

South Australian Perinatal Practice Guideline

Analgesia for Labour and Birth (Pharmacological)

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Note:

This guideline provides advice of a general nature. This statewide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this statewide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected to review specific details of each patient and professionally assess the applicability of the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient's medical record, the decision made, by whom, and detailed reasons for the departure from the guideline.

This statewide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for discussing care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes:

- The use of interpreter services where necessary,
- Advising consumers of their choice and ensuring informed consent is obtained,
- Providing care within scope of practice, meeting all legislative requirements and maintaining standards of professional conduct, and
- Documenting all care in accordance with mandatory and local requirements

Explanation of the aboriginal artwork:

The Aboriginal artwork used symbolises the connection to country and the circle shape shows the strong relationships amongst families and the Aboriginal culture. The horse shoe shape design shown in front of the generic statement symbolises a woman and those enclosing a smaller horse shoe shape depicts a pregnant woman. The smaller horse shoe shape in this instance represents the unborn child. The artwork shown before the specific statements within the document symbolises a footprint and demonstrates the need to move forward together in unison.



Australian Aboriginal Culture is the oldest living culture in the world yet Aboriginal people continue to experience the poorest health outcomes when compared to non-Aboriginal Australians. In South Australia, Aboriginal women are 2-5 times more likely to die in childbirth and their babies are 2-3 times more likely to be of low birth weight. The accumulative effects of stress, low socio economic status, exposure to violence, historical trauma, culturally unsafe and discriminatory health services and health systems are all major contributors to the disparities in Aboriginal maternal and birthing outcomes. Despite these unacceptable statistics the birth of an Aboriginal baby is a celebration of life and an important cultural event bringing family together in celebration, obligation and responsibility. The diversity between Aboriginal cultures, language and practices differ greatly and so it is imperative that perinatal services prepare to respectfully manage Aboriginal protocol and provide a culturally positive health care experience for Aboriginal people to ensure the best maternal, neonatal and child health outcomes.

Purpose and Scope of Perinatal Practice Guideline (PPG)

The purpose of this guideline is to give information about the range of pharmacological options of pain relief for women for labour, birth and following caesarean section. It describes benefits, procedural guidelines, adverse effects and contraindications for these options to inform practitioners. Practitioners may then use this information to discuss options with women so that they can make informed choices should they choose pharmacological options to assist with pain management.

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(Pharmacological)

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Summary of Practice Recommendations

Both non-pharmacological and pharmacological options for managing pain in normal labour should be discussed with women in the antenatal period.

All medical and midwifery/nursing staff caring for women who have pharmacological pain relief should be aware of the benefits, associated risks and management of adverse effects.

Abbreviations

>	Greater than
<	Less than
%	Percent
ANNT	Aseptic non touch technique
BP	Blood pressure
cm	Centimetres
CTG	Cardiotocograph
e.g.	For example
IT	Intrathecal
IV	Intravenous
kg	Kilogram(s)
L/min	Litres per minute
mg	Milligram(s)
mL	Millilitre(s)
mmHg	Millimetre of mercury
N ₂ O	Nitrous oxide
O ₂	Oxygen
PCA	Patient controlled analgesia
PCEA	Patient controlled epidural analgesia
PCIA	Patient controlled intravenous analgesia
RR	Respiratory rate
SAPR	South Australian Pregnancy Record
SpO ₂	Peripheral Capillary Oxygen Saturation
SS	Sedation score
SWI	Sterile Water Injection



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Definitions

Intradermal	Within the skin
Visual analogue scale	Assessment of pain with a visual scale between 1-10. 0 being no pain with 10 being the worst pain imaginable.
Aseptic non-touch technique	Aseptic non-touch technique guidelines are a framework for procedures to minimise introduction of infection and contamination of equipment.
Epidural space	Situated between the dura mater and the bone and ligaments of the spinal canal, (outer layer of the meninges). It extends from the cranium to the sacrum. Medications administered into the epidural space diffuse across the dura and the subarachnoid space and exert their effect on receptors in the dorsal horn of the spinal cord.
Opioid	A group of drugs, both naturally occurring and synthetic which act on opioid receptors to provide analgesia

Introduction

All pharmacological methods of pain relief have side-effects^{1,2} Women should be provided with information in the antenatal period to ensure informed decisions can be made for options to manage pain in normal labour. However, if this has not occurred and been recorded, the midwife must take responsibility for this discussion.

Women must have 1:1 midwifery care once labour has established.²⁻⁴ Continuous support is associated with less use of pharmacological analgesia, fewer operative births and increased satisfaction.⁵ Each woman should be assessed on an individual basis taking into account the stage of labour, psychosocial/emotional and physical wellbeing and the woman's birth plan. Midwifery support should include supporting the woman's choice to avoid or use pharmacological methods of pain relief.⁶

Prior to commencement of treatment the midwife and/or medical officer should explain the procedure to the woman and obtain informed consent.

All medical and midwifery/nursing staff caring for women who have pharmacological pain relief should be aware of the benefits, associated risks and management of adverse effects.

Documentation

Document medication consent, administration, effectiveness of pain management, adverse effects and any actions taken in the medical record, national inpatient medication chart (NIMC), partograph, anaesthetic record, e-records and databases where applicable.



