Epidural Analgesia

Site Applicability:

SPH and MSJ Surgical Program, SPH Maternity Centre

Practice Level:

RN's with completed PCA pump education /Q 2 yearly review, with supplemental epidural analgesia education.

Need to Know:

Clinical Indication: Patients receiving epidural analgesia post operatively or during labour and delivery

- Epidural infusions should NOT be used in conjunction with a lidocaine infusion OR perineural infusion with BUpivicaine or ROpivicaine. Cumulative systemic effects of local anesthetics can cause toxicity
- Epidural analgesia is an effective option for controlling acute pain after surgery or trauma to the chest, abdomen, pelvis or lower limbs or during childbirth. Compared to other modalities, epidural analgesia has the potential to provide excellent pain relief with minimal side effects and a high degree of patient satisfaction
- Epidural analgesia is the infusion of a local anesthetic and/or opioid into the epidural space via an epidural catheter. The epidural infusion is maintained with dedicated non ported tubing with a yellow stripe via a dedicated, locked and a labelled CADD Solis pump. The tubing and pump should be clearly labelled 'epidural'.
- The Acute Pain Service (APS) or anesthesiologist will:
    - Inform patient of procedure to insert epidural catheter,
    - Insert catheter and adjust the position of catheter
    - Change dressings.
- Epidural pump tubing is not changed unless epidural catheter site is changed; however, they are not usually in place longer than 7 days due to potential for infection.
    - **All epidural solutions must be prepared by pharmacy. No additions will be made to epidural bags outside of pharmacy.**
    - **Only epidural solution/concentrations found on the pre-printed orders can be used for APS patients.**

- **For palliative patients on the Palliative Care unit, epidural solutions and/or concentrations may be different.**

- Epidural medication bags are changed based on the expiry date provided by pharmacy.
- Ensure there is sufficient supply of epidural solution on the unit (pre-mixed by Pharmacy) prior to the evening and night shift
- Intravenous access is maintained for the duration of the epidural infusion and for 24 hours post epidural removal. A patent saline lock is acceptable.
- **No opioids** to be given except as ordered or approved by the APS or anesthesiologist.
- The **only acceptable VTE prophylaxis with Epidural Therapy:** Low molecular weight heparin such as dalteparin 5000 units or less subcutaneous daily or enoxaparin 40mg or less subcutaneous daily OR unfractionated heparin 5000 units or less subcutaneous BID OR TID* (*NEW) while epidural catheter in situ
- **Contact Acute Pain Service** (SPH) pager 34011 or **Anesthesiologist** (MSJ) if any other anticoagulant, antiplatelet, or thrombolytic ordered
- **RN's can reinforce epidural catheter dressings, but cannot change the dressing.**
- Epidural catheters are to be discontinued by APS, anesthesiologist or specially educated RNs with an order ensuring the correct timing of the removal in relation to VTE prophylaxis.
- RN's can cap epidural catheter with a dead end cap.
- 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, PCEA dose or delay interval). 2 RN's then cosign on the MAR and 24 hour Pain Flowsheet
    - 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.
- The PCA keys/Epidural keys are to be kept in a secure location such as the narcotic cupboard or carried by a nurse.

Protocol

Assessment and Monitoring:

Initial:

- Assess pain intensity using the numeric pain scale (0 to 10) of 0 (no pain) to 10 (worst pain imaginable) or Baker-Wong faces pain scale at rest and with movement (PHC validated tools). Note "↓ or ↑" is not an acceptable assessment documentation.
- Assess desirable comfort goal Patient's acceptable pain level on the NPS (0-10) that allows them to take deep breathes, eat, and perform required physical activities. (This only needs to be assessed once and/or PRN. May be carried forward on 24 hour flowsheet
- Assess sedation using the Pasero Opioid Related Sedation Scale (POSS) (see Appendix B).
- Assess respiratory rate (RR) including (quality, rhythm and depth) O_2 saturation
- Blood pressure and pulse
- Assess degree of motor block using the motor block scale (Appendix D)

