

Epidural Analgesia for Labour Pain Clinical Guideline

V4.1

April 2024

1. Aim/Purpose of this Guideline

1.1. Epidural analgesia is the most effective form of labour pain relief. It may be particularly useful for women whose labour is likely to be long or difficult, when operative delivery is likely and in women where general anaesthesia may be challenging, e.g. morbid obesity, likely difficult intubation, and cardiac disease. In the first stage of labour, pain from uterine contractions and cervical dilatation is conducted through spinal nerve roots T10-T12 via the paracervical plexus. For the second stage of labour, innervation of the pelvis and perineum is via the pudendal nerve to spinal roots S2-S4.

Properties of the ideal labour epidural include:

- Provision of sensory blockade adequate for both first and second stages of labour.
- Avoidance of motor block to enable mobility and pushing and avoid risk of pressure sores.
- The ability to top up and convert the labour epidural to an operative epidural.
- A low risk of procedure-related complications.

1.2. This guideline makes recommendations for women and people who are pregnant. For simplicity of language the guideline uses the term women throughout, but this should be taken to also include people who do not identify as women but who are pregnant, in labour and in the postnatal period. When discussing with a person who does not identify as a woman, please ask them their preferred pronouns, and then ensure this is clearly documented in their notes to inform all health care professionals.

1.3. This version supersedes any previous versions of this document.

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2. The Guidance

- 2.1. In practice, the L2/3 or L3/4 interspace is normally used for epidural catheter insertion and the necessary block achieved by the spread of an appropriate dose and volume of drugs.
- 2.2. Addition of opioid to the epidural mixture allows the local anaesthetic concentration to be reduced while maintaining good quality analgesia, thus reducing unwanted motor blockade.
- 2.3. A 24-hour epidural service is available. The time from the anaesthetist being informed of the request for an epidural until they are able to attend the woman should not normally exceed thirty minutes. This should be within an hour except in exceptional circumstances. Reasons for delay should be documented.
- 2.4. If the delivery suite anaesthetist is unable to attend for an epidural, following discussion with them regarding their anticipated availability another anaesthetist may be sought via switch. Between 5.30pm and 8pm from Monday to Thursday phone Theatre 7 (ext. 2262) to discuss with the CEPOD anaesthetist availability from the emergency lists. On Friday 5.30pm to 8pm there is an obstetric anaesthetist on-call from 5.30-8pm as well as the duty obstetric anaesthetist. From 8pm to 8am and at weekends the Senior Anaesthetic Trainee should be contacted.

2.5. **Absolute contraindications**

- Declined by woman.
- Inadequate midwifery staffing or training.
- No CTG or inadequate monitoring of fetus.
- Local infection at proposed site of insertion.
- Raised intra-cranial pressure.
- Uncorrected hypovolaemia.
- Coagulopathy.
- Anticoagulant therapy.
- Spina bifida occulta (unless magnetic resonance imaging (MRI) scan shows normal anatomy).

2.6. **Relative contraindications**

- Significant cardiac disease.
- Some neurological disorders.
- Some anatomical deformities, surgery, or injuries to woman's back.
- Sepsis.

- Intermediary or abnormal Cardiotocograph (CTG) which has not had obstetric review.

2.7. Conditions where epidural analgesia is more likely to be indicated

- Pre-eclampsia.
- Prolonged labour.
- Multiple gestation.
- Anticipated instrumental delivery.
- Cardiac and respiratory disease.
- Obesity.

2.8. Sepsis and epidural analgesia

Epidural abscess formation is a rare but serious complication of epidural analgesia. Abscess formation complicates around 0.2–3.7 per 100,000 obstetric epidurals, while bacterial meningitis is more common after spinal and combined spinal-epidural techniques, with an incidence not exceeding 1.5 in 10,000. If a pregnant person is to be treated for sepsis with antibiotics, administer the antibiotics before placing the epidural. Unwell patients with suspected sepsis can be discussed with the obstetric anaesthetic consultant if there is uncertainty about whether the epidural should be sited (NEW 2022). For further information on sepsis see RCHT guideline [Sepsis: Management of Maternal Sepsis Clinical Guideline \(cornwall.nhs.uk\)](https://www.cornwall.nhs.uk/clinical-guidelines/sepsis-management-of-maternal-sepsis/).

2.9. Midwifery checks prior to epidural

- Ensure midwife is trained in epidural management (on-line training booked on Clinicalskills.net).
- Provide the Obstetric Anaesthetist Association (OAA) fact sheet of risks (available in foreign languages) and document discussions and consent. See www.labourpains.com.
- Cannulate and commence fluid.
- Ensure at least twenty minutes of normal CTG has been obtained and continue monitoring throughout the epidural process. If loss of contact is evident consider FSE application to maintain good CTG acquisition prior to the epidural being sited.
- Check blood test results if coagulopathy suspected.
- SBARD style communication to anaesthetist.
- Commence fluid balance chart.
- Record a pre-insertion heart rate, blood pressure, temperature.

- Check pressure areas including FSE attachment on leg if applicable.

