

**Achieving Sustainable Quality in  
Maternity Services**

# ASQUAM

## Epidural Analgesia by Continuous Infusion Guideline

<b>Date of Ratification:</b>	February 2018
<b>Date of Next Review:</b>	February 2021
<b>Ratified by:</b>	Labour Ward Forum Sub-Group Obstetric Guideline Group and Anaesthetic Departmental meeting
<b>Reviewed by:</b>	Dr [REDACTED] Consultant Anaesthetist

**VERSION CONTROL SCHEDULE**

Version	Date	Author	Comments
1	1996		
2	2003		
3	2004		
4	2005		
5	2013 – October		
6	2016 – June	Dr [REDACTED] Consultant Anaesthetist	Minor change to include reference to Urinary Retention and staff to refer to UHNM ASQUAM Guideline for the Prevention of Urinary Problems during Labour and the Postnatal Period (Bladder care) September 2015  Full review due in February 2017
7	2018		Full review undertaken

<b>Contents</b>	<b>Page No.</b>
1. PURPOSE OF THE GUIDELINE	5
2. BACKGROUND	6
2.1 Effectiveness of epidural PCEA Regime	6
2.2 Effects on the progress and outcome of labour	6
2.3 Adverse effects of epidural analgesia in labour to the baby	6
2.4 Education, training and competency based assessments of Midwives and the responsibilities of both Midwives and Anaesthetists	8
2.5 Timing of epidural from request	9
2.6 Indications for epidural analgesia in labour	9
2.7 Contra-indications to epidural analgesia	10
3. THE PRACTICAL CONDUCT OF CONTINUOUS EPIDURAL ANALGESIA IN LABOUR	11
3.1 Consent	11
3.2 Investigations prior to epidurals	11
3.3 The epidural infusion Mixture	12
3.4 Equipment needed	12
3.5 Additional drugs which must be available on the Delivery Suite	12
3.6 Establishing and maintaining epidural analgesia	12
3.7 Assessment and management of the block	13
3.8 Intrapartum care	14
3.9 Use of top-ups	15
3.10 Additional monitoring and documentation	15

4.	MANAGING COMPLICATIONS OF EPIDURALS	16
5.	EPIDURAL CATHETER REMOVAL	18
6.	TRANSFER BACK TO WARD	18
7.	MONITORING AND AUDIT	19
8.	REFERENCES	20

FOI REF 223-1819

## 1. PURPOSE OF THE GUIDELINE

The purpose of the guideline is to provide up-to-date information for medical and midwifery staff to ensure the provision of consistent high quality evidence based care for women receiving epidural analgesia in labour by PCEA at the Royal Stoke Hospital.

### Identification and assessment of evidence:

The guideline will address the following issues relating to epidural analgesia in labour by continuous infusion:

- The effectiveness of pain relief in relation to other pharmacological methods
- The effects of epidural analgesia on the progress and outcome of labour
- Adverse effects of epidural analgesia in labour to mother and baby
- Timing of epidural analgesia
- The indications for epidural analgesia in labour
- The contra-indications to epidural analgesia on labour
- Education, training and competency based assessments of midwives and the individual responsibilities of both midwives and anaesthetists
- The practical conduct of continuous epidural analgesia in labour
  - The epidural infusion mixture
  - Equipment needed
  - Additional drugs which must be available
  - Assessment of the block
  - Establishing and maintaining analgesia
  - Continuous epidural infusion and the management of the 2nd stage of labour
  - Additional monitoring required
- Complications of continuous epidural infusion mixtures and actions to be taken
- Removal of an epidural
- Discharge to ward
- Storage

## 2. BACKGROUND

An established and effective method of pain relief in most units now is the use of a mixture of a low concentration local anaesthetic (LA) solution and an opioid, administered in this unit by PCEA<sup>(1)</sup>. A combined spinal intrathecal & epidural technique (CSE) may be used in certain circumstances, as assessed by the anaesthetist. These techniques are associated with good pain relief without an increase in caesarean section rate<sup>(2)</sup> or anaesthetic complications<sup>(3)</sup>.

### 2.1 Effectiveness of epidural PCEA Regime

PCEA is the most effective method of pain relief in labour with reduced motor block.<sup>(4,5)</sup> This method requires fewer additional top-ups resulting in reduced total dose of LA.<sup>(6)</sup>

The overall incidence of failure is around 16.9%,<sup>(7)</sup> and proves to be more difficult in the obese patients.<sup>(8)</sup> Therefore regular review of pain relief is required in obese patients.

