Epidural Analgesia in Labour – Management and Care

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1. Purpose of guideline

The purpose of this guideline is to facilitate the safe and effective care of a labouring woman with an epidural within Auckland District Health Board (Auckland DHB).

Once prescribed, in accordance with the Medications - Prescribing policy (see Associated documents), any medication should be administered and documented in accordance with the Medication Administration policy (see Associated documents).

2. Definitions

Term	Definition
APTT	Activated partial thromboplastin time
CSE	Combined spinal epidural
CSF	Cerebrospinal fluid
CTG	Cardiotocography
IDC	Indwelling catheter
INR	International normalised ratio
IV	Intravenous
IU	International units
L&BS	Labour and Birthing Suite
LMC	Lead maternity carer
LMWH	Low molecular weight heparin
LSCS	Lower segment caesarean section
MoH	Ministry of Health
NRFit	Small bore standard connector for neuraxial applications and major regional anaesthesia
NSAID	Non-steroidal anti-inflammatory drug
NWH	National Women's Health
PACU	Post Anaesthesia Care Unit
PCEA	Patient controlled epidural analgesia
PDPH	Post-dural puncture headache
PRN	Pro re nata

3. Training responsibilities

In order to care for a woman with an epidural on Labour and Birthing Suite (L&BS), Auckland DHB core registered midwives should have read this guideline and completed the following local education (culminating in the awarding of epidural care certification), which is valid for three years:

- Ko Awatea: Labour epidural workbook
- Ko Awatea: Management of epidurals for labour and birth – a practical assessment, completed with a L&BS Clinical Charge Midwife (CCM) or a Midwifery Educator (or a Charge Midwife or senior staff member nominated by the L&BS CCM or Midwifery Educator)

(An Auckland DHB email address is required to access Ko Awatea – all lead maternity carers (LMCs) are issued with one upon granting of an access agreement).

A two and a half hour face-to-face epidural teaching session with an anaesthetist is also available to book through Leader/Kiosk, and can be used as the required learning in place of the Labour epidural workbook.

Midwives who also work outside L&BS on antenatal and or on postnatal wards are additionally required to complete (as per Auckland DHB guidelines Pain: Epidural Analgesia for an Adult and Pain: Patient Controlled Intravenous Analgesia (PCIA) – Adult):

- Auckland DHB Adult pain study day
- Ko Awatea: Pain study day-Epidural workbook
- Ko Awatea: Pain Study Day-Patient Controlled Intravenous Analgesia Workbook
- Ko Awatea: CADD-Solis pain pump practical assessment.

Private lead maternity carers are reminded that it is a requirement of the Auckland DHB access agreement and Ministry of Health (MoH) referral guidelines that "… the practitioner is responsible for having the appropriate clinical competencies'' (MoH, 2012) for looking after a woman with an epidural. LMCs should be familiar with this guideline and Auckland DHB strongly encourages that they complete at least some (if not all) of the educational materials available to core staff and complete the labour and birth practical assessment, in situ, with an appropriate assessor. Those who do so will be awarded formal Auckland DHB labour epidural care certification.

Midwives who have not satisfactorily completed Management of epidurals for labour and birth – a practical assessment are not permitted to mobilise the women they are caring for (see Section 14: Mobilisation).

If the access holder does not hold the appropriate clinical competencies for epidural care:

- The LMC may consider contacting a back-up midwife who does.
- Alternatively, the LMC discusses with the Clinical Charge Midwife for the ongoing care of the labouring woman. Any midwife who is working towards obtaining the appropriate clinical competencies must have the elements of care relating to the epidural supervised by a midwife who has been Auckland DHB certified.

It is a requirement of the Australian and New Zealand College of Anaesthetists (ANZCA) that a qualified assistant be present with every epidural insertion and during the period that regional analgesia is administered in labour (ANZCA, PS03: see Associated documents).

4. Current evidence and best-practice recommendations

It is acknowledged that for many women, it can be an extremely difficult decision whether to choose an epidural for pain relief, as it represents deviation from the pathway of a 'normal' physiological labour. There is significant historical and ongoing debate amongst stakeholders in maternity care in regards to the effect that epidural analgesia may have on the duration of labour and the risk of an assisted vaginal birth or a caesarean section. Midwives play an important role in discussing methods of pain-coping or pain-relief methods for labour and birth, providing evidence-

based information to women and facilitating informed choice both antenatally and in early or advanced labour.

High- quality information on labour analgesia choices is available in the Auckland DHB leaflet Coping with Labour, through face-to-face attendance at the Labour Pain Relief talks held by the Anaesthetic Department, and on the National Women's Health (NWH) internet site (under Health information/ Pregnancy, birth and newborn care/ Labour and birth/ Pain relief options).

The Toolkit to Support Vaginal Birth and Reduce Primary Caesareans published by the California Maternal Quality Care Collaborative in 2016, reviews evidence-based, best-practice recommendations regarding the timing, placement and management of labour epidurals. Key points are quoted or paraphrased as below:

- The vast majority of studies indicate that labour is lengthened in women with epidural, with a larger effect on duration of second stage. However, the use of low concentrations of anaesthetic (≤0.1% epidural bupivacaine) are associated with relatively fewer operative vaginal births and a shorter second stage.
- Some studies show epidural to be associated with an increased risk of operative vaginal birth, more commonly where higher concentrations of local anaesthetic are used.
- Numerous studies show no significant causal relationship between epidural and the rate of caesarean birth.
- Do not avoid or delay epidural as a method of reducing risk for caesarean delivery. There is no difference in rate of caesareans based upon 'early' placement of epidural versus placement in active labour. In the presence of maternal request, there is no need to wait for a minimum or arbitrary cervical dilation to be reached. However, if the woman is requesting an epidural in the latent phase of labour, she should be counselled by the LMC regarding the possibility that in the latent phase, it is normal to see slower progress than in the active phase. See Intrapartum Care guideline.
- It is not clear whether labour epidurals predispose to persistent malposition however there is possibly an association between siting an epidural earlier in labour (<5 cm dilation, or <0 station) and more malpositions. This may be because an already malpositioned fetus increases the need for pain relief and hence an earlier epidural request, rather than being the cause of the malposition.
- Preserve as much motor function as possible by administering the lowest concentration of local anaesthetic necessary to achieve adequate pain relief. This is achieved at Auckland DHB using 'obstetric mix'.
- The woman should be assisted in changing positions at least every 20 minutes to assist necessary fetal rotation.
- Allow for longer durations of the second stage for women with an epidural (e.g. at least four hours in nulliparous women, at least three hours in multiparous women), provided that maternal and fetal wellbeing remains reassuring. This includes the passive component of the second stage.
- Allow for passive descent when there is no urge to push (delayed pushing until there is a stronger urge to push, generally one to two hours after full dilatation). Passive descent is correlated with shorter overall pushing time and greater chance of spontaneous vaginal birth.

- Turning an epidural off during the second stage of labour to improve pushing efforts is rarely necessary, nor does it significantly shorten the second stage. It does however result in increased pain for the woman.

Epidural analgesia should be complementary to non-pharmacologic coping methods such as continuous labour support, breathing and relaxation techniques, touch techniques and massage, and positions to promote comfort. Hydrotherapy and heat/cold therapy, however, are not compatible with safe epidural analgesia. The one exception to this is the use of dedicated perineal warming compresses sourced from a thermostat-controlled heating device, temperature-tested on the practitioners' own skin prior to application.