2.10. Consent

- 2.10.1. However, distressed the mother may be in labour, verbal consent must be obtained before undertaking epidural analgesia.
- 2.10.2. Consent for an epidural must be documented on the epidural form.
- 2.10.3. Women should be given the OAA epidural information card to read prior to discussion with the anaesthetist. This information is available in a number of different languages and can be printed out from www.labourpains.com from the translations tab.
- 2.10.4. Complication risks and their frequency of occurrence should be discussed in line with the information from the OAA.
- 2.10.5. The extent to which all potential complications are discussed will depend on individual circumstances, but the following risks must be explained:
 - Incomplete analgesia (incidence up to 1:5) and possible need to re-site epidural (about 5%).
 - Motor block.
 - Drop in blood pressure.
 - Headache due to accidental dural puncture (incidence 1 in 100).
 - Nerve injury both temporary (~1:1,000) and permanent (~1:13,000).
 - Risk of infection (1:50,000) or haematoma (1:170,000).
- 2.10.6. You should consider discussing the following if appropriate:
 - A possible association with a higher rate of operative delivery. This remains controversial and is less evident with the use of low-dose epidural infusions.
 - Urinary retention.
 - Good evidence that there is no association with long-term backache.

2.11. Preparation

The following measures must be taken before epidural insertion:

- OAA Epidural information card seen by patient.
- History taken to confirm no contraindications.
- Platelets should be >80, INR <1.4 (NEW 2022).
- Check thromboprophylaxis state.

- Maternal consent.
- Measure blood pressure.
- Establish large bore IV access (16G).
- Position patient in either the lateral or sitting position.
- Full aseptic precautions – gown, gloves, hat, and facemask.
- Preparation of the area with 0.5% Chlorhexidine spray away from epidural kit and allowed to dry (see AAGBI Safety guideline: skin antisepsis for central neuraxial blockade). If patient allergic use an 10% povidone iodine solution.
- **Chlorhexidine may cause serious neurological damage if in contact with neuraxial structures. Apply to the skin prior to preparation of epidural/spinal equipment.**
- Infiltration of the skin and superficial layers with local anaesthetic.

2.12. Thromboprophylaxis

- 2.12.1. Neuraxial block should not be sited within twelve hours of administration of up to 40mg of Enoxaparin Low molecular Weight Heparin (LMWH) and more than twenty-four hours if greater than 40mg.
- 2.12.2. Careful consideration should be given to obese women on higher doses of prophylactic LMWH. See the Association of Anaesthetists of Great Britain and Ireland (AAGBI) guideline 'Regional anaesthesia and patients with abnormalities of coagulation' as there is a spectrum of risk.

2.13. Labour Epidural Technique

- 2.13.1. Loss of resistance to saline should be used.
- 2.13.2. 3–5 cm of catheter should be left in the epidural space. Leave 1-2 cm more if obese. Be mindful that sometimes, especially in the obese, when the woman extends the back after being positioned for epidural insertion, the catheter may migrate in.
- 2.13.3. Secure with a Lockit™ and adequate sterile dressings.
- 2.13.4. Aspirate catheter for blood and CSF prior to first dose.
- 2.13.5. If catheter is intrathecal, see RCHT guideline [Accidental Dural Puncture in Obstetric Patients Clinical Guideline \(cornwall.nhs.uk\)](https://www.cornwall.nhs.uk/clinical-guidelines/accidental-dural-puncture-in-obstetric-patients/).
- 2.13.6. Attach the giving set to the 250ml 0.1% levobupivacaine + 2mcg/mL fentanyl bag, prime the set and connect to the epidural filter. This is the responsibility of the attending anaesthetist.
- 2.13.7. A test dose of 8 mg bupivacaine should be given – Give this using the low dose mix i.e. 8ml of bupivacaine 0.1% +2 mcg/ml fentanyl through the epidural pump as a Clinician Bolus and delay the Autobolus start (this will then start 60 minutes later).

- 2.13.8. Following the test dose, check maternal blood pressure and confirm the absence of motor block and rapid resolution of pain due to intrathecal administration.
- 2.13.9. Give a further 7ml of low dose mix via the epidural pump using a Clinician Bolus (15 ml in total).
- 2.13.10. The maternal pulse rate (PR), blood pressure (BP) are recorded every five minutes for twenty minutes and recorded on the epidural observation chart.
- 2.13.11. Prescribe the epidural protocol on the electronic record and prescribe fluids.
- 2.13.12. Document epidural insertion on the electronic record under obstetric anaesthetic procedure and epidural chart.
- 2.13.13. Return in 10 – 15 minutes to assess the quality of the epidural block.
- 2.13.14. There is evidence that reducing pain whilst maintaining motor function improves both maternal satisfaction and the outcome of labour. By avoiding high concentrations of local anaesthetic, motor block is minimised, cardiovascular instability reduced and the ability to push in the second stage maintained.

2.14. Inadvertent Intravenous (IV) placement

- 2.14.1. Be aware of signs of local anaesthetic toxicity these may include light headedness, circumoral tingling, tinnitus, odd taste in mouth, seizures, cardiovascular collapse.
- 2.14.2. If you suspect an IV catheter do not use it, call for senior help and consider re-siting epidural.
- 2.14.3. Refer to AAGBI guideline 'Management of Severe Local Anaesthetic Toxicity'.

