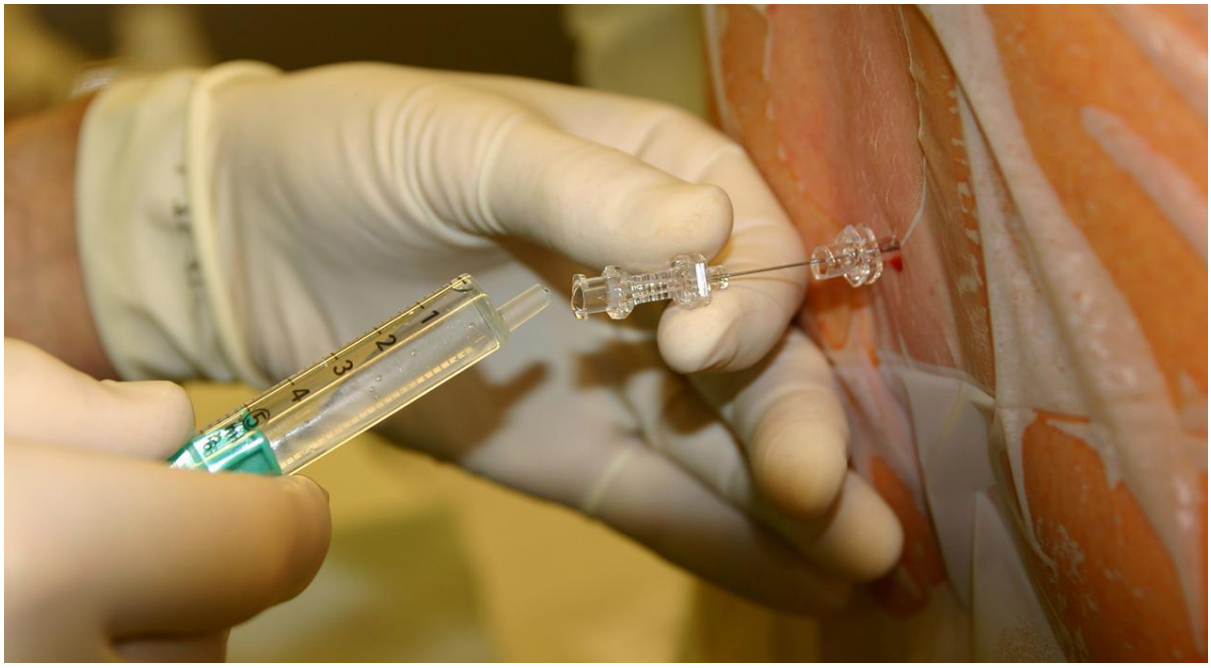
Obstetric Anaesthesia at Macclesfield Hospital

Information for Trainees and Locum Staff



June 2023

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Introduction

Welcome to Macclesfield Hospital.

This booklet is intended to give you an introduction to working on the Delivery Suite along with information about the day-to-day workings of our maternity services.

If you have any questions after reading this booklet, then please ask a colleague or contact Dr Willmott.

Consultant Cover

The Consultant Anaesthetists who participate in regular Maternity sessions are:

Dr James Willmott
Dr David Banks
Dr Mohammed Ikram
Dr Mohammed Imran

- During normal working hours there will be a Consultant Anaesthetist assigned specifically to delivery suite. If you have any queries regarding consultant cover during this time then please contact the Anaesthetic Department on extension 1307.
- Outside of normal working hours, there will be a designated Consultant Anaesthetist on-call for Delivery Suite. This information can be found on the weekly anaesthetic rota. They should be contacted via switchboard if senior help is required.

Departmental Protocols

- The full range of departmental protocols can be accessed via MaccGas.

General Duties when working on Delivery Suite

At the start of a shift:

- Write your name on the whiteboard in the office at the Midwives station & communicate with the Midwifery co-ordinator.
- Liaise with the ODP and carry out machine and equipment check.
- Attend the MDT handover in the delivery suite. This takes place at 08:30 and 20:30 and you should make every effort to attend.
- After the MDT handover, an MDT ward round should take place. An anaesthetist should be present. Please make sure your presence on the round is documented in the patient reviews for audit purposes.
- Per GMC guidance, patients should have time to consider the benefits and risks of a procedure when free from pain. This is clearly challenging in the delivery suite environment and isn't always achievable. It is, however, appropriate to approach patients in the pre-labour rooms and those in early labour, to enquire regarding their current preferences for pain relief. The 'Labour Pains' website has a variety of patient information leaflets (many translations are also available) that could be printed and provided for patients. The 'Epidural Information Card' and 'Pain Relief Comparison' are particularly useful. Their new 'RA/GA infographic' contains some useful statistical comparisons pertaining to risk.

Theatre set up:

- Main Theatre 1 is primarily for emergency work and has its own theatre team.
- If there are two emergency sections at once, an appropriate theatre will be made available. In this instance, liaise with the theatre coordinator.
- Dedicated elective caesarean section lists run in Main Theatre 3 in the afternoons of Monday, Thursday & friday with a separate theatre team
- We have separate standard intubation and difficult intubation trolleys in theatre. A McGrath videolaryngoscope and blades are kept in Mat theatre. Please familiarise yourself with the DAS Obstetric Failed Intubation Algorithm (attached to standard airway trolley).
- The following should be kept in the emergency drug tray in the fridge in both Mat 1 and 2:

Drug		
Propofol 1%	2 x 20ml ampoules	20ml + 10ml labelled syringes
Rocuronium 10mg/ml	2 x 5ml ampoules	1 x 10ml labelled syringe
Oxytocin 10IU/ml	1 x 1ml ampoule plus 10ml ampoule of saline	1 x 10ml labelled syringe
Gycopyrrolate 600mcg/3ml	1 x 3ml ampoule	1 x 3ml labelled syringe

- Phenylephrine should always be prepared and administered in a concentration of 100mcg/ml.
- Phenylephrine (100mcg/ml) should be drawn up and loaded on the syringe pump with a primed Y connector attached, along with Hartmanns run through the fluid warmer. Check the syringe is correctly loaded and recognised by the pump by switching the pump on to see that

the ‘clamp disengaged’ image does not appear. Please see the flow chart at the end of the document regarding how to adjust your rate of infusion depending on the patient BP.

