Faculty Development Talk

Updates in Obstetric Anaesthesia

Leong Wan Ling
Consultant, Women’s Anaesthesia,
KK Women’s & Children’s Hospital
13th September 2017

© Healthwise, Incorporated
Topics

• Labour ward
  – Neuraxial anaesthesia
  – Remifentanil PCA
• Caesarean section
  – Antibiotic guidelines
• Difficult airway algorithm
• PDPH and EBP protocols
• Code Red!
Neuraxial block for labour analgesia

• Combined spinal epidural
  – Intrathecal component
    • 2-3mg ropivacaine, 10-15mcg fentanyl
    • (2-3mg levo-bupivacaine, 10-15mcg fentanyl)
  – Epidural infusion (EPIVA pumps)
    • Basal infusion 8-12ml/hr with PCEA 5min lockout, 5ml bolus
    • CIPCEA 5-10-15ml/hr with PCEA 5 min lockout, 5ml bolus
    • VAMB 5ml bolus at 60-30-20-15 min intervals, PCEA 5 min lockout, 5ml bolus
Continuous Epidural Infusion

**Advantages**
- Consistent delivery of drugs
- Pumps readily available & cheap
- Easy to operate

**Disadvantages**
- Inflexible
- May result in inadequate analgesia
- May ↑ drug consumption
KKH practice

• Basal infusion may not be required in early labour

• As pain escalates in advanced labour, basal infusion may become beneficial

• Variable infusion rate which is responsive to the patient’s needs may provide more efficacious analgesia
Advantages of PCEA

- Autonomy
- Titratability
- Flexibility

Workload reduction
Increase patient satisfaction
The Prototype and Old Generation Pumps
CSE intrathecal ropivacaine 2mg + fentanyl 15mcg + epidural lignocaine 1.5% 3mls

- No infusion

- Demand bolus 5mls; lockout 10min

- Change infusion to 5ml/hr

- No demand within 1hr

- Demand within 1hr

- Change infusion to 10ml/hr

- No demand within 1hr

- Demand within 1hr

- Change infusion to 15ml/hr

- No demand within 1hr

- Demand within 1hr

- Change infusion to 20ml/hr

- No demand within 1hr

- Demand within 1hr

- Stop infusion; activate alarm
CSE (time 0)

Automated bolus of 5 ml every 60 min, to begin 60 min from time 0

1st patient bolus

Automated bolus of 5 ml every 60 mins (automated bolus rate 5 ml.h⁻¹)

2nd patient bolus (within 1 h)

Automated bolus of 5 ml every 30 mins (automated bolus rate 10 ml.h⁻¹)

3rd patient bolus (within 1 h)

Automated bolus of 5 ml every 20 mins (automated bolus rate 15 ml.h⁻¹)

4th patient bolus (within 1 h)

Automated bolus of 5 ml every 15 mins (automated bolus rate 20 ml.h⁻¹)

No demand in 1 h

No demand in 1 h

No demand in 1 h

No demand in 1 h
Dr Sng Ban Leong, Head and Senior Consultant, Department of Women’s Anaesthesia KKH demonstrates the use of the EPIVA smart infusion pump to delivery epidural pain relief to a patient.
COLEUS study

- Single-centred randomised controlled trial
- Commenced recruitment early 2015
- 3 arms – PCEA, CIPCEA, VAMB
- Nulliparous parturients, full term pregnancies
- Assessed on degree of satisfaction, pain and psychological vulnerability
- Followed up until 5-9 weeks post-partum
  - case controlled study on depression: Subgroup of 100 patients followed up for 6 months
- Currently recruited 580 patients
- Funded by NMRC 1.99 million grant
Remifentanil PCA

- **CADD-Solis pump**
  - Manual dosing
  - 20-40mcg bolus, 1-3 min lockout

- **Intrava pump**
  - VPIA algorithm
    - SpO₂, HR, RR
    - Variable dosing
Remifentanil PCA Protocol (CADD-SOLIS)

