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
   • 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:
     o PIEB or PCEA program against the medical orders
     o PIEB or PCEA infusion solution against the medical orders including the signature, date and time commenced
     o Only the yellow epidural infusion set is connected to the epidural filter
     o The infusion record must be completed by the two midwives or MOs loading the bags for each infusion
   • Explain to the woman:
     o That she is the only person to press PCEA button
     o How long it will be used for
     o How to use it
     o 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 2 and document on the NSW Health Obstetric Epidural Analgesia Chart
   • Refer to Appendix 3 for problem solving
   • Maintain a patent cannula for four hours after the removal of the epidural catheter

6. DOCUMENTATION
   • NSW Health Obstetric Epidural Analgesia Chart
   • Partogram
   • Medical record
   • Epidural sticker and line labels
   • Fluid balance chart
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**


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**REVISION & APPROVAL HISTORY**

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
**APPENDIX 1**

**STANDARD ORDERS – DOSE PIEB/PCEA**

<table>
<thead>
<tr>
<th>SOLUTION</th>
<th>PIEB Dose</th>
<th>PIEB Lockout Interval</th>
<th>PIEB Delay to First Dose</th>
<th>PCEA Bolus</th>
<th>PCEA Bolus Lockout</th>
<th>PIEB + PCEA Hourly Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ropivacaine 0.1% with fentanyl (2mcg per mL) in 250mL sodium chloride (Premix)</td>
<td>10mL/hr</td>
<td>60 minutes</td>
<td>30 minutes</td>
<td>5mL</td>
<td>10 minutes</td>
<td>25mL</td>
</tr>
</tbody>
</table>

**APPENDIX 2**

**OBSERVATIONS REQUIRED WITH PIEB/PCEA**

<table>
<thead>
<tr>
<th>TIME OF OBSERVATIONS</th>
<th>OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>After initial bolus given by anaesthetic MO on insertion and after any clinician bolus</strong></td>
<td>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</td>
</tr>
<tr>
<td><strong>Hourly</strong></td>
<td>• Record number of PIEB doses • Record number of PCEA boluses • Record number of clinician boluses delivered • Record cumulative dose in mL</td>
</tr>
<tr>
<td><strong>Hourly for two hours after insertion then two hourly unless there is:</strong> - a change in program - increasing pain - hypotension (a drop in systolic BP greater than 15mmHg)</td>
<td>• Height of block (dermatome level) • Motor block (Bromage scale) • Respiratory rate (RR) • Sedation score • Oxygen (O²) saturation</td>
</tr>
<tr>
<td><strong>Each shift clinician to check</strong></td>
<td>• Epidural insertion site and dressing • Epidural filter • PIEB/PCEA infusion lines • PIEB/PCEA program against the orders (two clinicians to sign)</td>
</tr>
<tr>
<td><strong>If any of the following occur:</strong> - Fetal bradycardia - Hypotension - Poor analgesia - Change in infusion or bolus</td>
<td>• Follow PACE, escalation and delivery suite protocols • Increase the frequency of observations for BP, HR, Height of block, O² saturations as per initial bolus observations</td>
</tr>
</tbody>
</table>
### APPENDIX 3

#### PROBLEM SOLVING FOR PIBE/PCEA

<table>
<thead>
<tr>
<th>Inadequate analgesia</th>
<th><strong>Education:</strong> Repeat education. Identify poor comprehension by excessive attempts versus successful delivery of PCEA doses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Bolus dose:</strong> 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.</td>
</tr>
</tbody>
</table>

| 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 \( \leq 5 \) 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. |