- Check atropine ampoules (600mcg/ml) are available on the work top.
- Drugs should not be pre-drawn, other than phenylephrine, which should be replaced every 24 hours. In order to reduce the risk of drug error, if pre-diluted syntocinon is found left in the fridges, these will be disposed of. Syntocinon should only be drawn up after delivery of the baby when it is about to be given.
- The Trust antibiotic policy can be located on the intranet
- If you are not familiar with any of the PCA pumps, infusion or volumetric pumps we use, or the epidural pumps please discuss with one of the consultants ASAP to get some training. One of our trainers will usually be able to help.

Postnatal Syntocinon Infusion

- Standard infusion: 40 IU in 500mls of normal saline administered over 4 hours, so 125mls/hr.
- Concentrated regime for fluid restricted patients: add 40IU of syntocinon into 36mls of 0.9% saline to make up a volume of 40mls. Give via a syringe pump at 10mls per hour.

Follow-up visits:

During your shift, please carry out the follow-up visits:

- All patients who have had anaesthetic input (i.e. any procedure in theatre or epidural for labour, including abandoned procedures) require their details inputting onto the excel database. It should only take a minute and if preferred you can do multiple entries at the end of your shift.
- All patients require a follow-up visit at around 24 hours post procedure. Most patients will be found on the post-natal ward, but some may still be on delivery suite.
- After a follow-up has been completed, please add these details to the patients’ entry, indicating whether or not they need to be seen again.
- If there have been any post-natal problems i.e., persistent paraesthesia or post-dural puncture headache, please discuss this with the Consultant Anaesthetist. The patient’s hospital number, along with a brief description of the problem & action required should be written in the notes & discussed at handover. The entry, including the history, any examination conducted and action plan, should also be made in the notes for any patient experiencing a significant post-partum anaesthetic related issue.
- If you feel the patient will need anaesthetic follow-up after discharge (this includes all patients who have required active treatment for a post-dural puncture headache) you can arrange for them to be seen in the Anaesthetic clinic run by Dr Willmott. You should discuss the patient with the Consultant Anaesthetist covering delivery suite in the first instance. To book a clinic appointment, please email rachael.benson6@nhs.net with the full patient details and the reason for the appointment. NB This for follow-up after discharge after approximately 4-6 weeks +, the tool for handing over any more short-term/urgent issues is the handover itself.
- Any patient experiencing a traumatic delivery in theatre related to anaesthesia, or has significant failure of analgesia/anaesthesia should be offered the chance to debrief and an appointment in the clinic.

- If a patient is followed up over the phone after discharge, please remember to note this. Please document any discussions in the patients' notes, even if these took place over the phone (the delivery suite ward clerk is usually happy to source notes when requested). Please make sure notes are returned to the ward clerk when regular follow-up has concluded.

Out of hours work

- At night the maternity anaesthetist may be the most experienced anaesthetist in the hospital. Therefore, you may be called upon to help out elsewhere i.e. theatre, ICU, A&E, paediatric ward. You should be pro-active and try to assist with emergencies in other parts of the hospital as needed. You must, however, use your clinical judgment if asked to leave maternity unattended during busy periods and liaise with the Consultant Anaesthetist on-call as indicated.

- If you leave the Delivery Suite for any reason, please inform the Midwifery co-ordinator.

- If you are on a night shift it is a good idea to check the rota to identify the skill mix & liaise with your colleagues.

High-risk patients

- Dr Willmott runs a fortnightly obstetric anaesthetic clinic for high-risk patients on a Monday morning. Patients are referred by the obstetricians for various reasons, e.g. high BMI or pre-existing diseases likely to affect anaesthetic practice.

- When a patient has been reviewed in the clinic, a copy of the clinic proforma is placed in their handheld and a second copy is placed in the high-risk folder in the anaesthetic office, filed under their expected month of delivery.

- The clinic can also accommodate follow-up of post-natal patients when needed e.g. following an epidural blood patch for PDPH, significant failure of analgesia/anaesthesia.

Guidelines for Epidural Analgesia in Labour

Epidural block is a common form of labour analgesia and can also be used to provide anaesthesia for operative procedures. This technique involves risks including intravascular or intrathecal migration of the epidural catheter, potentially leading to complications on subsequent injection of local anaesthetic drugs.

The practice of epidural test doses to prevent these complications and the use of top-ups for a failing epidural or for operative deliveries varies widely amongst anaesthetists. This guideline aims to standardise this practice based on current best evidence and provide the trainees with an outline to manage epidural catheters safely and efficiently.