### 2.2 Effects on the progress and outcome of labour

Compared to non-epidural methods epidural analgesia can lead to:<sup>(4, 10)</sup>

- An increase in the length of first and second stages of labour
- An increase in the use of oxytocin
- Increased caesarean section rate if high concentrations are used<sup>(9)</sup> not with low dose infusions.<sup>(4, 10)</sup>

Discontinuation of the epidural towards the end of the first stage is associated with a higher incidence of inadequate pain relief without a demonstrated reduction in the need for instrumental delivery.<sup>(11)</sup>

### 2.3 Adverse effects of epidural analgesia in labour to the baby

Compared to non-epidural methods epidural analgesia was not associated with an increase in neonatal acidosis and may:-

- provide some protection from hypoxia<sup>(14)</sup>
- improve neonatal outcome<sup>(5)</sup>

However intrathecal (in the cerebrospinal fluid) opioids may increase the incidence of fetal bradycardia.<sup>(15)</sup>

### **Adverse effects of epidural analgesia in labour to the mother**

There are a number of possible maternal adverse effects and complications of epidural analgesia.

- **Headache:** Dural puncture occurs in approximately 1-2% of labour epidurals.
- **Backache:** **No** evidence for long term backache<sup>(16)</sup> but there may be a reported increase in short-term backache (lasting less than two weeks).<sup>(17)</sup>
- **Neurological damage:** incidence of neurological complications 6:10,000 to 1:10,000.<sup>(18)</sup>
- **Life-threatening acute complications:** It can be associated with local anaesthetic toxicity.<sup>(18)</sup>
- Very high or total spinal block<sup>(18)</sup>

#### Other maternal effects

- **Maternal pruritus:** epidural opioid drugs increases the incidence of maternal pruritus.
- **Maternal pyrexia:** there is an association with maternal pyrexia.<sup>(4)</sup>
- **Hypotension:** uncommon with the use of epidural mixtures.
- **Nausea and vomiting**
- **Urinary retention** – Refer to current UHNM ASQUAM Guideline for the Prevention of Urinary Problems during Labour and the Postnatal Period (Bladder care)

## **2.4 Education, training and competency based assessments of Midwives and the responsibilities of both Midwives and Anaesthetists**

The Midwife caring for a mother should be familiar of the PCEA technique.

### **Responsibilities of the Midwife**

The midwife should have the knowledge and capabilities to manage the technique safely:

- Ensure correct delivery of the infusion within the prescribed range
- Monitor the effectiveness and extent of the block (sensory and motor block)
- Monitor the patient's vital signs and be able to recognise complications
- Initiate and communicate, appropriate responses where there are concerns to the anaesthetist.
- Complete appropriate documentation

### **Responsibilities of the Anaesthetist**

The anaesthetist:

- Should have knowledge of the technique and in managing its complications.
- Ensure that appropriately trained staff are available before using the technique.
- Assume overall responsibility for the epidural and that adequate anaesthetic assistance is available if called upon to perform duties elsewhere.

#### Specific responsibilities:

- Give appropriate explanation and obtain verbal consent and document in the anaesthetic epidural chart.
- Establish effective epidural analgesia as described herein
- Prescribe the infusion
- Prepare and connect the line to the patient
- Act upon concerns of the midwife providing care to the patient
- Manage complications/ trouble shooting as required
- Removal of the catheter and documentation

## 2.5 Timing of epidural from request

As a 24 hour epidural service is provided (attendance should not normally exceed 30-60 minutes) except in exceptional circumstances. <sup>(23)</sup>

### If prolonged delay expected:

- Document "**exceptional circumstances**", explain this to the woman.
- Refer to the SOP for Residence Anaesthetist on Call (RAC).
- Discuss use of Remifentanil PCA if circumstances allow.
- Discuss with the on call anaesthetist only if there is a medical indication for the epidural that cannot wait >1 hour.