Education on methods to support labour progress and prevent dysfunctional labour should include:

- Freedom of movement in labour, including upright and ambulatory positioning (see Section 14: Mobilisation).
- Techniques and tools such as the peanut ball that facilitate fetal rotation, flexion and descent for women with epidural analgesia
- Maternal exercises and positioning that facilitate fetal rotation.

4.1 Eating and drinking

Epidural analgesia in itself does not increase the risk of general anaesthesia in the peripartum period, and in the absence of other risk factors, women with a labour epidural may eat and drink freely. Refer to Auckland DHB Guideline: Oral intake and Gastric Acid Reduction Prophylaxis in Labour.

4.2 Third stage of labour

Auckland DHB recommends active management of the third stage of labour for all women. However, if a woman wishes to have a physiological third stage and remains mobile and co-operative, an epidural alone does not pose an additional risk of contributing to postpartum haemorrhage.

5. Benefits and contra-indications of labour epidurals

Epidural analgesia is a frequently used form of pain management for women during labour (58.3% of labouring women at Auckland DHB in 2018). The epidural catheter is usually inserted in the epidural space in the lumbar region. The administration of epidural analgesia is usually by patient controlled epidural analgesia (PCEA) but may be clinician-administered boluses.

Epidural analgesia is a safe and effective technique for providing labour analgesia on the L&BS provided recommended best practice is adhered to.

5.1 Fetal and neonatal benefits of epidurals

- Better Apgar scores, lower risk of neonatal respiratory depression, and reduced metabolic acidosis compared to systemic opioids.
- Epidurals can improve uteroplacental blood flow in the compromised fetus (example: severe pre-eclampsia, intrauterine growth restriction).

- In the premature, breech or multiple pregnancy, epidurals can facilitate manoeuvres for a controlled birth.

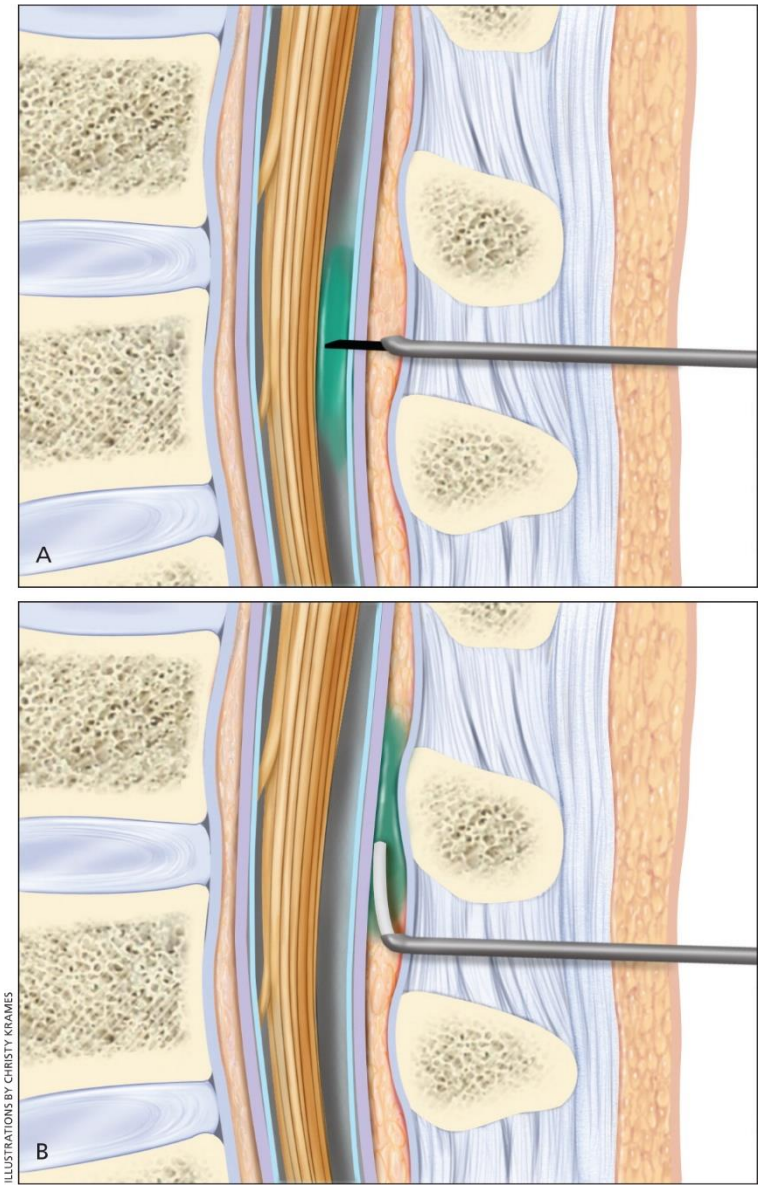
5.2 Maternal benefits of epidurals

- Most effective form of pain relief in labour.
- Can be used in conjunction with antihypertensive therapy in hypertensive disease of pregnancy, to stabilise the blood pressure response to painful contractions.
- Women with certain cardiac, respiratory, neuromuscular and neurological diseases for whom effective pain control may have significant safety benefits.
- Recommended for women who have significant risk factors for general anaesthesia (for example predicted difficult airway management, morbid obesity).

5.3 Contra-indications to epidurals

- Maternal refusal or withdrawal of consent (absolute contra-indication).
- Amide (bupivacaine, lidocaine, ropivacaine) local anaesthetic allergy (absolute contra-indication).
- Infection localised to the epidural insertion site, or systemic sepsis.
- Abnormal coagulation imposing an increased risk of epidural or spinal haematoma (for example: thrombocytopenia including related to hypertensive diseases of pregnancy; coagulopathy; blood factor disorders; recent enoxaparin (Clexane) administration).
- Unstable medical conditions (example: uncorrected hypovolaemia, stenotic cardiac lesions, unstable neurological disease).
- Insufficiently trained or credentialed staff to provide one on one care and monitoring.

6. Epidural anatomy



A) A *spinal* aims to place local anaesthetic and other drugs *within* the cerebrospinal fluid (CSF) around the nerves in the spinal space. This is usually used to provide a rapid onset anaesthetic for theatre cases, but is occasionally used for labour analgesia, e.g. to provide rapid pain relief to facilitate epidural placement where the woman is experiencing extreme pain. Spinals are rarely used at Auckland DHB for labour pain relief.

B) An *epidural* aims to place an epidural catheter within the epidural space, just outside the CSF. The epidural catheter has several holes that deliver the local anaesthetic and other drugs to the epidural space; the drugs then spread to the nerves to provide pain relief or anaesthesia.

A *combined spinal epidural (CSE)* uses a spinal needle through an epidural needle to place a spinal block, before the epidural catheter is threaded into the epidural space. This is not frequently used at Auckland DHB for labour pain relief but is commonly used for theatre cases.

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7. Labour epidural medications

Epidural analgesic medications can be a local anaesthetic agent, an opioid, or a combination of local anaesthetic and opioid.

7.1 Local anaesthetic

Local anaesthetic interrupts the transmission of the pain signal to the brain and its subsequent interpretation as pain by stopping the depolarisation of the nerve before it reaches the dorsal horn of the spinal cord.

Sympathetic and motor nerve fibres exiting the spinal cord are also affected by local anaesthetics administered in the epidural, resulting in vasodilatation (leading to hypotension) and motor block (leading to muscle weakness).

The nerves that conduct temperature are also affected by local anaesthetic, which is why ice is used to test the level of sensory block.

7.2 Opioids

Opioids diffuse across the dura mater and act upon the opioid receptors in the spinal cord in the same way as systemically administered opioids.

