



**DENVER
HEALTH**
Level One Care For ALL

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Management of the Acute Care Patient with Continuous Peripheral Nerve Blocks

Document Type: Guideline
Clinical Care Guideline

PURPOSE

This guideline describes the process for acute care patients to receive safe and effective administration of perineural analgesia via peripheral nerve catheters. Goals are:

- To provide guidelines for initiating, checking and verifying orders.
- To provide guidelines for use and safe practice.
- To standardize monitoring parameters.
- To standardize documentation.

INCLUSION / EXCLUSION CRITERIA

- A. Inclusion: Adult acute care patients.
- B. Exclusion:
 - 1. Absolute Contraindications for use of Continuous Peripheral Nerve Catheters:
 - a. Patient Refusal
 - b. Infection at block site
 - c. Allergy to local anesthetics
 - d. Evolving Nerve Injury
 - e. Coagulopathy (relative depending on block site)
 - 2. Relative Contraindications for use of Continuous Peripheral Nerve Catheters:
 - a. Pre-existing Neurologic deficits
 - b. Patient unable to cooperate

RESPONSIBILITY

- A. Decision to place continuous nerve block catheters will be based on discussion between the patient's Surgical and Anesthesia team.

- B. Pain medications and sedatives ordered by the primary surgical/physician team may be given concurrently with the block.
- C. All health care professionals (physicians, nurses, pharmacists) are accountable for verifying and checking continuous peripheral nerve block orders for accuracy.
- D. Nurses accountable for pump programming adjustments, patient monitoring, and administering an intermittent bolus from the continue pump as directed by an Anesthesia provider.
- E. Pharmacists are accountable for supplying medications for continuous nerve block infusions in prefilled elastomeric pumps.
- F. Only Anesthesia providers may administer bolus syringe injections of local anesthetics via a nerve block catheter.

GUIDELINE

A. Verification of Orders:

Healthcare professionals must verify and check continuous peripheral nerve block orders for accuracy, to include name and strength of drug, loading dose, continuous rate, incremental dose, lockout time, one-hour limit, and monitoring guidelines.

B. Use and Safe Practices:

1. Two Registered Nurses must verify and document orders and pump settings when initiating continuous peripheral nerve infusions, accepting a patient from another unit, with initial assessment, and changing of any settings.
2. Upon starting the continuous peripheral nerve catheter infusion, the Registered Nurse must aspirate the nerve catheter for blood. If blood is aspirated, the Anesthesia provider should be notified and the infusion should not be started. If no blood is aspirated, the infusion tubing can be attached to the catheter and the infusion can be started.
3. Registered Nurses may adjust pump settings and give bolus doses via the elastomeric pump as ordered.
4. Patient's peripheral nerve catheter should have a green "Nerve Block Catheter" sticker adhered closely to the infusion tubing connection site.
5. Healthcare professionals including anesthesia providers, nurses and pharmacist must all verify that local anesthetic infusions are not being administered concurrently at multiple sites (peripheral nerve catheter/epidural/rib block). In rare circumstances, multiple sites of local anesthetic may be safely infused at the same time but this must be evaluated on a case by case basis by the Anesthesiologist and Pharmacist to avoid possible local anesthetic toxicity.
6. Anticoagulation management:
 - a. Placement of peripheral nerve catheters in an anticoagulated patient is up to the discretion of the Anesthesiologist. Risks and benefits of placement must be weighed in this setting.
 - b. Anticoagulation with subcutaneous unfractionated heparin and once daily Low Molecular Weight Heparin (i.e.: enoxaparin/fragmin) is acceptable while the peripheral nerve catheter is indwelling.
 - c. Before removal of catheter:
 1. IV heparin infusions must be stopped for at least 2 hours.

2. Ensure that Low Molecular Weight Heparin has not been given for 12 hours.
 3. Withhold next administration of Low Molecular Weight Heparin for 2 hours after catheter removal.
 4. No additional precautions are necessary for catheter removal with subcutaneous unfractionated heparin.
- d. If the patient is on therapeutic or twice daily dosing of Low Molecular Weight Heparin, rather than prophylactic dosing, contact Anesthesia prior to removing the catheter.
7. Registered Nurses may remove peripheral nerve catheters as ordered by physician. Upon removal, the catheter must be evaluated to assess that the catheter tip is intact to ensure no residual foreign body.
 8. Peripheral nerve catheter and dressing care:
 - a. Patients cannot take a tub bath or shower while catheter is in place.
 - b. Patients with lower extremity blocks must have staff assistance with ambulation when infusion is running to prevent catheter dislodgement and falls due to extremity weakness.
 - c. Inspect dressing every shift and after activity for integrity and drainage.
 - d. Some leakage around the catheter insertion site is expected.
 1. Dressings may be reinforced or changed as needed using sterile technique.
 2. Ensure insertion site remains visible.
 - e. If catheter becomes dislodged, notify Anesthesia.
 - f. If catheter becomes disconnected from the pump tubing, tape a sterile gauze pad to the end of the catheter and notify Anesthesia.
 9. Patient must always have patent IV access.
 10. A sign must be placed on patient's head of bed indicating a peripheral nerve block is in place.
 11. The blocked extremity must be protected from injury including extreme temperatures, pressure, sharp objects and excessive traction.
- C. Monitoring:
1. Vital signs every 4 hours.
 2. Sensory / Motor function assessment:
 - a. Upon arrival and every 4 hours until block resolves completely.
 - b. If profound motor block of either lower extremity, notify Anesthesia.
 - c. If patient with lower extremity block has sensory block above T10 (umbilicus), notify Anesthesia.
 - d. If patient with paravertebral block has bilateral sensory block above T4, notify Anesthesia.
 3. Insertion site:
 - a. Upon arrival and every 4 hours until catheter is removed.
 - b. Notify Anesthesia for signs of redness, swelling or pain at the catheter insertion site.
 4. Pain Assessment
 - a. Upon arrival and every 4 hours.

