P81 Repeated hypotension associated with leucocyte depleting filter during infusion of cell salvaged blood
J Kerr, N Osborn
Anaesthetics, Heart of England NHS Foundation Trust, Birmingham, UK

Introduction: Cell salvage is common in obstetric practice, in which a leucocyte depleting filter is advised to remove fetal squames and amniotic fluid. Severe acute hypotension occurred on four occasions of attempted infusion of cell salvaged blood during a caesarean section in a lady with placenta percreta, which resolved on removal of the filter. We review the literature on hypotension associated with leucocyte depleting filters, and explore the option of removing the filter.

Case Report: A 35 year old lady, G8P7, underwent caesarean section at 35/40 for placenta percreta. In our trust the Electra Concept™ machine with a Leukoguard RSTM filter is used. After safe delivery of the baby, heavy blood loss ensued and allogeneic blood given. 1.5 litres of cell salvaged blood was processed and transfused. Acute hypotension occurred (BP 58/40) which resolved on cessation of the cell salvaged blood and treatment with vasopressors and crystalloid. A further 2 attempts at transfusion of cell salvaged blood resulted in severe hypotension. A central venous catheter was inserted to assess fluid balance and the cell salvage transfusion was recommenced. This caused a dramatic fall in BP and CVP. The filter was removed, as this has been implicated in hypotension. 1 2 Cell salvaged blood was transfused freely with no further adverse blood pressure events noted.

Discussion: There are many causes of hypotension in this scenario, but clinically it was felt the filter was responsible. The vasodilator bradykinin is produced as a result of platelets and FXII adhering to the negatively charged filter. 2 The main concern of removing the filter is of amniotic fluid embolism, but it is not clear which elements of the fluid are responsible. 3 Tissue factor and alpha-fetoprotein are effectively cleared by washing alone. The filter removes leucocytes, phospholipids and particulates of amniotic fluid. The AAGBI recommends that the decision to transfuse blood potentially contaminated with amniotic fluid is the clinician’s. 4 As yet, no adverse events have been reported as a result of removal of the filter. Adverse events should be reported to Medicine and Healthcare Regulatory Agency (www.mhra.gov.uk) and Serious Hazards Of Transfusion (www.shotuk.org).

References

P82 A survey of anaesthetists’ preference on the language used to explain an epidural to labouring women
PM Slater
Anaesthesia and Critical care, Northampton General Hospital, Northampton, UK

Introduction: The use of certain words and phrases with negative emotional content can exacerbate unwanted symptoms for patients. 1 Anaesthetists frequently use language containing negative suggestion whilst siting labour epidurals. 2 We are currently unaware whether anaesthetists are able to identify negative language and if they consider its use to be appropriate or inappropriate.

Method: All anaesthetists in the department at Northampton general hospital were sent a typed questionnaire form returned anonymously. Two explanations of an epidural were provided to anaesthetists (figure 1); one a traditional explanation containing negative language (explanation 1) and the other avoiding negative language (explanation 2). Anaesthetists were asked whether there was any difference between the 2 explanations and if so what the difference was. They were also asked which of the 2 explanations was more appropriate to use for a labouring woman and why.

Figure 1 - Explanations of epidural
1. The epidural is a small plastic tube which we put in the back using a needle. We put pain killer through it until you’ve delivered the baby. To put the epidural in, we’ll sit you forward and you’ll feel a sharp scratch and sting as we inject some local anaesthetic in the skin. Some women feel pain as the epidural goes in but let us know if it’s sore and we’ll inject some more local anaesthetic.
2. The epidural is a small plastic tube which we place in the back. We put medicine through it to keep you comfortable until you’ve delivered the baby. To put the epidural in, we sit you forward and numb the back with some local anaesthetic first so that it’s more comfortable to put the epidural in. Some women feel some pushing as it goes in but let us know if anything bothers you and we’ll make it as comfortable as possible.

Results: The questionnaire was sent to 59 anaesthetists and 36 replied - a response rate of 61%. 27 of 36 anaesthetists (75%) indicated that the 2 explanations were different because words with negative emotional content are used in explanation 1 but not in explanation 2. With regards to which explanation was more appropriate to use for labouring women, 6 (17%) chose explanation 1, 18 (50%) chose explanation 2, 9 (25%) indicated both were appropriate, 1 indicated neither was appropriate and 2 made no decision.

Discussion: Three quarters of anaesthetists noticed that the 2 explanations differed due to the use of negative language in one but not the other. However, only half of anaesthetists felt that the explanation avoiding negative suggestive language was more appropriate to use. This indicates that anaesthetists are divided as to whether language with negative emotional content is appropriate to use in patient communication in this clinical setting. The reasons for this need to be explored further to aid training in anaesthetists’ communication skills.

References
P83 Audit – Labour epidural and maternal risk recollection – are our women giving informed consent?