Opioids may also diffuse towards the brain resulting in cerebral effects (i.e. sedation and respiratory depression).

A woman may experience other opioid side effects including urinary retention, nausea, vomiting, pruritus and hallucinations.

7.3 Standard mix

Standard mix consists of bupivacaine 0.125% and fentanyl 2 microgram/mL. This mix of weak local anaesthetic and opioid aims to provide analgesia without dense motor block and without depressing the central nervous system. This is provided in pre-mixed syringes on the L&BS.

7.4 Obstetric mix

Obstetric mix consists of bupivacaine 0.0625% and fentanyl 2 microgram/ml. This weaker mix of local anaesthetic and opioid aims to provide analgesia when administered via PCEA during labour, while further reducing the risk of dense motor or sensory block. Obstetric mix is only available on the L&BS in premixed bags for PCEA pumps. The aim is to improve mobility in labour and optimise the chance of unassisted vaginal delivery.

8. Preparation

8.1 Pre-epidural request

- The decision for epidural analgesia in labour is normally agreed between the woman and her midwife or LMC. Ministry of Health Guidelines for Consultation with Obstetric and Related Medical Services (Referral Guidelines) recommend that a labour epidural should prompt a secondary care consultation. The name and designation of the medical practitioner carrying

out this consultation should be documented in the woman's notes prior to anaesthetic attendance to site the epidural.

- The midwife must ensure the woman has received the necessary information to make a fully informed decision regarding the use of epidural analgesia in labour and given an opportunity to ask questions.
  - The laminated epidural information sheet should be given to the woman to read whilst she is waiting for the anaesthetist to attend.
- Ensure that a full assessment of labour progress has been conducted prior to the request of an epidural.
- Cardiotocograph (CTG) fetal monitoring should be recorded for at least 20 minutes prior to the epidural insertion. If there are any concerns about the quality of the CTG recording, a fetal scalp electrode should be applied prior to the epidural insertion.
- Any obstetric concerns than develop after the initial consultation must be communicated to the obstetric team regardless of epidural status.
- Any request for an epidural at full dilatation should only be made following full assessment by the obstetric team.
- Avoiding urinary retention is an essential precaution for all women with an epidural. The decision as to whether to site a urinary catheter may be made in partnership with the woman, taking into consideration her ability to mobilise to void and/or willingness to use a bedpan. In the absence of catheterisation, voids >200 mL must occur at least four hourly. See Section 13 Monitoring-Bladder Care and Section 16.8: Urinary retention.
- Recordings:
  - Once the epidural is sited, continuous cardiotocograph (CTG) monitoring is required (See Auckland DHB Fetal Surveillance policy). If the CTG is abnormal, obtain obstetric review.
  - Baseline temperature, pulse, respiratory rate and blood pressure.
- Tests and equipment:
  - Site a large-bore intravenous cannula (size 16G) and connect a 1 L bag of Plasmalyte 148 (but do not start the fluid running unless needed for other reasons) – a fluid bolus does not need to be given.
  - Collect blood for a full blood count (FBC) if the woman has gestational hypertension or pre-eclampsia and the last test is >6 hours prior, or if she has known thrombocytopenia. In this context also consider sending coagulation studies (APTT and PT).
  - Epidural trolley should be immediately available (see Section 10: Equipment).

8.2 Pre-epidural insertion

- History should be taken, noting any medical problems, previous epidurals and drug therapy especially those that affect coagulation.
- For well women, there is normally no need to wait for the FBC result to be available for the epidural to be inserted.
- Women with gestational hypertension, pre-eclampsia or other risk factors for thrombocytopenia should have a recent platelet count (within six hours).
- Verbal consent should be documented on epidural form, including who was present at the time of discussion. This normally includes:
  - Time to effect (approximately 15 minutes after insertion of epidural catheter)
  - Failure (up to 1 in 10 inadequate analgesia; <2% complete failure)
  - Severe headache (1 in 200)

- Hypotension (1 in 50)
- Motor block, itch, shivering
- Possible requirement for urinary catheter
- Prolonged second stage (approximately 15 minutes compared to no epidural)
- Increased risk instrumental depending on density of block
- Temporary mild nerve damage. e.g. numb patch on leg 1:1000
- Serious permanent neurological harm (1:200,000)
- No increased risk of lower segment caesarean section (LSCS) or long-term back pain.

8.3 Epidural insertion

In the presence of a normal CTG, the monitor can be removed for the epidural insertion process. If there are concerns regarding fetal wellbeing, the midwife should either make an independent decision, or consult with the CCM and or registrar, as to whether CTG recording should continue throughout the procedure. It may be necessary to hand-hold the FH transducer, or consider the application of a fetal scalp electrode (with consent).

- Midwife will assist with positioning of the woman, and provision of chlorhexidine, sterile sodium chloride 0.9% and local anaesthetic to the anaesthetist.
- Chlorhexidine should be poured away from the epidural sterile field and must not risk splashing this area. Miniscule amounts of chlorhexidine have been associated with chronic adhesive arachnoiditis, which causes permanent paralysis.
- The epidural will be inserted by an anaesthetist.
- The initial test and loading dose of local anaesthetic will vary according to the inserting clinician but must be administered by the anaesthetist:
  - These initial doses will be both to ensure the epidural catheter is not in a vein or within the spinal space, and to ensure the epidural provides effective analgesia.
- Once epidural is inserted, the epidural catheter should be secured to avoid migration of the catheter from the epidural space.
  - Place an IV3000 dressing over the epidural insertion site.
  - Tape the edges and along the length of the catheter up to the shoulder, on the opposite side from the intravenous luer.
- Position the woman laterally or in an upright position of comfort, using pillows to assist, to avoid aorto-caval compression and hypotension. Turning to the opposite side or a different position of comfort periodically may help achieve an even block.
- Re-site the cardiotocograph as soon as possible.
- Care is needed when the woman is moving around the bed to avoid epidural catheter migration or inadvertent removal.

9. Prescription

Epidurals and any subsequent changes can only be prescribed by an anaesthetist. Ensure analgesia is prescribed on the appropriate prescription form (CR4039).

10. Equipment

10.1 Epidural trolley and additional equipment

The epidural trolley should be kept stocked by the midwifery staff as follows:

- Sterile epidural pack
- Sterile gown pack
- Surgical face mask
- Skin preparation solution (chlorhexidine 0.5% with alcohol 70%)
- Transparent sterile dressing (e.g. IV3000) and appropriate tape
- Sodium chloride 0.9% 10 mL ampoules x20
- Lidocaine 1% 5 mL ampoules x20
- Lidocaine 1% 20 ml ampoules x10
- Ropivacaine 0.2% 20 mL ampules x10
- Bupivacaine 1.25% 20 mL ampules x10
- 'After your epidural' cards
- CR4039: Epidural insertion record form

Additional equipment that is rarely used, such as longer needles and spare filters, syringes, epidural catheters, etc. are stored in the red 'epidural spares' box in the shelving above the epidural trolleys in the stockroom. This is replenished by the Anaesthetic department.

Additional equipment of the area in which the woman is being managed should satisfy the requirements the Australian and New Zealand College of Anaesthetist's professional documents PS03 Guidelines for the Management of Major Regional Analgesia and PS55 Recommendations on Minimum Facilities for Safe Administration of Anaesthesia in Operating Suites and Other Anaesthetising Locations.

Basic resuscitation equipment should be available and in working order as per the Resuscitation of Adults policy (see Associated documents)

Resuscitation drugs should be available in the Ward 91 drug room, including:

- Vasopressors (metaraminol & ephedrine)
- Atropine
- Adrenaline
- Naloxone
- Intralipid.

