Management of Epidural Analgesia in Labour - Full Clinical Guideline

Reference No: IP/07:23/E4

Contents

1. Introduction

The aim of epidural analgesia in labour is to help mothers cope with pain relief during labour and minimise motor block during labour and delivery. It is often given on maternal request, but may also be medically indicated in some women in order to reduce risk of morbidity / mortality. However, it also has the potential for harm and must be administered and maintained with care, by appropriately trained staff.

2. Purpose and Outcomes

To give guidance to midwifery staff, when caring for women receiving epidural analgesia in labour. To ensure consistency of care for women receiving epidural analgesia and to ensure that their care is managed according to their individual needs

3. Abbreviations

BMI	-	Body Mass Index in kg/m2
BP	-	Blood Pressure
CSF	-	Cerebrospinal Fluid
CTG	-	Cardiotocograph
HR	-	Heart Rate
LMWH	-	Low Molecular Weight Heparin
PIEB	-	Programmed Intermittent Epidural Bolus
PCEA	-	Patient Controlled Epidural Analgesia
LD	-	Loading Dose
CB	-	Clinician Bolus
PB	-	Patient Bolus
AB	-	Autobolus

4. Definitions Used

Analgesia – pain relief – suitable for labour pains
Anaesthesia (or regional anaesthesia) – absence of almost all sensation – suitable for awake surgery
Intrathecal / subarachnoid injection – an injection into the cerebrospinal fluid, commonly called a 'spinal' injection
Intravascular injection – an injection of drug into a vein / artery
Subdural injection – an injection into the layer between the epidural space and duramater, and the arachnoidmater and cerebrospinal fluid.

5. Key Responsibilities / Duties

Anaesthetist – gains consent from patient, sites epidural and gives Test Dose (TD) and Loading dose(LD), confirms satisfactory placement, sets up pump with the relevant protocol, records the procedure, 'troubleshoots' problematic epidurals, gives top ups for theatre
Midwife – informs anaesthetist of the request, and hands over details about the patient, assembles required equipment, assists anaesthetist during insertion, provides 1 to 1 care monitoring mother and fetal wellbeing as per guidelines, calls anaesthetist if any problem arise. Maintains competencies in looking after epidurals.
Obstetrician – attends if requested to assess fetal condition.

6. Epidural Agent

The epidural mixture of choice within the Trust is bupivacaine 0.1% and fentanyl 2micrograms/ml. This low dose mixture of local anaesthetic and opioid gives good pain relief and minimises motor block, allowing greater mobility during labour. This effect is greater using the Programmed Intermittent Epidural Bolus and Patient Controlled Epidural Bolus (PIEB & PCEA) pump protocol than the Continuous Infusion protocol.

6.1 Indications for epidural analgesia

- Maternal request for pain relief
- Maternal medical conditions, e.g. cardiac disease
- Obstetric conditions e.g. pre-eclampsia, need for analgesia for procedures such as fetal blood sampling
- Anaesthetic concerns, such as a woman who looks difficult to intubate, BMI >35, family history of malignant hyperthermia (epidural anaesthesia could be used instead of general anaesthesia for operative delivery).

6.2 Contraindications

- Maternal refusal
- Inability to provide appropriate midwifery support to monitor the woman
- Local sepsis (on the lower back), or systemic sepsis (chorioamnionitis on antibiotic treatment relative contraindication)
- Bleeding tendency – either a longstanding coagulation disorder, low platelets associated with pre-eclampsia, (if 80-100 or rapid fall, discuss with a Consultant Anaesthetist), or a patient being treated with heparin (see section on thromboprophylaxis in section 7.11)
- Some types of previous spinal surgery, or anatomical abnormality
- Uncorrected hypovolaemia
- Allergy to local anaesthetic

6.3 Information for women

Ensure that women receive the leaflet “Pain Relief in Labour” about choices of pain relief. Where relevant the leaflet should be given antenatally, if not then they should receive it at an early stage in labour. It is available in other languages by downloading from www.labourpains.com

Before choosing epidural analgesia, women should be informed by the anaesthetist about the risks and benefits and implications for their labour:

- It is not associated with a longer first stage of labour
- It is not associated with an increased caesarean section rate
- It is associated with a longer second stage of labour
- It is associated with an increased rate of vaginal instrumental delivery.

