Perineural Anesthesia/Analgesia Pain Management with or without Patient Controlled Perineural Analgesia (PCPA)

Site Applicability

SPH and MSJ Surgical Program

Practice Level:

RN: with supplemental perineural education and skill check on perineural pump i.e. Smith CADD Solis pump /Q2 yearly review

Need to Know:

1. Perineural infusions should NOT be used in conjunction with a lidocaine infusion OR epidural infusions with BUpivicaine or ROpivicaine. Cumulative systemic effects of local anesthetics can cause toxicity
2. Perineural anesthesia/analgesia can provide excellent pain control pre-operatively or post-operatively and reduce opioid consumption thereby reducing opioid-related side effects.
3. The patient with a perineural will either have received the block (single injection) for surgery or pain management pre-operatively (i.e. fractured hip) and/or will have a perineural catheter insitu with a continuous infusion with or without a patient controlled option called 'Patient Controlled Perineural Analgesia' (PCPA) for post-operative pain management.
4. A perineural block provides regional anesthesia or analgesia by temporarily interrupting the conduction of nerve impulses to a specific site or limb. Analgesia/anesthesia is achieved by the infiltration of local anesthetic around nerve trunks leading to the surgical or injured site. A single injection peripheral nerve block with a long acting local anesthetic can have an analgesic effect for 8 to 20 hours. A continuous perineural nerve block (CPNB) provides for longer lasting pain management. Perineural anesthesia/analgesia may also result in temporary loss of sensation and/or motor function to the affected limb.
5. This method of pain management is used for many types of surgeries such as: ankle and foot surgery, arthroscopic surgery, joint surgery such as knee & hip replacement surgeries, shoulder repair, re-implantation surgery, pain following amputation of a limb to prevent subsequent phantom limb pain and in patients who have complex regional pain syndrome.

6. The perineural infusion is maintained with dedicated non ported ***clear*** tubing and a labelled CADD Solis pump. The tubing and pump should be clearly labelled 'perineural'.
    a. A perineural infusion can be with or without a patient controlled option called 'Patient Controlled Perineural Analgesia' (PCPA).
    b. Perineural solutions are usually a diluted concentration of local anesthetic such as ROpivicaine 0.2% (most common) or BUpivicaine 0.125%.
7. Perineural pump tubing is not changed unless perineural catheter site is changed; however, they are not usually in place longer than 7 days due to potential for infection.
    a. All perineural solutions must be prepared by pharmacy.
    b. No additions will be made to perineural bags outside of pharmacy.
    c. Only perineural solution/concentrations found on the perineural PowerPlan orders can be used.
8. Perineural medication bags are changed based on the expiry date provided by pharmacy.
    a. Ensure there is sufficient supply of perineural solution on the unit (pre-mixed by Pharmacy) prior to the evening and night shift
9. The only acceptable VTE prophylaxis with a Perineural insitu:
    a. Low molecular weight heparin such as dalteparin 5000 units or less subcutaneous daily or enoxaparin 40 mg or less subcutaneous daily OR unfractionated heparin 5000 units or less subcutaneous BID OR TID while perineural catheter in situ.

       Contact Acute Pain Service (SPH) pager 34011 or Anesthesiologist (MSJ) if any other anticoagulant, antiplatelet, or thrombolytic ordered
10. RN's can reinforce perineural catheter dressings, but cannot change the dressing.
11. **RN's may remove perineural catheters** with an order from APS/anesthesia ensuring the correct timing of the removal in relation to VTE prophylaxis. Catheters are not usually sutured in place although some stump catheters may have a suture.
12. RN's can cap perineural catheters with a dead end cap.
13. Patients will have intravenous access that is maintained for the duration of the perineural infusion. A patent saline lock is acceptable.
14. If the perineural catheter becomes disconnected from the infusion do not reconnect it, it is no longer sterile. If the hub remains in-place, cap it with a non-vented cap or if apart at the catheter connector, wrap the perineural catheter in sterile gauze and inform APS. Anticipate removal of the catheter when it is safe to do so depending on the timing of the last dose of anticoagulant.