10.2 Epidural analgesia administration

A CADD-Solis pump:

- Dedicated NRFit yellow tubing with no injection ports
- Date, time and woman's name on the epidural bag
- An anti-bacterial filter should be attached to the epidural catheter at all times
- The epidural pump should be secured within its case.

11. Administration and independent double checking

The epidural PCEA pump should be connected when the woman is comfortable and within an hour of the initial top-up dose by the anaesthetist. Any woman not comfortable within 30 minutes of last top-up dose, or whose epidural becomes ineffective during labour, should be reviewed by the anaesthetist.

As per the Medication Administration policy (see Associated documents), an independent double check must be completed by two registered nurses/midwives when:

- Commencing an epidural infusion, including prior to connection
- Altering the programming of the epidural pump
- Changing the medication bag of an epidural infusion.

The independent double check must include two nurses/midwives going to the woman's bedside to check:

- Correct woman
- Correct drug
- Correct dose
- Correct route
- Correct time.

Ensure:

- Line and filter are secured to prevent disconnection
- If PCEA is prescribed, ensure the patient administration button is attached and accessible to the woman.

11.1 Manual bolus administration

- The first epidural dose should be administered by an anaesthetist. Where a combined spinal epidural (CSE) has been placed in labour, the anaesthetist must return when the initial spinal block is wearing off to administer the first epidural dose.
- Subsequent administration of all manually-administered epidural drugs should be performed by two registered midwives with current labour epidural competency.
- Aseptic no-touch technique should be used. The filter should NOT be wiped with an alcohol swab.
- Manual boluses above 5 mL should normally be fractionated into 5 mL aliquots.
- Additional top-ups to those prescribed may only be administered after consultation with and documentation by an anaesthetist.
- No other solution may be injected through the epidural unless prescribed by an anaesthetist.

11.2 Opioid medication

No other opioids are to be given via any other route, except by an anaesthetist, whilst a labour epidural is in progress. Refer to Auckland DHB guideline Opioid Analgesia for Women in Labour.

12. Education provided to the woman

Ensure the woman has adequate information to use the PCEA effectively and safely, which should include:

- The mechanisms of the pump, i.e. delivery of a small dose of analgesia, lock-out interval
- The use of the demand button, i.e. only the woman to press the button, either when pain has increased or as pre-emptive analgesia e.g. for operative vaginal birth
- Ability to continue to use the PCEA throughout labour, including the second stage
- Possible complications:
  - Immediate such as itch, nausea, motor block
  - Late such as headache and neurological complications, by providing the 'After your Epidural' card to the woman or her support person.
- Avoidance of heat/cold packs due to risk of burns
- Monitoring by the midwifery staff members.

13. Monitoring

Ensure observations are performed as below. The obstetric team and/or anaesthetist should be notified if observations are outside normal parameters or if concerned for any other reasons.

Observation	Initially and following top-ups	Ongoing frequency
Blood pressure-should be >100mmHg	Every five minutes for 20 minutes (or longer if unstable). taken between contractions	Hourly
Volume of epidural drug administered		Hourly
Sensory level/block (see guideline below)-should be T6-T10	20 minutes after loading dose or clinician bolus	Hourly
Sedation score-should be alert/rousable to voice	20 minutes after loading dose or clinician bolus	Hourly
Pain score (0-10)-should be 0-2	20 minutes after loading dose or clinician bolus	Hourly or as required
ADHB motor score (0-3)-should be 0-1	20 minutes after loading dose or clinician bolus, and when considering mobilisation	Hourly
Electronic fetal monitoring	Continuous for the duration of labour whilst epidural in situ	Continuous
Pressure area care	-	Two hourly
Fluid balance	-	Continuous
Bladder care	Monitor and encourage regular voiding (at least four hourly, void must be >200 mL/4 hours); otherwise insert IDC	Document micturition on CR3895: National Women's Partogram

Additional maternal monitoring (e.g. pulse oximetry, arterial blood pressure and central venous pressure) may be indicated in certain situations or at the request of the obstetrician or anaesthetist.

13.1 Measuring sensory block levels

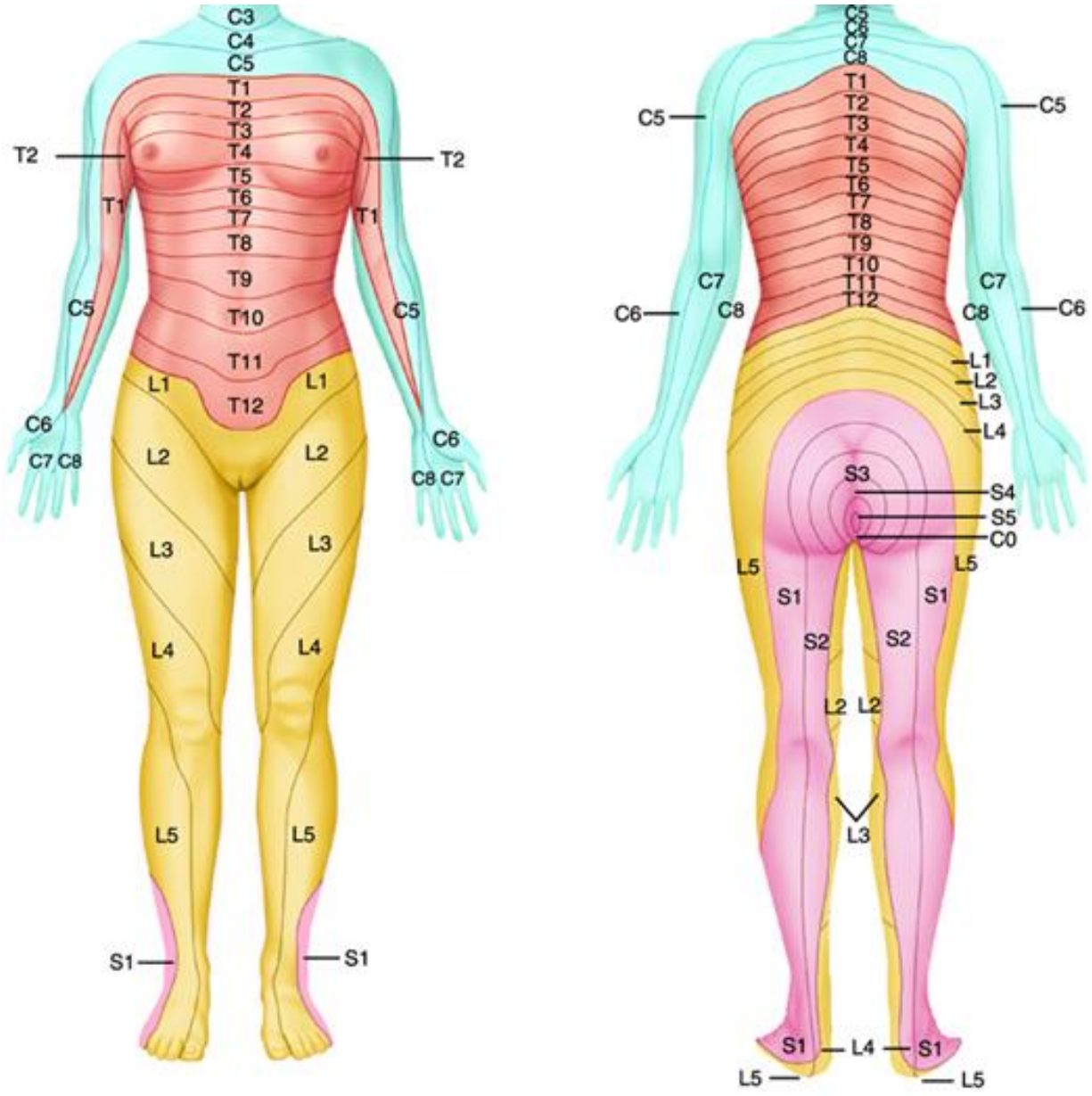
Upper level to be determined bilaterally using a cold stimulus – usually it is only necessary to determine the upper level.