7. Safe Practise of Epidural Analgesia in Labour

7.1 Siting the epidural catheter – actions by midwife

- A trained midwife must be available and responsible for the on-going safe care of a woman who has epidural analgesia.
- Progress should be assessed if there is the impression that the situation has changed significantly, to ensure that the woman is not in transition or fully dilated. The choice of analgesia may then need to be reviewed.
- If the woman has pre-eclampsia, ensure the full blood count results from the last 6 hours are available. Pre-epidural clotting studies are only indicated in pre-eclampsia if the platelet

count is <100, if it is falling rapidly (even if still above 100), or if the woman has severe or fulminating pre-eclampsia.
- Consider changing the patient into a gown.
- Ask patient whether she needs to empty her bladder before calling the anaesthetist.
- Check with the coordinating midwife that she has adequate midwifery staffing for your patient to have an epidural just now, and that it is appropriate to call the anaesthetist for your patient just at that moment. If the obstetric anaesthetist is busy with another patient, and expecting to be unavailable for the next 30 minutes, check with them first, and then call the 'SR' (Registrar) anaesthetist (out of hours), explaining clearly the nature of the request. They may be free to come and help.
- Have a fully-stocked epidural trolley ready in room.
- Obtain an epidural infusion bag **plus** 1 or 2 (depending on anaesthetist's preference) 10ml ampoules of 0.1% bupivacaine + 2 mcg/ml fentanyl from the CD cupboard.
- Record the maternal blood pressure, heart rate, respiratory rate and fetal heart rate on the PIEB and PCEA Delivery Chart, before the epidural is started.
- Explain to the woman the optimal position (back flexed), and determine whether the anaesthetist wants the woman sitting, or in the left lateral position.
- A 16g cannula should be inserted and connected to an intravenous (IV) infusion of 1 litre crystalloid (remember to attach a 2 port connection at the end of the giving set to allow a separate infusion). Have IV cannulation sticker available to insert in the documentation record. If there is no IV cannula, the anaesthetist will do this as part of siting the epidural.
- Ensure awareness of the location of resuscitation equipment and working suction in the room.
- RDH guidelines state that if there is a pre-existing indication for CTG then it should be continued and of adequate quality throughout siting the epidural. Consideration needs to be given to applying a fetal scalp electrode (FSE) if necessary. In women with no prior indication for CTG it should be started once the epidural is sited.

7.2 Setting up of the epidural

- The anaesthetist will direct the positioning of the mother, usually sitting or left lateral position. The left lateral position is preferred if the maternal blood pressure drops or adverse changes on the fetal electronic heart monitor are noted.

The following items are required:

- A stool for the mother and/or anaesthetist.
- Sterile gown pack and sterile gloves.
- NR Fit Epidural pack.
- Appropriate fixation devices/glue and dressings.
- Chlorhexidine 0.5% in alcohol solution with tint, 3ml applicator (Chloraprep with Tint)
- Normal Saline 10ml-20ml.
- Lidocaine 1% 5mls
- 0.1% bupivacaine + 2 mcg/ml fentanyl ampoules 10ml x 1 or 2
- Epidural Bag 240ml mixture of 0.1% bupivacaine and fentanyl 2mcg/ml.
- CME epidural pump

- During insertion of the epidural the midwife or partner may need to stabilise and support the woman as appropriate. The woman may become drowsy if using Entonox for analgesia and may slump forward if sitting. If the midwife needs to continuously hold the CTG electrodes, she ought to seek help from the ODP to assist the anaesthetist.
- The anaesthetist may also want four lengths of Mefix dressing.

- Once sited: apply Mefix tape around a rectangular transparent dressing (if the anaesthetist wishes) and up the back when catheter sited. The epidural catheter should pass over the opposite shoulder to the arm in which the IV cannula is sited.
- A yellow Epidural label should be attached to the epidural catheter by the anaesthetist. A pink Epidural label should be attached to the yellow epidural giving set.

8. Instructions for Use of PIEB & PCEA following Epidural Insertion:

8.1 Anaesthetist

- The prescription, the patient's name, hospital identification number and route of administration should be checked by the anaesthetist and the midwife and countersigned on the PIEB + PCEA observation chart.

