Royal Hospital for Women (RHW)
BUSINESS RULE
COVER SHEET

Health
South Eastern Sydney
Local Health District

Ref: T24/33899

NAME OF DOCUMENT	Epidural Analgesia
TYPE OF DOCUMENT	Clinical Business Rule (CBR)
DOCUMENT NUMBER	RHW CLIN053
DATE OF PUBLICATION	November 2024
RISK RATING	High
REVIEW DATE	November 2026
FORMER REFERENCE(S)	This CBR replaces: • RHW Epidural Analgesia Guidelines 2021 • RHW Epidural Analgesia - Maternity 2021 RHW Epidural Analgesia - Non-Maternity 2021
EXECUTIVE SPONSOR	Leonie Watterson, Co-Director Anaesthesia Craig Hargreaves, Co-Director Anaesthesia
AUTHOR	Louise McDonald, CNC, Acute Pain Service, RHW Louise.mcdonald@health.nsw.gov.au Preetha Pradeep, CNC, Acute Pain Service, RHW, Preetha.Pradeep@health.nsw.gov.au
SUMMARY	This document is a comprehensive guideline containing information referring to the management of a woman who has an epidural for either labour analgesia OR for post operative analgesia and escalation if required
Key Words	Analgesia, Anaesthesia

This Clinical Business Rule (CBR) is developed to guide safe clinical practice at the Royal Hospital for Women (RHW). Individual patient circumstances may mean that practice diverges from this Clinical Business Rule. Using this document outside RHW or its reproduction in whole or part, is subject to acknowledgement that it is the property of RHW and is valid and applicable for use at the time of publication. RHW is not responsible for consequences that may develop from the use of this document outside RHW.

Within this document we will use the term woman, this is not to exclude those who give birth and do not identify as female. It is crucial to use the preferred language and terminology as described and guided by each individual person when providing care.

1. BACKGROUND

This document is a comprehensive guideline for the management of a woman who has an epidural or combined spinal epidural (CSE) for either labour analgesia or for post operative analgesia, the latter including post-surgical and in conjunction with cervical brachytherapy.

Epidural analgesia is an effective modality of pain management that provides pain relief via a continuous infusion (CI) or via patient controlled epidural analgesia (PCEA) and/or programmed intermittent epidural bolus (PIEB) using the administration of pharmacological agents, usually local anaesthetic, with or without an opioid, into the epidural space via an indwelling catheter.

The use of an epidural for post operative pain relief will be decided by the procedural Anaesthetist and discussed with the woman prior to surgery.

Unless a contraindication exists, a woman may choose an epidural for pain relief at any time during her labour. An epidural may be chosen as the first line pain relief option or after trying other methods. This will be determined by the woman after receiving appropriate information on the available options.

A risk-benefit analysis must be determined for each woman and informed consent must be obtained.

2. RESPONSIBILITIES

2.1 Staff (medical, midwifery, Nursing, Allied health)

- Anaesthetists (Consultants, Fellows, Registrars) - Proceduralists and authorised prescribers. Decisions relating to the commencement and management of epidural analgesia are only to be made by Anaesthetists
- Registered Nurses (RN) and Midwives (RM) - manage established epidurals as per prescriptions and CBR
- RHW Acute Pain Service (APS) – oversees perioperative pain reviews, quality assurance and staff education
- All other medical staff must request an Anaesthetic or APS review of patient

3. PROCEDURE

3.1.1 Clinical Practice points (as previously called in LOPS)

- All junior medical anaesthesia staff involved in establishment and management of epidural analgesia must ensure they work within their scope of practice and seek support and advice from their supervising consultants, as appropriate for their level of training.
- All nursing and midwifery staff involved in managing epidural infusions must have received adequate education and training in the management of epidural analgesia and must have the necessary work competencies to undertake their duties safely and effectively.

Steps to attain competency (Medical: Anaesthesia):

1. Complete training as per internal departmental policy

Steps to attain competency (Nursing and midwifery):

1. Attend an in-service on Epidural Analgesia Management provided by APS CNC.
2. Complete the Neuraxial Analgesia Education Package (Birthing Services -BS or Ward) provided by APS CNC or respective ward or BS CNE/CME/CNC.
3. Attend an in-service demonstrating the setup and management of the epidural pain management pump and obtain accreditation to use Epidural pumps.
4. In-service attendance, completion of Neuraxial Analgesia Education Package and pump accreditation are mandatory before caring for patients with Epidural Analgesia.

Note:

- The procedure of insertion of epidural catheters is restricted to the operating theatre and birthing unit unless specific approval is provided from the on-call consultant anaesthetist to perform the procedure in an alternative setting.

- Patients with epidural infusions should only be managed in wards where the nursing/midwifery staff have received training and have been assessed as competent in the management of epidural analgesia.

3.1.2 Settings

- The procedure of insertion of epidural catheters is restricted to the operating theatre and Birthing Unit unless specific approval is provided from the on-call consultant anaesthetist to perform the procedure in an alternative setting. Epidurals are not to be inserted and or managed in Birthing Centre rooms.

- Patients with epidural infusions should only be managed in wards where the nursing/midwifery staff have received training and have been assessed as competent in the management of epidural analgesia.

3.1.3 Patient management and risk reduction

Consent

- The procedural anaesthetist should gain verbal consent for the insertion of an epidural and epidural analgesia and should be documented in the medical record.