Note: for any brachial plexus blocks for upper extremity/shoulder surgery there are some **expected** side effects that will wear off once the block wears off. These include :

- Horner's syndrome – ptosis (drooping of eyelid on side of block), miosis (unequal and small pupil on side of block), facial flushing and nasal congestion
- Phrenic nerve block occurs in approx. 30 to50% of patients. Most patients are asymptomatic , however, some people may feel shortness of breath.Can elevate patient's head of bed and/or prop up patient on pillows
- Laryngeal nerve block occurs in 10 to 20% of patients. Patients may experience hoarseness of their voice or a lump in their throat. Ensure patients sit upright when eating, and drinking
- Horner's syndrome occurs most frequently with interscalene blocks

15. An independent double check is required with initial programming of the pump AND with any changes to the pump programming (e.g. changes to the infusion rate, PCPA dose or delay interval) AND each time a new medication bag is hung. 2 RN's then cosign in the pain modalities section of the pain management band in Cerner PowerChart.
    a. Independent Double Check (IDC) is a process where two health care clinicians work independently to verify the medication and pump settings. The second health clinician performs another check of the medication without assistance or prior knowledge of the conclusions and steps followed by the first clinician. Results are compared and any discrepancies addressed before any action is taken with the medication.
16. The CADD-Solis keys are to be kept in a secure location such as the narcotic cupboard or carried by a nurse.

Protocol

Assessment:

1.

- Pain intensity (pain scale) and vital signs Q1H X 1, then Q4H and PRN
- Motor function Q4H and prn
- Assess for signs and symptoms of local anesthetic systemic toxicity (See table) Q4H and PRN
- If thoracic paravertebral block infusion – obtain initial baseline respiratory rate and quality of respirations; then ongoing respiratory rate and quality of respirations Q1H x 1; then Q4H and PRN

2.

Signs and Symptoms of Local Anesthetic Toxicity		
Mild Symptoms	**Moderate Symptoms**	**Severe Symptoms**
• Perioral Numbness and tingling • Metallic taste in mouth • Ringing in ears • Lightheadedness • Dizziness • Visual disturbances • Confusion	• Nausea and vomiting • Severe dizziness • Decreased hearing • Tremors • Changes in heart rate and blood pressure (hyper/hypotension) • Confusion	• Drowsiness • Confusion • Muscle twitching • Convulsions • Loss of consciousness • Cardiac arrhythmias • Cardiac arrest

3. Assess the insertion site for any signs of infection (redness or swelling) as well for integrity of the catheter site Q12H and PRN. Ensure all connections are secure and the tubing is taped and secure.

4. Assess limb for potential damage to the numb area:

   - The patient does not feel pain (and possibly sensation) in the affected limb and may not be able to protect the limb from injury
   - Use caution if using heat or ice
   - Provide assistance for ambulation for lower extremity blocks
   - Provide the use of a sling for upper extremity block
   - Provide assistance with repositioning and place the affected limb in anatomical position

Interventions:

1. Maintain the continuous infusion (with or without Patient Controlled Perineural Analgesia) (PCPA) in a dedicated, locked and labelled 'Perineural' analgesia using CADD Solis pump.
2. **Remember to:**
   a. Label the CADD Solis pump --"**Perineural analgesia** "
   b. Use dedicated non ported ***clear*** tubing clearly labeled "perineural"
   c. Check the medication bag (type of medication and volume) and infusion programming at the beginning of every shift, and with any programming changes or medication bag changes.

- Assess and record number of 'given' and 'attempted' doses Q4H in the pain modalities section of the pain management band on Cerner PowerChart.