## 2.6 Indications for epidural analgesia in labour

### Clinical Indications:

- Patient request

### Obstetric Indications:

- Prolonged/slowly progressing labour
- Abnormal presentation, especially breech
- Pregnancy induced hypertension
- Multiple pregnancies
- Pre-term labour
- Vaginal Birth after Caesarean Section (VBAC)

### Medical Indications:

- Cardiac disease (congenital & acquired)
- Respiratory disease
- Obesity
- Skeletal disorders
- Neurological disorders
- Myopathies and muscular dystrophies
- Diabetes Mellitus

## 2.7 Contra-indications to epidural analgesia

Assessment by Anaesthetist will be required prior to siting a continuous epidural infusion in a patient to determine if any of the following is present:

### **Absolute**

- Lack of trained staff to provide safe care.
- Maternal refusal
- Raised intracranial pressure
- Coagulopathy or disorders of blood coagulation
- Uncontrolled haemorrhage or hypovolemia
- Localised or systemic sepsis
- Severe spinal abnormalities
- Some neurological diseases
- Neuromuscular disorders
- Allergy to local anaesthetic agent

### Anticoagulant therapy

Do not insert epidural:

- for at least 12 hr after last prophylactic dose of LMWH
- for at least 24 hr after last therapeutic dose of LMWH

Asprin is not a contraindication to regionals

### Relative

*Discuss with consultant obstetric anaesthetist*

- Neurological disorders (spinal bifida occulta)
- Significant cardiac disease
- Anatomical deformity or back surge

### **Alternative analgesia**

Discuss the use of a Remifentanil PCA if epidural is contraindicated or the patient is not coping with the conventional analgesic techniques.

### 3. THE PRACTICAL CONDUCT OF CONTINUOUS EPIDURAL ANALGESIA IN LABOUR

#### ***Record BP and temperature prior to request for an Epidural***

- Ensure that at least 12 hours has elapsed since the last dose of low molecular weight heparin was given before considering epidural analgesia.
- Establish IV access. The anaesthetist will assess the need for a fluid "pre-load"<sup>(20)</sup>
- Provide local information leaflet on "epidural in labour"

#### **3.1 Consent**

Where time permits mothers should be given the epidural information sheets. Consent must be obtained in a manner appropriate to the clinical situation.

The following must be discussed with the woman:

Post Dural puncture headache 1-2%, failure, leg weakness,  
Need for urinary catheter, continuous fetal monitoring,  
Neurological problems

#### **3.2 Investigations prior to epidurals**

Though a routine FBC is not recommended, however the decision has to be individualised, based on the patient's history, physical signs and clinical diagnosis or picture.

Investigations are generally required prior to regional insertion in the following circumstances

- Check FBC
  - all pre-eclamptics.
  - septic woman (FBC and CRP)
- Coagulation screen: APPT and INR.
  - if there is IUD greater than a week
  - if platelet count <100,000/ul,

-HELLP syndrome

(DO NOT perform regional if INR and APTT >1.5)

### **3.3 The epidural infusion Mixture**

Only a pre-prepared mixture of levo-bupivacaine and Fentanyl (0.1% and 2 micrograms/ml respectively) is used at the Royal Stoke Hospital. This combination has a synergistic effect, allowing the concentration of anaesthetic to be reduced<sup>(21, 22)</sup>

### **3.4 Equipment needed**

The infusion must only be administered by a designated locking epidural pump, connected to the epidural filter by a coloured delivery tubing to distinguish it from IV sets.

If pumps unavailable, the method of infusion will be at the discretion of on-call consultant anaesthetist.

All resuscitation equipment must be available in labour suite.

### **3.5 Additional drugs which must be available on the Delivery Suite**

Naloxone 400 micrograms/ml

Ephedrine 30mg/ml, Phenylephrine 1ml/10ml

Atropine 600 micrograms/ml

### **3.6 Establishing and maintaining epidural analgesia**

The PCEA regime needs to be recorded on the epidural sheet and signed for in the controlled drug register as required by law. The starting and finishing volumes of Epidural mixtures must be recorded. The volume of any solution (after being double checked by another midwife) must be recorded and discarded (on disposable towels).

#### **Establishing analgesia**

This is the responsibility of the Anaesthetist.

The Anaesthetist should use full aseptic precautions, including sterile gloves and gown and use a facemask when siting the epidural catheter.