Patient education

- All women booked to birth at the RHW should have education resources available in the antenatal period. Patients scheduled for major abdominal surgery should receive information on regional anaesthetic in the pre-operative assessment clinic, as relevant to the consent for anaesthesia. The following relevant information leaflet should be provided:
    - Epidural Pain Relief (Maternity) or
    - Epidural Pain Relief (Post-Operative)

- Women who have had epidural analgesia established should be provided with bedside education by the attending nurse/midwife. This should address:
    - the rationale for using epidural pain relief
    - how to use PCEA
    - her exclusive use of the PCEA button
    - anticipated length of time for analgesia
    - the need for ongoing observations

Vascular access and intravenous infusion

- All patients with epidural infusions must always have intravenous access via a large bore intravenous cannula (18 or 16 gauge) and continued for a minimum of four (4) hours post epidural catheter removal.
- Preloading with intravenous crystalloid solution is not mandated, but maintenance fluid by intravenous Hartmann's or Plasmalyte solution should occur as appropriate to maintain hydration, as directed by the procedural anaesthetist. The fluid rate should be individualised according to the woman's hydration needs using a target rate of 50 - 100mL per hour as a guide. This should be adjusted accordingly if the woman has increased fluid losses, such as with haemorrhage or if the woman's oral fluid intake is reduced [26].
- Ensure that a patent intravenous (IV) cannula is maintained with which to manage any adverse effects of the epidural. This should be achieved by providing IV continuous fluids with a balanced salt crystalloid solution such as Hartmanns or Plasmalyte for the duration of the epidural.
- IV fluids should be prescribed on eMR

Oxytocin infusions (Birth Services):

- Oxytocin (Syntocinon) infusion should be continued during epidural insertion unless maternal discomfort precludes a woman from maintaining a sufficiently still position to allow for the safe insertion of an epidural. In such circumstances, after discussion with obstetric team & midwife, consideration can be given to pause Oxytocin infusion.

Observations and oxygen therapy

- Baseline vital signs including BP, HR and SaO2 should be checked and confirmed and recorded to be within the flags prior to insertion of the epidural and during its use, as per **Appendix 1 (Observations).**
- Regular observations of epidural block (sensory level and motor block) must occur while the epidural is in use, as per **appendix 1.**
- If woman is labouring, commence continuous electronic fetal heart rate (FHR) monitoring
  Supplemental oxygen is not required unless oxygen saturation falls below 95% or if otherwise ordered by an anaesthetist. Where supplemental oxygen is indicated it should be given at 2-4 litres per minute via nasal prongs or 6 litres per minute via face mask.

Positioning of woman

- Pregnant women in their 3rd trimester should be nursed in a lateral tilt position (at least 15 degree) unless and or until advised otherwise by the anaesthetist.

- **In the event of hypotension, lie the woman in the left lateral position. Do not position the woman head down as this may cause increase in the height of the epidural block**.

Management of woman who has risks for thrombocytopenia or coagulation disorders

- In low- risk women with a normal antenatal/booking platelet count, insertion of an epidural can proceed without a more recent platelet count.
- A platelet count of 70 x 10^9 /L or above is generally considered safe and appropriate for epidural analgesia in women with gestational thrombocytopenia or stable ITP [27]
- A recent platelet count will need to be checked and confirmed, where risk factors for thrombocytopenia or other disorders of coagulation exist. The latter include preeclampsia and or liver disease.
- Full coagulation screen is required where risk factors exist for other coagulation disorders, including liver disease, coagulation factor deficiency, placental abruption, major haemorrhage, and prolonged fetal death in utero, as examples.

See also RHW CBR Thrombocytopenia in Pregnancy.
See also **Appendix 2: Management of patients who are prescribed Anticoagulants**

Management of woman who is prescribed anticoagulant medication

- Insertion and or removal of **epidural catheters are contraindicated in patients who have recently received anticoagulant medication**. Side effects include serious permanent spinal cord injury including paralysis. **(See Appendix 2)**

Partners and relatives

- Partners and relatives are allowed to be present during the insertion of an epidural according to the woman's preferences and discretion of the proceduralist

Emergency drugs

- Naloxone, metaraminol, atropine, ephedrine, terbutaline and plasma volume expanders must be readily available on the ward or BS for management of potential side effects
- An emergency equipment Trolley must be available in reasonable proximity of the ward
- A Lipid Rescue Kit with the guidelines must be available on each Emergency Equipment Trolley

3.1.4 Preparation of the Epidural Infusion

- Always use pre-mixed epidural infusion bags (as per Dosing 3.6) to help reduce medication errors and to facilitate infection control.
- Use only dedicated epidural administration lines that are **yellow in colour and portless.**
- Epidural administration lines and infusion bags must be clearly labelled in accordance with NSW Ministry of Health policy Directive PD 2016 058 – User-Applied Labelling of Injectable Medicines, Fluids and Lines
- An aseptic no-touch technique must be used when connecting the epidural infusion to the epidural catheter and or when changing medication bags.
- A bacterial filter must be attached to the epidural set. **If disconnected, an epidural filter must not be reconnected by the RN/MW. Call Acute Pain Services (APS) or the on-call anaesthetist to assess and reconnect a filter or replace the epidural, as appropriate.**
- Careful attention must be given when attaching the epidural infusion set to the epidural catheter to ensure it is not inadvertently connected to the intravenous infusion line.
- Do **NOT** inject any other drugs into the epidural line.
- Refer to the Neuraxial Analgesia Education package for further details on setup and programming of the epidural pain management pumps.