Nitrous Oxide with Oxygen

Background

Nitrous oxide (N₂O) is a non-flammable, inorganic, colourless inhalation agent.^{7,8} Inhaled analgesia appears to be effective in reducing pain intensity for women in labour.⁹

The effect of nitrous oxide is transient. It is eliminated mostly via the lungs, rather than hepatically, and it does not accumulate. After inhalation there is rapid onset and recovery.^{8,10,11} The full effect after inhalation of nitrous oxide with oxygen is approximately 50 seconds, and it has been shown to leave the maternal system within five minutes. N₂O does not affect uterine contractility.⁸

There are no known adverse effects for the neonate.^{8,11} N₂O crosses the placenta but causes no effect on the fetal heart rate. If present in fetal circulation at birth N₂O is quickly eliminated when the neonate breathes.⁸

Procedure

Nitrous oxide with oxygen can be used for analgesia in the first, second and third stages of labour, or during post-delivery procedures.¹² Nitrous oxide with oxygen is self-administered via mouthpiece or facemask. Self-administration prevents overdose as the mouthpiece will fall away if drowsiness increases.⁸ Coaching is important to learn the correct technique and timing. Women's satisfaction can be improved by teaching appropriate timing of breathing.¹²

1. For optimal benefit the woman should be encouraged to start inhalation 30-50 seconds before the contraction starts, this requires monitoring and timing of contractions.
2. The woman's pain level using the verbal analogue scale, and conscious state should be continuously monitored.⁸
3. Initially the nitrous oxide should be set at 30%, and increased as required, ensuring that it is never administered with less than 30% oxygen to avoid a hypoxic mixture

Adverse Effects

N₂O alone may increase heart rate and have respiratory depressant effects.^{8,10} The most commonly reported side effects of nitrous oxide with oxygen are nausea and vertigo; however studies have shown that N₂O does not significantly increase the rates of maternal nausea or vomiting in labour.¹²

It is important to ensure adequate methods of scavenging unbreathed and exhaled gas are used to prevent environmental pollution. There may be an increased risk of adverse reproductive outcomes in health care workers due to occupational exposure if they are exposed for >5 hours per week in a poorly ventilated area, although the long-term effects on health care workers are unclear.¹³

Contraindications

- Women with inability to hold mouthpiece or facemask
- Impaired consciousness
- Impaired oxygenation (e.g. upper respiratory tract infection or respiratory disease)
- Women who have received excessive amounts of IV opioids, morphine derivatives and/or benzodiazepines as sedation, may be increased
- Vitamin B12 deficiency as N₂O + O₂ use can lead to megaloblastic anaemia
- Recent ear surgery
- Hypersensitivity to N₂O or any other component in the gas
- Any condition where air is trapped within a body and expansion may be dangerous (e.g. occluded middle ear, cysts, gross abdominal distension, maxillofacial injuries)
- Use > 24 hours

Intradermal Sterile Water Injections

Background

Back pain affects approximately 30% of labouring women and is a motivating factor in the use of pharmacological and regional analgesia.¹⁴ The pain supply of the cervix is the same as the body of the uterus (T10-L1). Referred pain from these nerve roots can be felt in the lower back and sacrum (T11-12) or over lower abdomen and pubis (T10-11).

Sterile water injections (SWI) may provide a safe, effective, low cost alternative that is specific to the relief of back pain in labour, assisting women to manage labour by remaining active and upright.

Research has shown that SWI was more effective than placebo (normal saline), standard care (shower and massage) or acupuncture.¹⁴⁻¹⁷ One study reported that at 30 minutes following the injection, 84% of participants reported at least a 30% reduction in pain; whilst 73% reported at least a 50% reduction.¹⁸ Quantitative and qualitative studies have suggested that women are accepting of the injection pain and most would consider using the analgesia in a subsequent labour.^{18,19}

Procedure

SWI administration can be performed by registered midwives, medical officers and midwifery and medical students (with supervision):

1. Prepare equipment
 - 2 insulin Syringes, or 2 x 1mL syringes with 25 gauge needles
 - Sterile water for injection ampoule
 - Alcohol Swabs
 - Gloves
 - Yellow mobile sharps container to take to the bedside
2. Explain the procedure and gain verbal consent. Ensure the woman is aware of intense burning/stinging for about 20-30 seconds and the relief of backache should be felt within 1-3 minutes. Usually the pain relief will last on average 90 minutes, and may be repeated within 30 minutes if required. Women to understand that SWI is effective for the relief of back pain only, abdominal contractions will still be felt.
3. Position woman in any position where the lower back is exposed and provide adequate privacy. The woman can be in any position as long as sacral region is exposed. If the woman is leaning forward this helps to expose the sacral dimples.
4. Demonstrate appropriate hand hygiene throughout procedure.
5. Draw up 2 syringes with 1mL of sterile water in each. It is possible to use one syringe twice.



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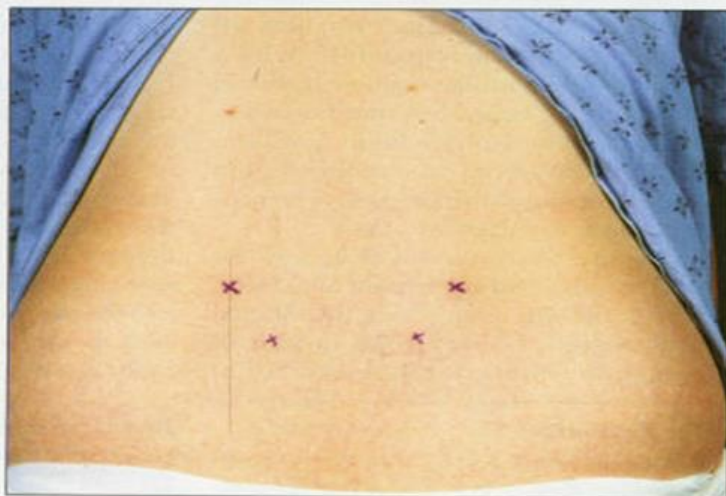
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6. Identify the four points in which the injections will be given. The first two injections are given just above the sacral dimples and the second two, 3-4 cm below and 1-2 cm in. See diagram below.