Indications

- Established first stage labour
- Patient request
- Maternal cardiorespiratory disease
- Morbid obesity
- Augmented labour
- Multiple pregnancy
- Breech presentation

Contraindications

Absolute

- Patient refusal
- Raised intracranial pressure
- Infection at the site of puncture
- Allergy to bupivacaine

Relative

- Systemic sepsis
- Hypovolaemia or shock
- Coagulopathy, thrombocytopaenia and full anticoagulation

Coagulopathy and anticoagulation

- Platelet count < 60 or INR >1.5 are absolute contraindications
- Prophylactic LMWH - wait 12 hours from last dose prior to insertion or removal
- Treatment dose LMWH - wait 24 hours from last dose prior to insertion or removal
- IV heparin infusions - stop heparin for 6 hours and aim for APTT ratio ≤ 1.5
- Allow 4 hours between removal of epidural catheter and first dose of LMWH
- If in doubt discuss with Consultant Anaesthetist

Prolonged ruptured membranes or signs of systemic infection

- If SROM > 24hrs obtain current White Cell Count and Temperature
- If WCC > 16, Temp ≥ 38, HR > 100, systolic BP < 100 ***consider benefit vs risk***
  Prophylactic IV antibiotics
  Amoxycillin 2g iv 8hrly and Metronidazole 500mg iv 8hrly and Gentamicin 5mg/kg od.
  If penicillin allergic, Clindamycin 600mg iv 8hrly and Gentamicin 5mg/kg od.
- An epidural abscess is a neurosurgical emergency with potentially devastating consequences but fortunately occurs infrequently
- Discuss with Consultant Anaesthetist if unsure

- Epidural analgesia should only be offered to women in established labour, as determined by the midwife or middle grade/consultant obstetrician.
- Epidural analgesia should be considered for women in severe pain in the latent phase of labour. Augmentation of labour may be required following insertion of an epidural at this stage of labour
- All women should have received the information leaflet entitled pain relief in labour during the antenatal period. A laminated copy of the Obstetric Anaesthetic Association's "Epidural Information Card" should be available in every delivery room.
- The midwife must ensure the woman has received the necessary information to make an informed decision regarding the use of epidural analgesia and is given an opportunity to ask questions. The information given must include

  1. The risks and benefits and the implications for her labour
  2. It provides more effective pain relief than opioids
  3. It is not associated with long term backache
  4. It is not associated with a longer first stage of labour or an increased chance of caesarean birth
  5. It is associated with a longer second stage of labour and an increased chance of vaginal instrumental delivery
  6. It will be accompanied by a more intensive level of monitoring and intravenous access, and mobility may be reduced

It will be the responsibility of the Anaesthetist to obtain informed consent prior to the procedure. For non-English speaking women use of interpreter is advised as soon as

possible. Obstetric Anaesthethetic Association provides leaflets for various procedures in different languages free of charge on their website.http://www.oaa-anaes.ac.uk

- Mothers at high risk of requiring a caesarean section, especially those with a BMI >40, should be encouraged to consider an epidural sooner rather than later.
- When the woman requests epidural analgesia, the midwife should inform the Anaesthetist on call on bleep number 9002. If there has been significant hypertension in pregnancy, e.g. diastolic reading greater than 100 or proteinurea on recurrent testing a Full Blood Count and clotting screen will be required by the Anaesthetist prior to commencing the procedure.
- The Midwife should make sure (the epidural trolley is stocked with) that the relevant equipment required for epidural insertion is available in the room.
- Once the epidural process is initiated it is not safe to leave woman unattended.
- Electronic Fetal Monitoring guideline. It may be appropriate to apply a fetal scalp electrode for fetal monitoring if abdominal auscultation is difficult
- Always secure intravenous access before starting regional analgesia.
- Preloading and maintaining fluid infusion need not be administered routinely before establishing low dose epidural analgesia
- The midwife should make ensure that the fetal heart is continuously monitored before, during and after the epidural insertion. Refer to the ECNHST Intermittent Auscultation and Continuous make sure that someone is available to assist the anaesthetist, the maternity support staff are able to do this.
- The midwife must ensure that the mother's pulse, blood pressure and respiratory rate have been taken prior to commencing the procedure. The woman should be encouraged to empty her bladder prior to the procedure.
- For women in labour with sepsis and any signs of organ dysfunction regional analgesia should only be used with caution and advice from a consultant obstetric anaesthetist. If there are concerns about providing a woman's choice of regional analgesia, this should be discussed with the consultant obstetric anaesthetist.
- For women in labour who need antibiotics for suspected sepsis start the antibiotics before inserting the needle for regional analgesia.

2. **Establishing the Procedure**

- The Anaesthetist performing the epidural will be responsible for undertaking consent for the procedure. Consent is a process that starts when the Pain Relief in Labour leaflet is given in the antenatal visit. Verbal consent for the various risks should be recorded by ticking the boxes on the epidural form. All relevant risks should be discussed and all the boxes should be ticked. If a mother, who refused early to have an epidural, now wishes to have an epidural, she should not be refused. If the mother is too distressed and does not want to listen about the complications, it should be documented in the notes. Anaesthetists are advised to quote the risks and complications as set out by the OAA.
- Good and effective communication between the woman, partner, midwives and anaesthetist can maximise the co-operation to make it safer for the woman
- Strict asepsis should be observed all the times, hand-washing, hat, mask, gown, gloves, sterile field and equipment.
- The midwife should assist the woman to adopt the position recommended by the Anaesthetist. (Call assistance from the maternity support staff if required)
- When the epidural catheter is in place the area should be lightly sprayed with OPSITE plastic spray to make the skin 'tacky'. The epidural fixation device too, must be used to secure the catheter followed by a 20x30 cm TEGADERM dressing over the insertion site.
- Prefilled bag 250ml bags of Levobupivacaine 0.1% with Fentanyl 2mcg/ml is the drug solution of choice for all epidural infusions at the ECNHST.
- Once the epidural catheter has been inserted and the infusion connected, the anaesthetist will usually administer a loading dose of 15mls of fentanyl/ levobupivacaine with the Gemstar pump. The initial dose of local anaesthetic plus opioid

is essentially a test dose, so administer cautiously to ensure that inadvertent intrathecal injection has not occurred.