PCEA prescription

- Initial loading dose = 10 – 15 mls
- Patient Controlled Demand Dose = 5 mls
- Lockout period = 20 minutes
- Background infusion rate= 5mls/hour
- 1 hourly maximum dose limit

**3.7 Assessment and management of the block**

Analgesia, sensory level (upper limit of block) and motor block and sedation level must to be formally recorded at least every hour.

**a. Sensory level (Block Height)**

For simplicity in assessing the upper level of the block four zones are used.

**Zone A**= the thighs and pubic region (inadequate level): *Contact the anaesthetist is analgesia not adequate after 20min.*

**Zone B**= above the pubic region to just above the umbilicus (*safe analgesia zone*):  
*No action (maintain regime)*

**Zone C**=From just above the umbilicus to just below the nipples (*caution advised zone*): *Stop the background infusion, and if level rising call anaesthetist.*

**Zone D**= The nipples and above (*danger zone*):  
*-STOP PCEA, take handset away from the mother*  
*-call anaesthetist*  
*-Turn mother on side (horizontally) and administer oxygen.*

**b. Pain Score Description**

0= No pain/unaware of contractions: *no action if sensory level at Zone B*

1= Aware of contractions, but not distressed: *no action*

2= Contractions painful/distressed: *contact anaesthetist as may require a bolus or labour progressing rapidly requiring additional opiates*

3=Contractions unbearable: *contact anaesthetist as may require a strong concentration bolus with opiates or epidural may have fallen out.*

**c. Motor Block:**

A simple scoring system of hip and knee movement will be used.

0= Full movement: *no action*

1= Partial weakness: *no action*

2= Virtually no movement: *see action below on 3*

3= No movement:

**-STOP PCEA**

*-check sensory level*

*-Contact anaesthetist*

*-Reassess every 30 minutes*

*-If improving and parturient uncomfortable restart PCEA*

*-If not improving after 4 hours further investigation maybe required*

**d. Sedation Score Description**

0= Fully alert: *no action*

1= Drowsy but easily roused (responds to name): *no action*

2= Only aroused with difficulty (requires shaking): *see action below on 3*

3= Un-arousable: *For score 2-3 call anaesthetist urgently and manage as for high spinal/collapsed patient (2.9)*

**3.8 Intrapartum Care**

- As long as epidural analgesia is maintained
  - Maintain venous access
  - Monitor Continuous electronic fetal monitoring
  - Encourage woman not to lie flat on her back.
  - Encourage change of position regularly to prevent pressure sore
  - Maintain an accurate fluid balance record during labour
- Diet and antacid prophylaxis

- In very high risk patients (as assessed by labour suite team) withholding oral intake may be appropriate
- Acceptable drinks for all include: water; tea; coffee; squash and non-fizzy isotonic sports glucose drinks
- Prescribe Oral ranitidine 150 mg every 6–8 hr while in labour

- Bladder care: *refer to bladder care guidelines*

### 3.9 Use Of Top-Ups

Only an anaesthetist **must** give top-ups ***if required*** in the following situations. The amount and concentration is at their discretion.

- Forceps deliveries in the labour room.  
*(the anaesthetist must be present for the delivery in such circumstances)*
- To extend the block for caesarean sections
- After a suspected Dural tap
- For intrathecal catheters

Use of high concentration of local anaesthetics may limit mother's ability to move and to push effectively and maternal satisfaction<sup>(21, 22)</sup>.

### 3.10 Additional Monitoring and Documentation

Blood pressure should be documented prior to the epidural and every 5 minutes for the first 20 minutes (after every 60 minutes).

Following a top-up or increase in the infusion rate they must be again checked every 5 minutes for 20 minutes, and then 60 minutes.

In addition to blood pressure and maternal heart rate, respiratory rate, block zone, pain motor and sedation score are recorded on the labour record at least every hour.

## 4. MANAGING COMPLICATIONS OF EPIDURALS

### a. High block/total spinal or collapsed parturient

- Call for HELP, including anaesthetist
- Either turn on side or manually displace uterus
- Oxygen therapy (if breathing) or Ventilation (if not) may be required.
- Rapidly infuse 500mls of Hartmanns if hypotensive
- Additional drugs and airway management may be required.