Figure 1. Identify landmarks by palpation



Figure 2. Mark optimal injection sites

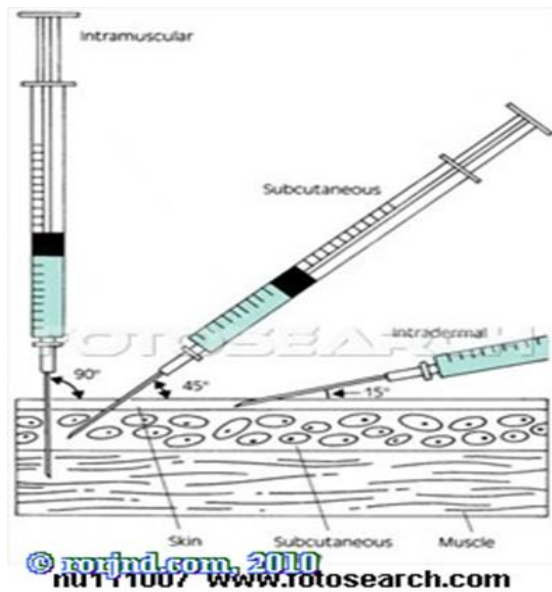


7. Clean the skins with alcohol swabs and ensure the skin is free from infections and bruising.
8. Two midwives/medical staff administer the SWI simultaneously. It can be performed during a contraction if the woman is able to remain still. This may reduce the burning sensation.
9. Quickly give 0.1-0.5 mLs of sterile water intradermally to raise a small bleb in the skin. To inject the intradermal layer, clean the area first. Using a 25 gauge needle, hold the syringe almost parallel to the surface of the skin. Direct the bevel of the needle upwards as the needle is inserted just under the epidermis.



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10. Dispose of needles into sharps container.
11. Avoid touching, rubbing, massage or counter pressure to the area after the injections as this can interfere with the effect of SWI.
12. Observe for effectiveness.
13. Procedure can be repeated once the pain relief wears off, at least 30 minutes after previous SWI.

Adverse Effects

The only side effect of the procedure is intense but brief (20–30 seconds) pain associated with the injection of sterile water.

Contraindications

Sterile water Injections are contraindicated in women who have active sacral genital herpes.



Subcutaneous Fentanyl

Background

Fentanyl administered by the subcutaneous route has been shown to be effective to relieve moderate to severe pain for women in labour.^{20,21} and is cleared quickly from the neonate without the formation of toxic metabolites.²⁰ The terminal half-life of fentanyl in the neonate ranges between 75 and 440 minutes.²² Fentanyl produces less sedation and nausea in women than pethidine.²¹ The placement of a subcutaneous cannula allows the use of intermittent injections without repeated skin punctures. Subcutaneous administration of fentanyl reduces the total dose received when compared to intravenous administration.^{21,23} Subcutaneous administration is well tolerated and avoids the need for venous access, unnecessary pumps and devices.^{24,25} The onset of analgesia is 15 minutes, and the duration of action is 1-2 hours. Data suggest that fentanyl results in lower incidence of nausea, vomiting, sedation and respiratory depression than morphine.²⁶

Procedure

1. Site of administration should be the upper pectoral, two finger breadths below clavicle in mid-clavicular line. The subcutaneous tissue is the fatty layer below the epidermis and dermis. This layer has less vascular tissue meaning the rate of absorption of medications administered subcutaneously will be slower.
2. Angle of cannula insertion is generally preferred between 30-45 degrees. Using a 24 gauge cannula the pinch the skin together and insert the needle fully with the bevelled edge facing upwards. Release the skin.
3. Apply transparent dressing and attach bung (do not apply a j-loop or flush the device after administration of fentanyl).
4. Administer fentanyl slowly, over 1-2 minutes during a contraction.
5. **Dose:**
 - Administer 200 micrograms as a stat dose, wait 1 hour then give 50 micrograms every 15 minutes as required, up to a maximum of 650 micrograms. Give slowly undiluted over 1-2 minutes.
 - If the woman's actual or ideal body weight is <50kg, a lower dose may be indicated initially i.e. 100 - 150 micrograms.
 - The medical officer may consider a dose adjustment depending on the woman's clinical situation.
 - If the maximum dose is administered or the medicine is not providing adequate pain relief, discuss pain relief options with the attending Medical Officer prior to administering further doses.
6. **Observations:**
 - The minimum observations required are: pain score, sedation score, respiratory rate, maternal heart rate and fetal heart rate
 - Observations should be documented prior to administration and 30 minutes following each dose and should be undertaken in conjunction with routine maternal and fetal observations for active labour
 - Observe the neonate post-birth for adverse effects, such as sedation or respiratory depression

Adverse Effects

- Over sedation indicating potential respiratory depression
 - Respiratory depression is almost always preceded by sedation, the best clinical indicator is increasing sedation
 - Check respiratory rate and oxygen (O₂) saturation levels via pulse oximetry
 - Administer oxygen and other resuscitation measures as needed
 - Activate local emergency procedures if required
 - If vital signs satisfactory and saturating well, continue SpO₂ monitoring until over sedation resolves