3.1.5 Programming of the Epidural Pump

- Only use dedicated epidural infusions pumps which are easily distinguishable from those used for intravenous and other types of infusions
- **General wards:** The dedicated epidural pump used for epidural infusion must be programmed and checked by two registered nurses or two registered midwives

who have been assessed as competent in this procedure. (Refer to section 3.1 - Education)

- **Birthing Services:** A **CADD Solis** brand pump must be used for the epidural infusion in Birthing Unit. Registered midwife, who has been assessed as competent in this procedure (Refer to section 3.1 - Education) and the anaesthetist commencing the Epidural must check the Epidural Infusion Program in the pump and the initial infusion bag at the start of the infusion and document the same. In exceptional circumstances where the anaesthetist needs to leave the woman before commencement of the pump, the Birthing Services Team leader will co-check the pump and the infusion bag with the Registered midwife (records kept for such cases). Subsequent infusion bags can be checked and documented by two RNs/RMs who are assessed as competent in this procedure.
- **Documentation to be done following commencement of infusion by both the Registered Nurses/Midwives/Anaesthetist on the relevant chart in the 'Record of Epidural drug Administration' section.**
- A pump used for epidural infusions must be programmed according to the parameters set by the authorised prescriber on the charts as documented in (Section 3.6 - Prescription).
- The epidural pump settings should be checked and documented at the commencement of each shift, on patient transfer, prior to administration of a rescue bolus dose and when the infusion bag is changed.

3.1.6 Prescriptions

- Epidural infusions must be prescribed on either the:
  - NSW Health Obstetric Epidural Analgesia Chart (SMR130.027) or;
  - NSW Health Epidural Analgesia (Adult) Chart (SMR130.022)
- Epidural analgesia may only be prescribed by an "Authorised Prescriber" (see section 2)
- No opioids or sedatives are to be administered by any other route except as ordered by an "Authorised Prescriber"

3.1.7 Dosing (See Appendix 3)

3.1.8 Management of complications (See Appendix 4)

3.1.9 Administration of a Rescue Bolus Dose (Continuous Infusion Only)

- An RN/RM who has been assessed as competent in this procedure can administer a rescue bolus dose and/or increase the rate as per prescription if a patient is experiencing inadequate analgesia
- Prior to administration check the epidural pain management pump and administration lines for faults, kinks or disconnection and perform a full set of observations, including catheter insertion site, motor block, wound check (where applicable) and urine output.
- Give prescribed rescue bolus dose using the "Clinician Bolus" feature in the epidural pump

- The dose must be checked and witnessed by a second RN/RM
- The RN/RM must then record the rescue bolus dose in the 'Rescue Bolus Dose' section and must countersign with a second RN/RM
- Perform observations as required after each rescue bolus dose
- If pain persists after 30 minutes and observations are stable, an additional rescue bolus dose may be given provided the dosing period is not less than the minimal interval prescribed. Administration of multiple rescue boluses is NOT recommended without review by the Anaesthetist / Anaesthetic (Consultants, Fellows, Registrars) / APS
- The infusion rate may also be increased (*if the maximum rate has not been reached)* and if not contra-indicated by height of block and motor block
- If pain continues to be uncontrolled, contact the APS or an Anaesthetist

3.1.10 Changing the Infusion Bag

- Epidural infusion bags to be changed once the infusion has run through, with a maximum hang time of 72 hours unless specified otherwise in the manufacturer's product information (available on MIMS)
- An aseptic no-touch technique must be used when changing medication bags
- An infusion bag must be checked by two RNs / RMs and changed by an RN/RM who has been assessed as competent in this procedure. It must be recorded on relevant chart in the 'Record of epidural drug administration' section and must be signed by both RNs/RMs
- Two RNs/RMs must witness the discarded amount and record in the 'Record of epidural solution discarded' section and both must sign
- The dedicated epidural giving set must not be changed without consultation with the Anaesthetist/ Anaesthetic (Consultants/ Fellows/ Registrars) / APS. Routine changing of the giving set is NOT required.

3.1.11 Procedure for Removal of the Epidural Catheter

- Check to confirm that the patient has not received anticoagulant medication (e.g. subcutaneous/intravenous heparin or oral anticoagulants) - **See appendix 2**
- Ensure the patient's recent coagulation results, including platelet count are normal
- Explain the procedure to the patient reassuring them that removal of the catheter is not uncomfortable.
- Stop infusion. Do not wean infusion
- Position patient lying on side or sitting up with spine slightly flexed forward
- Wash hands and organise equipment
- Carefully remove epidural catheter dressing
- Wash hands and put on sterile gloves
- Gently withdraw catheter. Do not forcefully pull-out catheter
- Contact APS if too much resistance is felt when trying to remove catheter
- If signs of infection (purulent drainage, redness or swelling) are present, send the epidural catheter tip for culture and notify APS
- Cover site with an occlusive dressing

3.1.12 After Removal of the Epidural Catheter:

- Confirm that epidural catheter tip is intact with second RN/RM and document and sign on the appropriate epidural chart and document in the clinical notes.
- **Two RNs/RMs must witness the discarded amount of epidural solution and record the amount discarded in the 'Record of Epidural Solution Discarded' section and both must sign.**
- Monitor woman's sensory and motor function every two (2) hours for first six (6) hours. If residual epidural effects at 6 hours, needs Anaesthetist Review.
- Check epidural site at 24 hours.
- If a woman is to be discharged from hospital prior to 24 or 48 hours, they must receive adequate education of possible complications and supplied with "Epidural Discharge Advice"

