EPIDURAL ANALGESIA PROGRAMMED INTERMITTENT EPIDURAL BOLUS (PIEB) AND PATIENT CONTROLLED EPIDURAL ANALGESIA (PCEA) – DELIVERY SUITE

This LOP is developed to guide clinical practice at the Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this LOP.

1. AIM

- Effective management of labour pain using a pre-set dose plus a self-administered bolus of local anaesthetic and opiate solution into the epidural space.

2. PATIENT

- Woman in labour with an epidural

3. STAFF

- Medical and Midwifery Staff

4. EQUIPMENT

- Dedicated epidural pump configured to PIEB and PCEA standard orders (Appendix 1)
- Compatible giving set and lock box

5. CLINICAL PRACTICE

- Ensure the prescription for the infusion has been completed by the anaesthetic medical officer (MO) using the NSW Health Obstetric Epidural Analgesia Chart.
- Order the PIEB medication in mL per hour and PCEA medication in mL per bolus as per Appendix 1.
- Label the infusion bag with a yellow epidural sticker including the woman's name, and place a yellow line label on the epidural line. This must be checked by second midwife and/or MO
- Ensure the following are correct:
    - PIEB or PCEA program against the medical orders
    - PIEB or PCEA infusion solution against the medical orders including the signature, date and time commenced
    - Only the yellow epidural infusion set is connected to the epidural filter
    - The infusion record must be completed by the two midwives or MOs loading the bags for each infusion
- Give the woman patient information leaflet "Epidural Pain Relief (IMaternity)" Appendix 2.
- Explain to the woman:
    - That she is the only person to press PCEA button
    - How long it will be used for
    - How to use it
    - The need for ongoing observations
- Co-load (during epidural insertion/initial dose) the women with 500mL of intravenous (IV) Hartmann's solution.
- Ensure that the woman maintains a patent IV cannula with which to manage any side effects of the PIEB or PCEA therapy. This should be achieved by providing IV continuous fluids of 100mL per hour for the duration of the epidural.
- Commence continuous electronic fetal heart rate monitoring
- Perform observations as per Appendix 3 and document on the NSW Health Obstetric Epidural Analgesia Chart
- Refer to Appendix 4 for problem solving
- Maintain a patent cannula for four hours after the removal of the epidural catheter

6. DOCUMENTATION

- NSW Heath Obstetric Epidural Analgesia Chart
- Partogram
- Medical record
- Epidural sticker and line labels
- Fluid balance chart

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7. EDUCATIONAL NOTES

- The objective of PIEB and PCEA is that the woman receives programmed intermittent boluses with the option of PCEA if analgesic requirements are not met
- A computerised delivery device is pre-set to deliver programmed doses with an additional prescribed bolus whenever the woman presses the PCEA button, within a set lockout period
- A woman who has limited comprehension may not be suitable for this epidural option
- It is important that pre-set values not be adjusted without anaesthetic consultation and only staff familiar with the delivery device make any changes

8. RELATED POLICIES / PROCEDURES / CLINICAL PRACTICE LOP

- Epidural analgesia – continuous infusion adult (non-maternity)
- Neuraxial (intrathecal and/or epidural) opioid – single dose morphine only
- Medication: administration
- Intrapartum fetal heart rate monitoring
- Labelling of injectable medicines fluids and lines
- Accreditation of staff to give drugs in specific units
- Naloxone - Treatment of opioid induced over-sedation, respiratory depression, pruritis and nausea

9. RISK RATING

- High

10. NATIONAL STANDARD

- Standard 5 – Comprehensive Care

11. REFERENCES

1 Intermittent vs continuous administration of epidural ropivacaine with fentanyl for analgesia during labour. P.D.W Fettes et al. British Journal of Anaesthesia 97 (3) 359-64 (2006)

2 Programmed intermittent epidural bolus versus continuous epidural infusion for labour analgesia: the effects on maternal motor function and labour outcome. A randomized double-blind study in nulliparous women. Capogna G, Camorcia M, Stirparo S, Farcomeni A. Anesth Analg. 2011 Oct;113(4):826-31.