- Provide frequent repositioning to prevent pressure areas and ensure proper patient positioning in anatomical position. Remind patient not to lift the limb without support to prevent injury. Leaking from the site, consider:

    i. If leaking from the connector – page APS as may be able to reconnect

    ii. If leaking from the insertion site:

Situation	Continued decreased: ✓ motor function ✓ sensation Pain acceptable	Continued decreased: ✓ motor function ✓ sensation Increasing pain (but acceptable)	No decrease in: ✓ motor function ✓ sensation Pain increasing and not acceptable
Catheter Position/ Effectiveness	Catheter may still be functioning -	Catheter **may** have been pulled out and/or is no longer in correct position	Catheter no longer in correct position and is no longer in effect
Action	1. Reinforce dressing. ** No need to page after hours – ensure APS/anesthesiologist on call (MSJ) aware in the morning	1. Reinforce dressing 2. Anticipate block may wear off and pain may increase – Provide ordered analgesia as necessary based on pain assessment 3. Call APS/anesthesiologist on call (MSJ) if pain management inadequate.	1. Reinforce dressing, 2. Provide analgesia as ordered 3. Call APS/anesthesiologist on call (MSJ). 4. Anticipate removal when it is safe to do so depending on the timing of the last dose of anticoagulant

- Notify the Acute Pain Services (APS) for the following:

    a. Inadequate analgesia or other problems related to continuous regional infusion.

    b. Any systemic symptoms of local anesthetic toxicity (see Assessment)
    DISCONTINUE THE INFUSION IMMEDIATELY and notify APS

    c. Signs of infection (increase temperature, redness, swelling, discharge at the insertion site)

Documentation

See Appendix A

Patient/Family Education

1. Teach the patient and family about pain control via a continuous perineural analgesia infusion and the Patient Controlled Perineural Analgesia (PCPA) PRN they have available as well. Their learning needs include:

    a. Nursing assessments to be done - when, what, how often

    b. Pump used for Patient controlled Perineural analgesia and continuous infusion i.e. Smith CADD-Solis pump and when to use PCPA

    c. Assistance with ambulating

    d. Possible side effects and when to notify the nurse

Related Standards & Resources:

1. B-00-13-10075 - Thoracic Paravertebral Nerve Block or Intrapleural Analgesia

References:

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1. Pasero, C. (2004). Perineural local analgesia: catheter placement and administration uses. American Journal of Nursing,104(7), 89-93.
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3. Griffiown, M. & O'Brien G., (2018). Analgesics administered for pain during hospitalization following lower extremity fracture: A review of the literature. *Journal of Trauma Nursing, 25 (6),* 360-365. Doi: 10.1097/JTN.000000000000402
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7. Sinha, S. & Suter, S. (2018). New blocks for the same old joints. *Co- Anesthesiology, 31 (5)* doi: 10.1097/ACO.0000000000641

8. Taboada M; Rodriquez J.;Bermudez M, Amor M, Ulloa B; Aneliros F, Sebate S; Cortes J; Alvarez J; & Atanassoff P.G.(2009). Comparison of continuous infusion versus automated bolus for postoperative patient-controlled analgesia with popliteal sciatic nerve catheters. Anesthesiology, 110(1), 150-4.

9. Zaric D; Boysen K.; Christiansen J; Haastrup U; Kofoed H; & Rawal N. (2004). Continuous popliteal sciatic nerve block for outpatient foot surgery—a randomized, controlled trial. ACTA Anaesthesiologica Scandinavica, 48(3), 337-43.

Persons/Groups Consulted:

APS Physician group, Anesthesia

Surgery Nurse Educators

Revised By

Clinical Nurse Specialist - Pain Service

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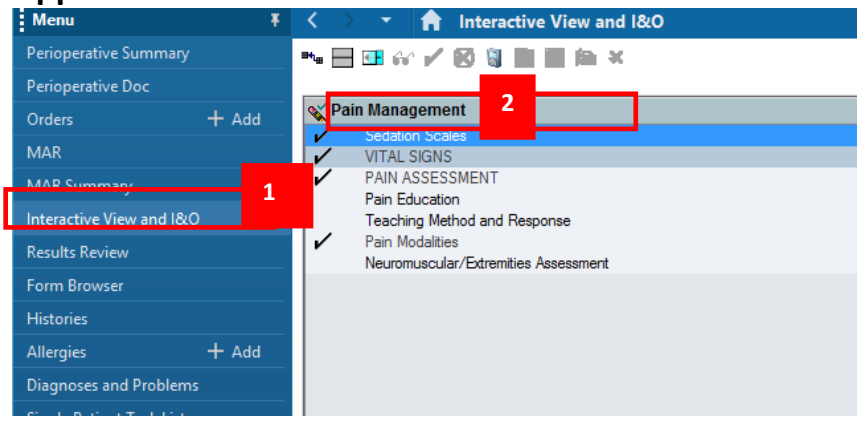
Owners:	PHC
	Acute Pain Service

