Team Name: Regional Perinatal Team Lead: Regional Director Public Health-Healthy Living and Director of Health Services - Portage District General Hospital Approved by: Executive Director - North	Reference Number: CLI.5810.SG.001 Program Area: Obstetrics Policy Section: General
Issue Date: November 27 2014 Review Date: Revision Date:	Subject: Epidural Analgesia: Continuous and Patient Controlled (PCEA) in Labouring Women

STANDARD GUIDELINE SUBJECT:

Epidural Analgesia: Continuous and Patient Controlled (PCEA) in Labouring Women

PURPOSE:

The purpose of this guideline is to provide safe and consistent information to nursing staff in providing pain management to patient via the epidural route.

Staff will recognize problems and rapidly institute corrective measures.

1. The anesthetist will perform epidural consult and write orders.
2. Prior to administering, monitoring epidural/intrathecal medications and initiating epidural pump, the nurse/midwife must have received the required epidural education.
3. **Intravenous (IV) access must be established and maintained for the duration of the epidural/intrathecal infusion.** A saline lock is NOT sufficient access.
4. A nurse/midwife will assist the anesthetist with the insertion of the epidural.
5. The anesthetist will give the test dose and the initial bolus before an epidural infusion is started. This includes the patient who has received a combined spinal-epidural (CSE).
6. Anesthetist will be responsible for the administration of epidural "top-ups".
7. The anesthetist is to be contacted if the system becomes accidentally disconnected or contaminated. The nurse must cover the disconnected end with a sterile gauze.
8. Epidural medication solution may be prepared and/or provided by Pharmacy. At some sites anesthetist may prepare the epidural solution.

DEFINITIONS:

Epidural anesthesia – a form of regional anesthesia for pain management during labour. A local anesthetic agent with or without narcotics is injected through a catheter that is inserted into the epidural space.

Patient controlled epidural analgesia (PCEA) – technique consists of a background epidural infusion supplemented by patient administered boluses.

Combined Spinal Epidural (CSE) – a regional anesthetic technique which combines spinal and epidural methods. Epidural space is identified with an epidural needle and then a longer spinal needle is inserted into the spinal space.

The spinal component gives a rapid onset of block. The indwelling epidural catheter gives the ability to provide long lasting analgesia and the ability to titrate the dose to the desired effect.

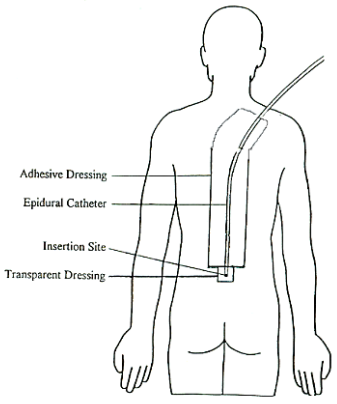
Epidural space – a "potential space" that contains fatty tissue and blood vessels and is located between the bony vertebral canal and the outer surface of the dura mater.

Subarachnoid space (intrathecal space) – the area that lies between the arachnoid and pia mater, and contains the cerebral spinal fluid (CSF).

Dermatome – the area of skin and soft tissue that is innervated by a single spinal nerve root.

PROCEDURE:

1. Nurse/midwife will assist the anesthetist with the establishment of epidural:
   - Ensure patient voids prior procedure
   - Ensure consent has been obtained by the anesthetist/physician prior to insertion
   - Obtain baseline maternal vital signs and assess uterine activity
   - Assess fetal status and obtain baseline fetal heart strip
   - Obtain venous access with 18 gauge cathlon (preferred) and 1000 mL normal saline (N/S) or lactated ringers solution. Bolus IV fluids as per anesthetist/physician's order
   - Position patient to ensure maximum widening of this intervertebral spaces (per anesthetist's preference: sitting or lying)
   - Ensure staff and support persons wear face masks. Hair covers (including the patient) as per anesthetist's request. Patient does not need to wear a mask
   - Assist in securing catheter. Opsite dressing spray may be used to cover insertion site and surrounding area. Cover insertion site with transparent dressing/securement device and apply tape dressing to shoulder level. Ensure that the insertion site is visible
     - See diagram:



2. Once the epidural is inserted and the test dose given, the nurse will monitor the patient's BP every 2 minutes including until 10 minutes after the bolus dose.