Where a woman reports a change in sensation to cold is what is considered the block level. Document the dermatome level on each side at which the woman reports the change in sensation.

An effective labour epidural should have a block level of T10 or above; block levels above T6 should be notified to the duty anaesthetist.

Quality of analgesia should be assessed using the numerical pain rating scale (0-10) or another appropriate tool. This should be assessed at rest and on movement. If pain score >3 during contractions, contact the anaesthetist.

Note that pain despite an effective epidural can be associated with uterine rupture and an obstetric review should be considered in this situation.



Dermatome (sensory level) map. Note T10=Umbilicus, T6=Xiphisternum, T4=Nipples (Hoffman, 2016).

13.2 Measuring motor block

Leg weakness is assessed at Auckland DHB using the following score to assess density of motor block where:

3 = Unable to bend knees or ankles
2 = Unable to bend knees at all, able to move feet
1 = Unable to bend knees normally
0 = Able to move legs freely

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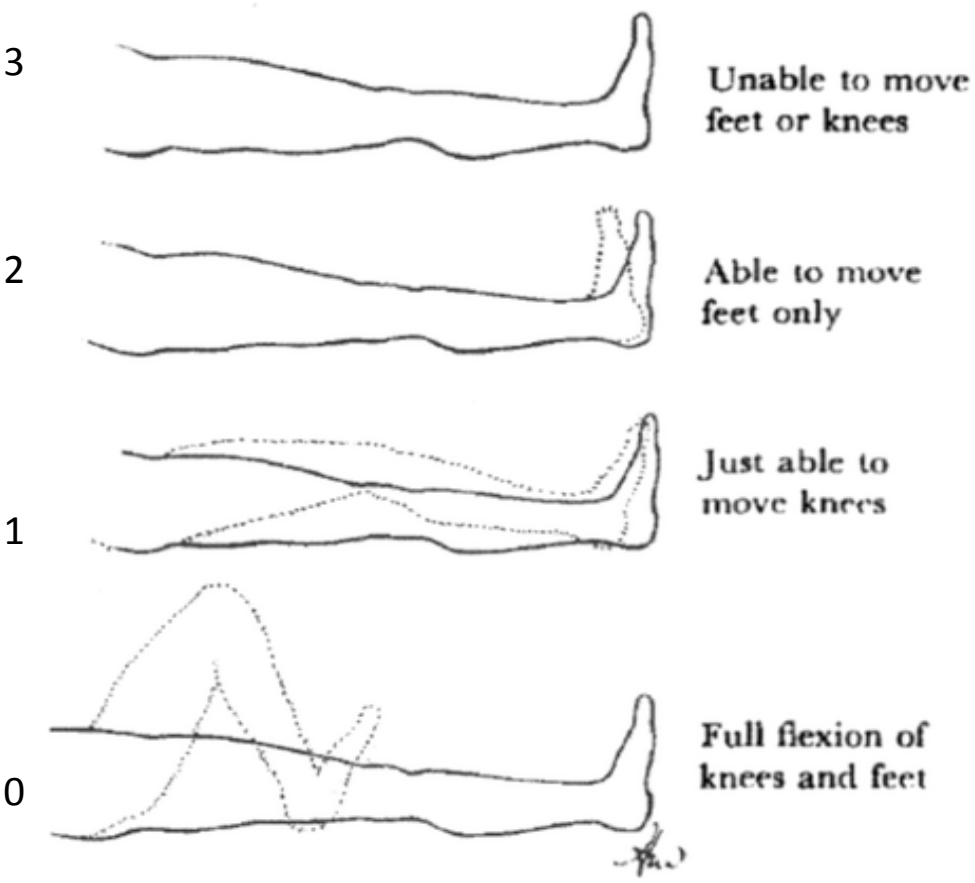
When assessing for potential mobilisation, all three leg joints should be tested (hip, knee and ankle). All three should be normal (i.e. Auckland DHB motor score=0) before mobilisation can be considered.



Auckland DHB leg weakness score (adapted from Bromage, 1965).

14. Mobilisation

Improved mobility for a labouring woman with an epidural is associated with improved maternal satisfaction. Mobility encourages the progress of labour and gravity assists with the descent of the presenting part. However, mobility is not guaranteed. Mobilisation is only to occur within the woman's room.

14.1 Pre-requisites for mobilising

Woman	• Woman wishes to mobilise • Woman is co-operative, alert and free of sedation • Partner or birth companion is available at all times and is willing and able to provide appropriate and safe support to the woman while mobilising • No physical or mental impairment that precludes mobilisation • Woman weighs < 120 kg • Woman wears bare feet or shoes with rubber soles (not socks alone) • Auckland DHB leg weakness score = 0
Midwifery	• Midwife has successfully completed 'Management of epidurals for labour and birth – a practical assessment' • Midwife agrees woman can mobilise • Ward resources permit mobilisation with safe fetal monitoring (ideally CTG telemetry) • No environmental hazards present
Obstetrics	• Obstetric team agrees to mobilisation
Anaesthesia	• No systemic opioids used in previous two hours • Epidural anaesthetic must be PCEA 0.0625% bupivacaine + 2 microgram/ml fentanyl ('obstetric mix') – a single initial loading dose of Standard mix or ropivacaine 0.2% to establish the epidural is acceptable • >20 minutes since last clinician-administered epidural top-up.

Certain conditions (example: pre-eclampsia and toxaemia (PET), antepartum haemorrhage (APH), multiple gestation) are relative contra-indications and should be discussed with anaesthetic and obstetric teams.

The woman should be informed that she may be asked to return to the bed for safety reasons or if any of her observations become unsatisfactory. If the woman rests in bed for longer than one hour, the motor block assessment should be repeated before she mobilises again.

14.2 Extent of mobilisation

- Women should be encouraged to change their position in bed when an epidural is running.
- The labouring woman can transfer from the bed to the chair, or a birthing ball, stand beside the bed, or mobilise to the bathroom if no urinary catheter is in situ.
- She should continue to have continuous CTG monitoring when mobilising.

- The woman must be accompanied at all times by a responsible adult companion to provide balance. This may be the midwife, the partner, or another suitable adult. A midwife must be present at all times when the woman is mobile.

15. Troubleshooting

If the woman is not experiencing the expected or desired level of pain relief from the epidural, the midwife should carry out the following checks BEFORE calling for an anaesthetic review:

- Ensure woman is using PCEA adequately
- Check bilateral block heights using ice and referring to dermatome map
- Observe the epidural site for catheter displacement and check for leakage under the dressing.

Epidural block	Action
Block height equal, and above T10	• Consider overall context of labour, station, and whether rapid progress should be checked for; consider uterine rupture. • Encourage woman to self-administer PCEA, or consider giving a clinician bolus via the PCEA if their attendance will be delayed. • The anaesthetist may recommend a bolus of more concentrated local anaesthetic and/or epidural fentanyl.
Block height equal, but below T10	• Contact anaesthetist; consider giving a clinician bolus via the PCEA if their attendance will be delayed. • Prescription may need to be changed to a larger volume, longer lockout by anaesthetist.
Block height differs by more than 2 sensory levels	• Contact anaesthetist; consider giving a clinician bolus via the PCEA if their attendance will be delayed. • Epidural catheter may need repositioning or epidural re-siting by anaesthetist, followed by epidural bolus administration by anaesthetist.
No detectable block to ice*	• Ensure PCEA connected and functioning, and check insertion site for leak/displacement. • Contact anaesthetist unless delivery imminent. Epidural likely to need re-siting. Offer alternative analgesia in the interim e.g. entonox.