Ongoing Assessment:	
	CICU/ICU **PACU/HAU/CSICU & Surgical Unit** **Palliative Care Unit (PCU)**
Infusion Drug(s), Rate, dose, right patient, route — 7 rights for medication administration	With each head to toe patient assessment as per unit specific practice standard.
Respiratory (rate & quality, O_2 sats), **Pain Scale, Sedation POSS score** **S not acceptable in the first 24 hours of therapy, patient must be awoken to assess sedation	Q1H x 12 hours, Q2H x 12 hours; then Q4H & PRN *Local anesthetic solutions only (without opioid) Q4H & PRN
BP and Heart Rate	Q15 min x 4, Q30 min x 1 hour then Q4H (start in PACU) & PRN *Palliative Care Unit: Q15min x 4 then Q1H x 1, then Q4H x 48H, then once per shift & PRN
Postural BP/HR	Prior to first ambulation
Sensory Dermatome assessment	Q12H *Sensory dermatome assessment not required for Palliative care unit
Side Effects Ex: Pruritus, nausea, vomiting, headache	Q4H and PRN

Motor Block	Q4H
Local Anesthetic Toxicity (see Appendix E)	Q8H
Urinary Retention	Q6H: bladder scan or ensure voids quantity sufficient Q6H
Maintain IV access until 24 hours post epidural removal. (saline lock is acceptable)	
Epidural insertion site Redness, swelling, leakage	Q12H & PRN

Interventions	
1. Epidural Infusion Maintenance	o Ensure non - ported CADD epidural administration set is used (yellow striped). o Label epidural catheter and epidural pump 'Epidural'. o Ensure that reservoir containing the epidural solution is loaded and locked into pump and the epidural tubing is free of kinks. o Ensure all connections are tight and the epidural tubing is securely taped with waterproof tape to prevent accidental disconnection or secured with Stat Lock anchoring device.
2. Inadequate Analgesia	o Assess the insertion site and catheter to ensure integrity of the system. Check that equipment is functioning correctly and that all connections are intact o Assess dermatomes to assess where (what part of the incision is covered) or if the epidural is in effect o Increase infusion rate and/or increase the Patient Controlled Epidural Analgesia (PCEA) dose as identified on the pre-printed order set o Administer breakthrough clinician (RN) bolus dose for pain (if ordered) PRN o Optimize additional multi-modal medications as ordered (e.g. Tylenol, NSAID's, etc.). Include non-pharmacological interventions such as positioning, distraction and relaxation. o Notify APS once you have reached the maximum parameters allowed on the pre-printed order.
3. Notify APS (acute pain service) at SPH or anesthesiologist on call at MSJH	o Pasero Opioid Sedation Scale (POSS) 3 or 4 o Respiratory Rate less than 8/min. o Postural BP drop of 15 mmHg or pulse increase greater than 20/min o Inadequate analgesia or other problems related to epidural o Numbness/dermatome level above T4 (nipples) and/or inability to bend knees or weakness in legs o Signs and Symptoms of local anesthetic toxicity (see Appendix E) o Sudden onset of moderate to severe back pain o If dressing is moist or wet
4. Side effect management:	If RR less than 8 and POSS 3 or more, stop epidural infusion and O Administer O_2 as necessary O If apneic, **CALL CODE BLUE** O Give **naloxone** as ordered STAT

	o Call APS STAT and identify call as respiratory depression • Continue to monitor • For nausea and vomiting: - administer antiemetic(s) (*) • For pruritus: - administer diphenhydrAMINE (*) • For urinary retention: - "in & out" bladder catheter if bladder scan volume greater than 200 mL and unable to void. If more than 3 in and out catheters in 24 hours discuss with physician – may need Foley(*) • For local anesthetic toxicity (see Appendix E)—stop epidural infusion and call APS at SPH or the anesthesiologist on call at MSJ immediately
5. IV Access	o Maintain during infusion and for 24 hours after epidural catheter discontinued (saline lock is acceptable).
6. Assist the patient with the first attempt to ambulate	o Make sure epidural catheter is intact and no numbness or weakness in legs o Assist patient with first ambulation, o Help patient sit at bedside first, assess BP and P o If no changes, no adverse effects assist patient with ambulation o If dizziness or weakness in legs experienced, return to bed and ensure APS aware.

