

Policy and Procedure



Policy Title: Patient Controlled Epidural Analgesia Use in Labour

Applies To: Registered Nurses and Physicians in the Birth Unit, Pharmacy

Location Applicability: IWK Health

Approved:

IWK Policy & Practice

November 14, 2023

IWK Drugs & Therapeutics

November 7, 2023

Effective:

November 30, 2023

Next Review:

November, 2027

Sponsor:

Director Women's & Newborn Health Program

Approval Authority:

Policy and Practice Committee

Drugs & Therapeutics Committee

Number: 7002

Manual: Women's and Newborn Health

THIS IS A BEYOND ENTRY LEVEL COMPETENCY (BELC) FOR REGISTERED NURSES PRACTICING AT IWK HEALTH AND REQUIRES INITIAL CERTIFICATION AND RE-CERTIFICATION EVERY TWO YEARS

Contents

| | |
|-------------------------------------|----|
| PURPOSE | 2 |
| POLICY STATEMENTS | 2 |
| GUIDING PRINCIPLES AND VALUES | 4 |
| PROCEDURE..... | 4 |
| REFERENCES | 12 |
| RELATED DOCUMENTS | 13 |
| Policies | 13 |
| Forms..... | 14 |
| Appendices | 14 |

This is a CONTROLLED document for internal use only. Any documents appearing in paper form are not controlled and should be checked against the electronic file version prior to use. OP3PO150710

| | |
|--|----|
| APPENDIX A – DEFINITIONS..... | 15 |
| APPENDIX B – Indications & Contraindications for Use of Regional Analgesia | 17 |
| APPENDIX C – DERMATOMES..... | 19 |
| APPENDIX D – BROMAGE SCORE | 20 |
| APPENDIX E – MANAGEMENT OF COMPLICATIONS | 21 |
| APPENDIX F - MANAGEMENT OF EPIDURAL EMERGENCY SITUATIONS..... | 23 |

PURPOSE

This policy applies to Patient Controlled Epidural Analgesia (PCEA) use for patients in labour.

This policy does not apply to:

- patients receiving Patient Controlled Analgesia (PCA) via the peripheral intravenous (IV) route for adults. Refer to the [IWK Health Policy #1516 Intravenous Patient Controlled Analgesia for Adults](#).
- pediatric patients receiving Patient Controlled Analgesia. Refer to the [IWK Health Policy #1518 Pediatric Patient Controlled Analgesia](#).

POLICY STATEMENTS

1. Management of patients who require PCEA care for regional analgesia in the Women’s & Newborn Health Program (WNHP) is the responsibility of Women’s & Obstetrics (W&O) Anesthesia Department.
2. All Registered Nurses (RNs) practicing in the Birth Unit at IWK Health must provide nursing care consistent with the guidelines and procedure outlined in this document when Patient Controlled Epidural Analgesia (PCEA) is required for regional analgesia.
3. Patients who require PCEA must be managed in the **Birth Unit only**.
4. All health care providers (HCPs) who utilize infusion pumps, including PCEA pumps, must receive competency-based training on their safe use (Refer to [IWK Health Policy # 1120 Infusion Pump Safety](#)).

- 4.1. Initial certification and re-certification must include successful completion and review of IWK Health's infusion pump resources and module training in advance of providing care for patients receiving PCEA therapy.
- 4.2. HCPs competence of infusion pumps safety, through initial certification and minimum every two years re-certification, must be evaluated and documented in a competency tracking record by the immediate manager (or delegate responsible for tracking competency) in the care area.
- 4.3. Following initial assessment and training, the HCP must maintain competence in the use of infusion pumps and care of patient receiving PCEA therapy.
- 4.4. The component of this care related to the programming of PCEA pumps by RNs is a Beyond Entry Level Competency (BELC) (Refer to [IWK Policy #336 Optimizing and Expanding the Nursing Scope of Practice](#)).
- 4.5. In addition, the removal of an epidural catheter is also considered a BELC as outlined per *IWK Policy #7001 Care Directive: Removal of Epidural Catheters by Birth Unit Registered Nurses* (Refer to [IWK Health Policy #336 Optimizing and Expanding the Nursing Scope of Practice](#)).
5. Following the clinical assessment of the patient and the patient's request for regional analgesia, an order must be acquired from the attending care provider.
 - 5.1. Upon confirmation of the attending care provider's order, notify the anesthesiologist/delegate of the patient's request for regional analgesia for labour.
6. The attending Anesthesiologist must be consulted before any supplemental systemic opioids/analgesics or sedatives are administered to patients receiving an epidural infusion. (See Form ID IWKPCEA).
7. All medication bags to be administered for PCEA will be provided by Pharmacy and must be removed from the automated dispensing cabinet (ADC) when needed.
8. Additional medications or solutions **must not be added** to the PCEA solution or tubing at any time.
9. The CADD infusion pump must be hung on a separate designated IV pole.