- Dilute 4 x 1mg Remifentanil hydrochloride in 100mls normal saline. (40mcg/ml)
- Press handset at start of contraction
  - Counsel patient that pain relief will only start after 2\textsuperscript{nd} or 3\textsuperscript{rd} contractions (especially for 1:1 contractions).
- Advise that pain relief is not complete, analgesia effectiveness is about 60% (but shown to be better than IM pethidine).
- Start patient on INO\textsubscript{2} at 2L/min and IV maxalon 10mg stat and 8hrly.
  - Patient may also choose to remain using Entonox to supplement the analgesia
Remifentanil PCA Protocol (CADD-SOLIS)

- PCA Remifentanil starting regime for contractions less frequent than 1:3
  - Bolus: 20-40mcg (start at 20mcg, stepping up by 10mcg every 15min if pain relief inadequate)
  - Lockout: 2min
  - Background infusion: 0
  - Max: 2400mcg/hr

- PCA Remifentanil starting regime for contractions 1:2 or 1:1
  - Bolus: 20-40mcg (start at 20mcg, stepping up by 10mcg every 15min if pain relief inadequate)
  - Lockout: 1min
  - Background infusion: 0
  - Max: 2400mcg/hr
VPIA Regimen

1 minute bolus lockout

20 µg remifentanil bolus

30 µg remifentanil bolus

40 µg remifentanil bolus

50 µg remifentanil bolus

50 µg remifentanil bolus +0.025 µg/kg/min remifentanil infusion

50 µg remifentanil bolus +0.050 µg/kg/min remifentanil infusion

50 µg remifentanil bolus +0.075 µg/kg/min remifentanil infusion

50 µg remifentanil bolus +0.100 µg/kg/min remifentanil infusion

Safety thresholds
1. SpO2 < 95%, for > 15 seconds
2. Heart Rate < 60bpm, for > 15 seconds

Safety mechanism
- At any time during regimen, if any safety threshold breached → pause pump for 5min and then reassess parameters.
- After reassessment, if all parameters are acceptable, resume pump regimen at previous level. If not, raise alarm and alert the attending anaesthetist.

Proceed to the next level when the number of patient demands is 3 or more within the last 15 mins.
Go back to the previous level when the number of patient demands is 2 or less within the last 15 mins.
Remifentanil Data Collection Form

OBSERVATION CHART: (q6min x 30 min then q30min x 1hr than hourly)
(Columns in grey may be left blank)

Sedation Score Definition
0 Sleeping
1 Awake, Alert
2 Occasionally drowsy, easy to rouse, responds to calling
3 Often drowsy, difficult to rouse, responds to shaking only
4 Unresponsive and unanswerable

Patient satisfaction with analgesia (0-100) at 24 hours MCR/Name/Signature Date/Time
Caesarean section

- Cefazolin 1gm 30 min before knife-to-skin
  - (2gm if >80kg, 3mg if >120kg)
- Spinal anaesthesia
  - 2.2-2.3ml 0.5% heavy bupivacaine
  - 15mcg fentanyl
  - 100mcg morphine
- Epidural top-up
  - 10-15ml 2% lignocaine with 1:200,000 adrenaline, 2ml 8.4% NaHCO₃
  - 3mg epidural morphine
- GA – Thiopentone/Sux induction + O₂/N₂O/Sevoflurane/atracurium maintenance
- Antiemetic (dexamethasone 4mg, ondansetron 4mg)
- Oxytocin (3-5 units +/- 30 units in 500ml normal saline)
- All neuraxial patients are followed up in the APS round the following day
# Antibiotic Guidelines