For epidural analgesia in labour, minimise motor block by using the low dose mix of 0.1% levobupivacaine with 2 mcg/ml fentanyl wherever possible

2.15. Patient Controlled Intermittent Epidural Bolus Pump setup

Automatic bolus: 7mls 0.1% Levobupivacaine and 2mcg/ml Fentanyl.

Automatic bolus interval: 60 minutes.

PCEA bolus: 6mls 0.1% Levobupivacaine and 2mcg/ml Fentanyl.

PCEA lockout: 20 minutes.

- 2.15.1. The anaesthetist is responsible for priming and setting up the epidural pump. See laminated sheet attached to epidural pump for setting up the pump.
- 2.15.2. An explanation of how the pump works to the woman and her birth partner is essential to ensure that the epidural has the best chance of success. This should be done after the initial top-up has had a chance to work.
- 2.15.3. Epidural top-ups for labour analgesia can be done by stopping the pump and selecting a Clinician Bolus of the epidural mixture. This is typically 5 mls of 0.1% Levobupivacaine plus 2mcg/ml fentanyl followed by a further 5 mls if required. A clinician level 2 code is required for this. 0.25% Levobupivacaine can be given but this requires disconnection of the pump and therefore should be avoided if possible. **Boluses should be given only by the attending anaesthetist and not the midwife.**

2.16. Protocol for the provision of labour analgesia using Programmed Intermittent Epidural Bolus (PIEB)

- 2.16.1. Following the initial bolus from the anaesthetist as above, the blood pressure is checked at least every five minutes for twenty minutes.
- 2.16.2. There should be a continuous CTG throughout labour once an epidural has been sited.
- 2.16.3. Once a satisfactory block has been established and the observations are stable, analgesia is maintained using PIEB.
- 2.16.4. Please ensure the PIEB stand is not on the same stand as any IV administration device to reduce the risk of drug administration error (NEW 2022).
- 2.16.5. A 250ml bag of pre-mixed solution of 0.1% bupivacaine with 2mcg/ml fentanyl is supplied by pharmacy. A patient identification sticker must be put on the epidural mix to ensure accurate documentation of any discarded epidural mix in the controlled drugs book. The anaesthetist should connect the epidural solution to the pump.
- 2.16.6. The PIEB pump has two functions:
 - The pump is programmed to provide a mandatory automatic bolus of 7mls of pre-mixed solution every hour.
 - A supplemental patient-controlled bolus, Patient Controlled Epidural Analgesia (PCEA) of 6mls of pre-mixed solution can be given by the patient via the handset. This has a programmed 20-minute lock-out to avoid inadvertent over-dosing. **The PCEA handset is to be given to the patient 20 minutes after the epidural has been started.**
- 2.16.7. If the PCEA is used there is an automatic delay of twenty minutes before the next PIEB. After the PIEB is given the PCEA is locked out for twenty minutes.

2.16.8. For the duration of the epidural use the midwife should record:

Blood pressure every thirty minutes. If the systolic BP falls to 90mmHg or below, then the following should be considered:

- 500mls Hartmann's solution.
- Positioning the patient in the left lateral position.
- Stop the epidural pump.
- Raise the patient's legs appropriately.

2.16.9. If these manoeuvres do not restore the BP, the anaesthetist must be called.

2.16.10. Count and chart the respiratory rate. If the rate is less than 10, call the anaesthetist for immediate review using SBARD format.

2.16.11. Document the amount of patient movement using the modified Bromage score. If the score is 2 or more contact the anaesthetist.

Bromage Score:

0 = Normal movement

1 = Just flex knee, feet move normally

2 = Unable to move knee, feet move normally

3 = Unable to move legs or feet

2.16.12. Document the volume infused of the pre-mixed solution every hour.

2.16.13. Measure and chart the block height every hour referring to the dermatome chart. It should ideally be T8-T11 bilaterally.

2.16.14. Ensure that the patient's bladder is empty four hourly during labour, catheterising if necessary.

2.16.15. Check pressure areas hourly as per epidural chart. FSE attachments should be moved to alternate legs every six hours.

2.16.16. **Level of block**

Category	Information
Above T4	Stop pump immediately and call anaesthetist using SBARD format
T4 – T8	Call anaesthetist to review protocol
T8-T11	Leave unchanged

Category	Information
Below T11 and in pain	Call anaesthetist

2.16.17. If the block is unilateral, turn the patient to improve the block height on the dependant side. If there is persistent pain due to a unilateral block or a missed segment call the anaesthetist.

2.16.18. **Epidural clinician bolus:**

2.16.18.1. If the block height and pain relief is inadequate there is an option for an additional clinician bolus. This should only be administered by the anaesthetist.

2.16.18.2. **Following** a clinician bolus, the midwife should measure the BP every five minutes for twenty minutes and document on the chart.

2.16.19. **Inadvertent spinal:**

If the BP falls markedly or the level of the block increases by four dermatomes in an hour, or the patient has marked leg weakness as assessed by the Bromage Score, this may be due to an inadvertent spinal block. Manage as follows:

- Keep the patient in the left lateral position.
- Run in a litre of Hartman's as fast as possible.
- Turn off the epidural pump.
- Call the anaesthetist.
- Give oxygen.

