CONSIDERATIONS:

1. Patient controlled analgesia (PCA) is an approach to pain management, which allows patients to self-administer intravenous, subcutaneous, or intraspinal pain medication within physician-ordered limits.
2. Parenteral administration may be indicated for severe or intractable pain when:
   a. Oral, transdermal or rectal routes are not feasible
   b. Nausea/vomiting or inability to swallow oral medications occurs
   c. Large oral doses can be replaced with smaller parenteral doses
   d. an uninterrupted level of analgesic is required
3. Parenteral administration of analgesics may be:
   a. Intermittent/bolus/demand dosing
   b. Continuous infusion
   c. Continuous infusion with supplemental bolus for breakthrough pain
4. Control devices are required for all opioid infusions. Two types are:
   a. External ambulatory pumps, e.g. CADD™
   b. Implanted pumps, e.g. .Infusaid™, SynchroMed™
5. Drug therapy alternatives include, but are not limited to:
   a. Opioids such as morphine and hydromorphone
   b. Opioid agonists such as meperidine and fentanyl
   c. Alpha2-adrenergic agonists such as clonidine
   d. Local anesthetics such as lidocaine and bupivacaine
6. Each of these drugs and routes has advantages and disadvantages.
   a. Morphine may be administered IV, SC, IM, or intraspinal; has a short half-life, and has no toxic or active metabolites. SC infusion of morphine works well for many hospice patients.
   b. Fentanyl is a very potent opiate agonist with a rapid onset of action and shorter duration of action than morphine. It is generally used epidurally in an attempt to lower narcotic requirements and improve analgesia or avoid nausea and epidural side effects of other narcotics.
7. The nurse involved in a PCA patient's care should be knowledgeable about the drug(s) being administered including dosing, contraindications, side effects and their management, IV access device care and management, and pump operation and troubleshooting.
8. The nurse should assess for the appropriateness of PCA therapy and the ability of the patient to participate in own pain management. If the patient is unable to participate actively, the nurse should assess for appropriateness of Authorized Agent Controlled analgesia (AACA), which requires strict and careful monitoring.
9. Physician orders should include:
   a. Name of drug, dosage in mg/hour, dosage and frequency of bolus dose, and route (SC, IV, epidural, or intrathecal)
   b. Limits or range of continuous infusion and bolus dose to be set in programming the infusion pump
   c. Flushes and site care
   d. Adjunctive medication for constipation, nausea, vomiting, or other CNS effects
10. Verification of infusion pump settings as per physician order should be done every nursing visit.
11. Infusion pump settings should be changed in collaboration with another clinician according to organizational policy. Telephone read back of changed parameters should be done when the drug, dose, concentration, or rate of infusion is changed. Nurses should consider verifying pump programs with IV pharmacist.
12. Dosage:
   a. Titrate to optimize individual pain control while minimizing adverse effects of medication
   b. For initiation of continuous parenteral therapy from the oral route, the infusion pharmacist converts the total daily usage of patient's current oral intermittent therapy into an appropriate infusion dosage using an equianalgesic chart
   c. Nurses should be familiar with eguianalgesic dosing of opioids. See the *Equianalgestic Pain Chart*, attached to procedure: *Pain Management-Management with Medications, Addendum C.*
13. Adverse Reactions/Side Effects:
   a. Respiratory depression is a deadly adverse effect of opioids, especially in the opioid-naïve patient:
      i. Opioid-naïve patients have been on opioid therapy at comparable doses for less than a week
      ii. Respiratory rate should be at least 10 – 12 respirations/minute and be of adequate depth
      iii. Teach caregivers how to monitor respirations and to never push bolus button while the patient is sleeping unless specifically instructed by nurse/physician to do so
      iv. If respiratory depression occurs, depending on severity:
         1. Reduce/stop the infusion to reverse respiratory depression
         2. Consult physician for orders. Severe respiratory depression may necessitate a narcotic antagonist (i.e., naloxone)