<table>
<thead>
<tr>
<th>TYPE OF PROCEDURE</th>
<th>USUAL ORGANISMS</th>
<th>ANTIBIOTIC CHOICE</th>
<th>TIMING</th>
<th>TIME FOR REPEAT DOSE (Hours)</th>
<th>DURATION</th>
<th>REMARKS</th>
</tr>
</thead>
</table>
Elective caesarean section involves low-risk patients (non-labouring with intact membranes) while emergency caesarean section typically involves high-risk patients (in active labour, premature rupture of membranes). | First-line | Alternative therapy (severe allergy to penicillin/ 1st line) |        |                              |          |                                                                          |
| Elective or Emergency | Polymicrobial (Staphylococci, Streptococci (esp GBS), Enterococci, GN aerobes (esp E. coli), anaerobes (esp. Bacteroides divus), Peptococci, Peptostreptococci, Ureaplasma urealyticum) | IV Cefazolin 1g  
(IV Cefazolin 2g if \( \geq 80kg \),  
IV Cefazolin 3g if \( \geq 120kg \)) | IV Clindamycin 900mg | Within 60 min before incision | 4 (Cefazolin)  
6 (Clinda) | ONCE, Q8H up to 24H | Administration of peri-operative antibiotics prior to skin incision associated with reduced maternal morbidity without compromising neonatal outcome. Prophylaxis should be administered even if patient is on GBS /PPROM prophylaxis. |
Antimicrobial stewardship program (established 2011)

Timing of antimicrobial prophylaxis

Widmer AF et al. ICAAC Meeting, Washington, DC, 2005
**Difficult airway guidelines**

**Master algorithm – obstetric general anaesthesia and failed tracheal intubation**

**Algorithm 1**
Safe obstetric general anaesthesia

- Pre-induction planning and preparation
  - Team discussion & consider regional/CMAC/TROOP
- Rapid sequence induction
  - Consider facemask ventilation (P_{max} ≤ 20 cmH₂O)
- Laryngoscopy
  - (maximum 2 intubation attempts; 3rd intubation attempt only by experienced colleague)

- Success
  - Verify successful tracheal intubation and proceed
  - Plan extubation

- Fail
  - Declare failed intubation
  - Call for help
  - Maintain oxygenation
  - Supraglottic airway device (maximum 2 attempts) or facemask

**Algorithm 2**
Obstetric failed tracheal intubation

- Declare failed intubation
  - Call for help
  - Maintain oxygenation
  - Supraglottic airway device (maximum 2 attempts) or facemask

- Fail
  - Declare CICO
  - Give 100% oxygen
  - Exclude laryngospasm – ensure neuromuscular blockade
  - Front-of-neck access

- Success
  - Is it essential / safe to proceed with surgery immediately?

- No
  - Wake
- Yes
  - Proceed with surgery

*See Table 1, †See Table 2

Algorithm 1 – safe obstetric general anaesthesia

**Pre-theatre preparation**
- Airway assessment - consider regional
- Fasting status
- Antacid prophylaxis
- Intrauterine fetal resuscitation if appropriate

**Plan with team**
- WHO safety checklist / general anaesthetic checklist
- Identify senior help, alert if appropriate
- Plan equipment for difficult / failed intubation/CMAC/TROOP
- Plan for / discuss: wake up or proceed with surgery (Table 1)

**Rapid sequence induction**
- Check airway equipment, suction, intravenous access
- Optimise position - head up / ramping + left uterine displacement
- Pre-oxygenate to $F_{102} \geq 0.9$ / consider nasal oxygenation
- Cricoid pressure (10 N increasing to 30 N maximum)
- Deliver appropriate induction / neuromuscular blocker doses
- Consider facemask ventilation ($P_{max} 20$ cmH$_2$O)

**1st intubation attempt**
- If poor view of larynx optimise attempt by:
  - reducing / removing cricoid pressure
  - external laryngeal manipulation
  - repositioning head / neck
  - using bougie / stylet

Fail → Ventilate with facemask
Communicate with assistant

Success

**Verify successful tracheal intubation**
- Proceed with anaesthesia and surgery
- Plan extubation

**2nd intubation attempt**
- Consider:
  - alternative laryngoscope
  - removing cricoid pressure

Fail

Follow Algorithm 2 – obstetric failed tracheal intubation

Algorithm 2 – obstetric failed tracheal intubation

Declare failed intubation
Theatre team to call for help
Priority is to maintain oxygenation

Supraglottic airway device
(2nd generation preferable)
Remove cricoid pressure during insertion
(maximum 2 attempts)

Facemask +/- oropharyngeal airway
Consider:
- 2-person facemask technique
- Reducing / removing cricoid pressure

Is adequate oxygenation possible?