- The initial test dose may cause a drop in the woman's blood pressure, therefore, the midwife should take and record the blood pressure and heart rate every 5 minutes for 15 minutes and ensure intravenous fluids are given if necessary.
- The epidural drugs will be infused using a Gemstar infusion pump with a yellow lock box label, yellow coloured giving set with a yellow epidural label attached. The Gemstar epidural giving sets have an integral anti- siphon valve built into the line.
- The epidural programme will be prescribed by the anaesthetist to deliver Patient Controlled Epidural Analgesia (PCEA). The pre-set epidural Infusion involves a continuous hourly rate of 6mls with a 3mls patient controlled bolus dose and a lockout period of 20 minutes. This system allows the woman to have an element of control over the amount of epidural drugs administered.
- Throughout the epidural infusion the midwife should undertake half-hourly blood pressure, heart rate and respiratory rate readings in addition to the Intrapartum observations and document findings accordingly. Any further manual top up of 10mls or more of low dose solutions should be followed by blood pressure measurements every 5 minutes for 15 minutes as for the initial loading dose.
- Encourage the woman to move in the bed and adopt whatever position they find comfortable in labour. The woman will be unable to mobilise with an epidural.
- Continuous fetal monitoring in labour must be maintained for a woman with epidural analgesia.
- If adequate analgesia has not been achieved after 30 minutes the anaesthetist should be recalled.
- The midwife caring for a woman with an epidural in-situ should inspect pressure areas as a minimum 2 hourly and document the MPAS in the notes with any appropriate action.
- The midwife should assess the sensory level of the epidural every 60 minutes to determine the epidural block height. If the woman is unable to detect a cold sensation at or above the nipple line (Thoracic Level 4), **the epidural infusion should be stopped immediately as the epidural block is too high.** The midwife should manage this situation by following the guidelines below:

3.3 Management of a High Epidural Block for Women in Labour
(Refer to the Acute Pain Service Protocol)

- Stop the epidural infusion.
- Give high flow oxygen therapy
- Check the woman's observations (Pulse, BP, Respiratory rate, and sedation score).
- If any of the 'Danger signs' are present, contact anaesthetist immediately, who must review patient before restarting pump.
- Monitor patient observations, including block height, every 15mins
- When block falls to a safe level (below T4), the continuous hourly infusion rate will need to be reduced from 6mls/hr to 4mls/hr and reduce the bolus dose from 3mls to 2mls. Leave the 'lockout time' at 20mins.
- If the systolic blood pressure falls below **90mmHg or if the woman becomes sleepy and difficult to rouse, the epidural infusion should be stopped immediately and the anaesthetist and obstetrician called.**

N.B. Occasionally during labour there may be a sudden hypotensive episode.
In such instances, the midwife should take the following action: -

Use mnemonic **SPOIL**

Syntocinon off (If applicable)
Position uterus left lateral

Oxygen high flows
Intravenous Plasmalyte 1000mls
Low BP the Anaesthetist will treat with Phenylephrine or Ephedrine

- If the drowsiness is due to opioids consider giving Naloxone (All women with epidurals will be prescribed Naloxone, see Epidural Prescription Chart).

3.4 **Caesarean section**

- If the woman requires a caesarean section the epidural infusion should be discontinued at the filter point with a sterile cap applied to the filter.
- The pump should remain in the labour ward and not taken to theatre.
- The amount of the infusion which is being discontinued should be recorded on the epidural chart.

3.5 During the Second Stage of Labour

- Upon confirmation of full cervical dilatation in a woman with regional analgesia, unless the woman has an urge to push or the baby's head is visible, pushing should be delayed for at least 1 hour and longer if the woman wishes, after which actively encourage her to push during contractions
- After diagnosis of full dilatation in a woman with regional analgesia, agree a plan with the woman in order to ensure the birth will have occurred within 4 hours regardless of parity
- Do not routinely use oxytocin in the second stage of labour for women with regional analgesia

6. **Following Delivery Including the Third Stage of Labour**

- Once established, continue regional analgesia until after completion of the third stage of labour and any necessary perineal repair
- The epidural catheter should be removed after the end of the third stage and any necessary perineal repair. The midwife removing the epidural catheter should follow the ECNHST Acute Pain Service: *Removing An Epidural Catheter:*
- The post partum maternal satisfaction audit data should be completed by the mother and midwife on the back of the epidural form.
- Contemporaneous records should detail all actions and care given

3.7 Delay in Obtaining an Epidural

- If the midwife feels the time delay for an epidural is inappropriate she should negotiate with the 3rd on call to see if there is any scope for reducing this delay.
- If the delay from calling the anaesthetist to their arrival is more than one hour it should be recorded as a DATIX incident
- If the epidural is purely for analgesia, the midwife may need to discuss an alternative form of pain relief with the woman until the epidural service is available. The delay in obtaining an epidural must be explained to the woman in relation to work priorities. This must be documented in the notes with any alternative pain relief discussed and the subsequent choice made.
- If the epidural is for a medical indication and the resident anaesthesia team is unable to provide an epidural within a reasonable period of time, then the 3rd on call anaesthetist should contact the on call consultant anaesthetist to see how best this can be managed.

This guideline cannot anticipate all possible circumstances and exist only to provide general guidance on clinical management to clinicians.

4.0 Audit /monitoring compliance of this guideline

This Guideline will be reviewed within three years.

Coordination of audit

Any audits undertaken will be the responsibility of the Clinical Governance Midwife/ Anaesthetic lead

Reporting arrangements

The Clinical Governance Midwife will report the results of audit to the overarching Maternity and Women's Service Clinical Governance Committee Any action plans will be tabled at the overarching Maternity and Women's Service Clinical Governance Committee by the Clinical Governance Midwife

Acting on recommendations

The audit recommendations and subsequent action plan will be discussed and agreed by the overarching Maternity and Women's Service Clinical Governance Committee.