- 9.1. All other IV fluids not directly part of the PCEA set up must be hung on a separate IV pole.
 - 9.2. All PCEA tubing will be labelled according to [IWK Health Policy #10.15 Labelling of Medication Outside of Pharmacy](#).
10. An independent double check (IDC) by two nurses or a nurse and anesthesiologist /anesthesia assistant (AA), as per [IWK Health Policy # 1181 Independent Double Check](#), is required in the following situations:
- 10.1. Initial PCEA programming
 - 10.2. Pump parameter changes
 - 10.3. Shift change or assignment changes (handover)
 - 10.4. Bag and tubing changes
11. The PCEA pump key is to be treated as a control narcotic key and must be secured for limited access by approved care providers i.e. locked cupboard or with Team Leader.
12. The PCEA patient bolus button is strictly for **patient use only**.

Note: Low molecular weight heparin, oral anti-coagulants, antiplatelet medications, and therapeutic dosing of IV heparin, **are not** recommended in combination with epidural analgesia. Discussion must occur with W&O Anesthesiologist/delegate prior to administration of any of these medications

GUIDING PRINCIPLES AND VALUES

Experience of pain in labor and satisfaction with the birth process is multifaceted, multidimensional, individualistic, and unique. (AWHONN, 2020).

The goal of pain management during labor is to assist in managing the patient's pain without interrupting labor or doing harm to the patient or baby.

Epidural and spinal analgesia/anesthesia are effective methods used for intrapartum pain relief and have minimal maternal and neonatal adverse effects (AWHONN, 2019).

PROCEDURE

1. Assess for indications and contraindications for use of regional analgesia. (Refer to Appendix B).

2. Establish intravenous access using an 18-gauge cannula and maintain for the duration of the epidural infusion. A 0.9% sodium chloride Lock is **NOT** sufficient access.
3. Gather equipment:
 - 3.1. CADD Solis infusion pump with button
 - 3.2. Yellow striped administration set (filtered tubing)
 - 3.3. Prefilled and labelled medication bag
 - 3.4. Key for PCA pump
 - 3.5. PCEA flowsheet (Form IWKPCEA) if required (i.e. during IT downtime procedures)
 - 3.6. Appropriate IV tubing labels for tubing (*refer to [IWK Health Policy # 10.15 Labeling Medications Outside of Operating Rooms and Pharmacy](#)*).
4. For high-risk situations such as hypertension disorders of pregnancy (HDP), ensure current (within last 6 hours) blood work (CBC, platelets, INR, and PTT) is completed prior to consulting the anesthesiologist/delegate.
5. Ensure any tongue piercings have been removed and current height and weight have been documented.
6. A vaginal exam should be performed within one hour before the epidural is commenced.
7. Encourage the patient to void prior to the procedure.
8. Obtain baseline vital signs including blood pressure, pulse and respiratory rate.
9. Assess and document fetal health surveillance (FHS) prior to the procedure according to [IWK Health Policy #7070 Intrapartum Fetal Health Surveillance](#).
 - 9.1. If normal, fetal surveillance may be interrupted to complete the procedure.
10. The patient can be in side-lying or sitting position, at the discretion of the anesthesiologist. The RN/health care provider (HCP) provides support to obtain the optimal position for insertion of the epidural catheter.
 - 10.1. The RN provides essential physical and psychological support to the patient throughout the procedure as patients may have difficulty maintaining the desired position during contractions.

11. Obtain medication from the ADC for the patient. Medication will be available in the following strength: Ropivocaine 0.1% + FentaNYL 2 micrograms/mL
 - 11.1. The anesthesiologist will give the initial bolus before an epidural infusion or combined epidural (CSE) is started.
12. Following confirmation of placement and securement of the epidural catheter and tubing by the anesthesiologist/delegate, assist the patient to a comfortable position (generally side lying).
13. The catheter will be connected to the tubing for the infusion and the infusion pump will be started by the anesthesiologist/delegate.
14. Program the pump with a lockout period and maximum dose to ensure safety for patients on a PCEA infusion and avoid overdosing.
 - 14.1. Obtain anesthesiologist order for the infusion rate, lockout period and prescribed dose on the Patient Controlled Epidural Anesthesia (PCEA) Adult form (IWKPCEA).
15. Label infusion tubing as per [IWK Health Policy #10.15 Labeling of Medication Outside of Operating Rooms and Pharmacy](#) with appropriate designated label.
16. Complete initial IDC with anesthesiologist/delegate as they are initiating the initial infusion according to the completed preprinted order immediately following initiation.
17. Confirm with the anesthesiologist/delegate the type of technique performed epidural or combined spinal-epidural (CSE) to guide monitoring and assessment for any potential complications associated with the procedure.
18. Document the completion of the procedure, the patient's response to the procedure and any associated patient education related to the PCEA in the patient's health care record.
19. Two RNs complete additional IDCs and document (on the PCEA flowsheet Form ID PCEAFL) or electronic health record) at each change of shift and anytime changes are made to therapy settings per PCEA preprinted order (Form ID IWKPCEA).