A Senathirajah, M Khan, A Troy
Anaesthesia, Countess of Chester Hospital, Chester, UK

Introduction: Obtaining consent for labour epidurals is an ongoing issue. Despite our current practice of providing early antenatal information which includes printed information of analgesic options, as well as the anaesthetist’s verbal explanation pre-procedure, the consent process can be problematic. A significant measure of the informed consent is recall of information provided. We performed this prospective audit where 43 women were interviewed within 48 hours of delivery to assess their ability to recall the vital information shared. The results showed poor recall despite early antenatal information and availability of antenatal classes.

Method: We performed this prospective audit looking at women who had a labour epidural. Mothers were interviewed by the 2 auditors using a questionnaire (approved by PALS) within 48 hours of delivery. 43 mothers were interviewed with their consent.

The interview consisted of discussing reasons for epidural request and recollection of risks that had been explained in both the written and verbal explanation. They were also asked in they felt the had given ‘informed consent’ - a term that was explained to the mother.

Results: 95.3% (41/43) had printed information available. 32.5% (14/43) mothers considered having an epidural as part of their birth plan.

60.4% (26/43) mothers did not consider an epidural, of which 57.6% (15) read the printed information.

90.7% (39/43) had pain scores of >6.

Maximal number of risks recalled without prompt (maximum score 12): 9 (mode - 2), Minimum recalled - 0.

Maximal number of risks recalled with prompt 12 (mode - 8).

Conclusion: The AAGBI states that mothers may not be incapacitated while in labour, and if so, they are capable of giving informed consent. At times it is difficult to decide if they do possess capacity. This audit highlights this problem. Their pain scores are severe, many have used diamorphine or entonox and they have all demonstrated a lack of recall. Despite this, the vast majority feel they gave informed consent. Would this opinion still remain if they faced a complication? We proposed a shortened list of ‘Pros and Cons of Epidurals’ to read in the labour room or ward. This allows mothers to re-consider their options while they are not in fully established labour, and without the interference of strong medication on their judgement. We also propose to encourage midwifery and antenatal class staff to discuss labour analgesia. As it can be seen from this audit, verbal information appears to be better retained than written.

References
3. DCA, Mental Capacity Act 2005: Code of Practice, p.41

P84 Documentation of risk associated with central neuraxial blockade (CNB) in labour in obstetric anaesthesia: an audit of maternity units in the West of Scotland

R Jadhav, J Glen, R O’Connor
Anaesthesia, Wishaw General, Glasgow, UK. *Anaesthesia, Southern General Hospital, Glasgow, UK

Introduction: Informed consent for CNB in labour is a legal requirement and it is accepted that despite the stresses of labour, women retain capacity. A national survey in 2009 showed that wide variations exist across the country regarding the information given to women regarding CNB. However, survey data and clinical practice often differ. Our aim was to audit current practice by analysing anaesthetic charts and noting documentation of risk during consent. We also audited the use of written information cards and maternal satisfaction.

Method: A three day snapshot of all elective obstetric cases requiring CNB for labour analgesia or caesarean section were analysed in five maternity units in the West of Scotland. The type of blockade, grade of anaesthetist, use of an information card, along with documentation of risk was recorded. Quotation of incidence of specific risks was not audited. Women were then followed up prospectively within 48 hours to ask if they were satisfied with the consent process.

Results: All units obtained only verbal consent for CNB. A total of 113 anaesthetic records were audited over five centres, of which 42% were spinals, and 58% epidurals. Consent was documented in 94% and risks quoted in 88% of cases. Consultants performed 25% of cases, trainees 55% and trust grade doctors 20%. The five most commonly documented risks were inadequacy (73%), headache (60%), hypotension (59%), infection (50%), and non-specific neurological consequences (54%). The highest percentage of risk documentation was by trainees. A wide variation of other risks and complications were documented in different units by different grades of anaesthetists. Three units had ready access to a local information card, but only 19% of women overall received it. Despite this, all women were happy with the consent process at follow-up.

Conclusions: The vast majority of practitioners document consent for neuraxial blockade in labour. There is, however, marked disparity between units and individuals. In particular, it is of interest that almost half of practitioners do not document the risk of headache or neurological damage. Despite 100% maternal satisfaction, there is evidence to suggest that written information can help patient recall and aid consent, yet this is not widely used in our region. The consistent use of a standardised written consent tool, quoting risks and their incidence could aid both patients and anaesthetists in obtaining consent for CNB, and standardise the process across the region.

References
P85 Mothers’ knowledge of epidural complications: can we do more?
A V M Riccoboni, E Evans
Department of Anaesthetics, St Georges Hospital, London, UK

Introduction: Women have the right to be involved in their care during delivery and need to make decisions. 
Informed consent is required to site an epidural. The ability to recall knowledge is a major component of informed consent and is increased by the provision of antenatal written information. 
Multi-modal sources of information are used regularly, yet despite this, recall remains poor. 
We look at the current sources used to deliver facts on epidural complications, information recall and the need for a novel approach to improve epidural complications’ awareness.

