Peripheral Nerve Blocks

NURSING EDUCATION

JPS Acute Pain Service
"Peripheral nerve blocks are used as part of a multimodal analgesic program which provides the patient with safe and effective postoperative pain management with very minimal side effects."

(Gonzalez, et. al, 2002)
Advantages of Peripheral Nerve Blocks

• Dramatic reduction / elimination of pain during and/or after surgery or injury
• More effective than traditional IV opioids
• Faster recovery from surgery and earlier discharge
• Increased patient satisfaction
Schematic diagram of peripheral nerve anatomy

Placement of Peripheral Nerve Block

ULTRASOUND
The frequency of complications can be reduced if the block is administered before induction of general anesthesia.

(Jeng et. al., 2010)
Complications

• Hematoma
• Injury or anesthetic blockade of adjacent structures:
  • Injecting into the lung and pleura with a needle can result in a pneumothorax
• Nerve damage
• Systemic local anesthetic toxicity
Local Anesthetic Toxicity

S/S:

- Dizziness, light headedness
- Blurred vision
- Ringing, buzzing in ears
- Metal taste in mouth
- Numbness/tingling around mouth, fingers or toes
- Drowsiness or confusion
- Seizures and cardiac arrest
- **Discontinue Immediately And Notify The Acute Pain Management Team ext 7755.**
Nursing Assessment

- **INSERTION SITE**: Check the site of insertion (being very careful not to disturb the placement of the PN catheter) and document any drainage, redness, pain, swelling.

- **PAIN LEVEL**: Assess patient’s pain level each time you assess the OnQ Pain Ball, insertion site and perform neurovascular checks.
Neurovascular Checks

The 5 P’s of neurovascular checks

- **PAIN**
- **PARASTHESIAS**
- **PULSES**
- **PARALYSIS**
- **PALLOR**
Vascular Checks

Perform neurovascular checks at least every 4 hours.

• **VASCULAR CHECKS**
  • Document pulse including pulse presence, pulse quality, and rate.
  • If unable to find pulse in affected extremity, immediately Doppler the pulse.
  • If unable to Doppler the pulse contact the physician immediately.
  • Assess warmth of extremity with PNB, skin color (red, pale, etc...), and capillary refill.
  • Assess swelling to extremity. Always check opposite extremity for comparison and document.
Neuro Checks

• NEURO CHECKS:
  • Assess strength tests in feet (pushes/pulls) or hands (grip strength).
  • Always test bilaterally and document.
  • Check for sensation presence by using ice as detailed below on how to test an epidural block.
Nursing Care Tip Sheets

Epidurals

Peripheral Nerve Blocks

**Epidural Blocks**

**Tips for Nurses**

**Overview**

Epidurals are placed either in the thoracic or lumbosacral region of the spine for both pain management. An epidural catheter is left in the epidural space which surrounds the spinal nerves and is out in the spinal cord. They are left in the epidural space between T2-T3 spaces.

**Things to Consider**

**ANESTHESIA:** Ensure that the patient is comfortable at all times. Pain management can be challenging in this setting due to the nature of the procedure.

**OFFICE CARE:** Place the patient in a comfortable supine position.

**RISKS:** Epidural catheters can cause hypotension, which should be monitored and treated.

**ANTI-EMETICS:** Ensure that the patient is free from any nausea or vomiting.

**Pain Management:** Pain management should be well-controlled. The patient should be re-evaluated after the procedure to ensure that pain is adequately managed.

**PERIODIC ASSESSMENTS:** Regular assessments should be made to ensure adequate pain control.

**Troubleshooting:** If problems arise, consult with the attending anesthesiologist.

**Peripheral Nerve Blocks**

**Tips for Nurses**

**Overview**

Peripheral nerve blocks are used to achieve pain relief in various settings. They are administered using a catheter, which is inserted into the area to be blocked.

**Things to Consider**

**Single Shot Blocks**

**PERIPHERAL NERVE BLOCKS:** These blocks are typically performed on a single shot basis. The patient should be in a comfortable position.

**CONTINUOUS INFUSION BLOCKS:** Continuous infusion blocks are used to provide long-term pain relief. The catheter is left in place.

**IMMOBILIZATION:** The patient should be immobilized to prevent movement and strain on the nerve block.

**PAIN MANAGEMENT:** Pain management should be well-controlled. The patient should be re-evaluated after the procedure to ensure adequate pain control.