3.1.13 Escalation in Birthing services

- Notify anaesthetic team on admission of a woman with identified anaesthetic risk factors
- Contact anaesthetic consultant-in-charge if:
  - The anaesthetic registrar/fellow has been unable to site an effective epidural after 30 minutes and/or three attempts
  - The anaesthetic registrar/fellow is unavailable and likely to remain so for the next 40 minutes
  - The woman is admitted under the care of a private obstetrician
  - Escalation is required
  - The anaesthetic registrar/fellow requests assistance at any stage, including opening a second operating theatre

3.2 Documentation

- NSW Health Obstetric Epidural Analgesia Chart (SMR130.027)
- NSW Health Epidural Analgesia (Adult) Chart (SMR130.022)
- eMR – Documentation and Between the Flags
- eMeds

3.3 Education Notes

- The goal of regional neuraxial blockade (epidural analgesia) in moderate to severe pain is to diminish the development of an efficient pain pathway, by blocking conduction along pain nerve fibers.
- Monitoring the epidural block through sensory height and range of the motor strength provides information on the area being affected by the epidural infusion and potentially serious side effects, such as excessively high block.
- Depending on the concentration of anaesthetic agent and the total dose used, all nerves i.e., sensory, sympathetic, and motor can be affected. However, sensory (pain, temperature) and sympathetic nerves are thin and unmyelinated and thus easier to block. Motor nerve fibres are thick and myelinated and more

difficult to block. Immobility is usually not desirable after surgery or labour, so low concentrations of local anaesthetic are used to avoid weakness of the limbs.

- An Anaesthetist may provide a combined spinal epidural (CSE) instead of a plain epidural. A CSE has a faster onset of analgesia, higher success rate, less sacral sparing and unilateral block.

3.4 Related Policies/procedures

- NSW Ministry of Health Policy Directive PD2013_043 - Medication Handling in NSW Public Health Facilities
- Ministry of Health Policy Directive PD2016_058 - User-applied Labelling of Injectable Medicines, Fluids and Lines
- RHW – Neuraxial (Intrathecal or Epidural) opioid – Single Dose Morphine Only (April 2022)
- NSW RHW Naloxone – Treatment of opioid induced over-sedation, respiratory depression, pruritis and nausea (May 2020)
- SESLHD- Naloxone for treatment of opioid induced over-sedation and respiratory depression (August 2023)
- RHW Intralipid – Management and Treatment of Severe Local Anaesthetic Toxicity (Adult Only) (May 2021)
- RHW Neurological Deficit Post-Partum – Diagnosis and Management (Oct 2020)
- RHW CBR Thrombocytopenia in Pregnancy 2021

3.5 References

1. NSW Health Epidural Analgesia (Adult) form SMR130.022 2.
2. NSW Health Obstetric Epidural Analgesia Chart (SMR130.027)
3. NSW Ministry of Health Policy Directive PD2013_043 - Medication Handling in NSW Public Health Facilities
4. NSW Ministry of Health Policy Directive PD2016_058 - User-applied Labelling of Injectable Medicines, Fluids and Lines
5. Macintyre, PE & Schug, SA 2015, Acute pain management: a practical guide, 4th edn, CRC Press: Boca Raton, Florida.
6. Al-Rawi, OY, Pennefather, SH, Page, RD, Dave, I & Russell, G 2008, 'The effect of thoracic epidural bupivacaine and an intravenous adrenaline infusion of gastric tube blood flow during oesophagectomy', Anesthesia and Analgesia, vol. 106, no. 3, pp. 884- 887.
7. Fegley, AJ, Lerman, J & Wissler, R 2008, 'Epidural multi-orifice catheters functions as a single-orifice catheters: an in vitro study', Anesthesia and Analgesia, vol. 107, no. 3, pp. 1079-1081.
8. Kuthalia, G & Chaudhary, G 2011, 'Ropivacaine: a review of its pharmacology and clinical use', Indian Journal of Anaesthesia, vol. 55, no. 2, pp. 104-110.
9. Lim, Y, Chakravarty, S, Ocampo, CE & Sia, AT 2010, 'Comparison of automated intermittent low volume bolus with continuous infusion for labour epidural analgesia', Anaesthesia and Intensive Care, vol. 38, no. 5, pp. 894-899.
10. Sng, BL, Kwok, SC & Sia, ATH 2015, 'Modern neuraxial labour analgesia', Current Opinion in Anesthesiology, vol. 28, no. 3, pp. 285-289.
11. Wong, CA, McCarty, RJ & Hewlett, B 2011, 'The effect of manipulation of the programmed