3. Fifteen minutes (or as ordered by the anesthetist) after the initial bolus has been given, the patient should be assessed as follows, and the findings charted:
   3.1 **Quality of Analgesia**
   - Assess patient's comfort level using pain scale 1-10

   3.2 **Dermatome Levels**
   - Use ice to stroke the skin, comparing area of normal sensation with areas of block
   - Start on one thigh and work upward to determine upper boundary

- Repeat on the other side
- The infusion may be started if the levels are at T4 or lower (refer to dermatome diagram on Labour Record)

3.3 **Motor Function (Bromage scale)**

- Ask patient to flex her knees and ankles. The Bromage scale must be 0 (refer to diagram on Labour Record)

3.4 **Vital Signs**

- Check and record maternal vital signs (BP, pulse, respiratory rate) and fetal heart rate (FHR). Hypotension will be defined as a drop of greater than 20% in the patients systolic BP OR a systolic BP of less than 100

4. If the patient is stable (as per 3.1, 3.2, 3.3, 3.4) then the infusion may be started as ordered.

5. Once the epidural infusion has been initiated, BP monitoring will consist of:
   - Every 15 minutes x 2, then
   - Every 30 minutes thereafter

   NOTE: If a combined spinal epidural (CSE) technique is being used, the same assessments must be completed.

   Fetal heart rate (FHR) monitoring will consist of:
   - Continuous monitoring x 30 minutes after epidural initiation
   - Intermittent auscultation may then be used if appropriate

6. **Hourly** (and prn) assessments (whether ambulating or in bed) will consist of:
   - Pain scale (0-10)
   - Dermatome levels
   - Motor function (Bromage scale) – **if motor function is greater than 1 (for walking epidurals) or dermatome levels higher than T4, discontinue infusion and notify anesthetist**
   - Respiratory rate
   - Bladder fullness
   - Total amounts of infusion (pump displays this as Total Volume)
   - Number of patient boluses given and bolus attempts
   - Visually inspect the epidural catheter for disconnects (between epidural tubing and catheter)

   The goal is to maintain the women's comfort with a dermatome level no higher than T4.

7. Assess epidural site/dressing every 8 hours.

8. **Walking epidural**: the patient may ambulate 30 to 60 minutes after initiation of the epidural infusion if ambulation criteria met. Patients in labour who have a PCEA or CSE must meet the following criteria before ambulation is permitted. (all must be repeated prior to each ambulation session).

   8.1 The anesthetist must leave an order.

   8.2 The dermatome levels must not be higher than T4.

   8.3 The motor function (Bromage scale) must be 0. The women must demonstrate the ability to lift her legs one at a time or the ability to do a deep knee bend. She can hold on something for balance if necessary (See diagram on right side).
   - A woman is at greater risk of a motor block if sitting for prolonged period

   8.4 The BP must remain stable (systolic should not drop more than 10% from baseline or fall below 90 mmHg). Check and record BP before getting the woman out of bed (lying position) and again in standing position. Assist the woman out of bed slowly. The woman must be standing at least 1 minute prior to taking the standing BP. If light-headed, return to bed and wait 10 minutes before trying again.

- Ambulation is **NOT** permitted within the first hour once a patient has received a top-up with 0.25% bupivacaine. After the first hour, the patient must meet the ambulation criteria and an order must be obtained from the anesthetist

9. For inadequate pain relief, it is **important** to do a thorough patient assessment, and to trouble-shoot the equipment:
   - Check tubing/pump to ensure medication is infusing properly (i.e. not leaking at connection)
   - Check the dressing – if dressing appears wet, the catheter may be dislodged
   - Check frequency of PCEA doses
   - Assess dermatome levels
     - If the woman has "no levels" or has a dramatic decrease in the level of the dermatomes plus inadequate analgesia, the catheter may have migrated out of the epidural space and possibly into the intravascular space (refer to "Complications" #2)
   - Assess for conditions which may result in analgesia becoming ineffective, i.e. bladder distention, rapidly progressing labour. Less frequent causes of "break through" pain include separation of a uterine scar and placental abruption
   - Consider increasing the basal rate
   - After consideration of above, contact anesthetist for top-up administration

10. Discontinue the infusion and remove the epidural catheter, once the woman has delivered and all suturing is complete. Refer to section on "Epidural Catheter Removal":
    - Patients with low platelets or anti-coagulants have increased risk of developing an epidural hematoma on removal of epidural catheter. For patients with low platelets, discuss with anesthetist for further direction
    - Heparin should not be started/restarted for at least one hour post removal of epidural catheter

11. Post epidural infusion discontinuation, the woman can ambulate when her motor block is **0** and her BP has been stable for the last hour.