3. Activate the EMS system

b. Gastrointestinal effects:
   i. Constipation is such a common side effect of opioid therapy, that patients will be started on a bowel program at the same time opioid therapy begins. Bowel program can consist of a high fiber diet and adequate hydration, escalating to stool softeners, laxatives and then stronger laxatives
   ii. Nausea and vomiting. Antiemetics may be helpful in treating nausea and vomiting but may add to other unwanted side effects
c. Neurologic effects include drowsiness, seizures, agitation, restlessness, confusion, tremors and somnolence. Changing to an alternative medication may alleviate these symptoms. Patients may benefit from dose reduction or adjunct medications
d. Immunologic effects include vasodilation, hypotension, pruritus, flushing, sweating and allergic reaction. Antihistamines are sometimes useful in treating these symptoms. If antihistamines are not effective or contraindicated then an alternative analgesic should be employed

A. INITIATION OF PCA PUMP

EQUIPMENT:

Medication cassette with attached, primed tubing
Infusion pump
Alcohol wipes
Nonsterile gloves
Preservative free normal saline flush

PROCEDURE

1. Adhere to Standard Precautions and explain the procedure and purpose to patient/caregiver.
2. Assess patient's current vital signs mental status and pain, including location, quality, severity (level, using a 0 to 10 pain scale) as a baseline.
3. Verify physician order (and consider verifying pump screen readings with IV pharmacist via phone call) including:
   a. drug name and concentration
   b. basal/continuous rate
   c. bolus/demand dose
   d. lockout/interval time
   e. maximum number of boluses/demand doses per hour
4. Assemble the equipment on a clean surface, with adequate lighting, close to the patient.
5. Place patient in comfortable position, making sure that site is accessible.
6. Attach medication cassette to pump per manufacturer's directions.
7. Clean needleless connector at end of central venous access device (CVAD) with alcohol. Allow to air dry.
8. Attach syringe and flush with 10 mL saline or as ordered.
9. Remove syringe and attach pump tubing to needleless connector. Open all clamps.
10. Verify pump settings per physician order and start infusion.
11. Remain with patient for at least 30 minutes, assessing vital signs and response to pain medication.

AFTER CARE:

1. Document in patient record:
   a. Drug name, concentration, dosage, route
   b. Screen readings programmed into the pump for drug delivery
   c. Patient's vital signs and pain level pre- and 30 minutes post-procedure
   d. Instructions given to patient/caregiver
   e. Communication with physician
2. Instruct patient/caregiver in:
   a. Signs and symptoms of adverse reaction/side effects as well as their management, especially:
      i. respiratory depression
      ii. constipation
   b. Operation of infusion pump including administration of bolus/demand dose and troubleshooting. Caregivers should not press button while patient sleeping.
   c. Care, observation, and management of device and infusion site.
   d. Storage and disposal of controlled substances
   e. Physician/nursing contact and emergency phone numbers

B. MONITORING & FOLLOW-UP

EQUIPMENT:

Medication cassette, if change due

PROCEDURE

1. Monitor patient's response to PCA pain management plan, including vital signs, pain location, quality, severity (level, using a 0 to 10 pain scale)
2. Review the number of bolus/demand doses given and total amount of opioid administered by patient since the previous nursing visit.
3. Evaluate patient for any adverse effects that might be caused by the medication and report to physician as appropriate.

AFTER CARE:

1. Document in patient record:
   a. Patient's status, including
      i. Vital signs, especially respiratory rate and depth
      ii. Mental status: orientation, level of sedation
      iii. Pain location, quality, severity (level, using a 0 to 10 pain scale)
      iv. Last bowel movement
      v. Description of infusion site
   b. Drug name, concentration, dosage, route
   c. Total number of bolus/demand doses given and total amount of opioid administered by patient since the previous nursing visit.
   d. Current screen readings programmed into the pump for drug delivery
   e. Instructions given to patient/caregiver
   b. Communication with physician

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