No
Follow Algorithm 3
Can’t intubate, can’t oxygenate

Yes
Is it essential / safe to proceed with surgery immediately?*

No
Proceed with surgery

Yes
Wake to REGIONAL?

*See Table 1, §See Table 2
Algorithm 3 – can’t intubate, can’t oxygenate

Declare emergency to theatre team
Call additional specialist help (ENT surgeon, intensivist)
Give 100% oxygen
Exclude laryngospasm – ensure neuromuscular blockade

Perform front-of-neck procedure

Is oxygenation restored?

No

Maternal advanced life support
Perimortem caesarean section

Yes

Is it essential / safe to proceed with surgery immediately?*

No

Wake⁵ / Regional?

Yes

Proceed with surgery⁶

*See Table 1, ⁵See Table 2

SingHealth

Defining Tomorrow’s Medicine
Difficult Airway Cart

- C-mac
  - D-blade
- McCoy blade
- TROOP pillow
## Table 1 – proceed with surgery?

<table>
<thead>
<tr>
<th>Factors to consider</th>
<th>WAKE</th>
<th>PROCEED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before induction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal condition</td>
<td>• No compromise</td>
<td>• Mild acute compromise</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fetal condition</td>
<td>• No compromise</td>
<td>• Compromise corrected with intrauterine resuscitation, pH &lt; 7.2 but &gt; 7.15</td>
</tr>
<tr>
<td>Anaesthetist</td>
<td>• Novice</td>
<td>• Junior trainee</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td>• Supermorbid</td>
<td>• Morbid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical factors</td>
<td>• Complex surgery or major haemorrhage anticipated</td>
<td>• Multiple uterine scars</td>
</tr>
<tr>
<td>Aspiration risk</td>
<td>• Recent food</td>
<td>• No recent food</td>
</tr>
<tr>
<td></td>
<td>• In labour</td>
<td>• In labour</td>
</tr>
<tr>
<td></td>
<td>• Opioids given</td>
<td>• Opioids not given</td>
</tr>
<tr>
<td></td>
<td>• Antacids not given</td>
<td>• Antacids given</td>
</tr>
<tr>
<td>Alternative anaesthesia</td>
<td>• No anticipated difficulty</td>
<td>• Predicted difficulty</td>
</tr>
<tr>
<td>• regional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• securing airway awake</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>After failed intubation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airway device / ventilation</td>
<td>• Difficult facemask ventilation</td>
<td>• Adequate facemask ventilation</td>
</tr>
<tr>
<td></td>
<td>• Front-of-neck</td>
<td></td>
</tr>
<tr>
<td><strong>Airway hazards</strong></td>
<td>• Laryngeal oedema</td>
<td>• Bleeding</td>
</tr>
<tr>
<td></td>
<td>• Stridor</td>
<td>• Trauma</td>
</tr>
</tbody>
</table>

Criteria to be used in the decision to wake or proceed following failed tracheal intubation. In any individual patient, some factors may suggest waking and others proceeding. The final decision will depend on the anaesthetist’s clinical judgement.