COMPLICATIONS:

1. **Migration into the subarachnoid space:**
   - Signs include a sudden rise in the level of the dermatomes and/or a Bromage scale (motor block) of greater than 1
   - Less common signs include fetal bradycardia and maternal hypotension
   - If you suspect the catheter has migrated, **discontinue the infusions and inform the anesthetist**

2. **Migration into the intravascular space:**
   - Signs and symptoms may include a dramatic decrease in the levels of the dermatomes or a patient with "no levels" **plus** inadequate analgesia
   - If you suspect that the catheter has migrated, **discontinue the infusion and inform the anesthetist**

3. **Hypotension:** (20% below the patient's baseline systolic BP or a systolic BP of less than 100)
   - Stop administering the medication
   - Increase IV rate
   - Position the patient on her side (preferably left side); do not elevate the head of the bed
   - Inform the anesthetist if BP does not quickly normalize or if you suspect a subarachnoid migration
   - Other measures if BP does not normalize quickly include raising patient's legs to the level of or above the heart. Avoid the trendelenburg position
   - Continue to monitor vital signs including oxygen saturation frequently
   - Have **ephedrine** 50 mg/mL and sterile N/S readily available for anesthetist

4. **Pruritus:**
   - Frequently occurs around face and neck and is related to the narcotic
   - Not an allergic response unless associated with rash, etc.
   - May be treated with antihistamine as ordered

5. **Infection of catheter site:**
   - Monitor temperature at least every 4 hours
   - Inspect dressing every 8 hours; dressing not to be changed for labouring patient
   - Notify the anesthetist

"TOP-UP" INTERMITTENT ADMINISTRATION FOR LOCAL ANESTHETIC

Restricted to Anesthetic Only

- Equipment:
  - 10 mL syringe
  - Medication: 0.25% bupivacaine or as ordered
  - BP monitor and Fetal Heart Monitor
  - Oxygen source and suction equipment (ensure functional and readily available)

1. If the patient on an epidural infusion is having inadequate analgesia, assess the following:
   - Check tubing
   - Check pump and epidural site to ensure medication is infusing properly
   - Dressing site: if the dressing appears wet, consider that the catheter may be dislodged, notify the anesthetist
   - Dermatome level (should not exceed T4)
   - Bladder distention
   - Progress of labour

   Consider infrequent causes of breakthrough pain:
   - Uterine rupture
   - Placental separation
   - Migration of catheter into intravascular space (dramatic decrease in the dermatome levels or "no levels" **plus** inadequate analgesia)

2. Assess if both patient and fetus are stable (maternal blood pressure, dermatome level, motor block, and FHR); notify the anesthetist for administration of "top-up" epidural analgesia. DO NOT proceed with "top-up" if any of the following exist:
   - Dermatome levels above T4
   - Patient has "no levels" or dramatic decrease in the level of the dermatomes plus inadequate analgesia
   - Motor block greater than 1

3. Ensure patency of IV line.

4. Position patient on her side or on her back with a wedge (maintain angle of at least 45°). Avoid right lateral tilt. If the woman is feeling the pain in one particular area, position her so that gravity can assist in the distribution of the medication. For example, if the pain is felt on the right side, have the patient lie on her right side.

5. Stop the infusion pump.

6. **Following the test dose**, the nurse/midwife will monitor BP every 2 minutes and FHR continuously.

7. The anesthetist will assess the patient's response to the test dose. The nurse/midwife/anesthetist must remain with the patient to observe for complications such as hypotension, intravascular or subarachnoid injection. If any complications noted, do not proceed with top-up.
    - **Hypotension**
        - Drop of more than 20% in systolic BP
        - Dizziness, shortness of breath, and nausea/vomiting

    - **Test dose is intravascular**
        - Tinnitus
        - Circumoral tingling (around the mouth)
        - Tongue numbness
        - Metallic taste in the mouth
        - Dizziness
        - Blurred vision
    - **Test dose is in subarachnoid**
        - Immediate analgesia
        - Leg weakness (motor function should be same as pre test dose)

8. **Five minutes after test dose,** assess the patient's response and motor block. **Function should be same as pre test dose**. If no complications, the anesthetist will slowly proceed to administer the remainder of the medication. Local anesthetic will be injected between contractions. Explain to the patient that she may experience the feeling of cold traveling down her back during the injection.

9. Anesthetist/nurse/midwife will reconnect tubing to epidural catheter and restart epidural catheter.

10. Do not allow the patient on PCEA to self-administer a PCEA dose for at least 30 minutes post top-up. Ensure pendant is not accessible to the patient for 30 minutes post top-up.