The Maternity and Women's Service Clinical Governance Committee will agree which individual will be responsible for action(s) within a specified timeframe. This will be documented on the action plan and within the minutes from the Maternity and Women's Service Clinical Governance Committee.

Changes in practice and lessons to be shared

Any required system or organisational change to practice will be discussed and agreed by the overarching Maternity and Women's Service Clinical Governance Committee.

Changes to practice will be identified and actioned within a specified time frame. A lead member of the team will be identified to take each change forward. This will be documented on the agreed action plan and monitored at the Maternity and Women's Service Clinical Governance Committee on a monthly basis until completion.
Lessons will be shared with the relevant stakeholders.

5.0 Reference

East Cheshire NHS Trust Acute Pain Service protocol: Managing High Epidural Block

East Cheshire NHS Trust Intermittent Auscultation and Continuous Electronic Fetal Monitoring Guideline

East Cheshire NHS Trust Acute Pain Service protocol: Assessing Height of an Epidural Block

East Cheshire NHS Trust Acute Pain Service protocol: Removing an Epidural Catheter

East Cheshire NHS Trust Care in Labour

NICE CG55: Intrapartum care of healthy women and their babies during childbirth (December 2017)

Epidural Trouble Shoot Guide

MIDWIVES:

High Block:
- If sensory level >T8 notify the on-call anaesthetist
- If sensory level >T4 switch off PCEA and notify the on-call anaesthetist

Equal Low Block with Pain:
- If sensory level <T10 and patient complaining of breakthrough pain encourage patient to press PCEA in sat up position

Unequal Low Block with Pain:
- If block unequal, <T10 and patient has pain, lay patient on painful side and encourage her to press PCEA
- If patient has a 'missed segment' and block <T10, lay patient on painful side and encourage her to press PCEA

If after 2 PCEA boluses (20 minutes) the patient still has pain, notify on-call anaesthetist

If at any point the patient has a Bromage Score (Motor Block) of **2 (almost complete motor block) or more** in either leg to notify the on-call anaesthetist **(bleep 1333)**.

ANAESTHETISTS:

Equal, upper level pain breakthrough

- Check catheter position
- If not dislodged give 10-15mls of low dose 'bag mix'
- If successful, consider encouraging patient to press PCEA more regularly
- Consider increasing rate up to max 10ml/hr
- If low dose bolus fails, give 10mls 0.25% Bupivacaine + 1 mcg/kg fentanyl

Unilateral block or missed segment

- Check catheter position to ensure catheter has not migrated
- If not give 10-15mls of low dose 'bag mix' with bad side down
- If this fails after 20 minutes withdraw catheter to max 3cm in epidural space and repeat bolus, bad side down.

Persistent perineal pain, pressure or backpain

- If poor sacral block then sit patient up and give 10 mls of low dose 'bag mix'
- If pain persists but sacral coverage adequate consider either a single dose of:
- 10mls 0.25% bupivacaine
  or
- 1mcg/kg Fentanyl
  or
- 60 mcg Clonidine (useful for those patients whose baby is OP position) (**watch for fetal bradycardia or maternal hypotension- warn midwife)**

If after 2 rescue attempts the epidural is still inadequate consider and offer a re-site.

Remifentanil PCA (Not in use yet).

- Remifentanil PCAs are available to patients in labour. Remi PCA forms are located in the top of the tall blue cupboard in theatre 1. The Remi Protocol and Patient Info Leaflet are available on the obstetric anaesthesia microsite. NB: the new guideline states that Remi should not be administered within **4 hours** of either diamorphine or pethidine.

- Ensure you explain the common side effects of opiate drugs, including the risk of nausea and vomiting, sedation, dizziness, respiratory depression including the need for SpO_2 monitoring and administration of N/C O2. Also discuss the transfer of the drug across the placenta, and for this reason we ask patients to stop the drug at least 10 minutes before the expected time of delivery to allow time for clearance of the drug from the baby.

- The PCA is prescribed, set up and initiated by the anaesthetist on call for Delivery Suite with the assistance of the ODP. Ensure the Remifentanil PCA is connected to its **own dedicated 20G** cannula.

- Commence nasal oxygen from the beginning.

- Ensure the light blue Remifentanil prescription sheet is filled in. This form also includes the observation chart. Continuous SpO_2 monitoring is required. Sedation score, respiratory rate, nausea and vomiting score and foetal heart rate must be recorded every 30 minutes.

- We use pre-filled syringes containing 2mg Remifentanil in 50mls Normal Saline, providing a 40mcg/ml solution.

- Code for pump is '3210'.

- **All** patients are to start on **20mcg bolus.** Please remain with the patient for the first few presses of the button, both after starting and/or changing the dose.

- If a patient's pain is not controlled on the 20mcg bolus (pain score 'severe'), check for issues with the delivery of the drug (e.g. tissued/kinked cannula, pump failure). If the patient is alert, not snoring, RR ≥ 10 and saturations ≥94% without oxygen, consider increasing the bolus to 40mcg.

- **If the patient is on the 20mcg protocol and has a sedation score of ≥ 3 or RR <10 or O2 saturations <94% stop using Remi and discuss alternative analgesia.**

- **If on the 40mcg bolus, reduce dose to 20mcg and check for improvement.** The ODP has the appropriate key and will be able to assist with this.

- A midwife **must** remain with the woman at all times. Leaving the patient alone or with a midwifery student is not acceptable.