3 A randomized comparison of programmed intermittent epidural bolus with continuous epidural infusion for labor analgesia. Wong, Ratliff JT, Sullivan JT, Scavone BM, Toledo P, McCarthy RJ. Anesth Analg. 2006 Mar;102(3):904-9

REVISION & APPROVAL HISTORY

Addition of Appendix 2 July 2019
Reviewed and endorsed Maternity Services LOPs 8/3/19
Minor amendment March 2016
Approved Quality & patient Safety Committee 21/5/15
Approved Quality & patient Safety Committee 20/9/12
Previous title : *Epidural Analgesia Patient Controlled – Delivery Suite*
Endorsed Maternity Services Division LOPs group 11/9/12

FOR REVIEW : FEBRUARY 2021

…./Appendices

STANDARD ORDERS – DOSE PIEB/PCEA

SOLUTION	PIEB DOSE	PIEB LOCKOUT INTERVAL	PIEB DELAY TO FIRST DOSE	PCEA BOLUS	PCEA BOLUS LOCKOUT	PIEB + PCEA HOURLY LIMIT
ropivacaine 0.1% with fentanyl (2mcg per mL) in 250mL sodium chloride (Premix)	10mL/hr	60 minutes	30 minutes	5mL	10 minutes	25mL

APPENDIX 2

Epidural Pain Relief (Maternity)

Even if an epidural is not part of your birth plan, it is worthwhile learning some facts about this method of pain relief.

What is an epidural?

An epidural is an injection of local anaesthetic or pain-relieving drugs (or both) into the lower back to block the nerves that come from the uterus and the surrounding muscles. These are the source of the pain felt during contractions in labour. Other methods of pain relief include spinal or combined spinal/epidural which are more often used for caesarean section.

An anaesthetist:

An anaesthetist will insert your epidural. An anaesthetist is a medical doctor who requires an additional 5-7 years of post-graduate training and exams to qualify as a "specialist anaesthetist". The RHW has both specialist anaesthetists and anaesthetists-in-training, known as registrars. You may choose to have the anaesthetic specialist attend to you, this however, will incur an additional cost.

Insertion of an epidural:

You will be asked to sit up or lie on your side. An intravenous "drip" will be inserted into your arm which is necessary for hydration. The anaesthetist will explain the procedure to you. A small amount of local anaesthetic is injected under the skin on your lower back, then the epidural catheter is inserted into the lower back via a needle. The needle is then removed and the epidural catheter is left in the lower back and is taped to your back. It is important to keep still at all times during the insertion. Once the epidural catheter is in place and local anaesthetic solution is injected, pain relief usually takes approximately 15 minutes, sometimes longer. The epidural catheter remains in place throughout the labour. The insertion success rate should be over 90%. In the event that the epidural is not working, and you continue to feel uncomfortable, the first epidural catheter may need to be removed and a second epidural catheter will be inserted.

Potential complications:

Minor

- A decrease in blood pressure which can be treated with intravenous fluids
- Legs may feel heavy, weak and numb. This means you will have to remain in bed following insertion of the epidural and until you have gained full feeling in your legs
- You will require a bladder catheter as you will find it difficult to pass urine
- Shivering
- Itching
- Backache – for a day or two afterwards due to the bruising from the needle. There is no association with long-term back pain and epidurals.

Serious

- Headache – this may be seen in about 1 in 100 women with an epidural following an accidental dural puncture (puncture of sac of fluid around the spinal cord). Approximately 80% of these women will have a headache within 1 day to 1 week if they have suffered a dural puncture.

 “Spinal block” resulting in a fall in blood pressure, a decreased level of consciousness and difficulty breathing may be seen. To avoid this the anaesthetist will give a test dose to ensure the epidural catheter is in the right position

 Nerve damage – affects 1 in 3,000 mothers (with or without an epidural) with temporary nerve damage after childbirth resulting in some leg weakness and/or a patch of numbness. Virtually all of these cases heal spontaneously within 4-5 weeks. Permanent nerve damage is rare.