### b. Intravascular injection of local anaesthesia

Intravascular injection arises as a result of incorrect site of administration (IV) or incorrect dose administered

#### ***Symptoms and signs***

Peri-oral numbness, difficulty speaking, Tinnitus, Dizziness, Restlessness, Dysrhythmia (bradycardia, VT and VF), Hypotension, Convulsions, Loss of consciousness

#### • **Stop epidural infusion**

- Summon help immediately including anaesthetist
- Commence resuscitation, manually displace uterus
- All principles of basic and advanced life support apply
- Control seizures (drugs by anaesthetist only)
- Bag-mask ventilate with 100% oxygen before intubation
- Use 20% intralipid (kept in theatres) as a bolus and infusion.
- Perform caesarean section if unstable or in an arrest situation
- Take blood for analysis and other investigations.
- It may take 1 hour before stability is restored.

### c. Significant Hypotension

If the blood pressure falls by >30 mmHg of baseline or to <90 mmHg

- Stop infusion and call anaesthetist.
- Place in lateral position (horizontally).
- Consider use of supplementary oxygen. Infuse 500ml Hartmann's solution stat.

#### d. Respiratory depression/Sedation

When the respiratory rate (RR) is less than 10 breaths per minute

- STOP the infusion and call the anaesthetist.

If the RR is 6 or less:

Administer oxygen by mask,

- Administer Naloxone 400 mcg subcutaneously.
- Call the anaesthetist  
(Naloxone to the IV infusion may be considered).

#### e. Itching

Itching of the trunk and of the nose is quite common

- Reassure mothers that it's harmless and self-limiting.
- If severe and distressing pruritus use Naloxone 40-100mcg iv
- If symptoms are very severe, abandon infusion mixture
- Consider just local anaesthetic for analgesia or alternate analgesia

#### f. An accidentally disconnected catheter

A clear dressing around the filter and catheter point may prevent disconnection.

- Witnessed disconnection.
  - Cover both ends with sterile gauze.
  - Call the anaesthetist immediately
  - The anaesthetist will decide on the decision to reconnect
- Unwitnessed disconnection
  - DO NOT RECONNECT
  - Unwitnessed disconnections will likely require the epidural to be removed at the earliest possible time to reduce the risk of infection.
  - if delay in anaesthetist attendance cover with sterile gauze.

**g. Suspected neuroaxial infection in labour**

*Patients temperature rises to 37.5–38 °C with epidurals (0.33 %/hr) – maternal and fetal implications of this are still unclear*

However, if infection is suspected (e.g., fever, headache, backache, erythema, and tenderness at the insertion site) in labour(27):

- Immediately remove catheter.
- Send
  - tip of catheter for culture (aseptically taken)
  - Swab of entry site for culture/sensitivity
  - CSF if intrathecal, for CSF analysis,
  - Send blood cultures FBC, C reactive proteins,
- Consult with microbiologist and infective medicine consultant.
- Perform appropriate imaging studies after delivery.

**5. EPIDURAL CATHETER REMOVAL**

- **Do not** remove for at least 12 hours after prophylactic and 24 hours of therapeutic LMWH administration
- In severe PET and after a massive bleed, ensure normal FBC and clotting profile before removal
- Unless otherwise directed by anaesthetist, remove just before discharge back to ward
- Pull firmly on catheter, but **do not** use excessive force – catheter should come out easily with minimal resistance.

*If not, seek senior or consultant anaesthetist`s advice*

- Remove catheter and check if blue tip is complete
- Document removal of catheter and whether tip intact
- Inform anaesthetist of any problems
- Document the volume of the epidural mixture used.

**6. TRANSFER BACK TO WARD**

Before transferring to ward, midwife should ensure:

- Vital signs are normal
- Adequate return of motor power to legs and document
- Epidural and Intrathecal catheter has been removed and was intact.
- No headache present

If not, contact anaesthetist

In line with the current ASQUAM Maternity Services Record Keeping Standards including Hand Held Records Guideline, all anaesthetic records including epidural or spinal anaesthesia records should remain stored in the patient’s maternity hand held record following completion of care by Maternity Services.

## 7. MONITORING AND AUDIT

The need to monitor/audit the standards set out below will be considered alongside other Directorate requirements and prioritised accordingly. The Directorate Clinical Audit programme is drafted by the Directorate Clinical auditor, in liaison with clinical staff, and approved by the Directorate.