- After aspirating the catheter to check for cerebrospinal fluid (CSF) or blood, the anaesthetist will administer the epidural **test** dose consisting of 10ml of 0.1% bupivacaine with 2mcg/ml fentanyl from the ampoule. After 5 mins they will then administer the **loading** dose – this may be the 10mls from the second 0.1% bupivacaine with 2mcg/ml fentanyl ampoule, or they may use the first 7ml autobolus direct from the pump. Both doses are to be considered as 'test doses', since the catheter can migrate into CSF / vein at any time.

- The premixed epidural bag containing 240 ml prepared with 0.1% bupivacaine + 2 mcg/ml fentanyl will then be attached to the epidural pump (if not already done).

8.2 Midwife

- The maternal pulse rate (PR), blood pressure (BP), respiratory rate (RR) are recorded every 5 mins for 20 mins on the PIEB and PCEA delivery chart. The midwife does **NOT** need to record a set of observations after a PCEA bolus.
- The woman must be continually observed by the midwife during this period, watching for any adverse signs. If systolic BP is below 90mmHg, the woman may show symptoms of **hypotension,** or **fetal bradycardia** occurs.
  The following interventions are recommended:

  - The woman should be turned to the left lateral position.
  - Increase the IV fluids
  - Repeat the blood pressure measurement. If still low, call for the anaesthetist.
  - If fetal bradycardia, call the obstetrician.
  - Drugs to manage severe hypotension are available in prefilled syringes (phenylepherine, ephedrine) kept inside plastic cover (one cover should be taken out from the first drawer of the epidural trolley and kept in each room after doing epidural) for the anaesthetist to administer.

- Once established, the height level of the epidural block, pulse rate, blood pressure and respiratory rate should be recorded hourly on the PIEB + PCEA chart.
- The Trust standard Infusion Checklist is to be completed on commencement of the protocol. The Maintenance No. of the Pump must also be recorded
- An **hourly record of total amount delivered** needs to be made on the Infusion Checklist (Press "info" to view the Infusion Summary). The starting volume is recorded by the anaesthetist.
- If the woman complains of pain 30 minutes after the epidural pump is started, encourage her to press the PCEA button on the hand set. It will give an audible bleep if a dose is delivered. If the woman remains in severe pain call the anaesthetist for review and further management.
- The midwife must **NOT** disconnect and give an escape dose using this protocol.

8.3 Care in labour and 2nd Stage

- The risk of aortocaval compression can be reduced by avoiding placing the woman on her back. It is preferable to sit the mother upright, lie her on her side (left is best) or place a wedge/pillow under her right buttock.
- It is recommended to continue epidural analgesia throughout labour and 2nd stage. In line with NICE guidelines the **epidural must not** be allowed to wear off for the 2nd stage in the mistaken belief that the woman will be better able to 'push'.
- Once full dilatation has been confirmed, unless the woman has an urge to push or baby's head is visible, consideration of a passive period should be in accordance with RDH Second Stage Guidelines. A top up may be required in this stage.

8.4 Testing the block

- The woman is very unlikely to feel numb. The block can be tested with ice or ethyl chloride spray. The woman may report that it feels 'cool, but not as cold as it does on my arm', 'warm', or 'nothing'. Most women can also test the block by pinching themselves, first on the arm for comparison, and then on the thigh or lower abdomen. They will still feel normal pinch, but will usually agree that it feels a little different 'like pinching myself through clothing'. A few women are unable to tell the difference by testing themselves with pinch, and have to rely on testing with ice or ethyl chloride.

9. Conversion from Labour Analgesia to Anaesthesia

Procedure	**Levo-bupivacaine**	**Volume**	**Given by**	**Desired block height**
Suturing	0.25%	4+6ml	Anaesthetist	Perineal
Ventouse / lift out in room *topping up an epidural with the woman in the lithotomy position is not recommended.	0.5%	4+6ml	Anaesthetist	Perineal (prefer T10)