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- If naloxone has been used to reverse the action of the opioid continue frequent observations for the next 4 hours, as the effect of naloxone dissipates after 2 hours or less and over sedation can recur
- Pruritus
 - Uncommon, but if severe, naloxone 40 micrograms may be administered intravenously as necessary
 - Cetirizine, a non-sedating oral antihistamine, may be useful if there is no response to the above measure. Dose is 10 mg once or twice a day
- Nausea and vomiting:
 - Follow local guidelines for the management of nausea and vomiting
 - Administer antiemetics (e.g. metoclopramide or ondansetron) as ordered for opioid induced nausea and vomiting
 - Maximise opioid sparing using simple analgesia
 - Report nausea and vomiting that persists despite available measures being used
 - Review fluid status
 - Consider other causes for persisting nausea and vomiting

Contraindications

- Women with a history of allergy to fentanyl
- Women with impaired consciousness (sedation score 3 Or SS 2 with RR < 7)
- Women with impaired oxygenation
- Women who have received excessive amounts of intravenous opioids, or morphine derivatives and/or benzodiazepines, as sedation may be increased



Epidural Analgesia

Background

Epidural analgesia is considered to be one of the most effective forms of pain relief available to women in labour, reducing the pain of labour more than any other form of pain relief.²⁷ It is also the most invasive and carries risks of severe side effects.²⁸

Epidural solutions are a combination of local anaesthetic and opioid drugs administered via a catheter into the epidural space by bolus injection, continuous infusion or using a patient-controlled pump. Onset of action, duration and the degree of block depends on the concentration and volume of local anaesthetic and opioid used. Epidural analgesia works by blocking the transmission of signals through the spinal nerves as well as the absorption into the systemic circulation via the epidural veins.²⁸

Any plan to use epidural analgesia should be discussed prior to labour commencing and documented in the hand held pregnancy record (SAPR). A woman who wants to include epidural analgesia in her birth plan should be provided with the Epidural analgesia in labour information sheet (see [Appendix](#)). If English is not the woman's primary language, download information from the Obstetric Anaesthetists Association (UK) website in her designated language (www.oaa-anaes.ac.uk). An interpreter may be required.

If epidural analgesia is not in a woman's birth plan, midwives should direct women to less invasive analgesic techniques such as water use, movement and continuous labour support.²⁹

Epidural analgesia may be recommended during labour and birth for medical reasons such as hypertension and pre-eclampsia, or for prolonged labour, preterm birth, instrumental birth and caesarean section. It may also be recommended following birth for repair of extensive perineal trauma or manual removal of placenta or retained products.

Procedure

Role of the Anaesthetist

1. Insertion of epidural catheter as per anaesthetic standards of practice and local guidelines.
2. Responsible for distinguishing the epidural catheter with the appropriate coloured medication labels and administering the first dose as per National Standards for User-Applied Labelling of Injectable Medicines, Fluids and Lines.³⁰

Midwifery care of the woman with epidural analgesia

Midwives caring for women with epidural analgesia in labour should be experienced and competent in this area. Hospital management should consider epidural analgesia education updates or accreditation processes. Junior or inexperienced midwives should be given adequate education and supervision when caring for a woman with epidural analgesia in labour.

Procedure below adapted from the Women's and Children's Hospital clinical guideline.³¹

1. Prepare room by reducing clutter to accommodate epidural and procedure trolleys entering the room and for staff to still be able to safely navigate around the room with access to all sides of the woman on the bed.
2. Encourage the woman to go to the toilet to void prior to positioning for epidural insertion if appropriate.
3. If an oxytocin infusion is in progress, consider not increasing the dose until the epidural is inserted.
4. Hand hygiene must be performed at the beginning of the process and then as required.
5. Ensure IV access is patent and IV fluids are commenced.
6. Equipment and set up as per local policy and procedure guidelines. Ephedrine must also be in the room during insertion on the epidural trolley.
7. Check maternal blood pressure (BP), pulse, respiratory rate (RR) and fetal heart prior to positioning woman.

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8. Continue to monitor the woman and fetal heart as appropriate throughout the procedure. If a CTG is in progress, all attempts must be made to continue to facilitate continuous fetal heart rate monitoring. It may become necessary to displace TOCO strapping to below maternal hip line and compromise recording or remove the TOCO transducer during epidural insertion if a CTG is already in use.
9. If a support person is present, they need to remain on the side of the bed where the woman is facing.
10. Cover the woman's hair with a disposable hat if necessary to minimise contamination of epidural procedure area.
11. Don a facemask prior to preparing trolley and equipment for insertion of epidural catheter, maintaining strict Aseptic non-touch technique (ANTT) while adding items to the open epidural analgesia tray.
12. Assist the woman to sit/lie as directed by the anaesthetist and according to maternal comfort. An epidural can be inserted with the woman in either of three positions:
 - left lateral position with knees flexed, chin on chest and back parallel to the edge of the bed, placing a pillow between the knees;
 - sitting position with rear of knees touching the edge of the bed, chin on chest and shoulders relaxed and lumbar spine arched backwards towards anaesthetist;
 - cross-legged on the bed with lumbar spine arched back towards the anaesthetist
13. Wearing a facial mask, clean the woman's back as directed by the anaesthetist. Two antiseptic swab sticks are usually used. Explain to the woman and her support person that the area should not be touched after the skin has been prepared.
14. Continue to support the woman while the epidural catheter is being inserted. Encourage the woman to remain as still as possible, especially during contractions with breathing technique changes and/or nitrous oxide and oxygen.
15. Following insertion, assist with taping of epidural catheter, according to the anaesthetist's preference. Ideally, the catheter should be secured at the site of insertion with a transparent dressing. The remainder of the catheter is taped from the dressing site up to the woman's shoulder with medical dressing tape, contra lateral to the side with the IV line.
16. If the woman has been in a sitting position for catheter insertion, assist the woman to a semi recumbent position, with left lateral tilt to minimise aortocaval compression