 Abscess/Haematoma – is a collection of pus or blood in the epidural space that can cause nerve damage. This is very rare affecting about one in 100,000 women

 Paraplegia – the incidence of paraplegia in modern practice is now very rare and is less than 1 in a million

What is the effect of an epidural on the progress and outcome of labour?
Many studies have looked at this question. Epidurals do not increase the need for caesarean section.
Epidurals may be associated with a lengthening of both the first or second (pushing) stage of labour (by minutes). Epidurals may be associated with an increase in the need for an assisted birth with either vacuum cup or forceps. Epidurals early in labour do not appear to prolong labour any more than one placed later.
Epidural effects on the baby:
A complication free epidural should have no effect on the baby. The midwives in attendance will monitor your blood pressure and your baby’s heart rate closely.
TALK TO AN ANAESTHETIST AND ASK QUESTIONS
You may write down any questions you have at the end of this page.
I _____ have read this information and I understand what an epidural entails.
Please note: Signing this form does not make an epidural compulsory nor will one be performed on you in labour without your agreement.
SIGNATURE _____

OBSERVATIONS REQUIRED WITH PIEB/PCEA

TIME OF OBSERVATIONS	OBSERVATIONS
After initial bolus given by anaesthetic MO on insertion **and after any clinician bolus**	Record blood pressure (BP) and heart rate (HR) • 5 minutely for 20 minutes • then at 30 minutes • then every 30 minutes provided the woman is stable
Hourly	• Record number of PIEB doses • Record number of PCEA boluses • Record number of clinician boluses delivered • Record cumulative dose in mL
Hourly for two hours after insertion then two hourly unless there is: - a change in program - increasing pain - hypotension (a drop in systolic BP greater than 15mmHg)	• Height of block (dermatome level) • Motor block (Bromage scale) • Respiratory rate (RR) • Sedation score • Oxygen (O^2) saturation
Each shift clinician to check	• Epidural insertion site and dressing • Epidural filter • PIEB/PCEA infusion lines • PIEB/PCEA program against the orders (two clinicians to sign)
If any of the following occur: • Fetal bradycardia • Hypotension • Poor analgesia • Change in infusion or bolus	• Follow PACE, escalation and delivery suite protocols • Increase the frequency of observations for BP, HR, Height of block, 0^2 saturations as per initial bolus observations

APPENDIX 4

PROBLEM SOLVING FOR PIEB/PCEA

Inadequate analgesia	**Education:** Repeat education. Identify poor comprehension by excessive attempts versus successful delivery of PCEA doses **Bolus dose:** Any woman requiring three bolus doses per hour for more than two hours requires review by the anaesthetic team. An increase in the bolus dose must be done cautiously and the lockout period reviewed. If woman is distressed with breakthrough pain, please contact anaesthetic MO.
High block > T4	• Call PACE Tier 2 • Give the woman supplemental oxygen • Remove the PCEA button from the woman • Pause PIEB/PCEA pump until medical review • Sit the woman up • Check the height of the block every 30 minutes • Follow the revised management plan from the anaesthetic team
High block > T7 with inadequate analgesia	• Remove the PCEA button from the woman • Call anaesthetic team for review within 30 minutes • Pause PIEB/PCEA pump until anaesthetic medical review
Increased Sedation	**Sedation Score 2 (Constantly drowsy, unable to stay awake)** • Cease administration of all opioids. • Give oxygen • Check respiratory rate frequently • **Observations in YELLOW ZONE - Activate a PACE Tier 1** **Sedation Score 3 (Difficult to rouse)** • Cease administration of all opioids • Give oxygen • Check respiratory rate • **Observations in RED ZONE - Activate a PACE Tier 2** • Give naloxone as prescribed OR as per naloxone LOP **Sedation Score 3 (Unresponsive)** • Cease administration of all opioids • Give oxygen • Check respiratory rate • **Observations in RED ZONE - Activate a CODE BLUE** • Give naloxone as prescribed OR as per naloxone LOP
Respiratory Depression	**If RR is between 6-10 respirations per minute (rpm)** • Cease administration of all opioids. • Give oxygen via mask and support airway if necessary • Assess sedation level and if possible encourage woman to breathe deeply • **Observations in YELLOW ZONE - Activate a PACE Tier 1** **If RR ≤ 5 rpm** • Cease administration of all opioids including PCA • Give oxygen at 10L/min via Hudson mask and support airway if necessary • **Observations in RED ZONE - Activate a PACE Tier 2/CODE BLUE** Give naloxone as prescribed OR as per naloxone LOP
Hypotension (systolic BP <85mmHg)	• Call PACE Tier 2 • Remove the PCEA button from the woman • Pause PIEB/PCEA pump until anaesthetic review
Poor comprehension	In general, a woman with limited comprehension is less suited to PCEA analgesia.