - Pain Medication Infusion Record or
    - Computerized medication administration record.

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REFERENCES:

Institute for Clinical Systems Improvement. Health Care Guidelines: Assessment and Management of Acute Pain (6th ed.). March 2008. pp. 24-25. www.icis.org

ISMP. Misprogramming PCA concentration leads to dosing errors. August 28, 2008 issue. www.ismp.org

The Joint Commission. High-alert medications and patient safety. Sentinel Event Alert. Issue 11, Nov 19, 1999.

The Joint Commission. Patient controlled analgesia by proxy. Sentinel Event Alert. Issue 33, Dec 20, 2004.

McCaffery, M., Pasero, C. (1999). Pain Clinical Manual (2nd ed.) pp 248-257.

Pasero, C., McCaffery, M. Safe use of continuous infusion with IV PCA. J PeriAnesth Nurs. 2004; 19(1): pp 42-45.

San Diego Patient Safety Task Force. Tool Kit; Patient Controlled Analgesia (PCA) Guidelines of Care for the Opioid Naive Patient. Dec. 2008.