2.17. Anaesthetist Troubleshooting Inadequate Epidural Analgesia

2.17.1. If the anaesthetist is asked to review an inadequate epidural block, assess the distribution of the block, and observe the woman during a contraction to try to establish a possible cause and solution.

2.17.2. Also consider the parity of the woman, stage of labour and likelihood of subsequent intervention.

2.17.3. Improvements in pain relief can sometimes be achieved with simple manoeuvres including changing the position of the woman and withdrawing the epidural catheter rather than immediately administering a higher dose of local anaesthetic.

2.17.3.1. **No effect of epidural dose on labour pain** – if after the first dose of low-dose mix there is no effect on pain and no demonstrable sensory block after twenty minutes, the catheter is unlikely to be correctly sited in the epidural space.

Discuss with the woman and re-site the epidural if still indicated.

- 2.17.3.2. **Missed segment** – lie the woman affected side down and give a bolus of 10 ml low-dose mix (e.g. 10 ml 0.1% bupivacaine + 2mcg/ml fentanyl) or 5 +5 ml 0.25% bupivacaine. If no improvement, manage as for unilateral block.
- 2.17.3.3. **Unilateral block** – withdraw the catheter by 1 – 2 cm and give a further dose of low-dose mix (e.g. 10 ml 0.1% bupivacaine + 2mcg/ml fentanyl) with the woman lying with the affected side down. If this fails to improve pain relief, consider re-siting the epidural.
- 2.17.3.4. **Patchy block** – consider a top-up with fentanyl 50-100 mcg in 10 ml 0.9% sodium chloride to improve spread. A stronger dose of local anaesthetic (see above) may also be required. Consider the possibility of a subdural block (see below).
- 2.17.3.5. **Persistent perineal pain** – consider giving a bolus of fentanyl 50-100 mcg or clonidine 50-75 mcg and/or a sitting bolus top up of 5-10mls 0.25% Levobupivacaine.
- 2.17.3.6. **Pain breaking through a good epidural block** – consider the possibility of uterine scar rupture in women labouring with a previous caesarean section scar. Assess vital signs and request obstetric review.

2.18. Important Points

- 2.18.1. If the above troubleshooting approaches fail to establish adequate analgesia, the epidural should be re-sited.
- 2.18.2. Poor regional analgesia in labour predicts poor surgical anaesthesia should the epidural be topped up. Have a low threshold for re-siting a poorly performing epidural, for example: in women at risk of caesarean section, in women where caesarean under general anaesthesia may be problematic (e.g. obesity, difficult intubation) or women where optimal pain relief in labour is necessary e.g. cardiac disease.
- 2.18.3. Women with an epidural are at higher risk of operative delivery and should be reviewed so any problems with the block can be identified early and potentially rectified.
- 2.18.4. A low risk parturient with an epidural can have a light diet. If labour becomes complicated in any way, the mother becomes a high-risk patient and should be nil by mouth but may drink free fluids. The woman can have water and isotonic drinks only.

High risk patients include:

- Multiple pregnancy.

- Breech.
- Meconium-stained liquor.
- Slow progress, as defined in by the obstetric guidelines
- Oxytocin augmentation.
- Intermediary or abnormal CTG.
- FGR.
- Prematurity less than 36/40.
- APH.
- Previous Caesarean Section.
- Pregnancy induced hypertension/pre-eclampsia (moderate to severe).
- Medical illness: such as cardiac disease.
- BMI >35.
- Diabetes.

2.19. Bloody Tap

- 2.19.1. If there is blood from Tuohy needle after removal of stylet reinsert in different interspace.
- 2.19.2. If blood through the catheter, then withdraw 1cm and then flush with Saline until no further blood appears on aspiration, if sufficient catheter remains in space proceed cautiously with test dose.
- 2.19.3. If blood is still seen re-site epidural at a different interspace. LMWH should not be given for twelve hours following a bloody tap through the Tuohy needle.

2.20. Total spinal

- 2.20.1. Signs include high sensory level, bradycardia, hypotension, respiratory inadequacy, and loss of consciousness.
- 2.20.2. Call for help.
- 2.20.3. Reassure and talk to woman.
- 2.20.4. Left lateral position, 100% oxygen, may need to assist ventilation with Bag and Mask Ventilation.
- 2.20.5. Treat respiratory compromise with RSI GA and IPPV. Maintain anaesthesia and ventilation until local anaesthetic has worn off.

2.20.6. Treat hypotension with fluid and vasopressors.

2.20.7. Treat bradycardia with an anti-muscarinic agent e.g. Atropine or Glycopyrrolate.

2.20.8. Consider delivery of the baby so involve obstetrician early.

2.21. Subdural Block

2.21.1. An epidural catheter may rarely cause separation of the arachnoid mater from the dura and enter the subdural space. Characteristics of a subdural block include:

- An unexpectedly high level of sensory block, sometimes as high as the cervical dermatomes, occurring over 20-30 min after a top-up.
- Sensory block may be patchy, often with missed segments and persisting pain.
- Nasal stuffiness and Horner's syndrome can develop.
- Motor block is often minimal.