(*) order required

See Potential Complications and management Appendix A

Documentation:

PACU/HAU/CSICU:	
On Preprinted Epidural analgesia MAR	• Record the initiation of Epidural analgesia where the orders & set up are independently double checked by 2 RN's and cosigned on the MAR
On 24 hour Pain Management Flow sheet	• Initiate by documenting the medications and concentrations of medications used, entering date, time started, continuous infusion rate, clinician (RN) bolus doses given, desired comfort level

Surgical Unit ICU/CICU, Palliative Care Unit or if in PACU/HAU/CSICU if longer than 1 hour:	
On 24 hour Pain Management Flow sheet *This is your only record of the amount of analgesic used remember to complete!*	• Document medications and concentrations used, date, time, continuous infusion rate, clinician (RN) bolus doses given, desired comfort level, assessment as per protocol, and assessed potential side effects as per protocol
Interdisciplinary Progress notes	• Record epidural in place when return from PACU (if applicable) and when the epidural stopped • Record interventions and outcome of interventions for side effects treated.
On PACU/HAU or CSICU/CICU Flow sheet and/or On Interdisciplinary	• Record epidural in place when arrives in HAU or CSICU/CICU (if applicable) and when the epidural stopped.

Progress Notes (if longer than 1 hour)	• Record intervention and outcomes of interventions for side effects treated.
Medication Administration Record (MAR)	• Bracket the epidural administration and drug dose parameters for the hours of duty RN administering medication worked and initial • Record the time stopped and the amount of the epidural medication wasted. Wastage must be recorded by 2 RNs in the Omnicell.

Patient/Family Education:

1. Teach patient and family about pain control via epidural analgesia/anesthesia according to method used and their learning needs PRN, these include:
    - Inform patient and family they will be assessed around the clock and woken up for assessment in the first 24 hours.
    - Will require assistance with the first ambulation. Ask patient to inform you right away if they experience any new onset motor weakness, back pain or any untoward symptoms.
    - If PCEA enabled, ensure that your patient and family are aware that ONLY the patient can use the control button.
    - Encourage your patients to contact you if their pain level is unacceptable so you can assess and intervene.
    - Pain assessment – explain the pain scale and how to use it
    - Provide patient with appropriate educational material: "Epidural Analgesia" from PHEM web site http://phc.eduhealth.ca/

Related Standards & Resources:

1. B-00-12-10014 – Epidural Catheters: Removal
2. B-00-12-10001—Pump, Epidural—Set up of Smith CADD Solis pump

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Persons Groups Consulted:

APS physicians

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Appendix A: Potential Complications, Assessment and Management

Potential Complication	Assessment & interventions	Rationale
Inadequate Pain Control	• Assess pain intensityQ4H and PRN • Assess the insertion site and catheter to ensure integrity of the system. Check that equipment is functioning correctly and that all connections are intact • Perform dermatome assessment (Appendix C) to determine where epidural in effect • Increase infusion rate and/or increase the Patient Controlled Epidural Analgesia (PCEA) dose as identified on the pre-printed order set • Administer breakthrough clinician (RN) bolus dose for pain (*) PRN • Optimize additional multi-modal medications as ordered (e.g. Tylenol, NSAID's, etc.). Include non-pharmacological interventions such as positioning, distraction and relaxation. • Notify APS once you have reached the maximum parameters allowed on the pre-printed order.	• Patient's pain will be at an acceptable level that allows for participation in physiotherapy, ADL's, deep breathing and coughing.
Increased Sedation and/or Respiratory Depression	• Assess POSS Q1H x 12 hours, then Q2H x 12 hours, then q4h for duration of the infusion (If epidural solution has an opioid), patient must be woken in the first 24 hours for sedation assessment, S is not acceptable in the first 24 hours of therapy. • If POSS 3 and RR 8 or greater ; o Remove PCEA button (if applicable); stop epidural infusion, and notify APS • If POSS 3 or greater **and** RR less than 8, stop epidural infusion, remove PCEA, and o Administer O_2 as necessary o If apneic, **CALL CODE BLUE** o Give **naloxone** as ordered STAT o Call APS STAT and identify call as respiratory depression Continue to monitor	• Opioids in the epidural solution can cause opioid related sedation. • Opioids administered via the epidural route must diffuse across the dura mater into the spinal space. Opioids linger in the CSF until they bind to the opioid receptors in the spinal cord. • Patients are still at risk for opioid related side effects post administration of opioids via the epidural route for: o fentanyl 2 hours o HYDROmorphone 18 hours o morphine 24 hours
Displaced epidural catheter	• Ensure occlusive dressing intact Qshift • Ensure connections are secured and taped in place Qshift	• Epidural catheters are not sutured in place, the dressing is what is keeping the catheter secured to the patient and prevents it from being displaced