10. Accidental Disconnection of Filter from Epidural Catheter

- Occasionally the filter can become detached from the epidural catheter. This breaks the sterility of the system and can allow bacteria to enter the epidural catheter. This could potentially risk an epidural abscess. Prevention is the best strategy. Tape the filter itself to the woman's clothing, so that its weight is not dangling from the catheter.
- If it comes off in your hands, and does not touch anything at all, then call the anaesthetist urgently to decide whether to reopen the connector and reattach it, or re-site the epidural completely. Do not let either the filter or the port on the connector touch anything in the meantime.
- If the filter falls off and touches something, the end can no longer be considered clean. It can only be considered for shortening and reconnection if you saw it fall off, and can vouch for how long it has been disconnected and where it has been. The anaesthetist will clean a segment of catheter near the end with an alcohol wipe, taking great care not to get alcohol on the open end of the catheter. The catheter must be allowed to dry completely, and then cut with sterile scissors. A new filter and connector will then be attached. If there is any

doubt about how long it has been detached, or where it has been (e.g. in the woman's axilla), the catheter should be removed and the epidural re-sited.

11. Mobilisation following Epidural

See appendix A

12. Pressure Areas

All women with a working epidural should be encouraged to move position frequently to reduce the risk of pressure sores. The sacrum and heels are particularly at risk. A Plymouth score chart should be completed

13. Removal of the Epidural Catheter after Delivery

- Epidural analgesia should be continued until after completion of the 3rd stage and any necessary perineal repair. The epidural catheter can be removed once the 3rd stage has been completed, cardiovascular stability confirmed, and there is no evidence of any bleeding. Occasionally the anaesthetist may ask that the epidural catheter is removed later either at a specific time or when requested. Timing of removal is especially important in women who have been receiving or will be requiring low weight molecular heparin for thromboprophylaxis. The anaesthetist should give clear written and verbal instructions.

14. Heparin Thromboprophylaxis

Low molecular weight heparin (LMWH, e.g. enoxaparin)

- prophylactic dose regime:
  - an epidural must not be inserted / removed (or spinal injection given) within 12 hours after a prophylactic dose of LMWH except in unusual clinical circumstances agreed by a Consultant Anaesthetist
  - next dose of LMWH must wait for four hours after epidural catheter insertion or removal (or spinal injection)
- therapeutic dose regime which is planned to stop during delivery
  - an epidural should not be inserted (or spinal injection given) within 24 hours after a therapeutic dose of LMWH except in unusual clinical circumstances agreed by a Consultant Anaesthetist
  - next dose of LMWH must wait for four hours after epidural catheter insertion or removal (or spinal injection)
- therapeutic dose regime which is planned to continue during delivery
  - therapeutic dose LMWH, which is to be continued during delivery is a contraindication to epidural insertion, unless there is an overwhelming clinical reason, agreed by a Consultant Anaesthetist
- standard unfractionated heparin
  - an epidural catheter should not be inserted or removed (or spinal injection given) within 4 hours after a dose
  - next dose must wait for one hour after epidural catheter insertion or removal, or spinal injection

15. Checks Prior to Discharge of a Woman who has Received Epidural Analgesia

- The tip of the epidural catheter should be inspected for the 'blue/black end' to show it is complete. This should be documented, together with the time of removal in the intrapartum record. If removed in the operating theatre after a procedure this should also be recorded.

- The mobility assessment should be done by the midwife caring for the woman and recorded in the intrapartum document. The woman has should then be encouraged to mobilise.
- Document in the observation chart assessment of pressure areas
- Any woman who has any residual numbness or weakness (unable to straight leg raise) 6 hours after the last dose in an epidural or spinal should be referred urgently to the Labour Ward anaesthetist for assessment, rather than awaiting her routine follow up visit the following day.
- Check that she has had the sensation of needing to pass urine, and is able to empty her bladder fully – if there is any doubt check a post void residual volume
- Check whether she has any questions about her epidural.
- Check with the anaesthetist if there is any doubt that the epidural has worn off.
- The above applies to women having a 6-hour discharge as well as women who have had a longer postnatal stay.

16. Serious Complications of Epidural Analgesia

16.1 Local Anaesthetic Toxicity:

The woman should be observed for signs of **local anaesthetic toxicity** which may occur due to inadvertent intravenous injection of test/loading or bolus dose. The woman may complain of odd sensations.