*An epidural that has been allowed to completely wear off is unlikely to be able to become effective during labour again using 'obstetric mix' boluses only. An additional bolus of 'standard mix' or a more concentrated local anaesthetic will be required to re-establish adequate analgesia.

16. Complications

Complications can occur at any time whilst epidural is in situ as well as after it is removed.

16.1 Fetal bradycardia

Step	Action
1.	Call for assistance by using the red emergency bell in the room.
2.	Place the woman in left lateral position (or right lateral if bradycardia persists) to try to re-establish and maintain fetal wellbeing with intrauterine resuscitation (see Auckland DHB guideline Oxytocin for Induction and Augmentation of Labour).
3.	Check blood pressure (BP): if low, act accordingly (see below).
4.	Contact obstetric registrar.
5.	Contact anaesthetist.
6.	Consider urgent vaginal assessment to site an FSE (with consent) if FH recording is difficult to maintain abdominally, and/or if it is indicated to check for a presenting or prolapsed cord, or for rapid progress.
7.	Call Obstetric Emergency code if fetal heart has not recovered within 5 minutes

16.2 Hypotension

Postural hypotension may occur when the woman tries to mobilise. Local anaesthetic creates a sympathetic block, which in turn causes vasodilatation.

Note: remember other unrelated causes for hypotension such as haemorrhage

Observation	Action
Systolic <100 but >90	• Increase intravenous (IV) fluid rate. • Place woman in full lateral position. • Contact obstetric team and anaesthetist.
Systolic < 90 **and or** **Difficult to rouse**	• **STOP epidural immediately.** • Call for assistance immediately (obstetric team and anaesthetist). • Place woman in lateral position. • Increase IV fluid rate to maximum. • Give oxygen via face-mask at 6-15 L/min.
Unrecordable blood pressure **and or** **Decreased level of consciousness** **and or** **Convulsion**	• **STOP epidural immediately.** • Ring the emergency bell for assistance and call 777 'Obstetric Emergency'. • Stay with the woman. • If not breathing, initiate basic life support with manual uterine displacement. • Monitor fetal heart closely to ensure utero-placental perfusion is not compromised.

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16.3 Motor weakness, pressure areas and burns

Due to potential impairment of sensory and motor function, midwives should be vigilant with pressure area assessment and on-going pressure area care (see Associated documents).

- Monitoring, interventions and any changes should be documented.
- Hot or cold compresses, packs or hot water bottles must not be used in a woman with an epidural in situ.
- Notify the anaesthetist if leg weakness score > 1 or any increase in scores after an epidural is discontinued.

16.4 Itching

Itching may be due to the opioid. Discuss with obstetric team and anaesthetist regarding appropriate treatment. Opioid related itch may be treated with naloxone or ondansetron.

16.5 Nausea and vomiting

May have several unrelated causes. Assess, treat and control with anti-emetics.

16.6 Sedation and respiratory depression

Due to central effects of opioids.
Management: Stop infusion and call Code Red if woman is difficult to rouse or respiratory rate is <10 per minute.

16.7 Unpleasant paraesthesia

May be due to local anaesthetic effect and should disappear when the epidural infusion is stopped. Discuss with anaesthetist if it persists.

16.8 Urinary retention

- Not every woman will require a urinary catheter, but it may be necessary, due to the lack in sensation of bladder fullness and ability to pass urine. It also enables close monitoring of fluid balance. Encourage regular voiding (at least 4-hourly), record micturition on CR3895: National Women's Partogram and regularly assess abdomen for bladder fullness.
- Voids should be at least 200 mL per 4-hour epoch.

If woman is unable to void 4-hourly, or if she is unable to mobilise to the bathroom and unwilling to use a bedpan, a urinary catheter should be inserted and removed postpartum as per Auckland DHB guideline Bladder Care Postpartum and Management of Urinary Retention.

16.9 Local anaesthetic toxicity

Toxicity affects the central and cardiovascular systems and is the result of high plasma concentration of local anaesthetic. Sudden onset of local anaesthetic toxicity at any stage of therapy can occur in the previously stable woman, either due to the accumulation of local anaesthetic or less commonly due to the catheter migrating intravascularly.

16.9.1 Signs and symptoms of local anaesthetic toxicity

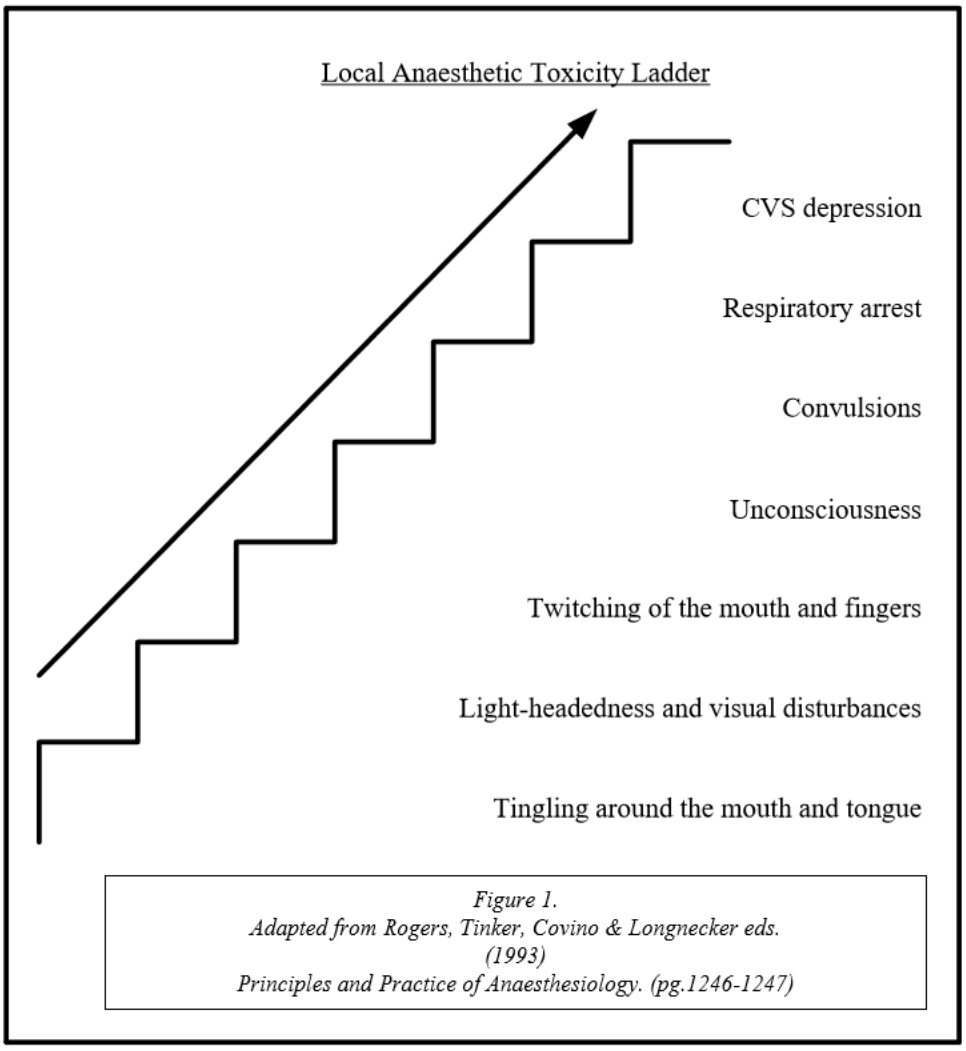


Figure 1.
Adapted from Rogers, Tinker, Covino & Longnecker eds. (1993) Principles and Practice of Anaesthesiology. (pg.1246-1247)

16.9.2 Management

- Stop infusion and call anaesthetist.
- Call 'Adult Code Blue' if the woman has become unconscious, and start resuscitation.
- Obtain intralipid (stored in Ward 91 drug room and in Level 9 theatre drug cupboard).
- Monitor vital signs every 15 minutes for signs of local anaesthetic toxicity – see the local anaesthetic toxicity ladder and opioid side effects.