Method: A questionnaire was designed to test recall of a total of 6 epidural complications, the range of antenatal education received, and views on the benefits of receiving an SMS in this period. This occurred over 3 months, from September to November 2011. Mothers involved had used various methods of analgesia in labour and were on their first post partum day. Standardised questions were asked by the same anaesthetist. Complications chosen were taken from the OAA leaflet.

Results: 90 mothers were questioned. 69% had epidurals despite only 40% planning one. 80% received some form of epidural information antenatally. 44% received an OAA leaflet, 10% could not remember and 46% did not receive one. 89% wanted another service providing information with 78% thinking that this should be with an SMS and that it would be beneficial. Only 2% managed to recall all 6 complications with only 13% doing this post prompting (Table 1).

<table>
<thead>
<tr>
<th>Number answered correctly</th>
<th>Pre-prompting %</th>
<th>Post-prompting %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>28</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>29</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>26</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>13</td>
</tr>
</tbody>
</table>

Conclusion: Provision of an SMS is a simple and effective way of meeting mothers’ demands and may aid recall of epidural complications. This simple use of technology, combined with increased availability of the OAA leaflet, could enhance the informed consent process. Further research is being undertaken.

References
2. Bradock C. The emerging importance and relevance of shared decision making to clinical practice. Med Decis Making 2010; 30: 5s-7s

P86 Audit of intrapartum bladder care in women receiving epidural analgesia
V J Hunt, A Banks
Anaesthesia, NUH NHS Trust, Nottingham, UK

Introduction: Bladder care is an important part of intrapartum management. Adequate bladder care can reduce the incidence of bladder overdistension and enable prompt recognition of women who have voiding dysfunction. The use of epidural analgesia is associated with postpartum bladder dysfunction. 
NICE guidelines, in line with WHO recommendations, advise that emptying of the bladder should be routine once in established labour. 
This has been adapted in our institution as one of the observations to be recorded four-hourly once the first stage of labour is established. 
We audited the documentation of bladder care given to women in established first stage of labour who received epidural analgesia.

Method: 50 consecutive patients receiving epidural analgesia were retrospectively identified from the labour ward admission book, working backwards from 31st July 2011. The intrapartum record was examined and the times, methods and volumes of bladder emptying for the duration of labour were recorded. Some leeway was granted due to the often pressured situations and the very small space available on the partogram for the urine void check. Where documented, the time from the last pre-delivery bladder care episode to the first postpartum void was recorded, excluding those women who were catheterised with an in-dwelling catheter. We also noted the mode of delivery, the length of labour and whether a referral was made to a specialist for postpartum voiding difficulties.

Results: 50 sets of records were identified. 37/50 (74%) patients had at least four hourly bladder emptying recorded during the first stage of labour; 13/50 (26%) did not. This included up to an hour extra for maternal interventions, crises and discrepancies in record keeping. There was incomplete documentation of first postpartum void in 21 cases (42%), but documented times of 8 hours in 2 cases, 10 hours in 2 cases, and 1 instance each of 12,13,14 and 15 hours between the last pre-delivery void and the first postpartum void. None of the women were referred to a specialist for bladder dysfunction but 2 were discharged home with in-dwelling catheters which were successfully removed after 7 days.

Discussion: Despite local and national guidelines, bladder care in labouring women receiving epidural analgesia was below our audit standard, with only 74% of the cases following the local guideline. Perhaps more worryingly, there were some instances of prolonged periods, with the effects of epidural blockade on the bladder, when bladder care seemed to be lost in the transition from labour suite to ward. As a result of this audit we plan to heighten awareness of the issue of bladder care in labour, particularly in the context of epidural analgesia, and work closely with the obstetricians, midwives and urogyneacologists in reviewing the current clinical guidelines.

References
P87 Lateral versus Sitting position for epidurals: A training issue?
A Thangamuthu, M Purva
Anaesthetics, Hull Royal Infirmary, Hull, UK

Introduction: Evidence suggests that lateral position for placing epidurals is safer than sitting as it results in fewer dural punctures, inadvertent vessel cannulation and a better functional block for the mother.1 We wanted to investigate the relationship between position, epidural failure rate and complications among the trainees in our hospital

Method: 1407 epidurals were analysed from our computerised database from September 2010 to November 2011. Epidural failure was defined by the presence of any of the following factors: inadequate pain relief by 45 minutes of placement, dural puncture, resiting or mother dissatisfied at follow up visit.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Lateral (n%)</th>
<th>D. Puncture Sitting n%</th>
<th>D. Puncture Lateral n%</th>
<th>Failure Lateral n%</th>
<th>Failure Sitting n%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT2</td>
<td>86/367 (23.4%)</td>
<td>3(1.1%)</td>
<td>57 (20.2%)</td>
<td>21(24.4%)</td>
<td></td>
</tr>
<tr>
<td>ST3</td>
<td>19/210(9.1%)</td>
<td>6(3.1%)</td>
<td>43 (22.5%)</td>
<td>4(21%)</td>
<td></td>
</tr>
<tr>
<td>ST4</td>
<td>106/605 (17.5%)</td>
<td>3(0.6%)</td>
<td>83 (16.6%)</td>
<td>28(25.2%)</td>
<td></td>
</tr>
<tr>
<td>ST5,6,7</td>
<td>42/219 (19.2%)</td>
<td>2(1.1%)</td>
<td>24 (13.5%)</td>
<td>9(21.4%)</td>
<td></td>
</tr>
</tbody>
</table>