The classical signs and symptoms include:
Central nervous system:

- Tingling around the mouth
- Tinnitus or ringing in the ears
- Rolling of the eyes
- Drowsiness
- Seizures
- Loss of consciousness

Cardiovascular system:

- Tachycardia
- Bradycardia
- Arrhythmias
- Hypotension
- Cardiac arrest

The risk is reduced by using low concentrations of local anaesthetic in our protocols.

If signs and symptoms are observed it is recommended to:

- Inform the anaesthetist / press the emergency buzzer, according to the degree of emergency
- Call for help
- Turn the mother into the left lateral position
- Assess and support airway
- Give oxygen 15 L/min via oxygen mask
- Bring the resuscitation trolley
- Assess breathing - bag and mask ventilation and or intubation may be required if comatose.
- Increase IV fluids
- Assess cardiovascular system
- Monitor electrocardiogram (ECG) through cardiac defibrillator.(To ensure electrical safety the CTG leads **MUST** be disconnected if maternal defibrillation is required)

- Lipid rescue drug (Intralipid) and protocol are in the Obs theatre anaesthetic room. Frequent maternal ABCDE assessment and fetal wellbeing.
- Document and plan further management.

16.2 Inadvertent spinal injection:

If the woman becomes unable to move her legs, if there is fast onset of pain relief or a dense or high block within 5 to 10 minutes after the top up, the possibility of an **inadvertent spinal injection** must be considered.

The following actions are recommended:

- Call for additional help and the anaesthetist if not already present
- Turn the woman to the left lateral position
- Increase the IV fluids
- Repeat the blood pressure measurement, expect hypotension
- If fetal bradycardia, call the obstetrician
- Give oxygen
- Drugs to manage hypotension are available on the epidural trolley for the anaesthetist to administer.
- Frequent maternal ABCDE assessment and assess fetal wellbeing

Signs of an inadvertent **total spinal block:**
If the woman develops difficulty in breathing, drowsiness, loss of consciousness or severe hypotension / bradycardia.

The following actions are recommended:

- Summon the anaesthetist and theatre ODP immediately.
- Call for help. Fetch the emergency trolley.
- Airway and breathing - will need intubation and ventilation.
- Cardiovascular monitoring and support with fluids and vasopressors.
- Fetal monitoring.
- Consultant Anaesthetist and Obstetrician to assess the situation and plan ongoing safe care of woman and fetus.
- Once oxygenation, BP and HR have been restored, patient will need anaesthesia to prevent awareness until motor function and ventilator effort has returned.

16.3 Accidental Dural Puncture:

For management of accidental dural puncture please refer to guideline WC/OG/39

17. <u>Guideline for combined spinal epidural in labour</u>

The NICE Intrapartum Care Guideline (CG190) recommends

- Either epidural or combined spinal epidural may be used for establishing regional analgesia in labour.
- If rapid analgesia is required, combined spinal epidural should be used.
- Combined spinal epidural analgesia should be established with intrathecal bupivacaine and fentanyl
- Indications: late first stage (cervical dilatation of 8-9cms and distressed)
  failed epidural
  non-cooperative/mobile patient - epidural could increase the risk of complications
- Procedure:
  - explain to the patient technique and complications. Needle through needle or double needle technique (single space or double space).

- ‘Single shot’ spinal anaesthetic with aseptic technique (hat/mask/gown/gloves) using 3ml ± 2mls of premixed solution (0.1% bupivacaine with fentanyl 2mcg/ml).
- be prepared to lie patient down quickly if she feels dizzy / BP falls or CTG suddenly deteriorates.
- as soon as pain under some control and patient calmer use a Tuohy needle to locate the epidural space, then pass and secure the epidural catheter. This may need to be done with patient in the lateral position – see above.
- if pain relief not adequate with spinal after ten minutes, give 2ml increments of the same mixture via epidural catheter at 5 minute intervals until comfortable and then start epidural pump.
- If pain relief adequate with spinal alone start infusion pump approx twenty minutes post spinal. Impress upon the midwife that there has been no test dose and insist that the block is checked after 30 minutes and again at one hour.