MAINTENANCE

1. Following initiation, and after each subsequent top-up or clinician bolus administered by anesthesiologist/delegate monitor the patient's blood pressure and pulse: every (q) 5 minutes x 3, q15 minutes x 1 and then q30 minutes until discontinued.
2. The RN informs the anesthesiologist/delegate if at any time analgesia effect is diminished or systolic blood pressure is less than 90mmHg or 20mmHg below baseline or if the patient experiences bradycardia.
3. Monitor the epidural catheter site q1 hour for signs of bleeding, redness, inflammation, pain or purulent drainage.
 - 3.1. If present, report the assessment immediately to the anesthesiologist.
4. Monitor skin sensation and its correspondence to dermatome levels using ice or an alcohol swab to stroke the skin comparing areas of normal sensation with areas of block. Refer to Appendix C for dermatome levels.
 - 4.1. Start on one anterior thigh and work upward to determine upper boundary and repeat on the other side.
 - 4.2. If sensation is felt at a dermatome level higher than T4, stop infusion and notify anesthesiologist. The goal is to maintain the patient's comfort with the absence of sensation at a dermatome level no higher than T4.
5. Assess Bromage score (refer to Appendix D) q1 hour.
 - 5.1. If the Bromage score (motor block) is greater than 3, stop the infusion and notify anesthesia.
 - 5.2. The RN is responsible for reporting and assisting in the management of any epidural complications and emergencies (i.e. hypotension, high epidural block). (Refer to Appendices E and F).
6. Ensure patients receive continuous fetal monitoring for a minimum of one hour following initiation of epidural analgesia.

- 6.1. Ongoing fetal monitoring should be performed according to [IWK Health Policy #7070 Intrapartum Fetal Health Surveillance](#). Intermittent auscultation is an acceptable method for FHS following the initial monitoring post epidural placement if the patient has no risk factors for adverse perinatal outcomes and oxytocin infusing.
7. The RN assesses the patient's bladder for distention q2 hours.
 - 7.1. If the bladder is distended and if patient is unable to void, perform catheterization and document the volume of urine obtained on the Intake & Output record (IWKINOU) or electronic health record.
 - 7.1.1. If the patient requires more than two (2) in-and-out catheterizations, consider requesting an order for a Foley catheter.
8. Assist the patient with position changes at minimum every hour, always ensuring lateral tilt. Encourage frequent position changes to promote more even distribution of the medication.
9. Prior to ambulation, the RN assesses vital signs and leg strength by requesting the patient perform a partial knee bend as per the Bromage Scale (See Appendix C).
 - 9.1. Patients in labour who have an epidural must meet the following criteria before ambulation is permitted:
 - 9.1.1. Sensation is not felt at a dermatome level higher than T4.
 - 9.1.2. The motor function (as per Bromage score) must be 6. The patient must demonstrate the ability to lift legs one at a time. The patient can hold on to something for balance if needed.
 - 9.1.3. The BP must remain stable (systolic should not drop more than 20 mmHg from baseline) or fall below 90 mmHg. Check and document BP before getting the patient out of bed and again in standing position.
 - 9.1.3.1. If the patient is lightheaded, return to bed and wait 10 minutes before trying again.
 - 9.1.4. Ambulation is not permitted for 30 minutes if the patient has received a top-up/clinician bolus to the PCEA infusion and must have strength re-tested before attempting ambulation.

10. Hourly and as needed (prn) assessments (whether ambulating or in bed) will consist of:
 - 10.1. Pain scale (0-10)
 - 10.2. Dermatome levels
 - 10.3. Bromage score (motor function)
 - 10.4. Respiratory rate
 - 10.5. Total amount of infusion (pump displays this as total volume)
 - 10.6. Number of patient boluses
 - 10.7. Number of attempted boluses
 - 10.8. Visual inspection of the epidural catheter for disconnects between epidural catheter and tubing
11. Provide the patients with information/instruction on use of the patient bolus button and ensure the button is always available and accessible.
12. Provide the patient who has a PCEA with information on the importance of maintaining a consistent level of pain relief when they become uncomfortable.
13. If the patient is experiencing inadequate pain relief, complete a thorough patient assessment and troubleshoot the equipment.
 - 13.1. Check tubing/pump to ensure medication is infusing properly (i.e. not leaking at the connection site)
 - 13.2. Check the dressing
 - 13.3. Check the frequency of PCEA doses
 - 13.4. Assess dermatome level

- 13.5. Assess for conditions that may result in analgesia becoming ineffective (i.e. bladder distention, rapidly progressing labour). Less frequent causes of breakthrough pain include separation of a uterine scar and placental abruption.
- 13.6. Notify the anesthesiologist/delegate of assessment details.
14. The epidural infusion should be stopped once the placenta is delivered during the 4th stage of labour unless an order is obtained to maintain the continuous infusion.
15. Documentation in the permanent/electronic health record should include the following:
 - 15.1. Initiation of infusion
 - 15.2. Hourly and prn assessments (as outlined in #11)
 - 15.3. Any interventions associated with assessments
 - 15.4. Rate and bag changes (IDC required)
 - 15.5. Total amount received (in mL) each shift

Note: Wasted medication requires two nurses to:

- visually verify amount remaining in the bag (wastage),
- observe the destruction of the wastage and bag,
- record waste in the ADC and the electronic/permanent health record.

