EPIDURAL MANAGEMENT

A Web Strategy for Nurses
Overview

- Epidurals are used to manage postop acute surgical pain, and at times for severe chronic pain.
- Nurses should understand spinal anatomy, epidural medications and be able to provide comprehensive care for a patient with an epidural.
Introduction

- Nurses spend the most time with the patient. Nurses should be prepared to identify problems in the patient’s pain management.

- The nurse’s focus of epidural pain management includes: safe administration of epidural medications, analgesia evaluation, optimal pain control, and identifying and managing adverse reactions or complications.

- This web strategy has been designed:
  - To educate the nursing staff about spinal anatomy, review the required standard nursing assessment, implications and interventions for a patient with an epidural
  - Expand their knowledge base on local anesthetics and opioids used in epidural solutions
  - Assessment of the epidural catheter site.
Background

- Epidural nursing was first introduced to BMC in 1992.
- Initially, education was disseminated from the Acute Pain Service. Today the education is continued through the nursing preceptor program.
- It is imperative for nurses to update their knowledge and technical skills in order to provide safe, effective epidural patient care.
Objectives

- Describe spinal canal anatomy.
- Discuss dermatomes.
- Identify contraindications for epidurals.
- Identify opioids used as adjuncts for epidurals.
- Describe the appropriate assessment of the patient with an epidural.
- Describe the physiologic effects for epidurals and appropriate nursing interventions.
- Describe catheter management and assessment.
Spinal Canal Anatomy

- The epidural space lies outside the dura, between the dura mater and the walls of the vertebral canal.
- Contains adipose tissue which surrounds and pads the spinal cord.
- This adipose tissue serves as a reservoir for opioids and local anesthetics when these medications are given for epidural analgesia.
- Opioids in the epidural space diffuse across the meninges and CSF to receptors in the doral horn.
Vertebral Column

- The vertebral column consists of 33 vertebra:
  - Seven cervical
  - Twelve thoracic
  - Five lumbar
  - Five sacral (fused to form the sacrum)
  - Four coccygeal (fused to form the coccyx).
Dermatomes

- **Levels to Remember!**
  - C3 - Neck
  - C5 - Clavicles
  - T4 - Nipples
  - T10 - Navel
  - L1 - Groin
  - L4 - Knees
  - L5 - Dorsum of foot
  - S1 - Lateral Ankles
  - S4 - Perineum

- With a continuous infusion an epidural can provide analgesia for 5-7 dermatome levels.
Epidural Anesthesia

- Performed along any level of the spinal column
  - **Lumbar epidural** - used for procedures on lower abdomen, hips, perineum, and lower extremities.
  - **Thoracic epidural** - used for upper abdominal and thoracic procedures
- Provides a localized band of analgesia at the incision site.
Epidural Anesthesia

- A continuous infusion of a dilute concentration of a local anesthetic mixed with an opioid into the epidural space

- **Purpose:** interrupt transmission of pain impulses along spinal nerve roots

- May cause sensory and motor blockade
  - lower local anesthetic concentrations generally allow motor function to remain intact
Indications

- Surgery
- Cancer pain
- Trauma
- Chronic pain syndromes
- Labor anesthesia
Benefits of Epidural

- Improved outcomes of patients with compromised preoperative cardiovascular or pulmonary function
- Superior pain control
- Improved pulmonary function
- Increased bowel motility associated with shorter hospital stay
- Decreased incidence of venous thrombosis
- Improved vascular graft survival due to the vasodilatation effect from the local anesthetic.
Contraindications
Epidural

- Absolute contraindications:
  - Patient refusal
  - Sepsis with homodynamic instability
  - Uncorrected hypovolemia
  - Coagulopathy - may lead to epidural hematoma formation
  - Anticoagulation therapy

- Relative contraindications:
  - Increased ICP
  - Prior back injury with neurological deficit
  - Progressive neurological disease - MS
  - Chronic back pain
  - Localized infection @ injection site
Epidural Anesthesia

- May be “single shot of an opioid” or a continuous infusion with a local anesthetic and opioid or a pure local anesthetic infusion omitting the opioid
- The combination of the local anesthetic and an opioid work synergistically together giving superior pain control with less side effects due to the lower concentrations needed when combined
- Level and spread of the block effect from the local anesthetic depends on:
  - Volume and concentration of the local anesthetic
Pharmacological Choices

- Local anesthetics
- Opioids
- Combination of a diluted concentration of both.