2.21.2. Since the arachnoid is thin and easily torn, a subdural catheter may rupture through this layer following a bolus dose and a subdural block may become a spinal block, which may result in a high regional block.

2.21.3. Have a high index of suspicion for a block with a 'bizarre' distribution. Seek advice and re-site the epidural at a different level.

2.21.4. If the catheter appears to be subarachnoid this should be clearly marked and explained to the patient. It can be used throughout labour, but the anaesthetist must give all top-up doses. See guidance under management of dural tap.

2.22. Epidurals sited before established labour

In view of potential complications associated with prolonged use, an epidural should only be sited prior to established labour:

- After alternative pain relief options have been considered.
- Discussion at senior anaesthetic and obstetric level.
- Careful discussion with the woman.
- Requires careful monitoring as they could be in-situ for an extended time frame.
- Increased risk of misplacement.
- Increased period of immobility.
- Pay particular attention to IV fluid regimen and monitor fluid balance closely.

2.23. Use of epidural for operative procedures

An epidural may be topped up for instrumental delivery, caesarean section, manual removal of placenta and tear repairs.

- Establish current block level.
- Ensure sitting or wedged left lateral position.
- Top up in increments with 0.5% Levobupivacaine or preservative free 2% Lidocaine to achieve desired block e.g. 20ml 0.5% Levobupivacaine to achieve T4 for caesarean section.
- The block may be enhanced by adding fentanyl 50-100mcg.
- Only use epidural if it has been working well, perform spinal if in any doubt.
- For extended post op analgesia add preservative free morphine 3mg (NEW 2022) or Diamorphine 3mg post-delivery.

2.24. Removal of the epidural catheter after delivery:

- 2.24.1. 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.
- 2.24.2. The time of the final bolus and the time of removal of the epidural catheter should be recorded in the patient notes and on the epidural chart.
- 2.24.3. The Bromage score should be completed at removal of the epidural catheter, at 1 hour post removal and 4 hours post removal. This should be documented on the Intentional Round checklist.
- 2.24.4. Women should not mobilise unless the Bromage score is zero.
- 2.24.5. 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.
- 2.24.6. The tip of the epidural should be inspected for the 'blue tip' 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.
- 2.24.7. The mobility assessment should be done by the midwife caring for the woman and recorded in the intrapartum document. If the woman has passed mobility assessment she should then be encouraged to mobilise.

2.25. Follow up

- 2.25.1. All women and neonates suitable for a six hour discharge are able to continue with early discharged as planned following epidural insertion and removal.
- 2.25.2. All women should receive information about when and how to seek help if complications should arise.
- 2.25.3. All women will need to have voided normally before discharge.
- 2.25.4. Complaints that should be reported to the anaesthetist immediately e.g. headache, severe backache, numbness, or weakness in the legs more than three hours following removal of an epidural catheter.
- 2.25.5. All women who remain as inpatients should be followed up by the duty anaesthetist within twenty four hours and this should be documented on Electronic notes.
- 2.25.6. Women who have complications arising from epidural analgesia are followed up while inpatients.
- 2.25.7. For management of women with lower limb neurological symptoms following neuraxial anaesthesia, see appendix 3 (NEW 2022).

2.26. Low dose Combined Spinal Epidural technique for labour

- 2.26.1. A low-dose CSE may be appropriate in some circumstances to establish rapid onset of pain relief in women who are nearing the end of the first stage of labour or who are unable to lie still to allow an epidural to be safely inserted.
- 2.26.2. A low dose CSE can be performed in the delivery room by placing a single shot low dose spinal (25G Whitacre needle) followed by an epidural once the woman is comfortable.
- 2.26.3. Alternatively, a needle-through-needle technique can be used. A dose of 1ml 0.25% Levobupivacaine or 2 mls of the epidural mix (0.1% levobupivacaine + 2mcg/ml fentanyl).
- 2.26.4. Note with the above CSE techniques the epidural catheter is not tested since a spinal block is provided first. The anaesthetist must test the catheter and give the first epidural dose e.g. 8ml low-dose mix (0.1% bupivacaine +2mcg/ml fentanyl).
- 2.26.5. Whenever injecting drugs intrathecally be cautious both in sterility and in preparation of correct dose.
- 2.26.6. Low-dose spinal anaesthesia as described above is unlikely to cause a significant fall in BP or a motor block.
- 2.26.7. Spinal doses higher than those detailed above must **not** be administered outside the operating theatre.

- 2.26.8. Experience from centres that perform high numbers of low-dose labour CSEs suggest that complications are no higher than when labour epidurals are routinely performed – including the risk of Post Dural Patch Headache (PDPH) or intrathecal migration of the epidural catheter.

3. Monitoring compliance and effectiveness

Information Category	Detail of process and methodology for monitoring compliance
Element to be monitored	100% of women receiving an epidural have had at least 20 minutes of normal CTG or an Obstetric review if intermediary or abnormal. A woman is seen within 30 minutes of a request for an epidural to the anaesthetist, if this is not achieved the reasons why are documented in the woman's notes.
Lead	Obstetric Anaesthetist Lead Consultant.
Tool	Case notes used for audit and data inputted onto a spreadsheet to calculate % compliance.
Frequency	This should be monitored every 2 years.
Reporting arrangements	The audit results will be received at the Maternity Patient Safety Forum and Clinical Audit Meeting.
Acting on recommendations and Lead(s)	If deficiencies are identified, an action plan will be developed and monitored through the group.
Change in practice and lessons to be shared	As per the action plan.