intermittent bolus time interval and injection volume on total drug use for labour epidural analgesia: a randomized controlled trial', Anesthesia and Analgesia, vol. 112, no. 4, pp. 904-911,
12. NHS National patient safety agency 2007, Patient safety alert: safer practice with epidural injections and infusions, United Kingdom.
13. Schug, SA, Palmer, GM, Scott, DA, Halliwell, R & Trinca, J 2015, Acute Pain Management: Scientific Evidence 4th edn, Working Group of the Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine, ANZCA & FPM, Melbourne.
14. Hadzic, A 2019, Hadzic's Textbook of Regional Anesthesia and Acute Pain Management 2nd edn, McGraw-Hill Education, USA.
15. Obstetric Anaesthetists' Association 2018, 'Treatment of obstetric post-dural puncture headache', Guideline, December 2018, viewed 7 August 2020.
16. Breivik, H 1998, 'Neurological complications in association with spinal and epidural analgesia', Acta Anaesthesiologica Scandinavica, vol. 42, no. 6, pp. 609-613.
17. Therapeutic Goods Administration Australian Government 2010, Australian Public Assessment Report for Ropivacaine.
18. Gogarten, W, Vandermeulen, E, van Aken, H, Hozek, S, Llau, JV, & Samama, CM 2010, Royal anaesthesia and antithrombotic agents: recommendations of the European Society of Anaesthesiology, Eur J Anaesthesio, vol. 27, pp. 999-1015.
19. Horlocker, TT, Vandermeuelen, E, Kopp, SL, Gogarten, W, Leffert, LR & Benzon, HT 2018, 'Regional anesthesia in the patient receiving antithrombotic or thrombolytic therapy: American society of regional anesthesia and pain medicine evidence-based guidelines' 4th edn, Regional Anesthesia and Pain Medicine, vol. 43, no. 3, pp. 263-309.
20. Horlocker, T 2011, 'Regional anaesthesia in the patient receiving antithrombotic and antiplatelet therapy', British Journal of Anaesthesia, vol. 107, Suppl. s1, i96-i106.
21. The Royal College of Anaesthetists, Royal College of Nursing, The Association of Anaesthetists of Great Britain and Ireland, The British Pain Society and The European Society of Regional Anaesthesia and Pain Therapy 2010, Best practice in the management of continuous epidural analgesia in the hospital setting, The Royal College of Anaesthetists, London.
22. Clinical Excellence Commission 2018, 'Guidelines on perioperative management of anticoagulant and antiplatelet agents', Government guideline, December 2018, viewed 7 August 2020.
23. Prescribing Protocol SESLHDPR/637 Fentanyl 2microg/mL with Adrenaline (epinephrine) 2 microg/mL and Bupivacaine 0.1%, February 2021.
24. NYSORA 2021 'Guidelines on Regional Anaesthesia in Anticoagulated patients', viewed 9 August 2023, http://www.nysora.com/regional-anesthesia-in-anticoagulated-patients/
25. RHW GUID002, 'Post-operative Pain Management Guidelines- BrachyTherapy', December 2023
26. NICE Guidelines 2023,'Intrapartum Care- Pain relief during labour', September 2023, viewed 3 March 2024, https://www.nice.org.uk/guidance/ng235/chapter/Recommendations#pain-relief-during-labour/
27. Bauer, EM, et al. 2021, 'The Society for Obstetric Anesthesia and Perinatology Interdisciplinary Consensus Statement on Neuraxial Procedures in Obstetric Patients With Thrombocytopenia', Obstetric Anaesthesiology, vol. 132, no. 6, pp.1531-1544.

4 ABORIGINAL HEALTH IMPACT STATEMENT DOCUMENTATION

- Considerations for culturally safe and appropriate care provision have been made in the development of this Business Rule and will be accounted for in its implementation.
- When clinical risks are identified for an Aboriginal and/or Torres Strait Islander woman or family, they may require additional supports. This may include Aboriginal health professionals such as Aboriginal Liaison Officers, health workers or other culturally specific services

5 CULTURAL SUPPORT

- For a Culturally and Linguistically Diverse CALD woman, notify the nominated cross-cultural health worker during Monday to Friday business hours
- If the woman is from a non-English speaking background, call the interpreter service: NSW Ministry of Health Policy Directive PD2017_044-Interpreters Standard Procedures for Working with Health Care Interpreters.

6 NATIONAL STANDARDS

- Standard 2 – Partnering with Consumers
- Standard 4 – Medication Safety

7 REVISION AND APPROVAL HISTORY

Date	Revision No.	Author and Approval
23.05.24	1	Preetha Pradeep Endorsed by RHW BRGC
22.10.24	2	Preetha Pradeep
18.11.24	2	Preetha Pradeep

Appendix 1 – OBSERVATIONS

Frequency of observations

The RN/RM caring for the woman receiving epidural analgesia is responsible for ensuring the following observations are performed and documented on either the:

- NSW Health Obstetric Epidural Analgesia Chart (SMR130.027) or;
- NSW Health Epidural Analgesia (Adult) Chart (SMR130.022).

• Observations	Frequency (Labour)	Frequency (Post Operative Analgesia)
Vital Signs (as per relevant chart)	Every 5 minutes for 20 minutes after initiation then hourly	Every hour for the six (6) hours, then second (2) hourly or more frequently if patient's condition warrants.
After clinician Bolus Dose	Same as above	Every 10 minutes for 30 minutes and then one hour post bolus.
Electronic Fetal Heart Monitoring	Continuous	N/A
Pain Scores	N/A	As per Vital Signs
Motor Block (Use Bromage Scale)	Hourly for two (2) hours then second (2) hourly and prior to mobilisation.	Every four (4) hours and prior to mobilisation.
Sensory Block (Dermatome Level)	Hourly for two (2) hours then second (2) hourly and prior to mobilisation.	Every four (4) hours and prior to mobilisation. One (1) hour after a rescue bolus dose.
Epidural Catheter Insertion	Every eight (8) hours	Every eight (8) hours
Epidural Infusion Delivery	Hourly	As per Vital Signs
Infusion Pump Settings	Every eight (8) hours	Every eight (8) hours

Motor Block Assessment (Bromage Score) Explain the procedure and purpose

- Ask the patient to flex their knees and ankles.
- The degree of motor block on both the left and right side should be assessed.
    - Bromage 0 (none) = Full flexion of knees and feet
    - Bromage 1 (Partial) = Just able to move knees and feet
    - Bromage 2 (Almost Complete) = Just able to move feet only

- Bromage 3 (Complete) = Unable to move feet or knees

- Document the score on the relevant chart

- If the motor function is different in each leg, document the scores accordingly, eg. Bromage L) 2, R) 0.