**Local anesthetics** (bupivacaine)
- Acts at the spinal nerve root level
  - Inhibits nerve impulse transmission.
- Blocks sympathetic impulses
  - Decreases heart rate, blood pressure and respiratory rate.
  - Change in sensation, pain, touch and temperature
- Motor block-
  - Weakness to paralysis
Narcotics

- Morphine - Duramorph/Astromorph:
  - Preservative free opiate
- Fentanyl
Preservative Free Morphine

- Usual initial dose is 2-5mg via epidural catheter every 12 hours

- ONSET: UP TO 1 HOUR for onset but can last for 8-12-24 hours (hydrophilic)

- LONG DURATION: 8-12 hours

- Adverse Effects
  - Respiratory depression
  - Hypotension
  - N/V
  - Urinary retention
  - Pupil constriction
  - Muscular rigidity
Fentanyl

- Usual bolus dose is 50-100mcg every 4 hours PRN
- Always use 10cc syringe with bolus dose
  - Example: Fentanyl 100mcg (2 cc)
    - Use 8cc preservative free NS to dilute
      - More volume spreads fentanyl across the dermatomes. Fentanyl is lipophilic in nature.
Fentanyl

- **ONSET**: 5-15 MINUTES
- **SHORT DURATION**: 2-3 HOURS
- **Adverse Effects**:
  - Respiratory depression
  - Sedation
  - Confusion/Agitation
  - Bradycardia
  - N/V
  - Urinary Retention
  - Urticaria pruritus
Narcotic Reversal Agents

- Naloxone (Narcan)
- Dosage: 0.1 mg (adult dose) every 5 minutes PRN: for respiratory rate less than 6 breaths/min. or sedation scale of D; repeat until respiratory rate >15 breaths/min. and patient more alert
  - Opiate antagonist
  - Reverses respiratory depression due to opioids
  - Reverses analgesia. Titrate to desired effect; (brief duration of action)

- Adverse Effects
  - Tremors, excitement, seizures, hyperventilation, pulmonary edema, hypotension, bradycardia, ventricular tachycardia/fibrillation, nausea/vomiting
Bupivacaine

- Common ordered concentrations: 0.05%-0.1%.
- Typical basal infusion 6-10cc/hr
- Slow onset but longer duration
- Adverse Effects:
  - Postural Hypotension
    - Secondary to blocking sympathetic nerve fibers
  - Numbness/weakness of legs
  - Urinary retention
Nursing Assessment

- Identify epidural catheter by checking for:
  - Yellow Cap
  - Yellow Catheter
  - Yellow lined tubing (Epidural PCA)
  - Luer lock tubing into catheter hub
  - Sterile storage of cap
Aspirate

- Nurses at BMC always use a 10cc syringe with an epidural.
- Check for air bubble with a 10cc syringe with preservative free normal saline in syringe to visualize the bubble.
- Aspiration requires same force equivalent to that required for injection.
- Look for a small air bubble. Observe for 10-20 seconds.
- Maintain a clean luer lock yellow connection at all times-replace PRN.
- Do not clean luer lock connection with alcohol.

If CLEAR fluid or BLOOD: STOP! DO NOT administer solution and notify APS (pager 47246).
Nursing Assessment

- **Injecting Medication**
  - Use only preservative free solutions.
  - Epidural injections may require some force, but should proceed smoothly.
  - Notify APS if patient experiences pain or burning on injection.
  - A “cold sensation” is normal.

*Use only 10 cc syringes.*
If the problem is: Change in CMS

Epidural Catheter in place?