Refer to [IWK Health Medication Management Policy #50.35 Narcotic and Controlled Drugs](#)

REMOVAL OF EPIDURAL CATHETER

1. Removal of the epidural catheter will take place when the patient is stable, comfortable and the infusion is no longer required. This will most often occur during the fourth stage of labour.
2. The epidural catheter should be removed prior to transfer to another unit, unless there is a physician order to state otherwise. **Note:** Any patient transferred to Family newborn care Unit (FNCU) with an epidural catheter in place must have a consult with/order from an anesthesiologist prior to removal.

Note: Situations where the patient has received a dose of any type of anticoagulant therapy while the epidural has been in place will require consultation with the

anesthesiologist **before removing**. The discussion and consultation with an anesthesiologist/delegate for these situations must be clearly documented in the interdisciplinary progress notes (Form ID IWKINPR) and orders obtained and written on the order sheet (Form IWKORSH) as to when the epidural catheter can be removed.

3. If an RN has completed the competency requirements for epidural catheter removal and the patient meets the criteria, as per the [IWK Health Care Directive: Removal of Epidural Catheters by Birth Unit Registered Nurses #7001](#), initiate the Care Directive and remove the epidural catheter as outlined.
4. The Care Directive may only be carried out by a Registered Nurse who is practicing in the Birth Unit in the Women's and Newborn Health program and has received education and training on epidural catheter removals and has demonstrated competency with the procedure (NSCN, 2023).
5. An anesthesiologist's order is required for removal of epidural catheter if the care directive is not implemented (Refer to [IWK Health Policy #7001: Care Directive: Removal of Epidural Catheters by Birth Unit Registered Nurses](#)).
6. Explain the procedure in detail to the patient and allow time to ask questions.
7. The patient must be placed in a lateral or sitting position. Explain to the patient that arching or curving their back outward slightly by bringing head and knees together as much as possible eases the removal of the catheter.
8. Loosen tape and pull the catheter out slowly. **If there is any resistance, stop the removal and page the anesthesiologist on call to remove the catheter.**
9. Once the catheter is removed, examine the tip closely for the presence of blue tip marker and intactness. If the catheter tip is not intact, notify the on-call anesthesiologist **immediately**. Save the tip for review and ask the patient to remain in lateral position until the anesthesiologist arrives and is able to assess.
10. After removal of the catheter, apply a band-aid to the epidural site if needed.
11. Assess for motor strength, sensation, pain and level of sedation. Report any unusual/abnormal changes in neurological status to the anesthesiologist.

11.1. As per assessment once epidural catheter is removed, provide instructions to patient regarding when they can resume normal activities.

12. The RN or HCP who removed the epidural catheter will document the care provided on the patient's permanent health record including, but not limited to: date and time of removal, integrity of the catheter, patient's response and any other assessment, observation, findings or associated orders.

REFERENCES

Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) (2019). Perioperative Care of the Pregnant Woman Second Edition: Evidence Based Practice Guidelines.

Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) (2020). Role of Registered Nurse in the Care of the Pregnant Woman Receiving Analgesia and Anesthesia by Catheter Techniques: AWHONN Position Statement

American College of Obstetricians & Gynecologists (2019). Obstetric Analgesia and Anesthesia. ACOG Practice Bulletin Number 209. *Obstetrics & Gynecology*, 133(3), e208-e225.

Association of Women's Health, Obstetric and Neonatal Nurses (2020). Analgesia and Anesthesia in the Intrapartum period: AWHONN Evidence-based Clinical Practice Guideline.