Results: Overall lateral position was used to place only 18.3% of all epidurals. CT2 trainees placed significantly more epidurals in the lateral position than any other grade of trainee (p<0.05). Excluding CT2, all trainees had a higher failure rate in the lateral position with the ST4 trainee being significantly worse (p=0.03). Excluding CT2, the dural puncture rate was higher among all trainees in the lateral position and significantly so among ST4 (p=0.03) who were worse than even CT 2 (p = 0.026). Among CT2, dural puncture was significantly lower in the lateral position (p=0.3). Even though not statistically significant the overall rese rate of lateral position is low when compared sitting.

Discussion: It has been noted that those taught in the lateral position initially and who then used it preferentially, have no problems adapting to the sitting position but the reverse is not true.2 Our CT trainees are preferentially taught to place epidurals in the lateral position and this may account for their better performance over the more experienced colleagues in this position. Under certain circumstances, such as cord prolapse, the lateral may be the only position available to perform a neuraxial block. Lack of confidence and expertise with this position can result in failure of epidural sitting and conversion to GA with its risks. Therefore this important issue needs addressing at an early stage in the trainee’s career.

References

P88 Patient controlled epidural analgesia (PCEA): A prospective audit of mobility during labour
CH Papageorghiou, N Patel
Anaesthetics, University College London Hospital, London, UK

Introduction: Maternal mobility in labour with low dose central neuraxial blockade has been found to between 37% and 58% from previous studies.1,2 The method for administering low dose mixture (LDM) is moving from midwife administered to patient controlled epidural analgesia (PCEA). Following the recent introduction of PCEA on our unit and concerns raised regarding reduced mobility of parturients, we conducted an audit to investigate this.

Methods: After discussion with our ethics department, data was collected prospectively over a one month period from parturients who received PCEA for labour. Method of initiation of analgesia (combined spinal epidural [CSE] or epidural) was recorded. Mobility pre and post PCEA (the highest modified Bromage score achieved and extent of mobility) were noted. Other data collected included: duration of labour post PCEA, total volume of LDM used, factors affecting ability to mobilise (intravenous infusions, catheterisation, monitoring), reasons for not mobilising, parturients and midwives attitude towards mobilising.

Results: Complete data was collected on 59 mothers. Patient demographic data were similar. 55 (93%) did not mobilise out of bed at any point in labour after receiving PCEA; 43 (78%) of these were mobilising in labour prior to PCEA. Reasons given by mothers for not mobilising after PCEA included tiredness in 16 of 55 (29%), feeling unsafe in 15 (27%) and being attached to monitoring in 14 (26%). 62% of parturients would have wanted to mobilise during their labour but less than half (45%) felt they were encouraged to do so. Some were discouraged (7%). Of the 4 mothers that mobilised: one walked briefly around bed, two mobilised to the toilet and one around the room. All patients receiving a PCEA were catheterised, cannulated and attached to CTG monitoring. There was no difference in total LDM used or duration of PCEA in labour between those that mobilised and those that did not.

<table>
<thead>
<tr>
<th>Mobilised Pre PCEA</th>
<th>Did Not Mobilise Pre PCEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility (n=55)</td>
<td>Mobility (n=4)</td>
</tr>
<tr>
<td>CSE: Epidural</td>
<td>3/4 (75%)</td>
</tr>
<tr>
<td>Bromage score PCEA</td>
<td>4 (100%)</td>
</tr>
<tr>
<td>Mean total LDM mL</td>
<td>82 (16-154)</td>
</tr>
<tr>
<td>Mean PCEA duration</td>
<td>362 (156-623)</td>
</tr>
</tbody>
</table>

Data are number (%) or *mean (range). $p = 0.64$, $t = 0.33$

Discussion: In our unit parturients with PCEA during labour mobilised significantly less than in previous studies despite the fact that more than half had minimal motor block. Portable PCEA pumps, telemetric CTG monitoring and avoiding unnecessary catheterisation where possible may improve mobility. We aim to repeat the audit once PCEA is more firmly established in our unit and mobility is encouraged to a greater extent.

References
2. COMET study group. Effect of low dose mobile versus traditional epidural techniques on mode of delivery: a randomised controlled trial. The Lancet 2001; 358; 19-23
P89 Patient satisfaction, analgesic efficacy and workload on changing from continuous infusion to patient controlled epidural analgesia for labour

MJP Drake, HE Jones
Department of Anaesthesia, Great Western Hospitals, Swindon, UK

Introduction: As part of changing from continuous infusions to patient controlled epidural analgesia (PCEA) to comply with NICE guidelines, two audits were carried out to determine the effect of this change on patient satisfaction, staff workload and quality of analgesia.