- b. PRN with additional pain interventions
- 5. Notify Anesthesia and stop infusion pump if:
 - a. Acute changes in patient status.
 - b. Excessive sedation or decrease in neurologic status.
 - c. Signs/symptoms of local anesthetic toxicity including numbness or tingling of tongue/mouth, tinnitus, visual disturbances, generalized muscles twitching, unconsciousness or seizure activity. Severe local anesthetic toxicity may progress to respiratory or cardiac arrest.
 - d. If severe local anesthetic toxicity is suspected, the Anesthesia provider should be notified and Intralipid infusion should be obtained from the pharmacy. See Attachment A for management of local anesthetic toxicity and Intralipid use.
 - e. *CLAMP CATHETER IF PATIENT BECOMES HYPOTENSIVE, HEMODYNAMIC INSTABILITY OR CARDIAC ARREST and notify physician. Call for intralipid from the pharmacy or the OR. Intralipid is the antidote for severe local anesthetic toxicity. Do not give without physician order. Intralipid per peripheral or central line use TPN filter (if possible) 1.5 mL/kg as an initial bolus over 1 min, followed by 0.25 mL/kg/min for 30-60 minutes Bolus could be repeated 1-2 times for persistent asystole Infusion rate could be increased if the BP declines Continue for at least 10 min after hemodynamic stability is restored.*

D. Characteristics of Nerve Block and Local Anesthetic Complications and Side Effects:

1. Immediate complications include pain or discomfort, block failure, vascular puncture, hematoma formation, nerve damage, allergic reaction, and local anesthetic toxicity.
2. Delayed complications include infection, nerve toxicity, and permanent nerve injury.
3. Local anesthetic toxicity may occur if local anesthetic is injected directly into a blood vessel for from vascular absorption over time.
4. Signs and symptoms of local anesthetic toxicity include drowsiness, numbness or tingling of tongue/ mouth, tinnitus, visual disturbances, generalized muscles twitching, unconsciousness or seizure activity, respiratory arrest, and cardiac arrest.
5. Anesthesia should be notified immediately if any complications or toxicity is suspected. See Attachment A for guideline for management of local anesthetic toxicity and Intralipid use.

E. Documentation:

The nurse is responsible for documenting all patient assessments, monitoring and education in the Electronic Health Record, including:

- a. Verification of settings with initial set-up, shift assessment, patient transfer, and changes in settings.
- b. Assessment of motor and sensory function of both blocked and unblocked extremity.
- c. Level of pain and sedation.
- d. Assessment of catheter insertion site and dressing status.

REFERENCES

- A. Capdevila, Xavier et al. Continuous Peripheral Nerve Blocks in Hospital Wards after Orthopedic Surgery. *Anesthesiology*. 103: 1035-45. 2005.

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- B. Chelly, Jacque. Thromboprophylaxis and Peripheral Nerve Block in Patients Undergoing Joint Arthroplasty. *The Journal of Arthroplasty*. 23 (3). 2008.
 - C. Horlocker, T.T. et al. Regional Anesthesia in the Patient Receiving Antithrombotic or Thrombolytic Therapy: ASRA and Pain Medicine Evidence-Based Guidelines (3rd edition). *Regional Anesthesia and Pain Medicine*. 35 (1). 2010.
 - D. University of Colorado Hospital Policy and Procedure. "Nerve Block Analgesia." Revised 07/2010.
 - E. Viscusi, Eugene R. et al. Organization of an Acute Pain Management Service Incorporating Regional Anesthesia Techniques. NYSORA. nysora.com. 2009.

ATTACHMENTS

Attachment A – "[Checklist for Treatment of Local Anesthetic Systemic Toxicity](#)".
American Society of Regional Anesthesia and Pain Medicine.

LINKS

Order Set Specification:

Attachments:



A: Checklist for Treatment of Local Anesthetic Systemic Toxicity