- A rising block must be assessed very carefully by the anaesthetist for evidence of intrathecal placement.
- A diminishing block must be assessed very carefully by the anaesthetist for evidence of intravascular placement. Once this has been done give 5+5 ml of infusion mixture (0.1% bupivacaine + 2mcg/ml fentanyl).Assess block again and start epidural infusion accordingly.
- Blood pressure measurements are taken just as for an epidural top-up – ie every 5mins for 20mins after each spinal or epidural dose is given and every 30mins after that

18 Nutrition

- All women with epidurals are classed as high risk and therefore are advised to have only clear fluids and have PPI prophylaxis. (Please refer to guideline UHDB/IP/07:21/L2 (labour care and risk assessment)).

19 Monitoring Compliance and Effectiveness

Monitoring requirement	Annual audit of waiting times for epidural analgesia Inspection of training records to ensure at least 85% of midwives and appropriate medical staff working on labour ward are up to date with training Complications and Incidents
Monitoring method	Complications and Incidents monitored from Obstetric Anaesthesia database, DATIX ‘IR1’ forms
Report prepared by	Training records by Practice Development Midwife Complications and Incidents by lead Consultant for Obstetric Anaesthesia
Monitoring report sent to:	Maternity Risk & Maternity Governance groups
Frequency of report	Every two years

20 References

NICE Intrapartum Care Guidelines – Care of healthy women and their babies during childbirth September 2007 (CG190)

Pain Relief in Labour- Leaflet available on the labour ward and the ante-natal clinic
Pain Relief in Labour (available in 22 different languages) from www.labourpains.com

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. Lower incidence of maternal motor block and instrumental vaginal delivery

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Appendix A

MOBILISING WOMEN IN LABOUR WITH EPIDURALS

Aims

- Adoption of upright posture in labour / posture of choice for delivery
- Ability to be escorted to, and use commode / toilet instead of bedpan
- Possible reduction in incidence of pressure sores
- Avoid risk of injury to patient or staff

Who can be mobilised?

- Any woman with motor power assessed as adequate (see below), and no exclusions

Exclusions

- Woman does not want to get out of bed
- Woman within 30 minutes of any top-up
- Woman who has received 0.25% or 0.5% bupivacaine in the last 4 hours
- 'Non-reassuring' CTG
- Systolic BP more than 20mmHg lower than the average reading during labour
- Dizziness on sitting on side of bed, once motor power has been assessed as adequate.
- Inability to stand up unaided from a lowered delivery bed.
- Inadequate staffing to be able to check motor block every thirty minutes.

When and where to assess motor block

- Performed in bed thirty minutes after initial top-up.
- In bed or chair every thirty minutes after that.
- Any further top-up to be given in bed. Motor block reassessed in bed thirty minutes after any subsequent top-up, in order to determine whether woman may again mobilise.

How to assess motor block

- Can perform straight leg raise unaided (lift foot at least 15cm)
- Can pull big toes towards face and push feet downwards at the ankles against resistance.
- Can bend and straighten each knee in turn against resistance.

Trial of mobilisation

- If motor block is absent or minimal, lower bed to minimum height.
- Ask woman to sit on the side of the bed, with her feet on the floor for one minute, to check that she does not feel dizzy. She should have an assistant on each side of her. One of these may be the patient's partner (if able-bodied), but one must be a member of staff who has undergone specific training in the use of mobile epidurals.
- Explain to woman that she may need to look directly at her feet to be sure exactly where they are. This type of epidural may cause a reduction of 'position sense' (the knowledge of exactly where the feet are).
- Woman may then stand up, with an assistant on each side of her (one of whom must be a trained member of staff). If the woman feels weak or dizzy, she simply sits back down onto the bed and abandons attempts

at mobilisation. To avoid risk of injury to the woman or her assistants, it is essential that she is not allowed to jump down from a high bed.
- Assistants remain, one on each side of woman, while she shuffles over to a chair and sits into it.

Other options if trial of mobilisation is successful

- She may choose to remain standing, to use a commode in the room or to be assisted outside to use the toilet if she wishes, either with one assistant and holding onto a piece of furniture / drip stand, or else with two assistants. In either case, one of the assistants must have been trained. Attach epidural pump to same drip stand as fluids.
- Each time she decides to move somewhere else, she must have two assistants, or one plus a drip stand. One assistant must be trained.
- She **may not** wander off down the corridor or go outside for a cigarette.
- Do **not allow** a woman to use a **birthing ball**, as it is an unstable piece of equipment.
- If a woman wishes to deliver on 'all fours' on the bed, and the midwife / obstetrician deems this appropriate, then she may do so if she is able to get herself onto 'all fours', and as long as one able-bodied person remains standing on each side of the bed at all times while she is in this position.