Observations

1. Commence CTG if not already in progress (see Fetal Surveillance (Cardiotocography) PPG available at www.sahealth.sa.gov.au/perinatal).
2. Check maternal BP and pulse between contractions at five minutely intervals for 20 minutes and document accordingly.
3. Consider all aspects of patient safety including risk factors for sustaining a fall and implement prevention strategies.³²
4. Perform a risk assessment with regard to the potential for pressure ulcers to occur. Include strategies for pressure area care including maternal position changes at least 2 hourly.³³
5. Following the initial dose and subsequent top ups, pulse and blood pressure should be taken every 5 minutes for 20 minutes (between contractions). Continue to observe the woman for the following, and report any deviations from normal:
 - CTG changes
 - Respiratory effort
 - Conscious state
 - Level of sensory block
 - Pain score
6. Respiratory rate, blood pressure, heart rate, sensory block level, Bromage score and cumulative total in mLs should be recorded hourly.
7. Record temperature 4 hourly. If temperature is outside normal parameters, notify a medical officer and repeat temperature hourly.
8. Monitor urine output. If woman is unable to void 2 hours after epidural insertion or if a palpable bladder is present, insert an indwelling catheter.

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Indications to contact the anaesthetist

Notify the anaesthetist immediately if a hypotensive episode or respiratory distress/difficulty occurs. Activate local emergency procedures if necessary.

Other indications include:

- Analgesia is inadequate, patchy or the block is unilateral
- Tingling of hands or numbness above nipples
- Catheter becomes displaced or disconnected from the filter
- Dressing has fallen off
- Excessive leakage around entry site
- Excessive sedation
- Unanticipated motor loss
- Back pain
- Headache
- Any other sign of neurological deterioration
- Entry site red or swollen
- Suspected Dural Puncture

Alternative positioning or ambulating in labour

Some women wish to have epidural analgesia and still be able to adopt alternative weight bearing positions or ambulate during their labour. Providing there is documentation in the case notes by the anaesthetist to facilitate this and maternal and fetal well-being can still be monitored, this may be possible in the following circumstances:

- The epidural block should be established and maintained with a low concentration local anaesthetic.
- Epidural top-ups must be performed with the women on the bed.
- The woman should remain on the bed until 4 x 5 minutely observations (i.e. 20 minutes) have been performed following the completion of the epidural top-up.
- If at any time stronger local anaesthetic solutions are used, the woman is excluded from moving into alternative positions.
- Movement of the woman to alternative labouring positions should only be considered if over 20 minutes has elapsed since the last top-up and maternal and fetal observations are within normal limits
- The woman has adequate motor and sensory function of their legs as evidenced by the ability to perform and maintain a straight leg raise with both limbs individually ≥ 5 seconds.
- BP is performed both lying and sitting with ≤ 20 mmHg drop in systolic BP and sitting BP is ≥ 100 mmHg.
- The woman is sat upright prior to attempting to stand or walk to assess possible effects of hypotension or epidural medication.
- The woman is able to weight bear (tested with 2 staff)
- A midwife must accompany the woman at all times.

Document in the woman's case notes assessment of sensory and motor block and the criteria met to use alternative labouring positions.

Adverse Effects

- Maternal hypotension (1/50), which can lead to FHR abnormalities²⁷
- Increased rate (x2) of instrumental birth^{27,34}
- Increased length of second stage and use of augmentation with oxytocin²⁷
- Maternal pyrexia³⁵
- Post dural puncture headache (1/100)³⁶
- Nerve damage (numb patch on a leg or foot, or having a weak leg) with effect lasting > 6 months (1/1000), or permanent (1/13,000)³⁶
- Epidural abscess (1/50,000)³⁶
- Meningitis (1/100,000)³⁶
- Epidural haematoma (1/170,000)³⁶

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- Accidental unconsciousness (1/100,000)³⁶
- Severe injury, including being paralysed (1/250,000)³⁵

Contraindications

- Patient refusal, including withdrawal of consent
- Bleeding disorders including abnormal or reduced clotting factors, anticoagulant therapy, platelet disorders
- Local or general sepsis
- Uncorrected hypovolaemia
- Woman unable to cooperate
- Local scarring or other condition limiting access to the epidural space e.g. spina bifida or back surgery
- Raised intracranial pressure
- Lack of availability of trained staff
- Woman unable to consent due to language barrier and interpreter unavailable
- Use of hot packs

Removal of Epidural Catheter

Indications

- Ineffective or leaking
- Epidural anaesthesia/analgesia has ceased and is no longer required
- Alternative analgesia is ordered
- Removal of epidural is clearly requested and documented in the case notes by the anaesthetist particularly if history of severe pre-eclampsia or thrombocytopenia