Methods: Following institutional audit department approval, data was collected during two 3-week periods before and after the introduction of PCEA. Patient questionnaires were completed 1-2 hours after sitting the labour epidural, during the second stage, and within 72 hours postpartum on all women receiving epidural analgesia. Patient rating scores were numbered between 1 and 5, with 5 being the best possible score. Extra epidural boluses and requests for anaesthetic assistance were verified against casenotes.

Results: A total of 34 infusion epidurals and 40 PCEA epidurals were identified as suitable for analysis during the audit periods. Median cervical dilation at epidural insertion was 5cm in the infusion group and 4cm in the PCEA group. Compared to continuous infusions, PCEA was eight times less likely to need additional staff-administered boluses for inadequate analgesia. Introduction of PCEA improved mean rating of quality of epidural analgesia from 3.85 to 4.47 (p=0.048), mean patient satisfaction score for epidural analgesia (Figure 1) improved from 3.97 to 4.58 (p=0.015), and mean score for feelings of control over labour pain increased from 3.61 to 4.29 (p=0.004).

Discussion: Changing from continuous infusions to PCEA in our institution, largely by reconfiguration of existing epidural pumps and therefore at minimal cost, has greatly reduced the requirement for staff-administered rescue boluses for pain, and hence staff workload and cost of consumables. Patient perception of their control over labour pain has been enhanced, and ratings for both quality of and satisfaction with labour analgesia have significantly improved with PCEA.

Reference
P91 Minimal fibrinolysis measured by ROTEM in obstetric haemorrhage
C P Brenton, C L Chevannes, P Barclay, S Mallah
The Tom Bryson Department of Anaesthesia, Liverpool Women’s NHS Foundation Trust, Liverpool, UK

Introduction: Point of care coagulation testing has recently been introduced to our tertiary referral obstetric unit to aid management of major obstetric haemorrhage. ROTEM thrombelastography measures visco-elastic properties of blood coagulation. This includes clot formation, and continues to include assessment of clot lysis. This is expressed as maximum lysis (ML) which describes the percentage reduction from maximum clot strength. Antifibrinolytic drugs are not used as standard in our unit’s major obstetric haemorrhage management, but have been shown to be of benefit in other areas of haemorrhage management1. We therefore audited the incidence of fibrinolysis measured by ML as part of our ongoing audit into coagulopathy in obstetric haemorrhage.

Method: ROTEM results from all obstetric patients who were tagged with haemorrhage or another diagnosis associated with haemorrhage. The fibrinolysis marker for maximum lysis (ML) were recorded as taken from Ex-Tem tests. Tests with artefact or which did not produce a value for ML were excluded. 165 tests from 134 patients over a ten month period were included.

Results: 165 tests from 134 patients over a ten month period were included. None were at or above the 15% lysis given as normal by the manufacturer. The range was 0% to 13% with the modal group being 0% lysis. The mean ML was 3.12% (95% C.I. +/- 0.45%)

Discussion: Antifibrinolytic drugs are not routine in the management of major obstetric haemorrhage. It seems reasonable to use a test for fibrinolysis in assessment of obstetric haemorrhage when use of antifibrinolytic drugs is considered. Within the population of our audit there is little to suggest a major degree of fibrinolysis when assessed with ROTEM thrombelastography. It may be that antifibrinolytic drugs will aid management of obstetric haemorrhage regardless of this and their role is currently being assessed in a major multi-national trial2.

References
2. World Maternal Antifibrinolytic Trial
http://www.womantrial.bthm.ac.uk/ accessed Jan 2012

P92 A high pressure situation
R Santhirapala, A Molokhia, J Arron, G Mathew
Anaesthesia and Critical Care, University Hospital Lewisham, London, UK

Introduction: Following the recent CMACE report, there has been an increasing emphasis on early recognition and aggressive treatment of pre-eclampsia toxaemia (PET).1 This relies on early and regular antenatal clinic (ANC) attendance. We describe a case where poor ANC attendance preceded complex emergency treatment to avoid potential morbidity and mortality.

Case Report: A previously fit and well 20 year old, gravida 3 mother presented at 32 weeks gestation with a one week history of blurred vision, visual disturbances and a headache. On arrival, she had a mean arterial blood pressure (MABP) of 140mmHg, with no history of pregnancy induced hypertension nor proteinuria. However, she had not attended the ANC during her third trimester. She was diagnosed with severe PET and immediately treated with labetalol, magnesium sulphate and hydralazine as per protocol. Her MABP persisted at 140mmHg and an hour later she reported complete bilateral visual loss. A category 1 caesarean section was declared and a general anaesthetic administered due to pending blood test results. Intraoperatively her blood pressure was labile. A healthy baby was delivered and transferred to the neonatal intensive care unit due to gestational age. Following extubation, she remained persistently hypertensive, nifedipine was added to reduce her MABP to a target of 100-110mmHg. An urgent CT head was performed due to persistent visual symptoms which reported focal occipital oedema consistent with posterior reversible encephalopathy syndrome (PRES). She was admitted to the critical care unit for further management of her PET with inputs from ophthalmology, neurology and obstetric teams. Despite regular nifedipine, hydralazine and labetalol therapy, metoprolol was necessary to control her MABP. As the patient did not intend to breast feed, ramipril was started to wean off the intravenous antihypertensives. Over the course of four days her blood pressure was optimised and her visual loss gradually and completely resolved. She and baby were discharged home with obstetric and ophthalmology follow up.