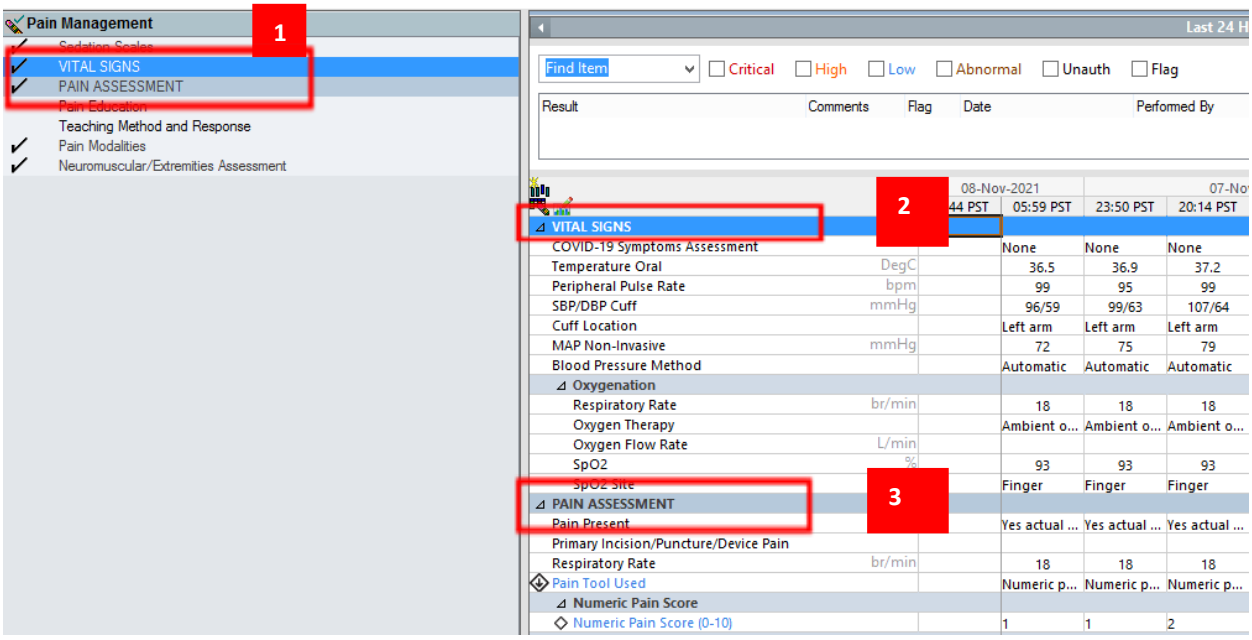
Appendix A Documentation



1 Go to Interactive view and I & O on the dark blue under the menu bar on the far left

2 Go to Pain Management Band – all your assessments related to the perineural will be found here

Vital Signs and Pain Assessment

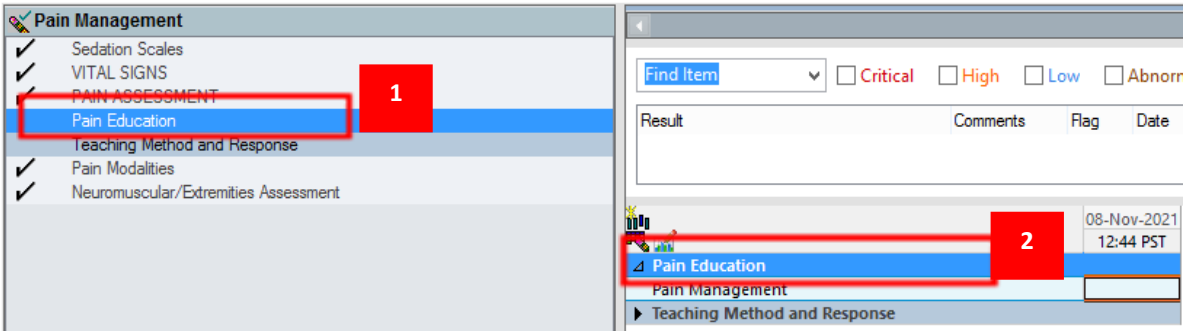


1 Under Pain Management band, click on Vital Signs

2 Document vital signs–this area pulls in from anywhere you document vital signs. Assess Vital Signs *– Q1H for 1 hour, then Q4H and PRN*

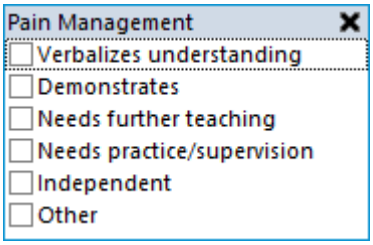
3 Document pain assessment –Choose a scale appropriate for your patient, and use the same scale every time, unless your patient status changes
Assess Pain *Q1H for 1hour, then Q4H and PRN for the duration of the infusion*