### Table 2 – management after failed tracheal intubation

#### Wake
- Maintain oxygenation
- Maintain cricoid pressure if not impeding ventilation
- Either maintain head-up position or turn left lateral recumbent
- If rocuronium used, reverse with sugammadex
- Assess neuromuscular blockade and manage awareness if paralysis is prolonged
- Anticipate laryngospasm / can’t intubate, can’t oxygenate

#### Proceed with surgery
- Maintain anaesthesia
- Maintain ventilation - consider merits of:
  - controlled or spontaneous ventilation
  - paralysis with rocuronium if sugammadex available
- Anticipate laryngospasm / can’t intubate, can’t oxygenate
- Minimise aspiration risk:
  - maintain cricoid pressure until delivery (if not impeding ventilation)
  - after delivery maintain vigilance and reapply cricoid pressure if signs of regurgitation
  - empty stomach with gastric drain tube if using second-generation supraglottic airway device
  - minimise fundal pressure
  - administer H₂ receptor blocker i.v. if not already given
- Senior obstetrician to operate
- Inform neonatal team about failed intubation
- Consider total intravenous anaesthesia

#### After waking
- Review urgency of surgery with obstetric team
- Intrauterine fetal resuscitation as appropriate
- For repeat anaesthesia, manage with two anaesthetists
- Anaesthetic options:
  - Regional anaesthesia preferably inserted in lateral position
  - Secure airway awake before repeat general anaesthesia

Nine-year audit of post-dural puncture headache in a tertiary obstetric hospital in Singapore

J.C. Tien, M.J. Lim, W.L. Leong, E. Lew
Department of Women's Anesthesia, KK Women's and Children's Hospital, Singapore

- 9 year audit (1 June 2005 - 31 May 2014)
- 43434 central neuraxial blocks
- 63 had event (0.15%)

Table 2  Incidence of events and outcome

<table>
<thead>
<tr>
<th></th>
<th>Intrathecal catheter</th>
<th>Epidural resite</th>
<th>PDPH</th>
<th>Epidural blood patch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Witnessed ADP</td>
<td>38 (60.3%)</td>
<td>34</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>Positive catheter aspiration</td>
<td>11 (17.5%)</td>
<td>9</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Features of subarachnoid block</td>
<td>9 (14.2%)</td>
<td>9</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Symptoms of PDPH</td>
<td>5 (7.9%)</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>63 (100%)</td>
<td>52</td>
<td>11</td>
<td>39</td>
</tr>
</tbody>
</table>

Data are number (%).
PDPH: post-dural puncture headache; ADP: accidental dural puncture.
• Labour analgesia
  – Intrathecal catheter
    • Infusion: 1-3ml/hr 0.1% ropivacaine, 2mcg/ml fentanyl
    • Intermittent bolus: 1-2ml 0.1% ropivacaine
  – Resiting of epidural catheter
    • Continued CSF leak through puncture site
    • High block
If you are still warded:
The Acute Pain Service team from the Women’s Anaesthesia department routinely reviews all patients who have had a spinal or epidural injection on the next day. If you develop a headache 2 to 3 days after delivery, you may inform your obstetrician who will inform the anaesthesia team.

If you have been discharged from hospital:
You may call the hospital to make arrangements for an anaesthetist to review in clinic. If your headache is severe, please go to the 24-Hour Women’s Clinic.

What you need to know about
HEADACHE after a spinal or epidural injection
Headaches are common after childbirth, regardless of whether you have had a vaginal delivery or caesarean section. They can be caused by many things, including:

- Lack of sleep or poor sleep
- Inadequate fluid intake
- Stress from looking after the baby
- Migraine attack (if you have a previous history of migraine)
- Hormonal changes of pregnancy

**POST DURAL PUNCTURE HEADACHE**

**Could this be the cause for my headache?**

If you have received a spinal injection for Caesarean section or an epidural injection for labour, there is a 1 in 100 to 1 in 500 chance of getting a headache after this procedure. This type of headache is called a post dural puncture headache (PDPH). It is an uncommon but known complication of a spinal or epidural injection.

Your brain and spinal cord are contained in a bag of fluid. This bag is called the dura and the fluid is the cerebro-spinal fluid (CSF).