Catheter comes apart from filter	If the catheter becomes disconnected from the infusion do not reconnect it. If the hub remains in-place, cap it with a non-vented cap or if apart at the catheter connector, wrap the epidural catheter in sterile gauze and call APS, anticipate removal of the catheter when it is safe to do so depending on the timing of the last dose of anticoagulant. See previous page for removal instructions • If it was a **witnessed** disconnection, contact APS, wrap the ends with sterile gauze and await direction from APS. If it is possible to reconnect, discard the medication set up including the tubing and set up a new system. (Do not reuse contaminated system cleaning the connectors with an antiseptic is NOT sufficient)	• Risk of infection is increased when the epidural system is opened.
Dressing becomes non occlusive	• Reinforce dressing with an occlusive dressing, reinforce edges with waterproof tape • Dressings are changed by APS	• Risk of infection when the epidural site is open to air
Infection	• Assess epidural site Qshift o Notify APS of any redness and/or purulent drainage • Assess temperature Q4H and PRN o Notify APS if fever	• Only change medication infusion bag based on the expiratory date and time provided by pharmacy. • **Epidural tubing is not routinely changed** to limit the disconnection and reconnection which can increase the incidence of infection. Only change the epidural tubing if the solution is changed.
Urinary Retention	• Ensure patient voids quantity sufficient or bladder scan Q6H • •	• The bladder innervates the spinal cord ~T10, the opioids and the local anesthetic in the epidural solution can cause urinary retention. • A Foley catheter is **not required** to be in place while an epidural is insitu. Generally, epidural infusions are at a rate that does not affect ability to empty bladder.
Nausea	• Provide antiemetic promptly and regularly • Anti-emetics can be found on the pre-printed orders • If attempts to control nausea and vomiting are unresolved, contact APS or MRP	• Opioids can cause nausea, usually resolves within the first 24 hours, if not, a change in opioid often helps. • Less nausea and vomiting noted with epidural administration of opioids • Nausea can be as distressing as pain
Pruritis	• Monitor skin integrity Qshift • Orders to initiate treatment are found on the pre-printed orders	• Some opioids cause the release of histamine from the mast cells, resulting in local or generalized itching

APPENDIX B: PASERO OPIOID SEDATION SCALE (validated sedation scale used at PHC)

Increased **SEDATION** is an indicator of impending respiratory compromise. Your sedation assessment is very important to the overall success pain management.

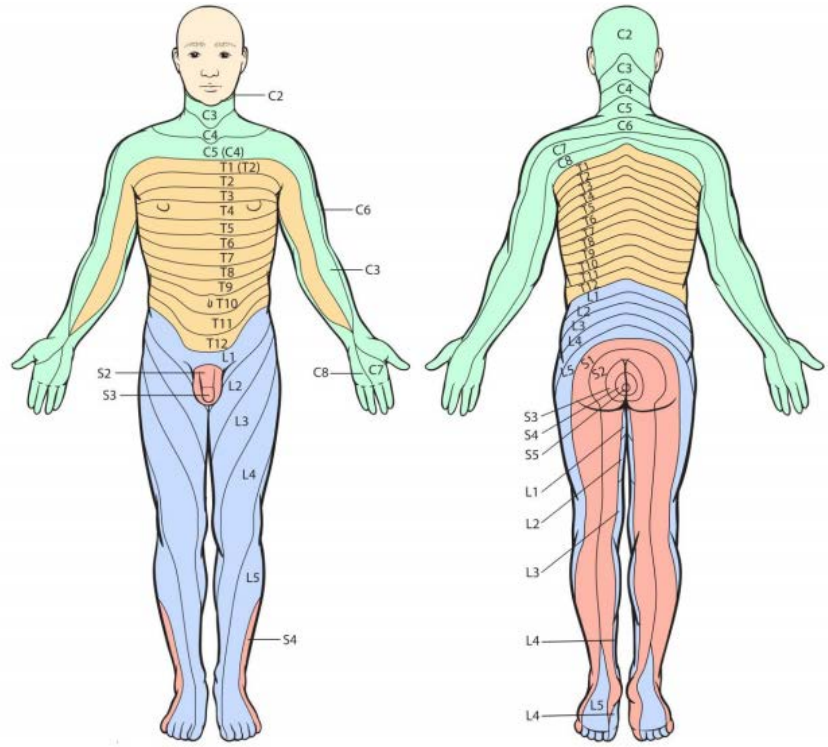
Procedure for Sedation Assessment:

1. Enter room and approach patient. Note the depth and rate of breathing. Count for a full 30 seconds (if respiratory rate is less than 12/minute then it should be counted for a full minute)
2. Ask a simple question 'how are you?'
3. Note how/when patient wakes up
4. Continue conversation with patient as you complete your pain assessment and assessif your patient can maintain wakefulness

PASERO OPIOID INDUCED SEDATION SCALE (POSS)		
S	Sleep, easy to rouse	**Acceptable**; no action necessary; may increase opioid dose if needed *S not acceptable in the first 24 hours of therapy, patient must be awoken to assess sedation
1	Awake and alert	**Acceptable**; no action necessary; may increase opioid dose if needed
2	Slightly drowsy, easily roused	**Acceptable**; no action necessary; may increase opioid dose if needed
3	Frequently drowsy, rousable, drifts off to sleep during conversation	**UNACCEPTABLE;** • remove PECA button if in use, hold next oral dose of opioid • stop any opioid infusions • monitor respiratory status and sedation level closely until sedation level is stable at less than 3 and respiratory status is satisfactory • NOTIFY APS for adjustment of opioid orders for a decrease of opioid dose by 25 to 50%
4	Somnolent, minimal or no response to verbal and physical stimulation (use trapezius muscle squeeze for physical stimulation - do not use sternal rub)	**UNACCEPTABLE;** • Stop epidural infusion and all other opioids • **Administer naloxone as per order** • Provide oxygen by mask 10 L/min and monitor closely until POSS • IMMEDIATELY page APS (SPH), Anesthesiologist (MSJ) STAT • **PROVIDE AIRWAY and BREATHING SUPPORT** • **DO NOT** re-commence opioid therapy prior to patient being seen by the prescribing service physician • When POSS score 1 or 2 and respiratory rate is 8 per minute and greater: reassess respiratory rate and sedation score Q15min x 1 hour following final dose of naloxone, thenQ1H x 4 hours •

Appendix C: Dermatome Assessment

Dermatome Chart



Assess for a "***change of temperature sensation***" (Sensory Block) which will indicate ***where*** the epidural is in effect

- Use ice (inside a glove or bag)
- Touch the patient's face with the ice to demonstrate the coldness
- Start at the upper anterior chest and work downwards until it does NOT feel as cold as their face– this is the top dermatome level
- Continue downwards until the patient states it feels cold again. The last dermatome where the patient does NOT feel as cold is the bottom dermatome level
- Repeat procedure on the opposite side of the body as it may be different on each side of the body.

Chart on 24 hour Pain Flowsheet under 'Sensory Dermatome Level':

Example: Right: T6 – T10
Left: T4-T10

Appendix D: Motor Block Scale

Motor Block Scale	
0	No residual motor block, free movement
1	Partial block, just able to flex knees, free movement of feet
2	Almost complete block, only able to move feet
3	Complete motor block, unable to move legs/feet

Appendix E: Signs & Symptoms of Local Anesthetic Toxicity

Check for signs and symptoms of local anesthetic toxicity (can occur if epidural catheter migrates into an epidural vein - rare)

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

Appendix F: Medications and Epidural Analgesia

Opioids administered via the epidural route will diffuse across the dura mater, the arachnoid membrane and into the spinal space to act on the opioid receptors. Opioids bind to the opioid receptors on the dorsal horn, preventing pain signals to be transmitted to the brain.

Patients can still be at risk for opioid related side effects for up to 24 hours once an epidural with morphine or hydromorphone has been stopped. Close monitoring of respiratory rate, and sedation is an integral part of care for the patient receiving opioids via the epidural or spinal route.

The use of local anesthetics such as bupivacaine given via the epidural route blocks the spinal nerves from sending pain signals to the brain. These nerves carry sensory and motor information. The dose of LA provided in a continuous epidural infusion is usually low enough that most patients retain motor function**,** although some motor block may be inevitable with a lumbar epidural.

Usual concentrations	ONSET	PEAK	DURATION	RR & Sedation with continuous infusion
morphine 0.05 mg/mL	30 to 60 min.	60 min.	12 to 24 hours	Q1h for 12 hours, Q2h for 12 hours then Q4H for duration of infusion
HYDROmorphone 0.01 mg/mL	15 to 30 min	45 to 60 min	12 to 18 hours	
fentanyl 4 mcg/mL	5 to 15 min.	10 to 20 min.	2 to 4 hours	
BUpivicaine 0.1%	5 to 15 min	30 to 45 min	2 to 5 hours	No effect