Yes

Call APS & then HO or MD

No

Epidural Catheter D/C’d?

Yes

No

Less than 12 hrs?

Yes

Administer medication

Notify APS (4-PAIN)

No

More than 12 hrs?

Yes

Administer medication

Notify APS (4-PAIN)

If the problem is: Injection

Slight force with administration

Patient c/o pain and burning

STOP

If the problem is: Aspiration

Blood or CSF

Stop/Do not administer

Notify APS (4-PAIN)

Small air bubble

Administer medication solution

Check Epidural catheter site. Catheter may be dislodged. Do not administer medication.

Notify APS (4-PAIN)
Nursing Assessment

- Assess integrity of insertion site and catheter
- Dressing inspected each shift.
- Assure **dressing is occlusive**
- Notify APS (Acute Pain Service) if:
  - Redness, drainage or swelling at catheter site
  - Bloody drainage
  - Tegaderm dressing concerns
Pain Assessment

- Assess level of pain at least every 4 hours if controlled
- At least every two hours if pain is not satisfactorily controlled.
- Have patients rate pain on a scale of 0 - 10 (no pain to excruciating pain.)
- Notify APS if pain is not acceptable.
Nursing Assessment

- Baseline Assessment Every 4 hours: this is a nursing standard:
  - Pain level (0-10 scale)
  - Respiratory rate
  - Blood pressure
  - Sedation scale
- Assess mobility
- Sensory and motor function of lower extremities
Nursing Assessment: Vital Signs
A Standard of Care:

Measure respiratory rate and sedation Scale:

Epidural Morphine (Astramorph) injection:
- q 15 min. x 2
- q 1 hr x 4
- q 2 hr x 4
- q 4 hr duration of therapy

Epidural Fentanyl injection:
- q 15 min. x 2
- q 1 hr x 2
- q 4 hr for continuous infusion

Measure blood pressure and heart rate:

Bupivacaine:
- q 4 hr for continuous infusion
Nursing Assessment: Neuro/Sensory Changes

Call APS if you observe

- Weakness of lower extremities
- Change in lower extremity mobility and/or tingling/numbness/or increasing paresthesia of lower extremity/extremities
- Acute onset of low back pain
- Loss of bowel or bladder function (may indicate catheter migration or epidural hematoma).
System Assessment

Respiratory
- Respiratory depression may occur initially and up to 24 hours after administration. APS should be notified for respiratory rate less than 10.
- Somnolence is a better indicator of respiratory depression than respiratory rate.
- Measure RR and sedation scale after each injection: follow nursing BMC standards

Cardiovascular
- APS should be notified if SBP< 90mm Hg unless otherwise specified.
System Assessment

**GI**
- Vomiting may occur without nausea. Protect airway from aspiration.

**GU**
- Patients without Foley catheters should be checked for bladder distention every 4 hours (consider bladder scan).
- Urine output should be assessed 8 hours and prn for duration of therapy
- Urine retention may be related to the effect of narcotic on the spinal nerve innervating the bladder.
System Assessment

Skin/Sensory

- Pruritus
- Patient may experience itching without evidence of rash or redness. Usually not an allergic reaction.
  - Itching secondary to:
    - Mu receptors in the spinal column
    - Histamine release occurs with peripheral narcotic infusions.
- Notify APS if present.
Complications

- **Epidural Hematoma**: bleeding into the epidural space from catheter placement or catheter erosion.
- **Epidural Abcess**: Infection within the epidural space.
- **Postdural Puncture Headache**: CSF leak as a result of accidental puncture of the dura during catheter placement.
  - S&S - severe headache that increase with severity when the patient is upright, double vision, auditory disturbances
  - Notify APS, conservative treatment: hydration, caffeine – encourage caffeinated drinks if allowed, bed rest in the supine position.
  - Blood patch.
References

- CO 13.312- Policy for Intraspinal Pain Therapy Using Opioids And Local Anesthetics
- DOA Department of Anesthesia 6.5.08- Epidural Protocols for Pediatric Patients
- ASPAN CBO