Sensory Block Assessment (Dermatome Level)

- Explain the procedure and purpose.
- Place ice on an area well away from the possible dermatome cover (e.g. face or forearm) and ask them to tell you how cold it feels to them.
- Apply ice to an area likely to be blocked on the same side of the body and ask the patient "Does this feel the same cold as your face / arm or different?"
- Apply ice to areas above and below this point until it is clear at which level the top and the bottom of the block is.
- Repeat the procedure on the opposite side of the body (Note: a block may be uneven or unilateral).
- Document the blocked dermatomes on the relevant chart.
- Record both the upper and lower limits of the block: e.g. T7-L1 L=R or R: T7-L1 L: T10-L2

- **A clinical review by the anaesthetist must be notified if clinical signs consistent with epidural catheter migration are observed including weakness in legs (motor block), a high sensory level (numb hands or sensory loss to ice at T4 or above, or asymmetrical eye opening).**

APPENDIX 2 - MANAGEMENT OF PATIENTS WHO ARE PRESCRIBED ANTICOAGULANTS

- Anticoagulation is the most important risk factor for the development of epidural haematoma following insertion of epidural needle/catheter.
- It is vital that adequate time delays exist between the administration of anticoagulants and the insertion and removal of epidural catheters.
- Each individual patient's risk/benefit assessment needs to be considered by the Anaesthetist.
- The anaesthetist must leave clear instructions about catheter removal and administration of any anticoagulants that are not discussed in this document.
- Specific guidance should be provided by the procedural anaesthetist after referral to current published guidelines and assessment of the patient's renal and liver function. At the time of writing this CBR, guidance recommended time intervals between discontinuation of anticoagulant medication and commencement of neuraxial blockade, safe removal of epidural catheters and recommencement of anticoagulants, are as follows:

4.1 NSAIDS /Aspirin

- Non-steroidal anti-inflammatory drugs (NSAIDs) and low dose aspirin alone do not significantly increase the risk of spinal haematoma although they are registered as a risk factor if combined with other classes of anticoagulants.

4.2 Unfractionated IV and SC heparin

- For patients who have had more than 4 days of heparin therapy, a platelet count should be done prior to removal of an epidural catheter to identify heparin-induced thrombocytopenia
- Intraoperative anticoagulation with IV heparin should start no sooner than 1 hour after placement of the epidural or spinal needle.
- Epidural catheters should be removed 6 hours after the last heparin dose or following an evaluation of the patient's coagulation status.

4.3 Low molecular weight heparin (LMWH)

- Epidural catheter placement should occur at least 12 hours after standard prophylactic LMWH doses or 24 hours after standard treatment dose of LMWH.
- LMWH for prophylaxis should be prescribed as a single daily dose and administered in the evening (e.g., at 1800hrs) to allow safe "time window" for removal of neuraxial catheter during daytime.
- **Therapeutic/treatment** doses of LMWH or other anticoagulants should be given under the specific and written guidance of the medical team consultant, in consultation with the anaesthesia department.
- The epidural catheter should be removed (at least) **12** hours after the last **prophylactic** dose of LMWH
- The epidural catheter should be removed (at least) **24** hours after the last **treatment** dose of LMWH.

ANTICOAGULANT	Brand Name	Time between last dose and insertion of neuraxial catheter	When to dose after INSERTION	When to REMOVE Catheter	When to Dose after REMOVAL of catheter
Low Molecular Weight Heparin	Clexane/Fragmin ***(prophylaxis)***	12 hours	24 hours	12 hours after last dose	4 hours after removal
Low Molecular Weight Heparin	Clexane/Fragmin ***(treatment)***	24 hours	Not recommended	24 hours after last dose	4 hours after removal

- **Consider surgical context and traumatic epidural insertion**.

4.4 Antiplatelet and Novel Oral Anticoagulants (NOAC) medications (assuming normal renal function)

The interval between cessation of the agent and insertion of the epidural is:

- 8 hours for eptifibatide and tirofiban
- 48 hours for rivaroxaban and abciximа
- 7 days for clopidogrel
- 14 days for ticlopidine

- **Note that the safe interval may change in patients with impaired renal function and or other comorbid disorders of coagulation**

4.5 Oral anticoagulants (Warfarin)

- Established warfarin therapy should be discontinued at least 4–5 days prior to neuraxial blockade and the International Normalised Ratio (INR) measured.
- Preoperative initiation of warfarin therapy requires an INR check prior to neuraxial blockade
- An INR ≤ 1.4 is a value estimated to be safe for removal of epidural catheter

4.6 Fibrinolysis and thrombolysis

- Insertion of epidural catheters in patients receiving fibrinolytic or thrombolytic therapy is contraindicated except in exceptional circumstances

Appendix 3 – DOSING SCHEDULES

5.1 Birth Unit

Lumbar Epidural for Labour Pain (Via CADD Solis PUMP)

Solution	PIEB Dose	PIEB Lockout Interval	PIEB Delay to first Dose	PCEA Bolus	PCEA bolus Lockout	Total Hourly Limit
Ropivacaine 250mg (**0.1%**) plus Fentanyl 500 mcg (2mcg/mL) in 0.9% sodium chloride 250mL (Premix)	10mL	60 minutes	30 minutes	5mL	10 minutes	30mL