Discussion: PRES is a rare complication of PET. The diagnosis requires presence of both clinical and radiological findings; the latter requires prompt neuroimaging. Whilst the underlying pathophysiology in PRES remains unclear; dysfunction of cerebral autoregulation, hyperperfusion and endothelial dysfunction have all been implicated.2 The differential diagnoses for PRES are numerous and haemorrhagic and thrombotic cerebral events must be specifically excluded. In this presentation, immediate operative delivery followed by aggressive anti-hypertensive therapy with the addition of agents that are atypical in obstetric practice was required. Regular ANC attendance may have enabled earlier recognition and treatment of her PET and prevented this critical presentation.

References
Clinical features include headache, although the patient was not completely pain asymptomatic to date. Following admission to labour ward for delivery: always before skin incision! IJOA 2011;20;Issue 1:1

**P93 Posterior reversible encephalopathy syndrome (PRES) and suspected post dural puncture headache: a case report**

A Kumar, JA Pickett
Department of Anaesthesia, Addenbrooke’s Hospital, Cambridge, UK

**Introduction:** Posterior reversible encephalopathy syndrome (PRES) is a neuroradiological diagnosis which has been described in women with preeclampsia.1 We present the case of a parturient who developed suspected post dural puncture headache (PDPH) with subsequent management complicated by a diagnosis of PRES.

**Case report:** A previously healthy 36 year old woman presented to delivery unit in labour at 36 weeks gestation. An epidural was sited and provided adequate analgesia. However, an epidural top up 10 hours later for caesarean section with 15 mL 0.5% L-bupivacaine resulted in a low sensory block and the catheter was removed. Two attempts at combined spinal epidural anaesthesia resulted in identification of the epidural space but no aspiration of cerebrospinal fluid (CSF). Anaesthesia was provided utilising the epidural catheter and uneventful surgery followed. Forty six hours post delivery the patient complained of postural headache with tinnitus. PDPh was diagnosed and managed conservatively with oral analgesia. The patient was cardiovascularly and neurologically stable. An epidural blood patch (EBP) scheduled for the next morning (day 3 post delivery) was postponed as the patient had received subcutaneous anticoagulation. That night the patient had a 3 minute generalised tonic-clonic seizure. She had a blood pressure of 150/80 mmHg and proteinuria - magnesium sulphate was started. CT head revealed subtle changes in the right occipital area with areas of low attenuation indicating PRES, signs of low CSF pressure, distension of dural venous sinuses and a thin subdural fluid collection. The patient continued to have a postural headache on day 4 but her blood pressure improved and the magnesium infusion was stopped later the same day. Soon she had another generalised seizure followed by hypertension. Magnesium, phenytoin and dexamethasone were commenced. She was transferred to the Neurocritical Care Unit where her Glasgow coma scale score fluctuated between 8 to 13 for the next 24 hours. She was fully conscious by day 6 and transferred to a neurology ward and subsequently home after a further 5 days.

**Discussion:** PRES typically presents with headache, seizures, altered sensorium and visual disturbances. It may be associated with acute hypertension, renal insufficiency and immunosuppressive disease. The most accepted pathophysiology of PRES is acute vasogenic oedema secondary to increased blood pressure and interstitial extravasation of fluids. In our patient, a suspected PDPh was complicated by the subsequent diagnosis of PRES. An EBP could potentially have increased her intracranial pressure and been detrimental. Fortunately, recent anticoagulation prevented an EBP being performed. PRES is being increasingly recognised in the postpartum period and we strongly recommend its consideration in the differential diagnosis before EBP is attempted for PDPh.

**Reference**


**P94 A rare cause of postpartum headache: Glioblastoma multiforme**

S Gibb, S Thomas
Anaesthesia, Royal Victoria Infirmary, Newcastle, UK

**Introduction:** We describe the management of a parturient with an undiagnosed large glioma who underwent spinal anaesthesia for caesarean section (CS) and suffered from a postpartum headache.

**Case report:** A 40 yr old para 2 at 35 wks gestation with placenta praevia presented for emergency CS. Spinal anaesthesia was performed to facilitate CS and delivery of a healthy baby boy. 11 days later the patient was referred to anaesthesia with a potential post dural puncture headache. The patient described a 3 day history of an occipitoposterior headache with a very slight postural component not associated with any neurological features. An Epidural Blood Patch (EBP) was not performed. Simple analgesia and hydration were recommended and the patient discharged home. 3 days later, the patient was re-referred to anaesthesia with continued headache now associated with drowsiness and confusion. Urgent CT showed a right frontal cystic tumour with enhanced oedema and midline shift as in Fig. 1.