Auckland District Health Board (2020). Epidural Analgesia in Labour – Management and Care. Retrieved from [Epidural Analgesia in Labour – Management and Care \(adhb.govt.nz\)](https://adhb.govt.nz/epidural-analgesia-in-labour-management-and-care).
Dobson, G., Chuu, A., Denomme, J., Fuda, G., McDonnell, C., Milne, A.D., Milkovich, R., Sparrow, K., Wang, Y., & Young, C. (2022). Guidelines to the Practice of Anesthesia; revised Edition 2023. *Canadian Journal of Anesthesia*, 70(1),

Dore, S. & Ehman, W. (2020). Society of Obstetricians and Gynecologists of Canada (SOGC) Clinical Practice Guideline No. 396- Fetal Health Surveillance: Intrapartum consensus guidelines. *JOGC*, 42(3), 316-348. <https://doi.org/10.1016/j.jogc.2019.05.007>

CADD Solis Ambulatory Infusion Pump (2009). Operators Manual Model 2100. Retrieved from [SMITHS MEDICAL CADD-SOLIS OPERATOR'S MANUAL Pdf Download | ManualsLib](#)

Grant, G.J. (2023). Pharmacologic management of pain during labor and delivery. Retrieved from [Pharmacologic management of pain during labor and delivery - UpToDate](#).

Institute for Safe Medication Practices Canada [ISMP] (2022). *Definitions of Terms*. <https://ismpcanada.ca/resources/?subject=definition-of-terms>

Ituk, U., & Wong, C.A. (2023) Epidural and combined spinal-epidural aesthetic techniques. Retrieved from [Epidural and combined spinal-epidural anesthesia: Techniques - UpToDate](#)

Nova Scotia College of Nursing (2023) care Directives Guidelines for Nurses. Retrieved from [CareDirectives.pdf \(nscn.ca\)](#)

Simpson, K.R. & Creehan, P.A. (2020) AWHONN Perinatal Nursing (5th edition) Lippincott Williams & Wilkins: Philadelphia, PA

Stannard, D. & Krenzischek, D.. (2012). *PeriAnesthesia Nursing Care: A Bedside Guide for Safe Recovery*. Jones & Bartlett leaning: Sudbury, MA.

Weigand, L.D. (2017) AACN Procedure Manual for High Acuity, Progressive and Critical care (7th edition). American Association of Critical care Nurses. Saunders: Elsevier.

The Sir Mortimer B. Davis Jewish General Hospital (2010). Care of Patient with Epidural Analgesia, Including Patient Controlled Epidural Analgesia (PCEA)

Toledano, R & Leffert, L. (2023). Neuraxial analgesia for labor and delivery (including instrumental delivery). Retrieved from [Neuraxial analgesia for labor and delivery \(including instrumented delivery\) - UpToDate](#)

RELATED DOCUMENTS

Policies

[IWK Health Medication Management Policy #10.15 Labelling of Medication Outside of Operating Rooms and Pharmacy](#)

[IWK Health Policy #704 IWK Code Blue Response to Medical/Obstetrical Emergencies for patient, Staff & Visitors](#)

[IWK Health Policy #1181 Independent Double Check](#)

[IWK Health Policy #1120 Infusion Pump Training for Nurses](#)

[IWK Health Policy #7070 Intrapartum Fetal Health Surveillance](#)

[IWK Health Policy #40070 Bladder Assessment and Management Guidelines for the](#)

[IWK Health Medication Management Policy #25.05 High Alert Medication](#)

[IWK Health Medication Management Policy #50.35 – Narcotic and Controlled Drugs – Pyxis MedStation](#)

[IWK Health Policy #336 Optimizing and Expanding the Nursing Scope of Practice](#)

[IWK Health Policy #7114 Intellispace Perinatal \(IPN\) System](#)

[IWK Health Policy #7001: Care Directive: Removal of Epidural Catheters by Birth Unit Registered Nurses](#)

Forms

Patient Controlled Epidural Anesthesia (PCEA) Adult (IWKPCEA)

Intake & Output Record (IWKINO)

Patient Controlled Epidural Anesthesia Flowsheet (PCEA) Adult (IWKPCEAFL)

Interdisciplinary Progress Notes (IWKINPR)

Order Sheet (IWKORSH)

Appendices

Appendix A – Definitions

Appendix B – Indications and Contraindications for Use of Epidural Analgesia

Appendix C - Dermatome levels

Appendix D - Bromage Scale

Appendix E – Management of Complications

Appendix F – Management of Epidural Emergency Situations

APPENDIX A – DEFINITIONS

Clinical Bolus dose or top-up dose: an additional dose of medication administered manually or via the infusion pump by the anesthesiologist/delegate for pain management to increase the level of sensory blockade and local anesthetic effect.

Care directive (CD): an order or authorization, which exists as an organizational policy and is developed and approved by an authorized prescriber and the organization for an intervention or series of interventions. A CD is meant to be implemented by another care provider for a range of clients with identified health conditions, in specific circumstances. The purpose of a CD is to provide safe, timely, effective and efficient client care and to optimize the practice of all care providers. (NSCN, 2023).

Combined Spinal-Epidural (CSE): a process using medication to provide immediate analgesia via a spinal, and longer-term analgesia via an epidural. Opioid medication (with or without local anesthetics) is first injected into the intrathecal space, followed by the insertion of an epidural catheter into the epidural space.