5.2 Cervical Brachytherapy Procedure

Lumbar Epidural PIEB-PCEA (Via dedicated epidural pump)

Solution	PIEB Dose	PIEB Lockout Interval	PIEB Delay to first Dose	PCEA Bolus	PCEA bolus Lockout	Total Hourly Limit
Ropivacaine 220mg (**0.2%**) and Fentanyl 220 mcg (2mcg/mL) in 0.9% sodium chloride 110mL (Premix)	5-10mL	60 minutes	Nil	4ml	30 minutes	18mL

Solution	PIEB Dose	PIEB Lockout Interval	PIEB Delay to first Dose	PCEA Bolus	PCEA bolus Lockout	Total Hourly Limit
Ropivacaine 250mg (**0.1%**) plus Fentanyl 500 mcg (2mcg/mL) in 0.9% sodium chloride 250mL (Premix)	10mL	60 minutes	Nil	5mL	15 minutes	25mL

See RHWGUID002- Clinical Guideline for complete Brachytherapy analgesia

5.3 Post Operative Analgesia

Lumbar Epidural – PIEB/PCEA (Via dedicated epidural pump)

Solution	PIEB Dose	PIEB Lockout Interval	PIEB Delay to first Dose	PCEA Bolus	PCEA bolus Lockout	Total Hourly Limit
Ropivacaine 250mg (**0.1%**) plus Fentanyl 500 mcg (2mcg/mL) in 0.9% sodium chloride 250ml (Premix)	5-10mL	60 minutes	Nil	5mL	15 minutes	30mL

Lumbar Epidural – Continuous Infusion (Via dedicated epidural pump)

Solution	Infusion Rate	Rescue Bolus Dose	Rescue Bolus Dose Minimal Interval	Hourly Limit
Ropivacaine 250mg (**0.1%**) plus Fentanyl 500 mcg (2mcg/mL) in 0.9% sodium chloride 250mL (Premix)	4 – 14 mL per Hour	10 mL	N/A	24mL

Thoracic Epidural – PIEB/PCEA (Via dedicated epidural pump)

Solution	PIEB Dose	PIEB Lockout Interval	PIEB Delay to first Dose	PCEA Bolus	PCEA bolus Lockout	Total Hourly Limit
Ropivacaine 250mg (**0.1%**) plus Fentanyl 500 mcg (2mcg/mL) in 0.9% sodium chloride 250mL (Premix)	3-5 mL	30 minutes	Nil	3-5mL	15 minutes	30mL

APPENDIX 4: Management of Epidural Complications

On the NSW Health Epidural Analgesia (Adult) chart (SMR130.022) and the NSW Health Obstetric Epidural Analgesia Chart (SMR130.027) observations for sedation, respiratory rate, blood pressure, heart rate and motor blockade are colour coded to provide an alert for a Yellow zone (Clinical Review) or Red zone (Rapid Response or Code Blue).

4.1 Respiratory Depression/Over Sedation

Concurrent use of parenteral opioids and sedatives increase the risk of respiratory depression. No other opioids or sedatives should be prescribed unless ordered by Anaesthetist or APS.

If respiratory rate < 10 and / or increasing sedation (Sedation score 2)

- Stop infusion
- Ensure oxygen therapy in progress and support airway if necessary
- Encourage patient to breathe deeply
- Activate a Clinical review
- Contact Anaesthetist or APS

If respiratory rate < 5 or patient is unrousable (Sedation score 3):

- Stop infusion
- Give oxygen at 15 Litre/minute and support airway if necessary
- Activate a Code Blue
- Administer IV Naloxone.

4.2 Hypotension

Sympathetic blockade may lead to hypotension. With low concentrations of anaesthetic drugs used for epidural infusions, hypotension may be the result of hypovolemia rather than the epidural infusion. Other causes of hypotension must always be investigated such as bleeding, sepsis, myocardial insufficiency, pulmonary embolus and dehydration.

If systolic BP is <90mmHg or as adjusted on the Alterations to Calling Criteria on the Electronic Observation Chart (BTF) via eMR.

- Stop epidural infusion
- Activate a Rapid Response
- Lie patient flat.
- Consider IV fluid bolus (must be ordered by a doctor)
- Consider vasopressor (must be ordered by a doctor)
- Contact Anaesthetist or APS

4.3 Bradycardia

If woman's heart rate is <40BPM or as adjusted on the Alterations to Calling Criteria on the Electronic Observation Chart (BTF) via eMR.

- Stop epidural infusion
- Activate a Rapid Response
- Atropine must be available in the clinical area
- Contact Anaesthetist or APS

4.4 Fetal Bradycardia

- Manage as per CERS escalation

4.5 Motor Block

- If Motor Block (Bromage Score) is 1, 2 or 3, **DO NOT** ambulate.
- Contact Anaesthetist or APS if Bromage score is 2 or 3.
- Observe for signs of spinal cord compression: Back pain, increasing motor block, bladder or bowel incontinence, numbness or tingling in lower limbs
- Contact Anaesthetist **urgently** if there are any signs of spinal cord compression
- Motor Block is a sign of possible intrathecal epidural catheter

4.6 High block

- A sensory block is considered as high in a laboring woman if higher than the T6 dermatome.
- In postoperative patients the defined high level varies. Any sensory level higher than T4 should be considered as high, unless advised otherwise by the procedural anaesthetist.
- In postoperative patients, if higher than defined upper level, remove the PCEA button/cease infusion and activate clinical review.
- In labour, if block higher than T6, remove the PCEA button and activate clinical review.
- In any patient, if block higher than T4, activate Rapid Response.
- Give supplemental oxygen if needed
- Call Anaesthetist or APS
- Check Sensory block every 30 minutes until below the defined high level.