Important points

- All pregnant women, (compared with non-pregnant women) are a little unsteady due to an altered centre of gravity. Women with epidural pain relief may become even more unsteady as they lose position sense in their feet (proprioception).
- Motor block tends to increase as labour progresses. Therefore frequent (half-hourly) observations of motor block are important in order to avoid a woman becoming 'stranded' in a chair, unable to get herself back into bed.
- Motor block is also more likely to increase after a top-up, so any top-ups must be given with the woman in bed. She must remain in bed for at least thirty minutes afterwards, until the degree of motor block has been reassessed.
- If the pregnant woman is not able to void,the midwife needs to empty her bladder once in a while.

Programmed Intermittent Epidural Bolus (PIEB) and Patient Controlled Epidural Analgesia (PCEA) Delivery Protocol

PIEB with PCEA protocol with the CME Bodyguard 545 is the preferred choice for delivering epidural analgesia in the Labour Suite. Studies have shown its benefits to be adequate maternal analgesia; reduced total dose delivered, increased mobility, and increased maternal satisfaction.

Definitions:

- **Autobolus (PIEB):** Fixed bolus delivered automatically by the Infusion Pump (7ml)
- **Patient Bolus (PCEA):** Fixed bolus initiated by the woman pressing the Infusion Pumps button (6ml)
- **Clinician Bolus (CB):** An override bolus delivered only by the Anaesthetist via the Infusion Pump – Up to 10ml per bolus
  Does **NOT** alter interval times for Autobolus or Patient bolus

Instructions for the Anaesthetist with PIEB &PCEA:

- The Following will be required;
  - NRFit Epidural pack
  - CME Bodyguard 545 Yellow pump + Lockbox
  - A CME yellow striped NRFit administration set
  - 240ml bag of bupivacaine 0.1% + fentanyl 2mcg/ml
  - 2x ampoules of bupivacaine 0.1% + fentanyl 2mcg/ml
  - Lockbox key
  - Epidural Chart
  - Trust Standard Infusion Checklist
- Once the epidural catheter is in place, use the bupivacaine and fentanyl ampoules to deliver the test and loading dose.
- The Anaesthetist is responsible for priming and setting up the epidural pump, selecting the chosen protocol and delivering clinician boluses.
- When priming the set, it is important to prevent air in the giving set to avoid ‘air in line’ alarms. It is recommended that the bag be held up when the line is primed.

1. Lift the door latch (on the right side of the door) to open the Body Guard® pump door and remove the administration set from the sterile packaging leaving the end caps on the line. Connect the administration set to the local anaesthetic mixture bag.
2. Hold the section of tubing with the black key (small plastic block) and make sure the flow direction is in line with the flow direction arrows inside the pump door.
3. Insert the IV tubing into the pump by placing the key into the keyway as shown in the diagram. Insert the tubing left to right, and avoid stretching or pulling the tubing. Check that the key located on the tube is placed in its correct position in the tubing guide.
   - NOTE: the key can only be fitted into the key space one way. If you are having trouble fitting it, do not force it. Try to turn the line around to ensure you have correctly lined up with the direction of flow.
4. Verify that the distal flow valve is on the right hand side of the pump.
5. Close the pump door until the catch clicks.
   - NOTE: Ensure that the tubing is inserted completely into the pump channel