4. Equality and Diversity

- 4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the [Equality Diversity And Inclusion Policy](#) or the [Equality and Diversity website](#).

- 4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.

Appendix 1. Governance Information

Information Category	Detailed Information
Document Title:	Epidural Analgesia for Labour Pain Clinical Guideline V4.1
This document replaces (exact title of previous version):	Epidural Anaesthesia for Labour Pain Clinical Guideline V4.0
Date Issued/Approved:	March 2024
Date Valid From:	April 2024
Date Valid To:	January 2026
Directorate / Department responsible (author/owner):	Katharine Sprigge, Consultant Anaesthetist
Contact details:	01872 252361
Brief summary of contents:	To give guidance to obstetric anaesthetists, obstetricians, and midwives on when an epidural can be offered and the process of administering an epidural in labour.
Suggested Keywords:	Analgesia, dural, epidural, labour, sepsis, spinal, pain, tap, anaphylaxis.
Target Audience:	RCHT: Yes CFT: No CIOS ICB: No
Executive Director responsible for Policy:	Chief Medical Officer
Approval route for consultation and ratification:	Maternity Guidelines Group
Manager confirming approval processes:	Caroline Chappell
Name of Governance Lead confirming consultation and ratification:	Tamara Thrilby
Links to key external standards:	None
Related Documents:	<ul style="list-style-type: none"> AAGBI/ OAA Guidelines for obstetric anaesthetic services (2013). OAA epidural information card (www.oaa-anaes.ac.uk).

Information Category	Detailed Information
	<ul style="list-style-type: none"> • Nice Guidelines CG190 Intrapartum care (2014). • AAGBI Best practice in the management of epidural analgesia in the hospital setting (2010). • The 3rd National audit project (NAP3) Royal College of Anaesthetists. • Sepsis in obstetrics and the role of the anaesthetist. • D.N. Lucas, a P.N. Robinson, a M.R. Nelb Department of Anaesthesia, Royal Devon and Exeter Hospital. • Boyce H, Plaats F. Postnatal neurological problems. Continuing Education in Anaesthesia, Critical Care and Pain. 2013; 13 (2): 63-66. • Yentis et al. Safety guideline: neurological monitoring associated with obstetric neuraxial block 2020. Anaesthesia 2020; 75: 913-919. • Bird R, Backe SK. Management of neurological deficit in post-partum patients. Northumbria Healthcare NHS Foundation Trust.
Training Need Identified?	Yes – Midwives require online training and practical assessment by anaesthetist.
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet and Intranet
Document Library Folder/Sub Folder:	Clinical / Midwifery and obstetrics

Version Control Table

Date	Version Number	Summary of Changes	Changes Made by
June 2010.	V1.0.	Initial issue.	Rebecca Brooks Obstetric Anaesthetist.

Date	Version Number	Summary of Changes	Changes Made by
May 2015.	V1.1.	Merged guidelines: Septic Patient – Insertion of Epidurals and Spinal Anaesthesia and Epidural Analgesia in Labour. Now includes guidance on epidural insertion in the septic patient.	Rebecca Brookes Obstetric Anaesthetist.
May 2018.	V2.0.	Full review 2.2, 2.2.12, 2.2.13, 2.7 updated. See new 2018	Rebecca Brooks and Helen King. Obstetric Anaesthetists
December 2019.	V3.0.	Full review and update with RD and E guidelines. 2.18.4 added around high-risk women in labour.	Helen King, Consultant Anaesthetist and Sam Banks, Consultant Anaesthetist.
June 2020.	V3.1.	1.3.0. Addition of inclusion statement. 2.16.3 Addition of patient identification sticker to epidural mix. 2.18.4 Addition of light diet for low risk parturient. 2.18.5 Addition of nil by mouth if complications except water and isotonic drink. Updated Trust templates	Rachel Mullins, Practice Development Midwife
December 2020.	V3.2.	2.24.2. Addition of recording time of final bolus and time of removal of epidural. 2.24.3. Addition of recording Bromage score at removal of epidural catheter, at 1 hour post removal and 4 hours post removal. 2.24.4. Addition of women should not mobilise unless Bromage score is 0.	Katharine Sprigge, Consultant Anaesthetist. Sally Nash, Consultant Anaesthetist.
November 2021.	V3.3.	2.16.2 There should be a continuous CTG throughout labour once an epidural has been sited.	Eleonora Palena.
November 2022	V4.0	Inclusion of labour pains information sheet. Inclusion lower limb neurology follow up pathway (appendix 3).	Katharine Sprigge. Nila Cota.

Date	Version Number	Summary of Changes	Changes Made by
March 2024	V4.1	Update of 2.12.1 to Enoxaparin.	Katharine Sprigge, Consultant Anaesthetist.

All or part of this document can be released under the Freedom of Information Act 2000.