When an epidural injection is given, a needle is used to inject local anaesthetic outside the dura. If the needle passes through the dura, CSF can leak out. When a spinal injection is given, a fine needle is intentionally inserted through the dura.

If too much fluid leaks out through the dural hole, the pressure in the bag is reduced. When you sit up, the pressure around your brain is further reduced, causing a headache.

**What are the features of a PDPH?**

The headache can develop within 1 week of the spinal or epidural injection, but commonly within the first few days. It is usually felt at the front or back of your head, worse on sitting or standing, and relieved by lying down. You may also have other symptoms, such as neck pain, nausea and discomfort when looking into bright lights.

Some patients describe it as a very bad migraine which is made worse when sitting or standing up.

**How can I treat my headache?**

- Rest flat in bed
- Keep hydrated by drinking plenty of water
- Take simple painkillers, such as paracetamol, codeine or non-steroidal anti-inflammatory drugs (NSAIDS) [e.g. mefenamic acid (ponstan), ibuprofen (brufen), diclofenac (voltaren)]
- Caffeine tablets or caffeine-containing beverages e.g. coffee or tea may help
- Avoid lifting heavy objects or straining at the toilet

**What are my choices if the headache persists?**

This headache usually gets better in a few days. If your headache persists despite the above measures, your anaesthetist may offer you an epidural blood patch to treat your symptoms.

**What is an epidural blood patch?**

An epidural blood patch is a procedure that is performed to seal the hole in the dura and stop further CSF leak. This often helps to stop the headache. An epidural blood patch involves drawing blood from your arm (similar to routine blood taking) and injecting the sterile blood through your back into the epidural space outside the dura. The blood will clot and plug the hole.

**What is the procedure like?**

This procedure is done in the operating theatre suite. You do not need to fast prior to the procedure.

You will be in a lateral position. The first anaesthetist will draw blood from the veins in your arm, while the second anaesthetist will locate the epidural space using a needle and some local anaesthetic. The first anaesthetist will hand over the blood to be injected into the epidural space.

The entire process should take about 30-40 minutes. You will be asked to rest in bed for up to 2 hours.

**What are the risks?**

Side effects such as bruising and backache over the injection site are common and temporary (<3 to 4 days). There is a small chance (<1%) that a second dural hole can be created similar to the first one. Infection, bleeding and nerve damage are rare and occur in < 0.1% of the cases.
POST DURAL PUNCTURE HEADACHE WORKFLOW

Patient with headache after spinal or epidural injection

Follow-up by APS MO (for spinals) / Epidural MO (for epidurals)

Anaesthesia informed by O&G team

Full history and physical examination (including neurological exam)

Inform anaesthetist involved in epidural insertion
Inform consultant-in-charge (Epidural consultant / OT consultant)

Initiate conservative treatment after confirmation of diagnosis and discussion with consultant
- Bed rest
- IV / PO hydration (minimal 2l/day)
- Regular analgesia
  - PO Durogesic 1g ODS
  - **PO Meperidine 50mg TDS or PO Naproxen 550mg BD with PO Famotidine 20mg BD
  - PO Tramadol 50mg TDS/PRN or PO Codeine 30mg TDS/PRN
  - PO Oxycodone 5mg Q6H/PRN

Anti-emetics: IV Ondansetron 4mg TDS/PRN, IV Metoclopramide 10mg TDS/PRN
Laxatives: PO Lactulose 10ml TDS, PO Senna 2 tabs QN

Anaesthetic team to review daily
- Document in patient's case notes
- Document in Labour Analgesia Audit Form

Patient's headache is mild and improves

Document patient's progress in case notes
Pass completed Labour Analgesia Audit Form to Latiff

Consider epidural blood patch

Patient's headache is moderate to severe and does not improve

Exclude other causes of headache
Full history and physical exam to exclude neurological deficits
Consider MRI brain and Neurology referral