16.10 Intrathecal/subdural migration of catheter

This can occur at any time while catheter is in situ.

16.10.1 Signs and symptoms

- Sudden increase in block height
- Numbness or weakness in arms/hands
- Hypotension and bradycardia
- Reduced depth of breathing and/or decreased oxygen saturation
- Dyspnoea leading to apnoea.

16.10.2 Management

- Stop epidural.
- If sudden increase in block height is the only symptom – notify duty anaesthetist.
  - Otherwise call 777 'Adult Code Blue' and lie woman in full left lateral position.

16.11 Intravenous migration of catheter

This can occur at any time while catheter is in situ.

16.11.1 Signs and symptoms

- Loss of analgesia and block height
- Signs of local anaesthetic toxicity.

16.11.2 Management

- Stop epidural.
- Notify the duty anaesthetist and/or call 777 'Adult Code Blue' if woman is unconscious.

16.12 Epidural haematoma/abscess

Can occur as a result of bleeding or infection respectively. This is a medical emergency, as delay in diagnosis and treatment will result in permanent paraplegia. Risk is increased in woman receiving therapeutic doses of anticoagulants or if there are co-existing risk factors, e.g. pre-existing coagulopathy or thrombocytopenia.

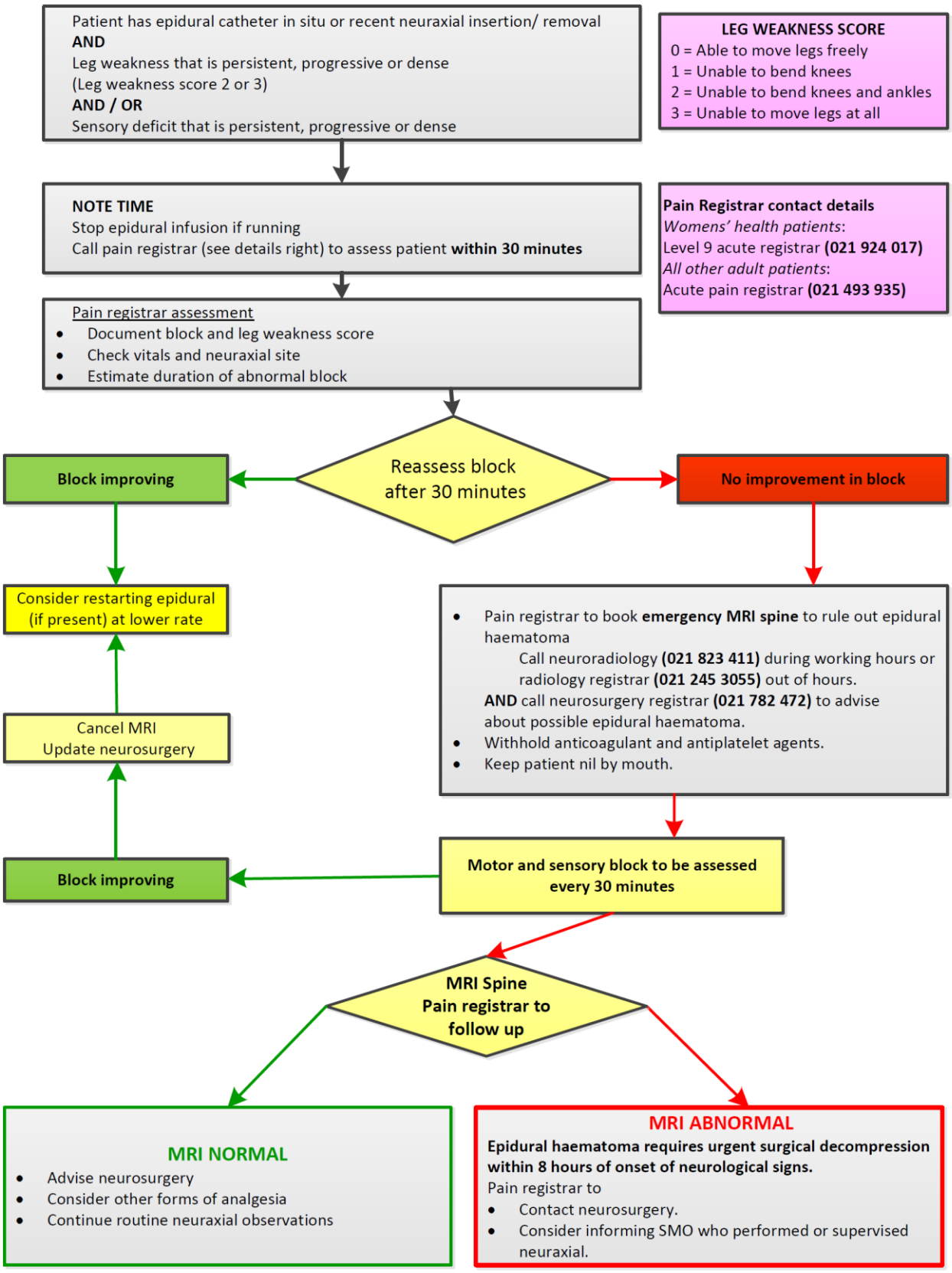
16.12.1 Signs and symptoms

- Severe new onset back pain
- Motor weakness at and below the level of haematoma or abscess:
  - This can be distinguished from epidural medication-related weakness by being much more severe than would be expected for a labour epidural, and persists despite epidural medication being withheld
- Acute onset incontinence or retention (bladder and/or bowels)
- Pyrexia and tenderness over the epidural site.

16.12.2 Management – See flowchart 'Management of Suspected Epidural Haematoma with Neuraxial'

- If the woman reports any new or worsening signs and symptoms, notify the duty anaesthetist and obstetric team immediately.
- If no response, contact the level 9 anaesthetic SMO on call or primary team consultant immediately so that woman is reviewed within 30 minutes.
  - If an epidural abscess or haematoma is suspected after medical review, an urgent MRI will be arranged, regardless of time of day.
  - Withhold anticoagulants e.g. Clexane
  - Keep nil by mouth pending review
- To avoid permanent neurological damage surgical decompression is required within eight hours of onset of symptoms.

MANAGEMENT OF SUSPECTED EPIDURAL HAEMATOMA WITH NEURAXIAL



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16.13 Post-dural puncture headache (PDPH)

Dural puncture can occur from both the epidural needle and epidural catheter, so may not be immediately evident at the time of epidural insertion. See Auckland DHB Guideline Post Dural Puncture Headache in Obstetrics for more information.