  Sedation Score
  0 Awake
  1 Dozing intermittently easy to rouse
  2 Mostly sleeping, easy to rouse
  3 Difficult to waken, poor or absent co-operation with pain score
  S Normal sleep

- **Prescribe remifentanil PCA on EPMA and administer it.** The remi PCA protocol is found under 'Protocols' →'Analgesia'→ 'PCAs and Epidurals' →'Remifentanil PCA (maternity)'.

Anaesthesia for emergency theatre cases.

Epidural top ups

- Only top up if the epidural is working well.
- Assess the height of your block before topping up and remember to document this in the theatre pathway. If it is above T10 titrate your top up to reach a block height to T4 (to cold)
- All high-dose top-ups should be administered in a fully monitored environment (i.e. theatre).
- Top ups may be started in the patient's room in urgent cases but the patient must be fully monitored, a small portable monitor can be used for this purpose. The anaesthetist must remain with the patient and have vasopressors to hand.
- Check the level of sensory and degree of motor block before and after the test dose and document in patient's notes.
- All anaesthetists must be aware of the location of Intralipid in the delivery suite and familiarise themselves with the available resuscitation equipment.
- The leading cause of cardio-respiratory arrest on delivery suite in the UK is from a high spinal.

Test dose:
After negative aspiration of the epidural catheter for blood and CSF, a test dose of 1mg/kg of Lidocaine (e.g. 4mls of 2% Lidocaine for a 80kg patient) can be given. In the event of an intravascular injection, 95% of the patients will complain of early symptoms of toxicity after this dose.
Alternatively, you can use an appropriate smaller volume from your top-up mix, however you should wait a few minutes to check observations/block height and for signs or symptoms of LA toxicity before proceeding to 'top up'.

Top-up:
If there are no problems with the test dose, the top-up can be given in small aliquots depending on the degree of existing block and the desired level of sensory block.

The options are as follows:

- **Up to 20 mls of 0.75% Ropivacaine (recommended)**
- Up to 20 mls of 0.5% Bupivacaine / 0.5% Levobupivacaine
- Up to 20 mls of 2% Lidocaine + 1:200,000 adrenaline (add either 0.1ml of 1:1000 OR 1ml of 1:10,000 adrenaline to 20mls of 2% Lidocaine)

PLUS…

- Fentanyl 100mcg via epidural to augment the block. This is usually given undiluted at the start of the top up process.

Post LSCS:
Epidural Diamorphine 3mg *may* be given after delivery, before removal of epidural catheter at the end of procedure.

Anaesthesia for emergency theatre cases

Spinals

When planning a spinal, if a patient has had an epidural during labour which has provided inadequate pain relief or there is not time to top up for an emergency Cat 1 caesarean section, **please take care with your dose of heavy bupivacaine** due to the risk of a high block**.** The leading cause of cardio-respiratory arrest on delivery suite in the UK is from a high spinal.

Assess the height of your block before performing the spinal. If it is above >T10 then;

1. Consider giving ***less than your standard spinal dose*** (normal dose is 2.6-2.7mls heavy bupivacaine). You will have to take into consideration the estimated time of length of surgery, patient's height, lumbar level of insertion.
2. Start the phenylephrine infusion as detailed on page 19. NB. Care should be taken in PIH.

3. When the patient is lying supine, ***increase the thoracic kyphosis*** by placing a wedge under the shoulders and flexing the neck with the pillow or operating table.

4. Start to check the height of the block early, position the patient head up if the block is rising rapidly.

5. Recording the block: Extent of motor block should be clearly documented. Height of the block to **light touch** and cold should also be recorded.

6. If the patient appears to lose consciousness and airway management is required due to what you think is a high spinal, remember that they will still be aware and therefore that an induction agent will need to be given before intubation.

7. Be alert for bradycardia associated with the Bezold-Jarisch reflex and have glycopyrrolate to hand.

Anaesthesia for emergency theatre cases.

General Anaesthesia

Key points:

1. Propofol and rocuronium are now first line drugs. (Thiopentone and suxamethonium are still available but not recommended). Make sue Sugammadex is available.

2. The incidence of 'awareness' is higher in obstetrics than any other surgical discipline. You need to mention the risk of 'awareness' as part of the consent process (1 in 700). You may not feel comfortable in mentioning this risk but the incidence is not uncommon. If you don't feel comfortable stating this risk and the patient does experience awareness you are at potential risk of litigation. There is a tick box to say this has been discussed in the obstetric theatre ICP.

3. Be generous with your dose of propofol (i.e 200+ mg) for haemodynamically stable patients who are likely to be very anxious and at risk of awareness. Draw up 20mls plus another 10mls before induction.

4. Alfentanil 500mcg - 1mg can be given at the discretion of the anaesthetist but this is not included as a first line induction drug due to the effects on the already compromised foetus. It's advised to give in pre-eclamptic patients to obtund the hypertensive response to laryngoscopy.

5. The dose of rocuronium is based on lean body weight, but for simplification we are using ideal body weight, where the patient's height is used to calculate the dose. There are laminates of the suggested doses of rocuronium, these are on top of the airway trolley and on the walls in theatre. A guide to reversal doses based on the train of four ratio is also included in a separate table.

6. Check reversibility in all patients using a peripheral nerve stimulator. Regarding reversal of muscle relaxant: neostigmine/glycopyrrolate and Sugammadex are both available for use. If the patient is not fully reversible and / or there is pressure for theatre then Sugammadex should be used (provided Roc was your relaxant of choice). If the patient is reversible and there is appropriate time available (or you have given any doses of atracurium) then neo/glyco may be used. If you choose to use glycopyrrolate/neostigmine, please note that at a dose of 50mcg/kg for a 75kg patient is a one and a half ampoules.