Procedure

1. Consider all aspects of patient safety including risk factors for sustaining a fall and implement prevention strategies.³²
2. Explain the removal procedure to the woman.
3. If the midwife removing the epidural catheter is unfamiliar with the procedure, direct supervision should occur with an experienced midwife.
4. Using the principles of ANTT dressing, slowly remove the adhesive tape used to secure the epidural catheter.
5. If sutured in position, remove suture prior to removal of epidural catheter.
6. Holding catheter 2-4 cm from insertion site, gently pull the catheter until it is removed.
7. If experiencing resistance, place the woman in the position used for insertion of the catheter and try again. Do not use force.
8. If unsuccessful call the anaesthetist.
9. Place an adhesive dressing over the puncture site, and advise the woman to remove after 24 hours.
10. Examine and document any alterations in skin integrity around the insertion site i.e. inflammation, swelling or broken areas.
11. Check the catheter for completeness, ensuring there is a rounded blue tip and all markings present.
12. Document the completeness and removal of the catheter in the medical record.
13. Ensure an alternative form of analgesia has been ordered.
14. Following the removal of the epidural catheter ensure the woman is comfortable and the call bell is within reach.
15. Explain to the woman that she is to stay in bed until full sensation has returned to her legs. Bromage score should be a zero (0) prior to attempting to mobilise. Advise the woman to call for assistance when getting out of the bed for the first time.
16. Prior to mobilising, the woman should be able to perform and maintain a straight leg raise with both limbs individually ≥ 5 seconds.
17. Sit the woman upright to exclude syncope from postural hypotension or medication effects before she tries to support her body weight, stand or walk.

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18. Re-affirm to the woman to notify staff if any signs of complications as provided by the anaesthetist at time of consenting arise and as in the Epidural analgesia in labour consent form.
19. As part of discharge planning and preparation ensure appropriate information is provided about when and where to seek medical advice if issues arise.



Epidural Morphine

Background

Morphine is an opioid drug used for pain relief. Given morphine's low lipid solubility it has a slower onset of action than fentanyl, but a longer duration of action making it more appropriate for analgesia following a caesarean section. The normal duration of effect would be around 12 hours.

Procedure

Morphine is administered via the epidural catheter at the completion of the caesarean section. It is only to be administered by an anaesthetist.

Dose: The normal dose is 1-3 mg with evidence showing higher doses resulted in no better analgesia, but more adverse effects.

Observations

- Routine post caesarean section observations (Pulse and blood pressure every hour for 4 hours, then 4 hourly until 24 hours.)
- Respiratory rate, pain score, sedation score and Bromage - Hourly for 12 hours, then 2 hourly until 24 hours.

Adverse Effects

- Respiratory depression
 - Can occur up to 24 hours after administration, but highest risk period 3-12 hours after administration. Very uncommon in the obstetric population, and with dose of less than 250 micrograms.
 - If respiratory rate <8
 - a. Give oxygen 6L/min via a Hudson mask
 - b. Call the anaesthetist
 - c. Administer naloxone 400 micrograms IV, repeating every 2 minutes
- Sedation
 - If sedation score of 3 (or SS 2 with RR < 7)
 - a. Give oxygen 6L/min via a Hudson mask
 - b. Call the anaesthetist
 - c. Administer naloxone 100micrograms IV, repeating every 2 minutes
- Pruritus
 - Itching is a common adverse effect (60%). If severe, naloxone 40micrograms IV as necessary may be administered.
 - Cetirizine, a non-sedating oral antihistamine, may be useful if the patient is not responding to the above measures. Dose is 10mg once or twice a day.
 - Avoid sedating anti histamines as they may worsen sedation.
- Nausea and vomiting
 - Common adverse effect (10-22%). Follow local guidelines for the management of postoperative nausea and vomiting.
- Urinary retention
 - An indwelling catheter will be inserted prior to caesarean section. If unable to void within 4-6 hours following removal reinsertion may be required. If ongoing issues with voiding please contact the anaesthetist.

Contraindications

- Morphine allergy
- Past history of severe nausea and vomiting after previous caesarean section
- Previous herpes simplex (risk of reactivation)³⁴

Inadequate analgesia

The woman should not have any other opioids administered within 12 hours of epidural morphine without the approval of the anaesthetist or pain service.



Intrathecal Morphine

Background

A single dose of intrathecal (IT) morphine can provide safe and effective postoperative analgesia following caesarean section. The onset of analgesia is 45-60 minutes, and the duration of action is 12-24 hours.

Procedure

Morphine is injected in to the spinal space by an anaesthetist prior to surgery.

Dose is 100-150 micrograms.

Observations

- Increased frequency of observations is required following administration.
- Routine post caesarean section observations (Pulse and blood pressure every hour for 4 hours, then 4 hourly until 24 hours.)
- Respiratory rate, pain score, sedation score and Bromage - Hourly for 12 hours, then 2 hourly until 24 hours

Adverse Effects

- Respiratory depression
 - Can occur up to 24 hours after administration, but highest risk period 3-12 hours after administration. Very uncommon in the obstetric population, and with dose of less than 250 micrograms.
 - If respiratory rate <8
 - a. Give oxygen 6L/min via a Hudson mask
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 - Avoid sedating anti histamines as they may worsen sedation.
- Nausea and vomiting
 - Common adverse effect (10-22%). Follow local guidelines for the management of postoperative nausea and vomiting.
- Urinary retention
 - An indwelling catheter will be inserted prior to the caesarean section. If unable to void within 4-6 hours following removal reinsertion may be required. If ongoing issues with voiding please contact the anaesthetist.
- Herpes simplex reactivation
 - There is some evidence of an increased risk of Herpes Simplex reactivation after IT morphine administration. Avoid intrathecal morphine if there is recurrent history of herpes.³⁸

Contraindications

- Morphine allergy
- Severe nausea and vomiting after previous IT morphine use is a relative contraindication. Options for alternative analgesia should be discussed with the patient and a plan agreed upon.

Analgesia for Labour and Birth (Pharmacological)

Inadequate analgesia

- This is uncommon, and the patient should have good analgesia for 12-24 hours. The patient should take regular oral paracetamol and anti-inflammatory medication provided there are no contraindications
- Breakthrough pain should be treated with oral oxycodone or tramadol provided there are no contraindications.
- Other opioids should be avoided or limited if possible for the first 24 hours following administration of IT morphine. Please contact the anaesthetist if pain cannot be controlled.