4.7 Inadequate analgesia

- Check connections
- Call APS/anaesthetist to advise and confirm management
- If block is present on only one side of patient's body and is not providing adequate analgesia, assist patient to roll so that the unaffected side is down to allow gravity filtration of local anaesthetic.
- Patient may require a rescue bolus as prescribed or a PCEA dose or a manual bolus from an Anaesthetist.

- Reassess in 15-30 minutes to determine effectiveness of intervention
- If no improvement/unable to roll patient call Anaesthetist or APS

4.8 Nausea and Vomiting

- Administer PRN antiemetics as prescribed on the patient's Medication Administration Record (MAR) via Electronic Medical Record system (eMR)
- If adverse effects continue, contact APS.

4.9 Urinary Retention

- Perform bladder scan to determine extent of retention
- Contact patient's primary care team for assessment ± Catheterisation

4.10 Pruritus

- Notify Anaesthetist or APS
- Consider low dose naloxone
- Avoid sedating antihistamines

4.11 Inadvertent Epidural Catheter Disconnection

- If catheter is disconnected at the filter, DO NOT reconnect
- Stop the infusion
- Cover the catheter end with sterile cap or sterile gauze.
- Contact Anaesthetist or APS

4.12 Epidural Dressing Detaching / Lifting

- Reinforce only if catheter insertion site is not exposed / do not change dressing routinely (use only vapour permeable dressings)
- If insertion site exposed contact Anaesthetist or APS

4.13 Leaking at the site

- If integrity of current dressing is compromised, clean and apply occlusive dressing over top of existing dressing. Do not try to remove dressing without APS or Anaesthetist review as catheter may inadvertently be removed.
- Assess effectiveness of epidural – if inadequate block, epidural may have dislodged and may need to be removed.
- If excessive bleeding, observe for signs of epidural haematoma. Epidural may need to be removed.

4.14 Air in administration line

- Pause infusion and clamp line.
- Disconnect set at connection port in filter using aseptic technique.
- Two registered nurses/registered midwives with epidural competency will be required.
- Flush catheter using priming option into tray to remove bubble then reconnect using aseptic technique.
- Avoid delays in recommencement of infusion regimen. If epidural has been paused for a prolonged period (i.e. close to/over an hour), administer a rescue bolus as prescribed or

educate patient regarding use of PCEA.

4.15 Post Dural Puncture Headache

- If the dura is inadvertently punctured during epidural insertion, leakage of cerebrospinal fluid (CSF) may occur. The decrease in CSF pressure can cause traction on the meningeal vessels and nerves.
- Signs and symptoms include headache (bifrontal or occipital), usually postural (exacerbated when patient is in an upright position and improved when lying flat)
- Contact APS or Anaesthetist
- Simple management includes lying flat, bed rest, analgesia (simple or opioid), increased fluid intake (unless contraindicated) +/- caffeine.
- In some cases, Transnasal Sphenopalatine Ganglion Block may help with symptomatic management.
- Patients may require an Epidural Blood Patch.
- If patient has had an Epidural Blood Patch they must be supplied with “Patient Discharge Instructions after Epidural Blood Patch” (Appendix 8)

4.16 Epidural Haematoma

- The puncture of epidural blood vessels during catheter insertion or removal may result in the formation of an epidural haematoma particularly in the presence of coagulopathy

Signs & Symptoms:

- back pain
- lower limb weakness and/or numbness (Increasing motor block)
- bowel or bladder dysfunction
- Patient requires **immediate neurological assessment** / may need urgent MRI / urgent surgical decompression if neurological changes develop due to nerve or spinal cord compression

4.17 Epidural Space Infection

- May be prevented by using strict aseptic technique during insertion, preparation, and administration of solutions. Always connect epidural line to a bacterial filter, ensure all connections are locked and maintain an occlusive dressing over insertion site.
- If patient has temperature spikes > 38.5, notify APS and consider removal of epidural catheter.
- If signs of inflammation/infection at insertion site, notify APS and consider removal of epidural catheter.
- The presence of severe or increasing back pain, may indicate epidural space infection and should be investigated promptly (even in the absence of fever)
- As epidural space infection can present up to 6 weeks post epidural catheter removal, patients should be educated re signs and symptoms.

4.18 Neurological Injury

- Direct damage to the spinal cord or peripheral nerves due to the epidural needle or catheter is extremely rare.
- Signs and symptoms may include weakness, numbness, tingling sensation in lower limbs, bowel or bladder incontinence. *(Usually evident once the block has worn off)*
- Stop infusion, call APS/medical team for immediate urgent neurological assessment.
- Refer to RHW CBR "Neurological Deficit Postpartum - Diagnosis and Management" 2020.

4.19 Catheter Migration

- Rarely a catheter placed in the epidural space may migrate into the intrathecal space or an epidural blood vessel
- Catheter migration into the intrathecal space will usually result in a rapidly increasing block with a sudden onset of complications.
- Catheter migration into a blood vessel will usually result in increasing pain, +/- signs of local anaesthetic toxicity such as perioral numbness, tinnitus, dizziness, facial twitching, and seizures
- Stop infusion
- Activate Clinical Response or Rapid Response according to symptoms of complications.
- Anticipate catheter removal or replacement
- Refer to RHW CBR "Intralipid – Management and Treatment of Severe Local Anaesthetic Toxicity (Adults Only)"