**PERIODIC ASSESSMENTS:** Regular assessments should be made to ensure adequate pain control.

**Troubleshooting:** If problems arise, consult with the attending anesthesiologist.
References


Lower Extremity Blocks

N U R S I N G  E D U C A T I O N

JPS Acute Pain Service
Most Common Lower Extremity Blocks at JPS

- Femoral Nerve block
- Adductor Canal Nerve block
- Popliteal / Sciatic Nerve Block
- Fascia Iliaca Field Block
Femoral Nerve Block

- Coverage includes upper and lower leg (*highlighted in blue*)
- Includes both sensory and motor nerves
- Used for knee surgery and surgery or trauma to medial portion of upper and lower leg.
Femoral Nerve Block Considerations

- Patient will have quadriceps weakness
- Ambulation should not be attempted without assistance
- Avoid cold, heat and prolonged pressure to affected area
Adductor Canal Block

- Coverage includes lower 1/3 of upper leg and medial aspect of lower leg (highlighted in blue)
- Same nerve as femoral nerve block but lower on leg
- Involves sensory nerves only
- Used for total knee surgery, surgery or trauma to medial portion of lower leg
Adductor Canal Block Considerations

- Avoid cold, heat and prolonged pressure to affected area
- **Sensory nerve block** - patient should not have motor weakness but always evaluate ability to ambulate.
Popliteal/Sciatic Nerve Block

- Coverage includes lateral portion of lower leg and foot
- Covers all colors of the illustration excluding the area shaded in purple (this is covered by adductor canal and femoral blocks)
- Utilized for lower leg surgeries including tibia, fibula, posterior knee, lateral malleolus of ankle, foot, etc
Popliteal/Sciatic Nerve block Considerations

- Avoid cold, heat, and prolonged pressure to affected area
- Involves both motor and sensory nerves
- **No weight bearing** to affected extremity
- Block can sometimes last for 24-36 hours
Fascia Iliaca Compartment Block
Fascia Iliaca Compartment Block

Blocks 3 different nerves:
1. Femoral nerve
2. Lateral femoral cutaneous nerve
3. Obturator nerve

- Post-op pain relief for procedures and injuries involving the hip, anterior thigh, and knee
- Useful both pre and post-op for fractures of the hip and proximal femur and total hip arthroplasties
Fascia Iliaca Compartment Block Considerations

- Avoid cold, heat, and prolonged pressure to affected area
- Involves both motor and sensory nerves
- **NO weight bearing** to affected extremity
Nursing Considerations

- Single shot nerve blocks can last 6-24 hours
- Patient should resume oral pain medicine regimen prior to block wearing off.
- Continuous nerve catheters will continuously infuse anesthetic solution via pain ball (On-Q ball)
  - Some leakage of local anesthetic around catheter insertion site may occur
- Patients can be discharged home with catheter at the discretion of the acute pain team.
- Anticoagulation is allowed with certain nerve blocks
Types of Blocks

**Upper Extremity Blocks**
- Interscalene
- Supraclavicular
- Axillary

**Field Blocks**
- TAP / Rectus Sheath
- PECS Block
- Serratus Anterior
Upper Extremity Blocks

- **INTERSCALENE** - blocks pain sensation primarily in the shoulder with residual coverage in the arm and hand

- **SUPRACLAVICULAR** - blocks pain sensation for most of the upper arm and all of lower arm and hand

- **AXILLARY** - blocks the pain sensation in lower part of arm and hand
Field Blocks

**TAP (transverse abdominis plane)/RECTUS SHEATH**
- Blocks pain sensation to the right, left or both sides of the abdomen extending down into the groin
- Can be performed after patient is asleep during surgery

**PECS BLOCK**
- Blocks pain sensation to the chest wall and breast area
- Used for patients having breast surgeries
- Can be performed after the patient is asleep during surgery
Interscalene Block

- Mainly used for shoulder surgeries
- Usually blocks phrenic nerve which controls diaphragm on one side
- Watch for shortness of breath
- Patients can have Horner's syndrome:
  - Miosis (a constricted pupil)
  - Ptosis (a weak, droopy eyelid)
  - Anhidrosis (decreased sweating)
  - With or without enophthalmos (inset eyeball)
Interscalene Cont.

• Patients can have catheters and On-Q pumps attached to them
• Single shot blocks can last from 12 to 30 hours
• Make sure patients arm is kept in a sling and protected
• Patients will not know if they injure their extremity while it is blocked
• Do frequent skin checks and neurovascular checks to the effected extremity
Supraclavicular block

• Similar to interscalene
• Less likely to affect phrenic nerve but still possible - watch for shortness of breath
• Blocks mid upper arm down to hand and fingers
• Same considerations as interscalene block:
  • Check skin frequently
  • Keep effected extremity in a sling
Axillary Block

- Used mainly for wrist and hand surgeries
- May not last as long as supraclavicular or interscalene blocks
- Patients may have pain in the upper arm from the tourniquet that was used during surgery
- Same considerations as supraclavicular and interscalene blocks:
  - Check skin frequently
  - Keep effected extremity in a sling
Field Blocks