![CT image illustrating a right frontal cystic tumour](image)

**Fig 1. CT image illustrating a right frontal cystic tumour**

The next day a right frontal craniotomy and debulking was conducted. Histology revealed a high grade gliial tumour consistent with a grade 4 glioblastoma.

**Discussion:** Firstly, it is surprising yet reassuring that spinal anaesthesia did not have significant complications. There have been case reports of brain herniation following spinal anaesthesia in patients with unknown intracerebral tumours1. General anaesthesia would have been the preferred mode of anaesthesia had we known. Secondly, this is a stark reminder that intracranial tumours, although rare, do present during pregnancy and must be considered as a differential diagnosis for postpartum headache.2 In one study of 126,000 deliveries, 7 had brain tumours3. Finally, had an EBP been carried out, there may have been less devastating sequelae, particularly had there been an inadvertent dural puncture. Should imaging be routinely carried out prior to EBP?

**References**

P95 Achondroplasia: Anaesthetic challenges for caesarean section
GA Scott, L Dubiel, K Litchfield, R Agaram, EM McGrady
Anaesthetics, Glasgow Royal Infirmary, Glasgow, UK

Introduction: Achondroplasia is the commonest cause of dwarfism and presents a number of challenges for the obstetrician and obstetric anaesthetist. We present a case of a patient with achondroplasia presenting for caesarean section.

Case report: A 20-year-old primigravida achondroplastic lady measuring 99cm in height booked for elective section at 32 weeks gestation. She weighed 36kg and her BMI was 36. She had severe thoracolumbar kyphoscoliosis despite extensive spinal surgery. She was referred to the high risk anaesthesia clinic. Her care involved the multidisciplinary team. Pulmonary function tests showed a moderate restrictive pattern. She had significant supine hypotension syndrome. Her mobility was restricted by dyspnoea. Airway assessment was unremarkable. She was previously a grade 1 laryngoscopy. An anaesthetic management plan including drug doses, fluid management and ventilation strategies was created. In view of extensive spinal surgery and unpredictable spread of local anaesthetic, regional anaesthesia was avoided. Equipment for difficult intubation was available. An experienced obstetric, anaesthetic and neonatal team were present. Intraoperative access was obtained and monitoring, including IABP, applied. The patient was positioned in the sitting position and pre-oxygenated for 5 mins. A target-controlled remifentanil infusion was commenced. Anaesthesia was induced using a modified RSI with thiopental 275mg and rocuronium 40mg. Intubation was achieved with a 6.5mm endotracheal tube. Post induction the SpO₂ fell to 65% due to a period of brief apnoea, her respiratory compromise and reduced FRC. This quickly resolved with ventilation. Mean airway pressures were 22cmH₂O, tidal volumes 200ml. Anaesthesia was maintained using a continuous remifentanil infusion and sevoflurane. Surgical incision occurred 10mins after induction and 4mins later a live male was delivered. Blood loss was 350ml. The patient was extubated in the sitting position and transferred to the high dependency unit. The patient became increasingly tachypnoeic and tachycardic requiring admission to the intensive care unit. Following observation she was transferred back to the high dependency unit the following day. She was discharged home on the eighth postoperative day.

Discussion: Dwarfism is a failure to reach a height of 148cm by adulthood.¹ This patient was 99cm tall, the smallest height documented to date. In addition to short stature and shortened limbs, achondroplastic patients commonly have significant CNS, craniofacial, spinal/skeletal, respiratory or cardiac anomalies.² Achondroplastic patients always need input from the anaesthetic and multidisciplinary teams. They are likely to need caesarean section due to cephalopelvic disproportion. Given the possible difficulties with airway management and regional anaesthetic techniques it is imperative that these patients are referred to the high-risk anaesthetic clinic early in pregnancy to allow detailed review and planning.

References

P96 Anaesthetic management of a parturient with type III Spinal Muscular Atrophy for elective caesarean section
SI Mohammed, J Mörch-Siddall, D Hughes
Department of Anaesthetics and Intensive care, Royal Victoria Infirmary, Newcastle upon Tyne, UK