Continuous Epidural Infusion (CEI): is a continuous infusion of a local anesthetic agent with or without an opioid analgesic into the epidural space. (CMNRP, 2014)

Dermatome: areas of skin on your body supplied by sensory neurons that rely on specific nerve connections on your spine. Knowledge of dermatome levels allows the Birth Unit nurse to assess the level of neuraxial blockade. Assessment can be accomplished with a small pin, wet cotton ball or alcohol wipe.

Dose duration: amount of time for drug dosage amount to be administered to the patient

Dose Limit: The maximum amount of drug that can be administered via the PCA bolus dose and continuous delivery in the programmed time frame (Capital District Health Authority, 2010).

Epidural analgesia: is a form of regional analgesia involving injection of drugs through a catheter placed into the epidural space.

Independent Double Check: A process in which a second health care provider conducts verification of a medication. Such verification can be performed in the presence or absence of the first practitioner. In either case, the most critical aspect is to maximize the independence of the double check by ensuring that the first practitioner does not communicate what he or she *expects* the second practitioner to see, which would create bias and reduce the visibility of an error. (ISMP, 2022) Independent double checks intercept potential errors thus preventing harm to patients.

Independent double check of a high alert medication: A procedure in which two people separately check a high-alert medication (alone and apart from each other, then compare results), each component of prescribing, dispensing, and verifying the high alert medication before administering it to the patient.

Loading Dose: An optimal dose programmed, often during setup. The loading dose can be administered at any time during the programmed therapy (CDHA, 2010).

Lockout Interval: A programmed time interval specifying the minimum time that must pass after a PCA bolus dose is administered and before the next dose can be administered (Weigand (2017) page 930).

Neuraxial or regional anesthesia is the use of localized methods, devices, technology and agents that results in partial or complete loss of sensation in a portion of the body. Motor function may or may not be diminished. Regional analgesia does not result in a loss of consciousness (Association of Women's Health, Obstetric & Neonatal Nurses, 2020, page 5).

Patient Controlled Analgesia (PCA): is a method of administering pain medication intravenously (IV) for the purpose of pain control and management where the patient has the ability to administer preset doses of an analgesic, on demand, by way of a designated infusion pump (Monitto, 2014).

Patient Controlled Epidural Analgesia (PCEA): An alternate method for delivering epidural analgesia. It permits patients to treat their pain by self-administering doses of epidural analgesics to meet their individual analgesic requirements.

PCA Bolus Dose: A prescribed amount of analgesic administered on patient demand

APPENDIX B – Indications & Contraindications for Use of Regional Analgesia

INDICATIONS for use of regional analgesia may include:

- Patient request – the primary goal being to provide adequate pain relief for uncomplicated labour and delivery whilst producing as little motor blockade as possible.
- High risk labour (i.e. breech, multiple gestation, hypertensive disorders of pregnancy, prolonged labour, preterm labour)
- Operative birth
- Manual removal of the placenta

In addition, patients must be:

- Alert and oriented and able to understand the use of the patient bolus button in relation to pain control (i.e. by pressing the demand button a preset volume of analgesia is delivered to the patient at specified time intervals);
- Prepared to actively participate in the management of their analgesia

CONTRAINDICATIONS for use of regional analgesia may include:

Absolute contraindications

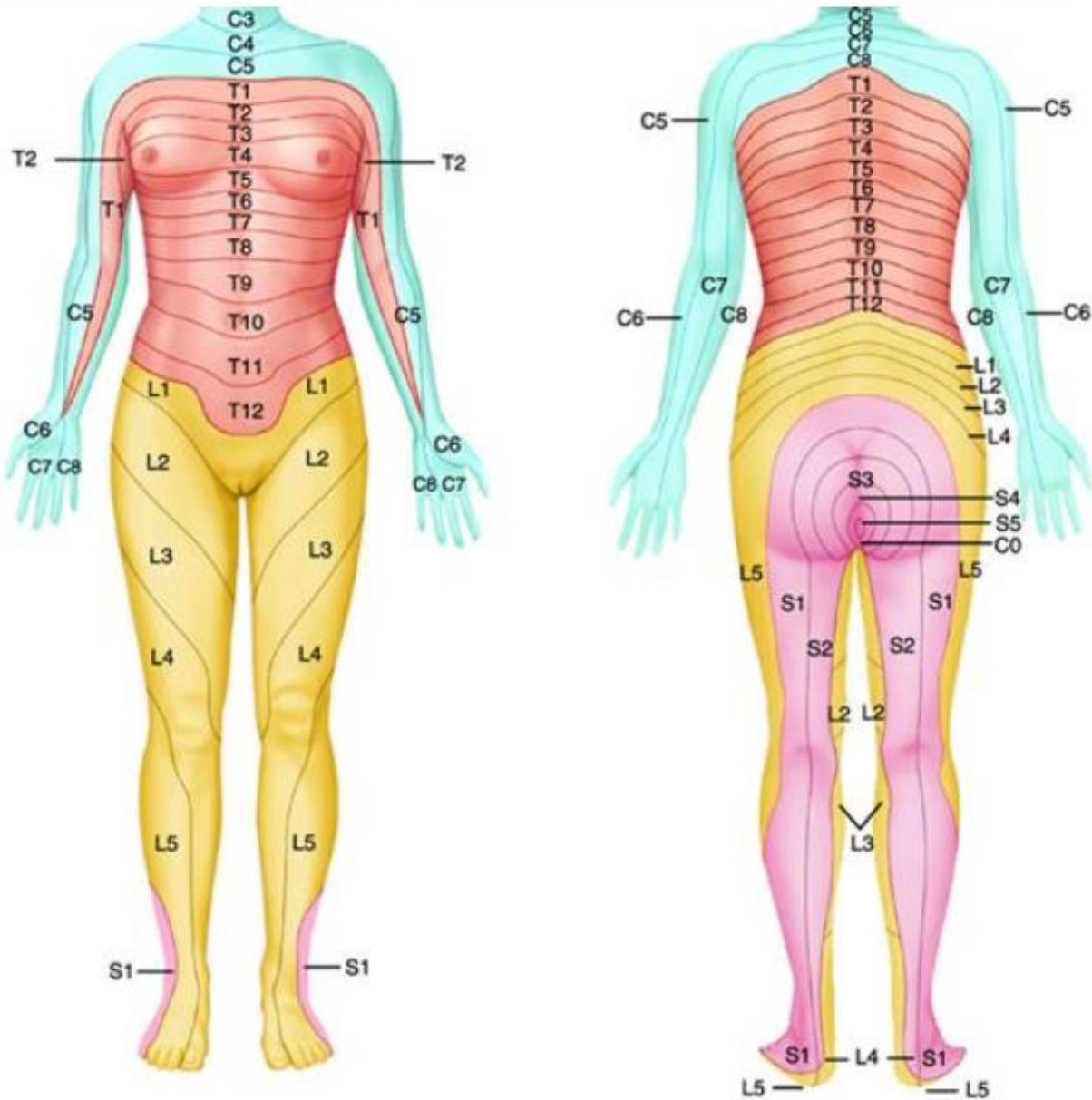
- Patient refusal
- Uncooperative patients
- Coagulopathy/coagulation disorders
- Therapeutic anticoagulation (last dose of low molecular weight heparin within 12 hours)
- Skin infection at the injection site/local infection at the site of injection
- Raised/increased intracranial pressure that could lead to herniation if dural puncture occurred
- Uncorrected maternal hypovolemia
- Maternal hypotension and shock
- Abnormal fetal heart rate (FHR) tracing requiring immediate birth
- Maternal inability to cooperate
- Allergy to local anesthetics

Relative contraindications

- Pre-existing neurological disorders
- Fixed cardiac output states

- Anatomical abnormalities of the vertebral column
- Prophylactic low dose heparin
- Thrombocytopenia
- Spinal instrumentation

APPENDIX C – DERMATOMES



Dermatome (sensory level) map. Note T10=Umbilicus, T6=Xiphisternum, T4=Nipples (Hoffman, 2016).

Retrieved from Auckland District Health Board (2020).

APPENDIX D – BROMAGE SCORE

Modified Bromage Score

| Score | Criteria |
|-------|---|
| 1 | Complete block (unable to move feet or knees) |
| 2 | Almost complete block (able to move feet only) |
| 3 | Partial block (just able to move knees) |
| 4 | Detectable weakness of hip flexion while supine (full flexion of knees) |
| 5 | No detectable weakness of hip flexion while supine |
| 6 | Able to perform partial knee bend |

Retrieved from Stannard, D. & Krenzischek, D. (2012).

APPENDIX E – MANAGEMENT OF COMPLICATIONS

(per AWHONN, 2020).

| Complication | Signs & Symptoms | Interventions |
|---|---|--|
| Hypotension | As a result of sympathetic blockade which results in a decrease in systemic vascular resistance | <ul style="list-style-type: none"> • Reposition patient • If FHR changes institute intrauterine resuscitation interventions as per IWK Health Policy #7070 Intrapartum Fetal Health Surveillance. • Notify anesthesiologist/ delegate • Continue to monitor BP every 5 minutes until BP stabilizes |
| Abnormal FHR changes | <ul style="list-style-type: none"> • Uterine tachysystole with or/without FHR changes • Intermittent/recurrent late decelerations or prolonged decelerations leading to atypical/abnormal classification • Fetal bradycardia | <ul style="list-style-type: none"> • Reposition patient • If FHR changes institute intrauterine resuscitation interventions as per IWK Health Policy #7070 Intrapartum Fetal Health Surveillance. |
| Pain Management | <ul style="list-style-type: none"> • Patient reports inadequate pain management • Dermatome assessment unequal | <ul style="list-style-type: none"> • Perform maternal assessment including vaginal exam is applicable and bladder assessment. • Notify anesthesiologist/ delegate for possible top-up or clinical bolus based on clinical assessment |
| Bladder Management <i>per IWK Policy #40070 Bladder Assessment and Management Guidelines for the Obstetrical patient.</i> | <ul style="list-style-type: none"> • Urinary retention • Patient is unable to spontaneously empty their bladder • Bromage score on assessment is decreased | <ul style="list-style-type: none"> • If no urge to void noted by patient, assist patient to bathroom/bedpan to attempt to void. • If unable to ambulate or void spontaneously consider intermittent urinary catheterization using a straight catheter as needed per clinical assessment |