Patient Education

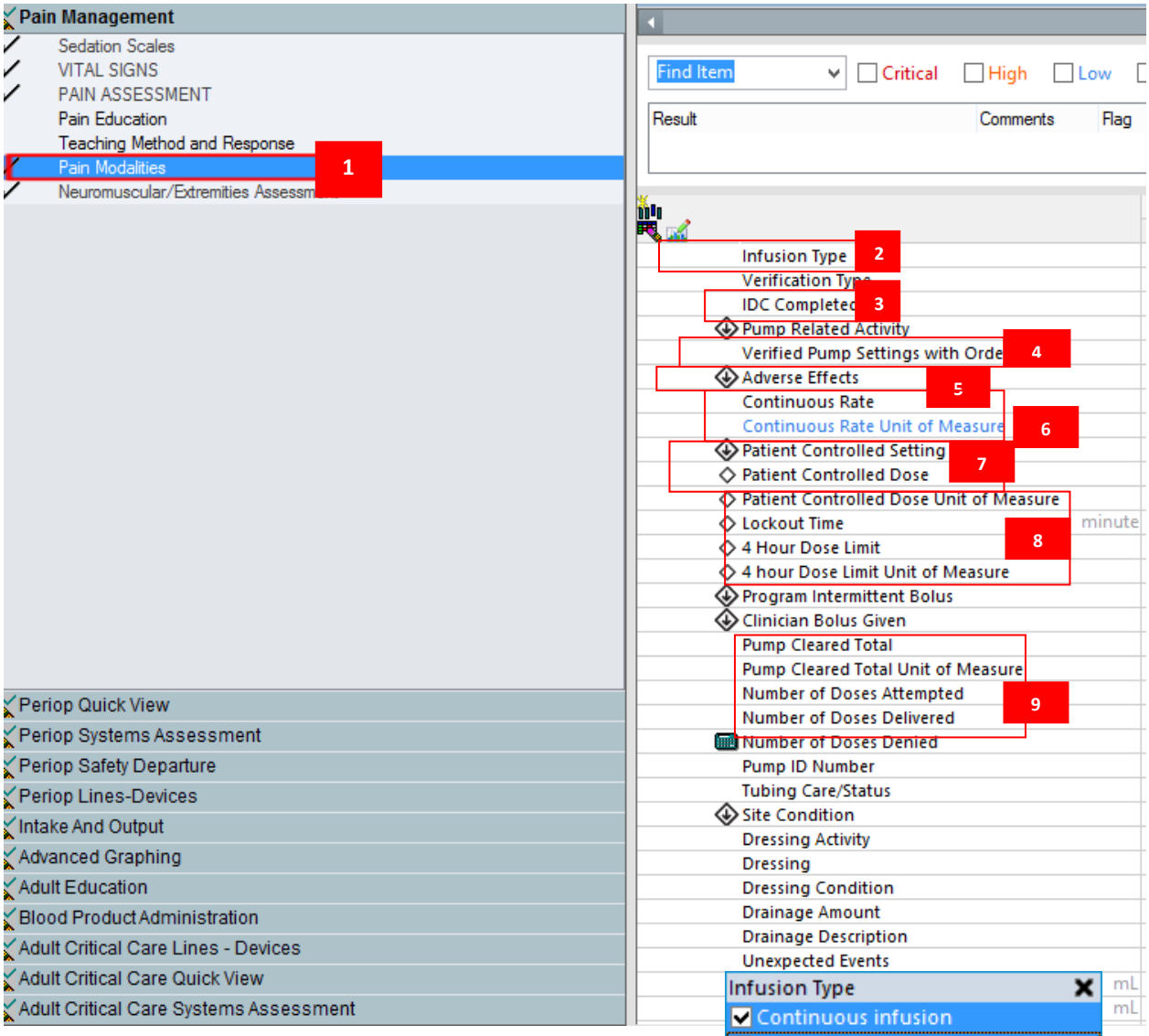


1 Under Pain Management band, click on Pain Education

2 Document pain education regarding pain management once per shift and prn



Pain Modalities

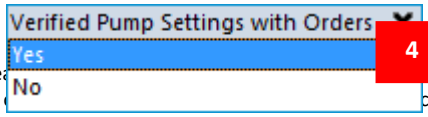


1 Choose Pain Modalities

2 Infusion type: Continuous Infusion AND patient controlled (if patient has PCPA)

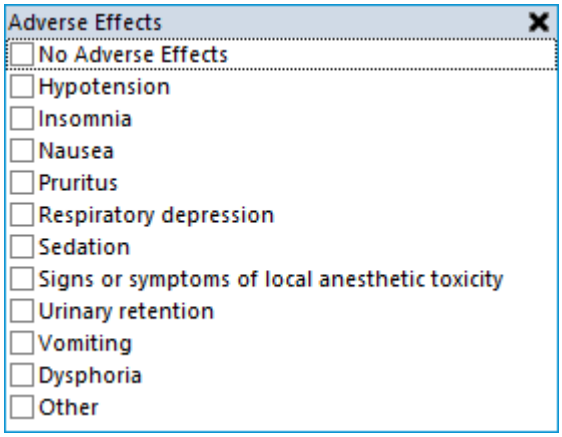
3 IDC required for initial set up and any change to pump programming/bag change, otherwise leave blank

4 Verify pump settings with orders



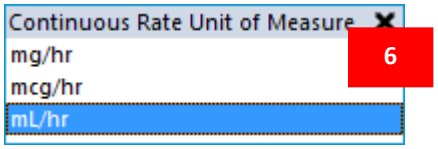
5 Observe and document for local anesthetic systemic toxicity q4h and PRN for the duration of the infusion

Signs and symptoms of local anesthetic systemic *toxicity (LAST) include: (CNS) tinnitus, metallic taste, light headedness, perioral numbness, headache, slurred speech, seizures, CNS depression, coma, (CVS) myocardial depression, bradycardia, hypotension, CVS collapse*

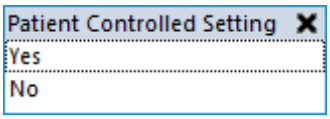


6 Document the mL/hr of the continuous rate as verified with pump programming

Continuous rate of measure is ordered as mL/hr



7 Choose 'Yes' if patient has PCPA



8 Document the PCA dose, ml, lock out time and 4 hours dose limit

9 Document number of doses attempted, number of doses delivered q4h; document pump cleared total at 0600 & 1800

Documenting Dressing Assessment