All Policies, Strategies and Operating Procedures, including Business Plans, are to be kept for the lifetime of the organisation plus 6 years.

This document is only valid on the day of printing.

Controlled Document.

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Appendix 2. Equality Impact Assessment

Section 1: Equality Impact Assessment (EIA) Form

The EIA process allows the Trust to identify where a policy or service may have a negative impact on an individual or particular group of people.

For guidance please refer to the Equality Impact Assessment Policy (available from the document library) or contact the Equality, Diversity, and Inclusion Team
rcht.inclusion@nhs.net

Information Category	Detailed Information
Name of the strategy / policy / proposal / service function to be assessed:	Epidural Analgesia for Labour Pain Clinical Guideline V4.1
Directorate and service area:	Obstetrics and Gynaecology
Is this a new or existing Policy?	Existing
Name of individual completing EIA (Should be completed by an individual with a good understanding of the Service/Policy):	Katharine Sprigge, Consultant Anaesthetist
Contact details:	01872 252361

Information Category	Detailed Information
1. Policy Aim - Who is the Policy aimed at? (The Policy is the Strategy, Policy, Proposal or Service Change to be assessed)	To give guidance to obstetric anaesthetists, obstetricians, and midwives on when an epidural can be offered and guidance on the process of administering an epidural in labour.
2. Policy Objectives	Safe administration of epidural analgesia in labour, improved maternal experience and maternal outcome.
3. Policy Intended Outcomes	Safe administration of epidural analgesia in labour, improved maternal experience and maternal outcome.
4. How will you measure each outcome?	Audit.
5. Who is intended to benefit from the policy?	All women who are considering or having an epidural in labour.

Information Category	Detailed Information
6a. Who did you consult with? (Please select Yes or No for each category)	<ul style="list-style-type: none"> • Workforce: Yes • Patients/ visitors: No • Local groups/ system partners: No • External organisations: No • Other: No
6b. Please list the individuals/groups who have been consulted about this policy.	Please record specific names of individuals/ groups: Maternity Guidelines Group.
6c. What was the outcome of the consultation?	Guideline agreed.
6d. Have you used any of the following to assist your assessment?	National or local statistics, audits, activity reports, process maps, complaints, staff, or patient surveys: No.

7. The Impact

Following consultation with key groups, has a negative impact been identified for any protected characteristic? Please note that a rationale is required for each one.

Where a negative impact is identified without rationale, the key groups will need to be consulted again.

Protected Characteristic	(Yes or No)	Rationale
Age	No	
Sex (male or female)	No	
Gender reassignment (Transgender, non-binary, gender fluid etc.)	No	
Race	No	
Disability (e.g. physical or cognitive impairment, mental health, long term conditions etc.)	No	
Religion or belief	No	
Marriage and civil partnership	No	

Protected Characteristic	(Yes or No)	Rationale
Pregnancy and maternity	No	
Sexual orientation (e.g. gay, straight, bisexual, lesbian etc.)	No	

A robust rationale must be in place for all protected characteristics. If a negative impact has been identified, please complete section 2. If no negative impact has been identified and if this is not a major service change, you can end the assessment here.

I am confident that section 2 of this EIA does not need completing as there are no highlighted risks of negative impact occurring because of this policy.

Name of person confirming result of initial impact assessment: Katharine Sprigge, consultant anaesthetist.

If a negative impact has been identified above OR this is a major service change, you will need to complete section 2 of the EIA form available here:
[Section 2. Full Equality Analysis](#)

Appendix 3. Management of neurological deficit in postpartum patients who have received neuraxial anaesthesia

Background

The majority of postpartum neurological complications are due to compressive neuropathy following prolonged labour, patient positioning or mode of delivery.

The incidence of permanent harm following regional block is estimated to be 1/80000 to 1/320425.

If neurological complications do occur, prompt recognition and management may reduce the risk of permanent neurological deficit.

Non-Anaesthetic Causes

Compressive Neuropathy: Incidence 1:100. Most common postpartum neurological complication. May be caused by the foetal head compressing the lumbosacral trunk, poor patient positioning or instrumental delivery. Usually, a unilateral sensory and motor deficit without back pain. Symptoms nearly always resolve within 6 weeks to 2 months.

Ischaemic Neuropathy: Incidence 1:500,000. May result from prolonged hypotension or obstruction of the internal iliac arteries by the fetal head in prolonged labour.

Anaesthetic Causes

Damage to the spinal cord or nerve roots may result from direct trauma, neurotoxicity, infection, ischaemia, or haematoma. Central lesions associated with neuraxial anaesthesia are commonly accompanied by back pain as the posterior rami of the nerve root are affected.

Category	Causes	Symptoms and Diagnosis	Prevention
Single nerve damage	Direct needle trauma or injection trauma disrupting the fibres of a single nerve.	Paraesthesia, loss of sensation and muscle weakness in the distribution of the nerve.	If persisting pain and resistance on insertion of catheter/epidural mix, stop insertion.
Spinal cord trauma	Direct trauma when placing spinal/epidural/CSE.	Pain on needle insertion, prolonged motor and sensory weakness at and below the level of injury. May be unilateral or bilateral. May have urinary symptoms.	If pain on injection of LA withdraw needle. Conus medullaris usually ends at L1 but may extend to L2/3 in 10% patients. USS may help identify correct interspace.