- Switch pump on and Press "**STOP/NO**" for Menu/New patient
- Enter the Level One code
- Following the menu, prime the set
- Once primed, connect the line to the epidural catheter and ensure the epidural sticker is fixed and visible.
- As prompted Press "**START/OK**" on 'Select Protocol'
- Enter the Woman's Hospital Number
- Scroll then select
  '**G: Mat PIEB w/PCEA Bupi0.1%+2mcg/mlFent**'
- Warning! Patient will periodically receive an automatic bolus
- Press "**PRIME/BOLUS**" to confirm
- Lock both the pump and the security lock box
- Double check with the midwife to confirm that the details on the epidural low dose mixture bag fit the prescription, that the yellow lined epidural giving set is correctly attached to the epidural filter and that the pump settings are correct.
- Confirm protocol - Press "**START/OK**"
- Start Auto-Bolus – Press **"Info"** to delay Auto-bolus
- Next Auto-bolus due in 60 Minutes – Press "**START/OK**"
- Start Infusion? - "**START/OK**"
- The first Auto-bolus will not be given for 60mins. Give the woman the PCEA cord **(it will not work until 30 minutes after the pump has been started)** and explain that if the green light is on the handset, then the PCEA is available.
- All boluses will be delivered at 500ml/h
- Give an explanation of how the pumps work to the woman and her birth partner; this is essential to ensure that the epidural has the best chance of success. This might be best done after the initial top-up has had a chance to work. Emphasize that only the parturient is able to press the button.
- If you need to give a Clinician bolus (over-ride bolus) at any time, you can do this through the pump. You will need to use the second level code. You can now bolus independently of the protocol.

DO NOT alter interval times for Auto-bolus or Patient bolus

  - Press "**STOP/NO**"
  - Press "**PRIME/BOLUS**"
  - The time to the next Auto-bolus will be displayed
  - To continue with the bolus, press "**START/OK**"
  - Enter the level two code
  - Enter a bolus of up to 10mls and press "**START/OK**"

Management of Break-through Pains/One sided blocks etc

- Following encouragement of the mother to use PCEA, it is the responsibility of the anaesthetist to administer a clinician bolus if needed.
- Prior to giving the top-up check the level of block with ethylchloride spray.
- If there is perineal discomfort or the block is at the level of the umbilicus or below on one or both sides then proceed to top-up.
- Top ups may be given with the woman sitting on the bed unless a particular side or area does not have satisfactory analgesia. If so, then position the woman for the top-up, either lying on the painful side with the head of the bed flat or sitting up if there is perineal discomfort:
- CHECK with another qualified person that the syringe and the volume of the drug you intend to give is the :-

- **Right drug** (as Prescribed)
- **Right dose** (as Prescribed**)**
- **Right patient**
- **Right route**

The epidural and the venous lines should be labelled. (If using an epidural infusion use a labelled yellow line, but do not solely rely on colour coding.)

- CHECK epidural insertion site and aspirate the line to check for blood or CSF in the catheter.
- Give 5ml of levobupivacaine 0.25% (2.5mg/ml) solution as an escape dose but not more than 10mls in an hour.
- Check BP every 5 minutes for 15 minutes and observe the woman for any adverse signs. Midwife to be present in the room for this period.
- Observe the mother for adverse signs of local anaesthetic toxicity or inadvertent spinal injection.
- Document the top-up details and sign the epidural observation chart.
- After 20 minutes re-check the height of the block and document this on the record. Assess adequacy of pain relief and document this in the intrapartum record.
- If the woman still has pain or discomfort and the block is still at or below the umbilicus give a further 5ml bolus and repeat the previous 4 steps. Sometimes pulling 1cm of catheter out and giving top up helps in completely unilateral block.

Procedure for replacing the infusion bag when empty

- When using a new bag of the epidural low-dose mixture check the details of the drug in the bag against the prescription on the epidural drug prescription sticker.
- Have this checked with one other qualified person and countersigned on the prescription.
- Stop the epidural pump and unlock the security box
- Remove the used bag and spike the new checked and labelled epidural bag to the epidural giving set.
- Fix the bag in the pump box and lock it. Record the volume of drug in the bag in the intrapartum record.
- Restart the pump
- Record and sign that a new epidural bag has been connected in the intra-partum record.

Documentation Control

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Version / Amendment	Version	Date	Author	Reason
	1	Feb 2003	Dr R Broadbent with Consultant Obstetric Anaesthetists	New Guideline
	2	March 2004	Dr R Broadbent Consultant Anaesthetist	Review
	3	March 2012	Dr R Broadbent Consultant Anaesthetist	Review
	4	March 2016	Dr R Broadbent, Consultant Obstetric anaesthetist	
	5	June 2016	Dr R Caranza – Consultant Anaesthetist. Kristen Goodall – Professional Development Advisor	Update
	6	Dec 2019	Dr A Brewer – Consultant Anaesthetist	Review
	7	May 2023	Dr V Subbarathnam-Associate Specialist Dr J Bland-Consultant Anaesthetist	Review
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