EPIDURAL BLOOD PATCH

PRE-PROCEDURAL CHECKLIST FOR ANAESTHETIST

Is the patient currently taking anti-platelet or anti-coagulation medications? □ Yes / No
- Aspirin – no need to stop
- SC Cloxane prophylactic dose – last dose to be served 12h pre-procedure
  (Date / time of last SC Cloxane dose: __________)
- SC Cloxane therapeutic dose – last dose to be served 24h pre-procedure
  (Date / time of last SC Cloxane dose: __________)
- IV Heparin – infusion to be stopped 4h pre-procedure, check PTT after 4h and ensure PTT < 1.3x control
  (Date / time of cessation of Heparin infusion: __________)
  (PTT value at 4h after stopping Heparin infusion: __________)

Does the patient currently have any evidence of active infection? □ Yes / No
- Localized infection at the back
- Systemic infection (e.g. fever)

Does the patient currently have any neurological symptoms? □ Yes / No
- Back pain
- Lower limb numbness or weakness

Has the benefits, risks and alternative options of epidural blood patch been counseled to the patient? □ Yes / No
- Epidural Blood Patch Patient Brochure passed to the patient
- Epidural Blood Patch Patient Information Sheet passed to the patient
- Informed written consent obtained with Consent for Procedure Form signed

Name of Anaesthetist: ______________
Signature of Anaesthetist: ______________
Date / Time: ______________

KKH Department of Women's Anaesthesia
Revised Aug 2016
What are the risks?
Side effects such as bruising and backache over the injection site are common and temporary (< 3 to 4 days). There is a small chance (< 1%) that a second dural hole can be created similar to the first one. Infection, bleeding and nerve damage are rare and occur in < 0.1% of the cases.

Are there any other treatments available?
There are alternative treatments but none has been shown to be as effective as an epidural blood patch. You may discuss these with your anaesthetist.
**Why am I being offered an epidural blood patch?**

If you have received a spinal injection for Caesarean section or an epidural injection for labour, there is a 1 in 100 to 1 in 500 chance of getting a headache after this procedure. This type of headache is called a post-dural puncture headache (PDPH). It is an uncommon but known complication of a spinal or epidural injection.

When an epidural injection is given, a needle is used to inject local anaesthetic outside the dura. If the needle passes through the dura, cerebrospinal fluid (CSF) can leak out. When a spinal injection is given, a fine needle is intentionally inserted through the dura.

If too much fluid leaks out through the dural hole, the pressure around the brain and spinal cord is reduced. This can cause a headache.

If your headache is severe and persistent, your anaesthetist may offer you an epidural blood patch to stop your headache.

---

**What is an epidural blood patch?**

An epidural blood patch is a procedure that is performed to seal the hole in the dura and stop further CSF leak.

To do an epidural blood patch, a needle is inserted into your epidural space, in the same way as when an epidural is given for pain relief. Instead of giving a painkiller through the needle, a small amount of your blood is taken from a vein in your arm and injected into the epidural space. The blood will clot and plug the hole to stop further CSF leak. This often helps to stop the headache.

---

**How do I prepare for the procedure?**

You anaesthetist will discuss the procedure with you in detail and answer any questions you may have.

You will be asked to sign a consent form saying that you understand the procedure, the advantages and complications of this treatment, and that you agree to have the epidural blood patch.

On the day of the procedure, you can continue to eat and drink. You can continue breastfeeding your baby prior to the procedure.

You can continue taking the painkillers and regular medications prescribed by your doctor. You may be asked to stop the medications that affect your blood clotting.

---

**What is the procedure like?**

This procedure is done in the operating theatre suite.

You will be lying on your side during the procedure. Two anaesthetists will carry out this procedure. The first anaesthetist will numb the skin on your lower back with a local anaesthetic injection and insert a needle into the epidural space. The second anaesthetist will take blood from the veins in your arm and hand over the blood to be injected into the epidural space.