Patient Controlled Analgesia (PCA)

Background

Intravenous and intramuscular opioids have only modest efficacy in reducing the intensity of pain during labour.³⁹

Patient-controlled intravenous analgesia (PCIA) with opioid is a method that may also produce satisfactory analgesia for a proportion of labouring women. The opioids commonly used for PCIA are Fentanyl and Remifentanyl. PCIA with fentanyl or remifentanyl is more effective and reliable than intramuscular or intravenous morphine or nitrous oxide inhalation.⁴⁰⁻⁴²

PCIA provides another option for women in labour in whom an epidural is contraindicated, unachievable or unwanted.

Procedure

Fentanyl

Dosing: 20microgram/mL solution (1000microgram in 50mL sodium chloride 0.9%) via PCA pump)

- Commence with a demand only approach (20microgram to 25microgram depending on the intensity of pain) using a 5 minute lockout time.
- If ineffective, the anaesthetist may choose to increase the bolus dose, shorten the lockout time or add a continuous infusion (e.g. 25microgram/hour).
- The recommended dose may be changed by the anaesthetist depending on the patient's clinical situation

Remifentanyl

More rapid onset and shorter duration of action than fentanyl.

Minimal accumulation of maternal plasma remifentanyl and thus possibly lower incidence of neonatal respiratory depression.^{43,44}

Dosing: 20microgram/mL solution (1mg in 50mL Sodium chloride 0.9%) via ALARIS® PCA pump

- Dose is based on ideal body weight
- Commence a demand bolus of 20microgram (1mL) with a lockout of 1 minute.
- The bolus dose must be delivered over 60 seconds.
- If ineffective, the anaesthetist may increase the bolus dose by increments of 10micrograms to a maximum of 0.5micrograms/kg. The anaesthetist may consider adding a background infusion of 0.05microgram/kg/min to a maximum of 0.1microgram/kg/min.^{45,46}
- The recommended dose may be changed by the anaesthetist depending on the woman's clinical situation

Observations

CTG monitoring is not required unless clinically indicated. The following observations need to be recorded on the Rapid Detection and Response (RDR) chart hourly for 8 hours and then every 2 hours until PCA is ceased:

- Pain score
- Sedation score
- Respiratory rate
- Maternal heart rate
- Fetal heart rate
- SpO₂



Adverse Effects

Maternal

Opioid use has been associated with respiratory depression and cardio-respiratory arrest.^{47,48}

An oxygen source must be readily accessible and naloxone for opioid reversal should be available. The following algorithm is suggested:

1. If maternal oxygen saturation is 85% - 94%, respiratory rate is above 8, and patient is awake then oxygen should be administered via Hudson mask at 6L/min and the woman should be encouraged to take deep breaths. Oxygen delivery may be changed to nasal prongs at 2 to 3L/min to maintain saturation above 94%.
2. If saturations remain 85% - 94% or respiratory rate is 5 - 8/min or patient is drowsy (i.e. sedation score = 2, sleepy but responds to verbal stimulation): stop the PCA pump and notify the duty anaesthetist. The anaesthetist may choose to modify or cease the PCA regimen or to administer higher concentrations of oxygen or naloxone.
3. If the saturation is less than 85% or respiratory rate less than 5/min or patient does not respond to verbal stimulation (i.e. sedation score >2): give naloxone, activate local emergency procedures and support airway and ventilation as required.

Neonatal

Opioids may cause neonatal respiratory depression (sedation, apnoea, slow establishment of respiration and hypoventilation).⁴⁹ Naloxone may be required.

1. A person skilled in neonatal resuscitation must be present at the time of birth. In cases in which large doses of opioid have been administered, it may be appropriate to ensure that a neonatology staff member is present.
2. Observe the neonate post-birth for adverse effects, such as sedation or respiratory depression. Observations for the first hour post-birth should include 15 minutely respiratory rate and heart rate.

Contraindications

- Allergy to proposed opioid (i.e. fentanyl, remifentanyl).
- Clinically significant maternal respiratory depression from previous exposure to opioids and sedatives
- Women with impaired consciousness (SS 3 or SS 2 with RR < 7)
- Women with impaired oxygenation

Analgesia for Labour and Birth (Pharmacological)

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Fact Sheet

Epidural Analgesia

Epidural analgesia, also known as an epidural block (EDB), reduces the pain of labour more than any other kind of pain relief. It contains different types and dosages of medications; usually a combination of a local anaesthetic (numbing) drug and an opioid (strong pain relief). EDB medication works by blocking the transmission of pain signals through your spinal nerves as well as being absorbed into your bloodstream via the epidural veins. An EDB can affect your labour and have serious side effects so it is important that you are fully informed before you make a decision to have an EDB for pain relief in labour.

What is labour pain?

- > Pain in labour is caused by the muscle fibres in the uterus contracting, which helps to dilate your cervix (opening to your womb) and push out your baby.
- > Labour pain is a normal part of how the body works and women experience it differently.
- > Most women use a range of strategies to cope with pain in labour, such as distracting themselves, having a shower or bath or opting to use pain relief medication.

What does having an epidural involve?