Elective Caesarean Sections (Enhanced Recovery)

- Patient will be informed that they should expect to be discharged 24hrs after their caesarean section.
- Patients are encouraged to drink clear fluids until 1am. The second and third patients should be given drinks straight after the team brief (when the order of the list is confirmed) and then regularly assessed to ensure that they are not excessively fasted (aim for 2 hours).
- Paracetamol may be given orally pre-op for elective patients.
- In your spinal give 2.5 - 2.7 mls 0.5% heavy bupivacaine and 300mcg diamorphine, the dose of LA should be guided by expected length of surgery and the height of the patient.

  Start the phenylephrine infusion as detailed on page 19. NB. Care should be taken in PIH.
- The extent of motor block in addition to the sensory block (both light touch, tested by asking the patient to first identify when they first feel the spray as ‘wet’ or a ‘blow’, and the block to cold) should be documented prior to KTS. Accepted levels are light touch to T5 and cold to T4 for a caesarean section.
- IV ondansetron, in addition to its anti-emetic action, has better anti-pruritic properties compared to chlorphenamine, it should be administered for all cases where IT diamorphine has been used.
- Patients should not need more than 1 - 1.5 litres of IV fluid for a straightforward case.
- In recovery, patients should be encouraged to drink and if this is tolerated then to eat a light diet (e.g. sandwich/toast) (See flow chart in enhanced recovery protocol).
- Post op pain relief should be prescribed using the post LSCS analgesic protocol.
- Paracetamol and ibuprofen should be administered orally before discharge from recovery, provided they haven’t already been given or there is a contraindication (e.g. EBL > 1L, PET, clotting abnormalities, history of asthma / allergy). No simple analgesics are to be given in theatre (unless it is a GA case). In addition, dihydrocodeine, oramorph and anti-emetics should also be prescribed, please see the guidance table below.
- Dihydrocodeine is suitable for use in breastfeeding mothers. You may wish to warn the patient re sleepiness in their baby, in which case they may need to reduce their dose/use. Codeine phosphate is available, but must only be used by those who are **not** breastfeeding.
- Removal of catheter and IV access 6 hrs post op if no signs of bleeding, good oral intake and good urine output.
- Mobilise 6-8hrs post op.
- Patient ideally should be reviewed by the anaesthetic team prior to discharge the following day. However, if the patient is mobilising with no problems, has no neurological symptoms and no complaints of a headache, discharge should not be delayed. (There is a guidance document for midwife led discharge of patients after elective caesarean section when not seen by the anaesthetist).

Regional:

Intraoperative: Regional technique	During procedure	Postoperative
Spinal: Diamorphine 300mcg	IV ondansetron 4mg*	Oral paracetamol 1g prn up to QDS Oral Ibuprofen 400mg prn up to TDS Dihydrocodeine 30 – 60mg PRN up to QDS Oramorph 10-20 mg 2-4 hrly Oral/IV Ondansetron 4mg TDS Oral/IV/IM cyclizine 50mg TDS Oral chlorphenamine 4mg 4-6 hrly
Epidural: Diamorphine 3mg after delivery		

General Anaesthesia:

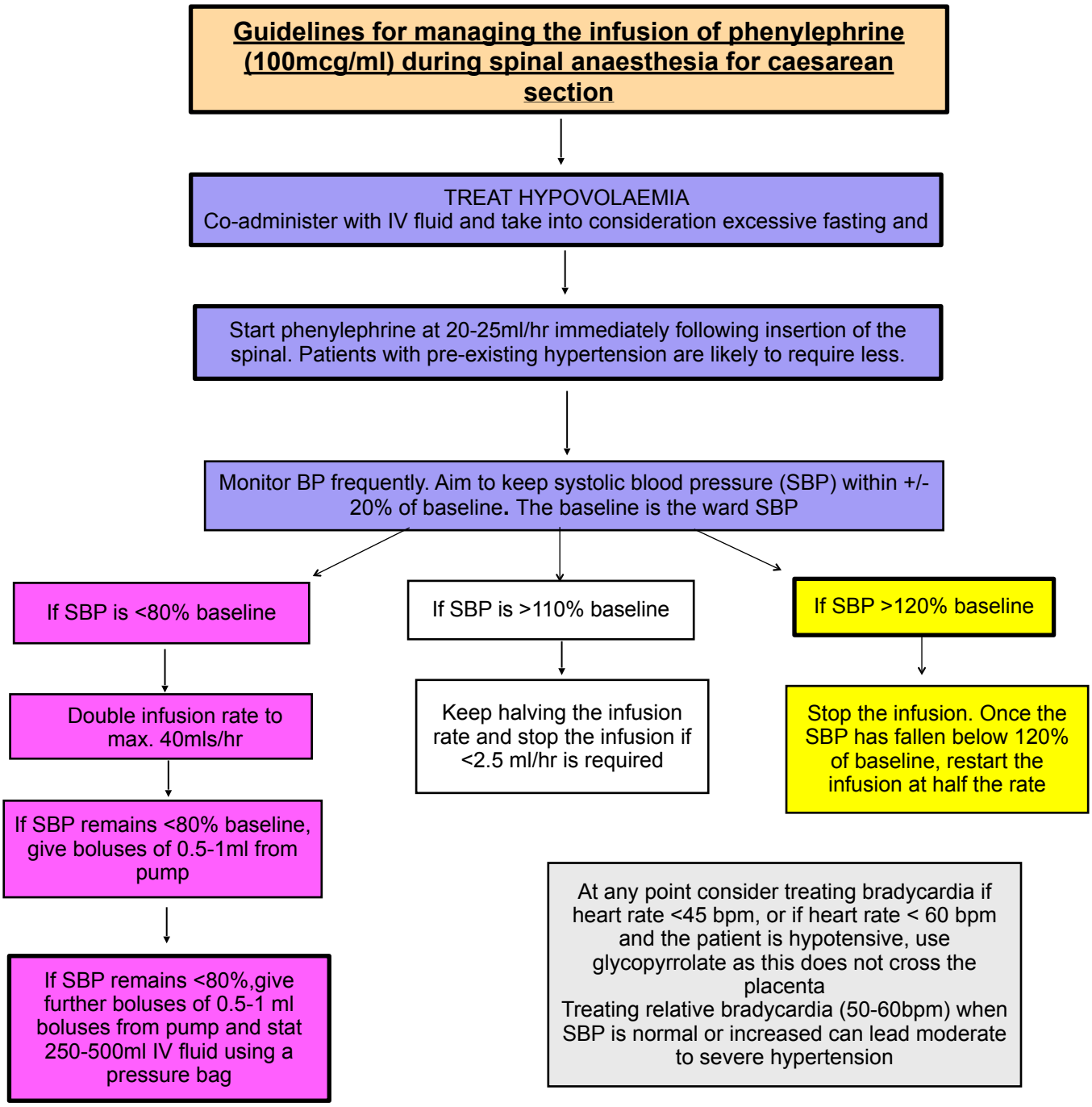
Intraoperative	End of procedure	Postoperative medication
IV alfentanil 1mg or fentanyl 100mcg *after delivery of baby* IV Morphine titrated IV Paracetamol 1g IV Parecoxib 40 mg / IV ibuprofen 400mg* IV ondansetron 4mg IV dexamethasone 6.6mg	TAP blocks or LA infiltration Plain Bupivacaine (usually 0.25%) bilaterally depending on patients' weight	Oral paracetamol 1g prn up to QDS Oral Ibuprofen 400mg prn up to QDS Dihydrocodine 30 – 60mg PRN up to QDS Oramorph 10-20 mg 2hrly* Oral/IV Ondansetron 4mg 8hrly Oral/IV/IM cyclizine 50mg 8hrly Oral chlorphenamine 4mg 4-6hrly Avoid morphine PCA where possible. It can delay mobilisation. Pump issues are common on the postnatal ward resulting in patients being unable to access analgesia when required.