Element to be monitored	Lead	Tool	Frequency	Reporting arrangements	Acting on recommendations and lead(s)	Change in practice and lessons to be shared
Guideline content	Guideline Co-ordinator	Guideline Review	Every three years	Labour Ward Forum Subgroup: Guideline Meeting	Required changes to practice will be identified and actioned with the release of the updated guideline.	Required changes to practice will be identified and actioned with the release of the updated guideline.
Clinical standards within guideline	Directorate Clinical Auditor	Clinical Audit	As required in relation to other Directorate priorities	Directorate Business, Performance and Clinical Governance Meeting	Required actions will be identified and completed in a specified timeframe as per the audit action plan.	Required changes to practice will be identified and actioned within a specific timeframe as per the audit action plan and, in addition, lessons will be shared with relevant stakeholders as per audit action plan.

## 8. REFERENCES

1. R. Burnstein, 1 R. Buckland<sup>2</sup> and J. A. Pickett<sup>1</sup>. 1999. A survey of epidural analgesia for labour in the United Kingdom. *Anaesthesia*, 54, pages 634–640.
2. Comparative Obstetric Mobile Epidural Trial (COMET) Study Group UK. Effect of low-dose mobile versus traditional epidural techniques on mode of delivery: a randomized controlled trial. *Lancet* 2001; 358: 19–23
3. Gambling DR, Yu P, Cole C et al. (1988) A comparative study of patient controlled epidural analgesia (PCEA) and continuous infusion epidural analgesia (CIEA) during labour. *Can J Anaesth* 35: 249 – 254.
4. CJ Howell (1999) Epidural versus non-epidural analgesia for pain relief in labour. The Cochrane Database of Systematic Reviews, Issue 3.
5. Halpern SH, Leighton BL et al (1998) Effect of epidural vs parenteral opioid analgesia on the progress of labour: a meta-analysis. *JAMA* 280 (24): 2105-2110
6. Van der Vyver M, Halpern S and Josphe G. (2002) Patient-controlled epidural analgesia versus continuous infusion for labour analgesia: a metaanalysis . *British Journal of Anaesthesia* 89 (3): 459-465. Ghislaine Le Coq, Béatrice Ducot and Dan Benhamou. 1998,
7. Risk factors of inadequate pain relief during epidural analgesia for labour and delivery. *Canadian journal of anaesthesia*. 45 (8): 719-723
8. Bamgbade W.M. Khalaf, O. Ajai, R. Sharma, V. Chidambaram<sup>£</sup>, G. Madhavan 2009 Obstetric anaesthesia outcome in obese and non-obese parturients undergoing caesarean delivery: an observational study. *International Journal of Obstetric Anaesthesia*, 18( 3): 221-225.
9. Hughes D, Simmons SW, Brown J, Cyna AM. (2003) Combined spinal-epidural versus epidural analgesia labour. The cochrane Database of Systematic Reviews, Issue 4.
10. Zhang J Klebanoff MA, DerSimonian R. (1999) Epidural analgesia in association with duration of labour and mode of delivery: a quantitative

review American Journal of Obstetrics and Gynaecology 180 (4): PP. 970-977 (original article) . Also, Database of Abstracts of Reviews of Effects, (Structured abstract). 2005 Issue 2

11. Torvaldsen S et al. (2004) Discontinuation of epidural analgesia late in labour for reducing the adverse delivery outcomes associated with epidural analgesia.  
The Cochrane Database of Systematic Reviews, Issue 4
12. Wong CA et al. (2005) The risk of caesarean delivery with neuraxial analgesia given early versus late in labour. N Engl J Med 352(7): PP. 718-20
13. Database of Abstracts of Reviews of Effects (2005) Effect of epidural analgesia for labour on the Caesarean delivery rate (Structured abstract).  
Database of Abstracts of Reviews of Effects, Issue 2
14. Reynolds F, Sharma SK, S and Seed PT. (2001) Analgesia in labour and fetal acid-base balance: a meta-analysis comparing epidural with systemic opioid analgesia . British Journal of Obstetrics and Gynaecology 109(12): PP. 1344-1353 (original article) Also, Database of Abstracts of Reviews of Effects, (structured abstract) 2005 Issue 2
15. Madirosoff C, Dumont L, Boulvain M and Tramer MR (2002) Fetal bradycardia due to intrathecal opioids for labour analgesia: a systematic review British Journal of Obstetrics and Gynaecology 109 (3) PP. 274-281  
Also, Database of Abstracts of Reviews of effects, (Structured abstract) 2005 Issue 3
16. CJ Howell et al. (2002) Randomised study of long term outcome after epidural versus non-epidural analgesia in labour. BMJ. 325: PP.337
17. Butler R, Fuller J. (1998) Back pain Following Epidural Anaesthesia in Labour. Can J Anaesth 45: PP. 724-726
18. Auroy Y et al. (1997) Serious complications Related to Regional Anaesthesia. Anaesthesiology 87: PP. 479-86
19. Jenkins JG. (2005) Some immediate serious complications of obstetric epidural analgesia and anaesthesia: a prospective study of 145,550 epidurals. International Journal of Obstetric Anesthesia 14(1): PP. 37-42