The entire process should take about 30-40 minutes. It is normal to feel pressure or discomfort in your back while the anaesthetist is injecting blood into your epidural space.

---

**What happens after the procedure?**

You will be asked to rest in bed for up to 2 hours. Avoid lifting heavy objects for at least 2 days after the procedure.

After your procedure, you may be discharged home in the afternoon or the next day if your symptoms have improved.

In 60 to 70% of patients, the epidural blood patch will cure the headache within a few minutes to a few hours. Please inform your anaesthetist if you still have a headache after 24 to 48 hours.
EPIDURAL BLOOD PATCH PATIENT INFORMATION SHEET

SECTION A:
For patients who are receiving an epidural blood patch during the current hospitalization

You have been scheduled to receive an epidural blood patch to treat your symptoms.

Your anaesthetist will explain the procedure to you. You may read more about this procedure in the "Epidural Blood Patch Patient Brochure" and ask your anaesthetist any questions prior to the procedure.

You will be asked to sign a consent form indicating that you agree to have this procedure.

On the day of the procedure:
- You can continue to eat and drink before the procedure.
- You can continue to breastfeed your baby before the procedure.
- You can continue your regular medications and painkillers.

Preparing for the procedure:
- You will be transferred from the ward to the operating theatre for the procedure.
- The entire procedure should take about 30 to 40 minutes.

After the procedure:
- You will be monitored in the recovery area for at least 1 hour before being transferred back to the ward to rest.
- You will be asked to rest in bed for up to 2 hours after the procedure.
- You can continue your regular medications and painkillers after the procedure.

EPIDURAL BLOOD PATCH DISCHARGE INSTRUCTIONS

You have received an epidural blood patch on (date) ____________ performed by Dr. (name) ____________.

To ensure safe recovery, please follow these instructions:
- Do not lift heavy objects or engage in strenuous activity for the next 48 to 72 hours. Avoid straining to move your bowels.
- Resume your regular diet and drink plenty of fluids.
- You may remove any band-aids or dressings after 24 hours.
- Take your usual medications as prescribed.
- You may experience some discomfort or pressure in your low back area. You may use a cold compress to decrease discomfort and inflammation at the injection site for 24 to 48 hours after the procedure, but do not leave on for more than 10 minutes at a time.

If you develop any of the following symptoms, please go to the KKH 24 Hour Women's Clinic:
- Increasing levels of discomfort, back pain, redness or swelling at the injection site.
- Fever > 38 degrees Celsius.
- Worsening headache which is not relieved by lying down.
- Severe leg pain, numbness or weakness.

Please bring this Information sheet with you and inform the staff that you have received an epidural blood patch. They will contact the Women's Anaesthetist on Duty who will review you.

If you have any questions or concerns, please call the KKH Main line at 62934044 and ask to be put through to the Women’s Anaesthetist on Duty.

KKH Department of Women’s Anaesthesia

Revised Aug 2016
Code Red

- Activated for maternal collapse in KKH
- Code is specific for pregnant women in advanced pregnancy (>20 weeks gestation) when aortocaval compression is significant
- In alignment with AHA recommendations to allow early recourse to perimortem caesarean section to relieve aortocaval compression during CPR
- Can follow Code-Blue, but is intended to be activated directly to save time to PMCS
Code Red

- PMCS is best performed within 5-min of loss of output, with CPR that is ongoing but proving ineffective despite manual left uterine displacement
- Code RED Brings to the ‘patients location’
  - Code BLUE nursing staff, porter etc with all the resuscitation kit
  - Anaesthetist, obstetrician and midwife
  - OT-staff with a PMCS kit, that will allow an LSCS at any location in the hospital
  - Neonatologist and NICU resuscitation nurse with equipment for the baby
  - Surgical kits are also available in high mobility areas for obstetric patients
- Idea is to minimise time to delivery if required for resuscitation
- Slightly different workflows at KKH for public and clinical areas
THANK YOU!