Category	Causes	Symptoms and Diagnosis	Prevention
Cauda equina syndrome	Damage to cauda equina nerve fibres due to compression or trauma.	Back ache, nerve root pain, saddle anaesthesia, paraplegia, sphincter dysfunction.	Linked with hyperbaric lignocaine: avoid. Strict asepsis on epidural insertion. Caution in coagulopathies/ anticoagulant use.
Arachnoiditis	Inflammation of the arachnoid meninges and subarachnoid space. Associated with chlorhexidine contamination.	Variable presentation, usually associated with pain. Progressive paraesthesia, numbness or leg weakness.	Use lower concentration (0.5%) chlorhexidine. Keep away from epidural preparation trolley and allow to dry before needle insertion.
Epidural abscess	Prolonged catheter insertion, presence of sepsis. May occur spontaneously. Usually, Staph aureus.	Back ache, nerve root pain, weakness, paralysis, fever, raised inflammatory markers. Needs urgent MRI	Caution in placement of epidural in infection, strict asepsis on epidural insertion.
Meningitis	Complication of dural puncture. Incidence 1:10,000. Usually, Strep viridians.	Headache, fever, backache, nausea, may be confused with PDPH.	Asepsis on placement of block including facemask.
Haematoma	May occur in epidural space because of prominent venous plexus. Causes neural ischaemia due to compression.	Back pain, nerve root pain, weakness, paralysis (late feature). Needs urgent MRI.	Risk factors: coagulopathy, anticoagulants, difficult CNB insertion.

Management (see also flow chart below)

History

1. Patients can be reviewed by the on-call anaesthetic prior to discharge, or if they have been sent home, they can be referred to DAU for anaesthetic review.
2. Neurological: any pre-existing neurology, conditions pre-disposing to neurology (obesity, back ache, disc disease, diabetes, malignancy, coagulopathy, infection, previous trauma).
3. Labour/mode of delivery: type of delivery, posture during labour, time in full dilation, hypotension.
4. Drugs: especially steroids, anticoagulants, hypoglycaemics.
5. Anaesthetic: type of block, any technical difficulty, bloody tap, spinal catheter, concentration of anaesthetic, additives, details of aseptic technique, pain/paraesthesia during injection.
6. Timing: deteriorating symptoms imply serious underlying pathology.

Examination

1. Full lower limb neurological examination (For dermatomes and nerves implicated see following page).
2. Examination of the back.

Investigation

Blood results: Raised WCC and CRP may imply an infective cause (meningitis, epidural abscess). Coagulopathy may be implicated in epidural haematoma.

MRI: indications include sinister symptoms such as acute onset back pain, bladder/bowel dysfunction, radicular leg pain, lower limb numbness and weakness. If MRI shows a central lesion discuss urgently with neurosurgeons at Derriford. Permanent injury may occur 6-12 hours after the onset of symptoms.

Nerve conduction studies (electro myelogram): can differentiate between central and peripheral nerve injury. They may also help identify muscles affected, potentially identify the precise lesion site, and help prognosticate recovery. However, the EMG only measures large nerve fibre changes so may take >3 weeks after injury to show changes.

EMG may provide temporal estimates as to the timing of injuries. An obstetric palsy will have EMG changes occurring distally from intervention. Assessment within 72 hours of neurological deficit will demonstrate PRE-EXISTING pathologies, as new electrophysiological changes take time to evolve. This is of note with regards to litigation.

Neurosurgical referral: Contact Neurosurgical SpR at Derriford via switchboard. Also submit online referral www.referapatient.org and follow the electronic prompts.

Neurology referral: Neurology consultant and registrar contactable via switch for discussion. If the Neurologist advises, outpatient consultant follow up referrals are made via Maxims: Click on patient, under patient details (left screen) click "Patient Internal Referrals List". Right click on white space and "New Referral Registration". Choose

“Neurology Outpatient Service, Con to Con” from service drop down menu and complete form.

References

Boyce H, Plaat F. Postnatal neurological problems. Continuing Education in Anaesthesia, Critical Care and Pain. 2013; 13 (2): 63-66.

Yentis et al. Safety guideline: neurological monitoring associated with obstetric neuraxial block 2020. Anaesthesia 2020; 75: 913-919.

Bird R, Backe SK. Management of neurological deficit in post-partum patients. Northumbria Healthcare NHS Foundation Trust.

Potential neurological deficit following neuraxial regional anaesthesia identified by Anaesthetic follow up or by Midwives

- **History:** Anaesthetic technique (review E3), mode of delivery, date and time since delivery, drugs administered, any pre-existing neurology.
- **Examination:** Record patient's temperature and perform a full neurological examination including examining the back for epidural/spinal insertion site.
- **Document:** on E3 under obstetric anaesthetic follow up, on OneDrive, and patient's notes.
- **Discuss:** with the obstetric anaesthetic consultant on delivery suite during the day. Out of hours discuss with on call anaesthetic consultant urgently if concerned. If not urgent, handover to the obstetric anaesthetic consultant on delivery suite in the morning.