20. Hofmeyr GJ, Cyna AM, Middleton P. (2004) Prophylactic intravenous preloading for regional analgesia in labour. The Cochrane Database of Systematic Reviews, Issue 4
21. Murphy JD, Hutchinson K, Bowden MI et al. (1991) Bupivacaine versus bupivacaine plus fentanyl for epidural analgesia: effect on maternal satisfaction. *BMJ* 302: PP. 564-567
22. Cohen SE et al. (1987) Epidural fentanyl/Bupivacaine for obstetric analgesia. *Anaesthesiology* 67: PP. 443-47
23. Association of Anaesthetists of Great Britain and Ireland and Obstetric Anaesthetists Association (2005) *OAA/AAGBI Guidelines for Obstetric Anaesthesia Services 2*. (London: AAGBI & OAA)
24. UHNM (current version) ASQUAM Maternity Services Record Keeping Standards including Hand Held Records Guideline
25. Velinor, A Urinary catheterization in labour: best practice for midwives. *British Journal of Midwifery* September 2010 Vol 18, No 9
26. UHNM (current version) ASQUAM Guideline for the Prevention of Urinary Problems during Labour and the Postnatal Period (Bladder care)
27. NICE guideline. 2016 Sepsis: recognition, diagnosis and early management  
Sepsis: recognition, diagnosis and early management

## Appendix 1

## What you need to know about an epidural

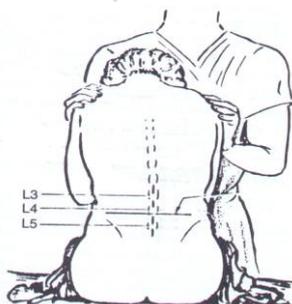
Patient information sheet Royal Stoke Hospital 2017/20

### ▶ What is an epidural?

- An epidural is an injection between the bones in your lower back
- A fine plastic tube is placed in your back
- The tube stays in your back so that painkillers can be given throughout labour
- The pain-killers act on the nerves carrying the pain messages

### ▶ What does it involve?

- The epidural is put in by an anaesthetist, usually takes 10 minutes
- You will be asked to sit up or lie on your side and to curl up as much as possible
- Your back will be cleaned with an antiseptic solution
- A small injection which may sting, will be used to numb the skin
- A needle is used to pass in the plastic tube
- The needle is removed once the tube is in place
- You will notice an effect within 20 minutes
- The procedure is uncomfortable rather than painful



## ► What are the benefits?

- Epidurals are the most effective form of pain relief in labour
- Normally they do not make you sick or sleepy
- An epidural can be used if you need an operation
- Epidurals are safe for you and your baby

## ► What are the risks?

- Epidural causes headache in about 1-2 in a 100 cases. The headache can be severe and last several days
- Epidurals do not always work. 1 in 10 cases may fail to give good pain relief
- The lower part of your body may become very numb, so you may not be able to move your legs normally
- As your blood pressure may fall, your BP will be regularly checked
- You may not be able to pass urine and may need a urinary catheter
- Nerve damage is very rare, though you may feel an electric shock down your legs as the procedure is being performed.
- Epidurals may lead to an increased chance of instrumental delivery
- Epidurals do not cause long term backache
- Life-threatening problems are very rare

Some complications may appear after being discharged. If you develop

- ***a positional or severe headache***
- ***severe or worsening backache***
- ***weakness or numbness, strange sensation of legs***
- ***loss of control of bowel or bladder.***

**In such circumstances you are advised to get in touch with us directly through the labour suite as these symptoms may require urgent medical attention**