***NSAIDS should not be used in patients with pre-eclampsia and those patients who have had a major haemorrhage. There is the risk of Acute Kidney Injury.**

ROTEM (Not currently available)

- The anaesthetic nurses/ODPs covering maternity have all had training on the device and should be able to run a test for you. One blue bottle is required for the test, it must be filled to somewhere within the height of the black arrow, else the concentration of reagent to blood will be in appropriate.
- Results from the test appear on the ROTEM display panel. When the test is finalised, these results are approved and will then appear on the Gem web live program. Gem web plus allows you to view historical ROTEM results. Both programs can be found in the list of trust applications and can be accessed from any trust PC.
- Please see the Powerpoint presentation by Dr Johal regarding interpretation of the ROTEM tomogram (on the obs anaesthesia microsite). A copy of the ROTEM interpretation flow chart is uploaded within this and should be used. NB: this is specific for the interpretation of tomograms for obstetric patients only.
- We are in possession of fibrinogen concentrate which is stored in the delivery suite blood fridge. It is likely to only be appropriate for abruption cases with DIC. A consultant must be in attendance for cases where fibrinogen concentrate is being considered.
- Please bear in mind that fibrinogen levels at term are approximately 4-6g/L and that fibrinogen tends to fall before all other coagulation factors in a PPH. Moderate fibrinolysis is common in major haemorrhage and therefore tranexamic acid is recommended in all cases.
- It is suggested you use the ROTEM for all patients with a 1000ml blood loss who are continuing to bleed.
- NB: 2 packs of cryoprecipitate (there are 5 units in each pack) will give approximately 3-3.5g/L of fibrinogen. FFP also contains fibrinogen but in a more dilute form, there is around 500mg of fibrinogen in each unit, so the standard 4 units of FFP will contain 2g fibrinogen. As the average fibrinogen in a woman following a 2L PPH is around 4g/L, giving FFP will reduce their fibrinogen by dilution.

Guidance regarding managing phenylephrine infusions in theatre



References:

Butwick AJ, Columb MO and Carvalho B. Preventing spinal hypotension during Caesarean delivery: what is the latest? British Journal of Anaesthesia 114 (2): 183– 6 (2015)

Lee A, Ngan Kee W.D, Gin T. A quantitative, systematic review of randomized controlled trials of ephedrine versus phenylephrine for the management of hypotension during spinal anesthesia for caesarean delivery. Anesthesia and Analgesia, 2002; 94: 920-6.

Ngan Kee W.D, Khaw K.S, Ng F.F, Lee B.B. Prophylactic phenylephrine infusion for preventing hypotension during spinal anesthesia for caesarean delivery. Anesthesia and Analgesia, 2004; 98: 815-21.

Useful Numbers:

Emergency numbers

Cardiac Arrest	2222
Major haemorrhage	2222

Maternity

Midwives Station phone	tbc
ODP Bleep	tbc

Male changing room	**C1368Y**
Female changing room	**C3589Y**

Main Theatre Recovery	
HDU/ICU	**1032/1033**

Blood Bank	**1808**	} Out of hours	**4437**
Haematology	**1807**		
Biochemistry	**1828**		
Anaesthetic Department	**1307**		
Switchboard	**0**		
External line	**9**		

Consultant Anaesthetist On-call	**Mobile, via switchboard**
1st on Anaesthetist	**Bleep 9000**
2nd on Anaesthetist	**Bleep 9001**

Maccgas **http://daviduf62.sixtytwo.axc.nl/MaccGas/anaesthetics/index.html**