- > An EDB is administered by an anaesthetist - a doctor who is trained in giving certain kinds of pain killers (analgesia and anaesthesia).
- > An EDB usually takes about 20 minutes to put in and 20 minutes for the painkillers to start working.
- > First, a cannula (a fine plastic tube) will be put in a vein in your hand or arm. Intravenous fluids (IV drip) will go through this to help keep you hydrated and in case your blood pressure drops (see side effects).
- > Your midwife will ask you to curl up on your side or sit bending forwards. The anaesthetist will clean your back with an antiseptic. The anaesthetist will inject local anaesthetic into your skin, so that putting in the epidural is as comfortable as possible.
- > The anaesthetist then inserts a needle into the lower part of your back and uses it to place an epidural catheter (a very thin tube) into the 'epidural space' near the nerves in your spine. The needle is then taken out and the epidural catheter remains in your back so that the painkilling drugs can be given during your labour.
- > It is important to keep still while the anaesthetist is putting in the epidural, but after the epidural catheter is fixed in place with tape you can move.
- > While the epidural is starting to work, your midwife will take your blood pressure regularly.
- > Sometimes, the epidural doesn't work well at first and your anaesthetist needs to adjust it, or even take the epidural catheter out and put it in again.
- > During labour, you can have extra doses of painkillers through the epidural catheter either as an injection into the epidural catheter (a top-up), or with a patient controlled epidural analgesia (PCEA) pump.

Who can and cannot have an epidural?

- > Most people can have an epidural, but certain medical problems (such as spina bifida, a previous operation on your back or problems with blood clotting) may mean that it is not suitable for you.
- > If you have a particularly long or complicated labour, or high blood pressure, your midwife or obstetrician may suggest that you have an epidural.

Benefits and risks of EDB

- > EDB reduces the pain of labour more than any other kind of pain relief.
- > EDB can be topped up and used for analgesia if you need a caesarean section. Sometimes this process does not work and you will require further analgesia using a spinal block or a general anaesthetic.
- > EDB can effectively lower blood pressure if you have high blood pressure in labour.



Risks of having an EDB in labour

- > You are twice as likely to need an obstetrician use a ventouse (a suction cup on your baby's head) or forceps to help with the birth of your baby
- > The second stage of labour is longer and you are more likely to need IV medication (oxytocin) to make your contractions stronger
- > It can cause your blood pressure to drop, which can affect the transfer of oxygen to the baby, leading to changes in your baby's heart rate
- > You have a higher chance of having a fever. If you do have a fever you or your baby may need antibiotic treatment
- > Although EDB has less effect on your baby than other kinds of opioids, there is some research suggesting that babies born under EDB are less likely to successfully establish breastfeeding

Anaesthetic risks and likelihood of occurrence

- > Significant drop in blood pressure: one in every 50 women (Occasional)
- > Not working well enough to reduce labour pain so you need to use other ways of lessening the pain: one in every 8 women (Common)
- > Not working well enough for a caesarean section so you need to have a general anaesthetic: one in every 20 women (Sometimes)
- > Severe headache (dural puncture): one in every 100 women (Uncommon)
- > Nerve damage (numb patch on a leg or foot, or having a weak leg)
 - o Effects lasting for more than 6 Months (Temporary): one in every 1,000 women (Rare)
 - o Permanent: one in every 13,000 women (Rare)
- > Epidural abscess (infection): one in every 50,000 women (Very rare)
- > Meningitis: one in every 100,000 women (Very rare)
- > Epidural haematoma (blood clot): one in every 170,000 women (Very rare)
- > Accidental unconsciousness: one in every 100,000 women (Very rare)
- > Severe injury, including being paralysed: one in every 250,000 women (Extremely rare)
- > If you are worried about the risk of serious problems that might happen with an epidural, talk about this with your anaesthetist.

What else do I need to consider?

- > An EDB is a medical intervention that can influence the outcome of your labour.
- > When you have an EDB you are less able to move around, and are usually confined to the bed.
- > You will need to have an intravenous cannula (IV drip).
- > You might find it difficult to urinate and may need to have a tube passed into your bladder (a bladder catheter) to drain the urine.
- > Your labour (your contractions and the baby's heart rate) will need to be continuously monitored with a cardiotocograph (CTG).
- > Having an epidural does not necessarily mean a more satisfying labour experience, and may even decrease women's satisfaction with their birth experience.
- > For some women an EDB works very well and is the best option for their labour.

For more information please speak to your midwife or doctor.

Epidural Analgesia for Labour Fact Sheet

SA Maternal, Neonatal and Gynaecology
Community of Practice

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SA Health

Acknowledgements

The South Australian Perinatal Practice Guidelines gratefully acknowledge the contribution of clinicians and other stakeholders who participated throughout the guideline development process particularly:

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South Australian Perinatal Practice Guideline

Analgesia for Labour and Birth (Pharmacological)

Document Ownership & History

Developed by: SA Maternal, Neonatal & Gynaecology Community of Practice

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Endorsed by: SA Health Safety and Quality Strategic Governance Committee

Next review due: 14/11/22

ISBN number: 978-1-74243-931-0

PDS reference: CG277

Policy history: Is this a new policy (V1)? **N**

Does this policy amend or update an existing policy? **Y**

If so, which version? V1

Does this policy replace another policy with a different title? **Y**

If so, which policy (title)? **Intrathecal Morphine PPG incorporated in PPG**

Approval Date	Version	Who approved New/Revised Version	Reason for Change
14/08/20	V1.1	Chair, SA Maternal, Neonatal & Gynaecology Community of Practice	Re-templated, risk-assessed and extended for 2 years. Removal of pain score level requirement for administration of intradermal sterile water injections.
14/11/17	V1	SA Health Safety and Quality Strategic Governance Committee	Original SA Health Safety and Quality Strategic Governance Committee approved version.