11. **Post top-up bolus dose** continue to monitor:
    - BP every 2 minutes for 10 minutes
    - Fetal heart rate continuously for 15 minutes

12. Observe for signs and symptoms of an intravascular or subarachnoid injection of the "bolus" dose of local anesthetic.

- **Bolus dose is intravascular**
    - Tinnitus
    - Circumoral tingling
    - Tongue numbness
    - Metallic taste in the mouth
    - Dizziness
    - Blurred vision
    - Seizures
- **Bolus dose is in subarachnoid**
    - Motor block greater than 1
    - Rapid increase in dermatome levels
    - Hypotension
    - Bradycardia (maternal or fetal)
    - Loss of consciousness

NOTE: Ambulation is **NOT** permitted within the first hour once a patient has received a top-up with 0.25% bupivacaine. After the first hour, the patient must meet the ambulation criteria and an order must be obtained from the anesthetist.

EPIDURAL CATHETER REMOVAL:

1. Ensure order for removal is present on the patient's chart.
2. Explain procedure to the patient.
3. Place the patient on her side in a fetal position, or sitting up on the side of the bed and leaning on the bedside table. These positions spread the vertebrae apart and achieve maximum curvature of the spine.
4. Put on clean gloves and remove dressing along catheter and transparent dressing at the insertion site.
5. Grasp catheter at the insertion site. Keep catheter at 90° angle while removing catheter with steady outward traction.
6. STOP REMOVING CATHETER, if there is a fair amount of resistance or catheter stretches excessively. Reposition patient and reattempt removal. If there is still resistance, notify the anesthetist.
7. Examine the catheter tip to ensure it is intact; catheter tip is black or navy. If the catheter is not intact, notify the anesthetist immediately.
8. Examine site for bleeding, hematoma, or serous fluid. If any of these are present, reassess site in one hour. If signs persist or there are signs of infection, notify anesthetist.
9. Apply a small dressing over puncture site.

DOCUMENTATION:

Labour Record/Integrated Progress Notes:

- Infusion rate in mL/hour
- Infusion rate changes
- Total amount of infusion every hour
- Number of patient boluses and attempts charted every hour
- Pain scale
- Dermatome levels
- Motor function (Bromage scale)
- Vital signs: maternal and fetal

Medication Administration Record (MAR):

- Epidural infusions bag and top-ups (2 person signature)
    - Epidural infusion bag changes, mark bag as #2, #3, etc. as the epidural pump will revert back to 0 after a bag change.

IMPORTANT POINTS TO CONSIDER:

1. Ensuring that a woman avoids a supine position after epidural placement may further minimize hypotension.
2. Any medication administered into the epidural space must be preservative free and contains no antioxidants.
3. Encouraging frequent position changes (eg. every hour) to promote more even distribution of the medication. Nerve injury can occur with exaggerated flexion of the hips or excessive pressure on lower legs. i.e. when pushing.
4. The woman with an epidural is only allowed to ambulate if accompanied by a nurse of labour support person. She must stay on the labour and delivery unit.
5. Two (2) person check required to program epidural pump, connect pump to catheter tubing and discarding of epidural medication.
6. Epidural/intrathecal medication must be wasted in accordance with hospital policy. Double signature required for wasting of narcotics.

EQUIPMENT/SUPPLIES:

- Epidural pump: Curlin® "PainSmart" Epidural Pump (yellow face plate and lock box)
- Epidural tubing (yellow strip) for Curlin® Pump
- 125 mL bag of epidural medication (bupivacaine or ropivacaine)
- Fetal heart monitor

- Blood pressure monitoring equipment
- Oxygen source and suction equipment (**Ensure these are functional and available)**
- Procedure mask
- Hair cover if requested by anesthetist

SUPPORTING DOCUMENTS:
CLI.5810.SG.001.SD.01 Equipment Set-Up: Curlin Pump

REFERENCES:
Health Sciences Centre (2008), Educational Learning Package: Epidural Catheter Learning Package

St. Boniface General Hospital, Woman & Child Program (2014). Patient Controlled Epidural Analgesia (PCEA) in a Laboring Women. Specialty Nursing Policy/Procedure Manual

St. Boniface General Hospital, Woman & Child Program (2003). Intermittent Administration of Local Anaesthetic (Top-Up) Via an Epidural Catheter. Specialty Nursing Procedure Manual