| Complication | Signs & Symptoms | Interventions |
|---|--|---|
| Maternal sedation/respiratory depression | <ul style="list-style-type: none"> Respirations less than 8 breaths/minute | <ul style="list-style-type: none"> Apply pulse oximeter Notify anesthesiologist Stop infusion of medication |
| Headache: <ul style="list-style-type: none"> Immediate onset (pneumocephalus) Post dural puncture headache | <ul style="list-style-type: none"> Sudden onset severe headache Neck or back pain Changes in mental status Unstable vital signs | <ul style="list-style-type: none"> Monitor for signs and symptoms Notify the anesthesiologist |
| Accidental disconnection of the epidural catheter | <ul style="list-style-type: none"> Patient reports inadequate pain management | <ul style="list-style-type: none"> Stop infusion Assess epidural insertion site and line assessment Cover tip with sterile gauze Notify anesthesiologist/delegate |
| Accidental removal of the epidural catheter | <ul style="list-style-type: none"> Patient reports inadequate pain management | <ul style="list-style-type: none"> Stop infusion Assess epidural insertion site and line assessment Follow post removal procedure Notify the anesthesiologist/delegate |
| Absence of blue tip end of catheter after removal | <ul style="list-style-type: none"> During removal of the epidural catheter assessment not intact | <ul style="list-style-type: none"> Notify anesthesiologist immediately. Keep the catheter for the anesthesiologist to see. |
| Intravascular Injection | <ul style="list-style-type: none"> Numbness of the tongue Metallic taste in the mouth Perioral paresthesia Difficulty speaking Dizziness or restlessness Hypotension Maternal tachycardia or bradycardia Loss of consciousness seizures | <ul style="list-style-type: none"> Stop or discontinue the anesthesia infusion Initiate a code blue response Initiate resuscitation measures as directed by the anesthesiologist. Treatment is IV administration of a 20% lipid emulsion infusion |
| High Spinal/Injection into the Intrathecal Space | <ul style="list-style-type: none"> Immediate upper thoracic sensory loss Loss of consciousness Respiratory paralysis Severe lower extremity motor blockage Total autonomic blockade | <ul style="list-style-type: none"> Stop or discontinue the anesthesia infusion Initiate a code blue response Initiate resuscitation measures as directed by the anesthesiologist. |
| Systemic toxicity of the Local Anesthetic | <ul style="list-style-type: none"> Bradycardia Cardiovascular collapse Contractile dysfunction and ventricular dysrhythmia hypotension | <ul style="list-style-type: none"> Stop or discontinue the anesthesia infusion Initiate a code blue response Initiate resuscitation measures as directed by the anesthesiologist. Treatment is IV administration of a 20% lipid emulsion infusion |

APPENDIX F - MANAGEMENT OF EPIDURAL EMERGENCY SITUATIONS

Complications with instructions for management

Migration into the subarachnoid space

Migration into the intravascular space

Hypotension

Infection of catheter space

1. Call for help, activate the emergency call system
2. Call/stat page for anesthesiologist and obstetrician
3. With cardiopulmonary arrest or rapidly deteriorating cardiopulmonary status activate a Code Blue as per IWK Health Centre Code Blue Response Policy #704.
4. Establish and maintain a patent airway
5. In the case of seizure protect the patient from physical injury
6. If respiratory insufficiency or respiratory arrest is evident, begin positive pressure ventilation and ventilate with 100% oxygen
7. Stop the epidural drug infusion
8. Turn off all infusing drugs (i.e. oxytocin, magnesium sulfate) and open main intravenous line and fluids
9. Reposition patient (left lateral tilt) to eliminate or prevent aorta-caval compression
10. Initiate cardiopulmonary resuscitation (CPR) if cardiac arrest ensues
11. Administer drugs as ordered by physician
12. Fetal health surveillance should be monitored during all emergency situations
13. Ensure accurate and precise documentation is being recorded by a designated RN
14. Inform patient's family of all occurrences

Version History

(To Be Completed by the Policy Office)

| Major Revisions (e.g. Standard 4 year review) | Minor Revisions (e.g. spelling correction, wording changes, etc.) |
|--|--|
| November 2023 | |
| | |
| | |
| | |