TAP Block

PECS Block
TAP/Rectus Sheath & PECS Blocks

- Called field blocks, because the local anesthetic is injected in a field or plane of tissue
- Specific nerves are not isolated to block rather a group or plexus of nerves are located in plane
- **TAP blocks**: anesthesia for abdominal procedures and covers most somatic pain from the inferior intercostal margin down to inguinal ligament
- **PECS blocks**: anesthesia for breast surgeries and covers the lateral thoracic wall
- Typically last for **8-18 hours**
Serratus Anterior Plane Block

- The procedure involves placing a catheter along the axillary midline around the 4th rib. An On-Q pain ball is then connected.
- Unlike with epidurals, patients can receive anticoagulation.
- These are used mainly for unilateral rib fractures.
- This is a great alternative to an epidural.
- Usually can stay in place for 3-6 days.
Serratus Anterior Plane Block

Target injection to plane just above (or just below) serratus anterior muscle

Lateral intercostal nerves emerge to surface of serratus muscle there branches travel anterior and posterior

Anterior intercostal nerves
General Considerations

• Best practice is to give scheduled PO narcotics to patients who have blocks to limit the overall amount of narcotic given to patients

• Extremities that are blocked need to be checked frequently for:
  • Neurovascular compromise
  • Decubitus ulcers
  • Any skin breakdown
  • New injuries

• Affected extremities need to be protected from injury and extreme temperatures, padded, and/or placed in a sling
General Considerations

• Educate patients to notify the nurse when the block is wearing off
  • Usually feels like pins and needles
  • New pain may develop where they had none in the past
  • Stay on top of pain medications during this period of time!

• Blocks can be tested for their effects with ice
  • Should be compared with a similar extremity that is not blocked
  • Nurses can test for this!!!

• Motor function should come back quickly, within 4-8 hours

• Always call ext. 7755 for questions!
Epidural catheters

- Epidural analgesia is the administration of local anesthetic into the epidural space at the thoracic or lumbar region.
Side Effects of Epidural Analgesia

Post Dural Puncture Headaches

• Can occur 24-48 hours after epidural placement

• S/S: severe headache, desire to lay flat, frontal headache, sensitivity to light, N/V, worse while sitting up

• Notify the Acute Pain Management Team ext: 7755
Side Effects of Epidural Analgesia

**Itching**

- Usually related to **narcotics** given via epidural catheter
  - Current cassettes only contain a local anesthetic and not opioids
- Maintain IV access
- Treat itching with **Zofran first**, if unchanged then progress to Benadryl
Side effects of Epidural Analgesia

Respiratory Depression

- Analgesia above T4 (nipple level) can cause some SOB, “high spinal” discontinue pump and notify APMT (x7755)
- Any concern for respiratory depression, discontinue infusion and **notify APMT**
- Narcotics given via catheter:
  - Fentanyl - observe for 2 hrs
  - Duramorph/morphine - observe for 24 hours
Side Effects of Epidural Analgesia

- **Motor block** should not occur if epidural **above T10** so **AMBULATE**
  - Prior to ambulation, assess the level of the block and assist with initial transfer
  - Lower extremity weakness **is not common** with thoracic epidurals (rib fractures) so **AMBULATE**
  - Lumbar epidurals below T 10 almost always have lower extremity weakness and **should not** ambulate
  - If there is any lower extremity motor weakness, **DO NOT AMBULATE**

- Sensory block **WILL** occur
  - Caution with cold/heat
Side Effects of Epidural Analgesia

**Epidural Hematomas/Abscesses**

- **S/S:** **SEVERE** lower back pain, fever, lower extremity weakness, loss of sphincter tone
- This is an **EMERGENCY**
- Notify the Acute Pain Management Team ext: x7755
Patient Care and Assessment

- Catheter can remain for 2-10 days
- Patient **SHOULD NOT NEED A PCA with IV opioids** unless they have other non-surgery related injuries
- Vital signs:
  - With epidural boluses and new placement, check blood pressure.
  - Monitor blood pressure prior to ambulation (orthostatic hypotension)
  - **Call Acute Pain Management Service with a MAP <60 or <20% from base line ext 7755**
Foley Catheters

- **T10 and above do NOT** require Foley Catheter placement
- **T10 and below DO** require Foley Catheter placement
  - Remove foley 12-24 hours after epidural catheter removal if the epidural was below T10
Dressing Site

- Dressing site should be dry and intact
- Excessive moisture under the dressing (leaking catheter), notify APMT
- Label with a yellow sticker indicating “epidural”
- Never disconnect the epidural! This should remain sterile!
Questions?