17. Hand-over

The following should be included in hand-over to other midwifery staff members:

- Block height
- Leg weakness score
- Checking of prescription and pump programming (once per shift)
- Checking of lines, site and dressings (once per shift).

18. Anticoagulation and epidurals

Some women needing an epidural will also be on anticoagulation in either prophylactic or therapeutic doses. Epidural analgesia should usually be avoided in women receiving treatment doses of anticoagulants.

18.1 Enoxaparin

- Prophylactic dose – epidural can be performed 12 hours post-last dose.
- Therapeutic dose – epidural can usually be performed 24 hours post-last dose.

18.2 Heparin

- IV heparin – at four hours post-stopping check APTT – can do epidural if APTT normal.
- SC heparin – to consult duty anaesthetist (may require coagulation tests).

Any woman receiving anticoagulation should be discussed with the duty anaesthetist so a plan for labour analgesia can be made.

19. Preventing infection or dislodgment of epidural

Leakage of epidural solution can occur around the site. This does not pose a problem for the woman's pain management, provided analgesia is maintained and the dressing is intact.

- Dressing is not routinely changed while intact.
- Tape may need reinforcing/replacing if it rolls up, in order to secure dressing and line.
- Should dressing need replacing, use a sterile technique and take great care not to dislodge catheter. This may require two midwives.

Epidural catheter, filter and infusion lines are not routinely changed and should not be disconnected for any reason until the epidural is to be discontinued.

If there are any signs of inflammation/infection contact duty anaesthetist. If an epidural infection is suspected, they will usually recommend that the epidural is removed and skin swabs from the epidural site and blood cultures to be sent for analysis.

Should the catheter, filter or line become disconnected accidentally:

- Stop the infusion.
- Place the disconnected ends in separate sterile gauze packets.
- Contact the duty anaesthetist immediately for advice:
    - For witnessed disconnections where sterility has been maintained, the duty anaesthetist may attend, clean the outside of the epidural catheter with an alcohol swab and allow this to dry (taking care not to allow any alcohol solution into the epidural line). They will then cut the epidural catheter two centimetres to the woman's side of the visible meniscus with sterile scissors before reconnecting using a new attachment and filter.
    - For unwitnessed disconnections, you will be given specific advice by the anaesthetist, however the epidural will usually need to be removed and appropriate alternative analgesia provided, which may include siting another epidural.

20. Stopping and removal of epidural catheter

20.1 Epidural management in second stage

Labour epidural analgesia should be continued until birth and sometimes into early puerperium. Discontinuation of epidural pain relief at full dilation does not improve spontaneous birth rate and increases late labour pain.

Women should be given the opportunity to continue pain relief in the second stage and encouraged to use the PCEA. If it is the midwife's opinion that continuation of the epidural is proving detrimental to the woman's ability to push and therefore hampering progress in second stage, she should discuss potential cessation of PCEA use with the woman, the on call obstetrician and the anaesthetist.

20.2 Indications for the epidural to be left in situ (post-birth)

- Women who sustain third/fourth degree tears or have large episiotomy
- Women who have significant perineal or labial swelling
- Women who appear to have a high risk of needing surgical intervention (post-partum haemorrhage)
- Specific instructions from anaesthetist to leave epidural in situ post-birth.

Although the epidural catheter may be left in place for the above reasons, **the PCEA pump (containing 'obstetric mix') must be removed before transferring to theatre or to a postnatal ward.** If PCEA is required postnatally, this will require a new epidural prescription with pethidine. 'Obstetric mix' is not used on the postnatal wards at Auckland DHB.

20.3 Removing labour epidural catheter

- The epidural catheter must not be removed until the woman is haemodynamically stable and there is no reason to anticipate postpartum haemorrhage.

- If there is any suspicion of coagulopathy then the duty anaesthetist should be consulted prior to removal.
- Epidural removal may be done by midwifery staff. This should only occur following delivery of a complete placenta, repair of any perineal tears and once postpartum blood loss is normal and stable, unless requested to the contrary by the duty anaesthetist or lead maternity carer.

20.4 Removal process

Step	Action
1.	Use a clean technique.
2.	Position the woman in a flexed position.
3.	Remove the dressing and tape.
4.	• Apply gentle traction to remove epidural catheter. • If the epidural catheter cannot easily be removed, leave it in situ and contact the duty anaesthetist for advice.
5.	• A dressing is not required but can be placed over the entry site if necessary. • Inspect catheter to ensure it is complete, check for the presence of an intact coloured tip (blue or black mark), and document date and time of removal on CR4039: Epidural/Spinal Insertion Record. If the tip is not intact, notify the anaesthetist. • If there are any indications of infection at the site, a wound swab and blood cultures should be sent to the laboratory for culture and sensitivity.
6.	• If the woman has received a dose of enoxaparin (Clexane) in the 24 hours prior to epidural removal, see Auckland DHB guideline Venous Thromboembolism in Pregnancy for safe timing of removal, or seek advice from the duty anaesthetist.

21. Post-epidural care

Step	Action
1.	The IV can be removed at the discretion of the LMC or midwife after a period of not less than 30 minutes since last epidural drug administration.
2.	• The woman should be mobilised with assistance until she has fully recovered from the effects of the epidural. • Notify the anaesthetist if normal movement and sensation have not returned within 4 hours of discontinuation of epidural.
3.	Midwife must provide on-going assessment of the woman's pain and ensure oral analgesia is prescribed and administered as appropriate.
4.	Complete page four of CR4039: Epidural/Spinal Insertion Record (see Associated documents) and leave this in the tray on delivery unit reception.
5.	Before discharge from the hospital, the midwife should ensure that the woman has received the 'After your labour epidural' follow up card (available on the epidural trolley).

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22. Supporting evidence

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23. Associated documents

Auckland DHB policies and guidelines

- Bladder Care Postpartum and Management of Urinary Retention
- Fetal Surveillance
- Informed Consent
- Intrapartum Care – Physiological Labour and Birth
- Medications – Prescribing
- Medication Administration
- Medications Allergies & Adverse Drug Reactions (ADRs) Identification, Documentation & Reporting
- National Women's Health Access Agreement for Lead Maternity Carers
- Opioid Analgesia for Women in Labour
- Oral Intake and Gastric Acid Reduction Prophylaxis in Labour
- Oxytocin for Induction and Augmentation of Labour

- Pain: Epidural Analgesia for an Adult
- Pain: Patient Controlled Intravenous Analgesia (PCIA) – Adult
- Post Dural Puncture Headache in Obstetrics
- Pressure Injury Prevention and Management in Adults
- Resuscitation of Adults
- Standard Precautions – Infection Control
- Venous Thromboembolism in Pregnancy – Prevention

Australian and New Zealand College of Anaesthetists professional standards

- Guidelines for the Management of Major Regional Analgesia (PS03)
- Recommendations on Minimum Facilities for Safe Administration of Anaesthesia in Operating Suites and Other Anaesthetising Locations (PS55)

Clinical Forms

- CR3895: National Women's Partogram
- CR4039: Epidural/Spinal Insertion Record (multiple pages)
- CR4039: Labour Epidural Analgesia Prescription (part of the above)

24. Disclaimer

No guideline can cover all variations required for specific circumstances. It is the responsibility of the health care practitioners using this Auckland DHB guideline to adapt it for safe use within their own institution, recognise the need for specialist help, and call for it without delay, when an individual patient falls outside of the boundaries of this guideline.

25. Corrections and amendments

The next scheduled review of this document is as per the document classification table (page 1). However, if the reader notices any errors or believes that the document should be reviewed ***before*** the scheduled date, they should contact the owner or Document Control without delay.