Case report: We wish to report the case of a 35-year-old female, BMI 25, who presented for an elective lower segment caesarean section (LSCS) at term. Our patient had a previous elective caesarean section under general anaesthesia in which etomidate, vecuronium, morphine were used. At that time she had delayed recovery from the neuromuscular blockade and had to be ventilated in the intensive care unit for 6 hours postoperatively. On this occasion, physical examination revealed decreased pincer grasp and fixed flexion deformities of her hips and knees. Airway examination was unremarkable. She was reluctant to consider regional anaesthesia and her extensive back surgery involving spinal fusion and rods precluded regional anaesthesia in our view. Due to difficult venous access a 22g cannula was sited. During preoxygenation, remifentanil was started at approximately 0.2mcg/kg/min. 100 mg of propofol and 1mcg/kg bolus of remifentanil were given and cricoid pressure was applied. She was intubated with a size 7.0 tracheal tube (Grade 2 Cormack and Lehane). Anaesthesia was maintained with sevoflurane, O₂/Air and remifentanil at 0.2mcg/kg/min. Intravenous access was then achieved with a size 16g cannula in the antecubital fossa using ultrasound guidance. After approximately 19 minutes following induction, 4 minutes following surgical incision a live female infant was delivered with APGAR scores of 4 at 1 minute and 9 at 5 minutes. The infant required intermittent bag and mask ventilation by the paediatrician whilst in the operating theatre and remained with her mother on the delivery suite thereafter. Apart from the remifentanil infusions, no other opiates were given. For postoperative pain relief, bilateral Transversus Abdominis Plane (TAP) blocks were performed using ultrasound guidance. After approximately 49 minutes following induction, our patient was successfully extubated. Postoperative pain relief was established with a morphine patient controlled analgesia (PCA) device and required an orally activated bolus button. In addition she received regular paracetamol and diclofenac. She was monitored in the obstetric High Dependency Unit for 24 hours postoperatively. After 2 days our patient was successfully discharged home.

Discussion: McLaughlin at al. reported delayed return of skeletal muscle power in a patient with Spinal Muscular Atrophy following the use of a neuromuscular blocker (rocuronium).¹ This was observed with our patient’s previous general anaesthetic involving the use of vecuronium. We avoided the use of a neuromuscular blocker as well as intraoperative morphine allowing us to successfully extubate our patient and avoiding the need for postoperative ventilation. From our experience, we found the technique of sevoflurane-remifentanil to be an effective technique for elective LSCS. It was easy to perform, provided excellent surgical conditions as well as good intubating conditions. There were minimal effects on the neonate as well as minimal residual effects on the mother. The use of ultrasound in helping to establish venous access as well as in performing the TAP blocks was very useful.

Reference
1. McLaughlin L, Bhagvat P. Anaesthesia for caesarean section in spinal muscular atrophy type III. International Journal of Obstetric
P97 Anaesthetic management of EXIT procedure for CHAOS syndrome
R Khirwadkar, P Barclay, T Wauchob, L Bricker
Anaesthetic Dept, Liverpool Womens Hospital, Liverpool, UK

Introduction: Congenital High Airway Obstruction Syndrome (CHAOS) is a rare condition with only 50 reported cases. We describe anaesthetic management for a case that required an Ex Utero Intrapartum Treatment (EXIT) during caesarean section.

Case History: Routine 20 week antental ultrasound scan in a healthy 37 year old primiparous woman identified fetal abdominal ascites and distended lungs suggestive of an obstructed trachea, which was subsequently diagnosed as CHAOS.

She presented in labour at 27 weeks in her local hospital and was transferred to our hospital. Upon arrival, she was found to have a breech presentation with a cord prolapse and required urgent caesarean. Rapid management and planning was vital, involving neonatologists, paediatric surgeons, obstetric surgeons and obstetric anaesthetists. General anaesthesia was induced using fentanyl and thiopental and maintained with desflurane and nitrous oxide at 2 MAC to aid uterine relaxation. A phenylephrine infusion was used to ensure adequate uteroplacental circulation until a tracheostomy was performed on the neonate. After cord clamping oxytocin by bolus and infusion was started along with simultaneous reduction of desflurane to aid rapid uterine contraction to minimise blood loss. Maternal analgesia was maintained with intravenous morphine and bilateral TAP blocks given at the end of the procedure.

Discussion: There are no case reports in the literature describing the anaesthetic management for a patient having an EXIT procedure for CHAOS syndrome. General anaesthesia may have advantages over regional techniques as neonatal analgesia can be maintained throughout the surgical airway insertion via the maternal circulation and desflurane aided uterine relaxation.

References

P98 Anaesthetic management of a parturient with Dandy Walker Syndrome for caesarean section (CS)
MS Brayshaw, G Philipott
Anaesthetic, Mid Essex NHS Trust, Chelmsford, UK

Introduction: Dandy Walker syndrome is a congenital malformation of the cerebellum and involves the ventricles. There is enlargement of the fourth ventricle, a partial or complete absence of the cerebellar vermis and a cyst formation at the base of the skull. There may be associated hydrocephalus and raised intracranial pressure. Diagnosis is usually antenatal. Intellect may be effected or may be normal. A shunt is often needed to treat the hydrocephalus. We present a case report of a women with this syndrome who has had two elective caesarean sections.

Case Report: The 25 year old para one patient presented to the anaesthetic antenatal clinic. She was diagnosed with Dandy Walker syndrome antenatally and a Venticuloperitoneal (VP) shunt inserted when she was 13 days old and the procedure repeated at age 7 and 12 years. She was of normal intellect. Her symptoms due to the Dandy Walker syndrome were an unsteadiness of gait and ocular palsies affecting her left eye. She also had a history of severe tension headaches. A CT scan in 2010 had ruled out raised intracranial pressure as a cause of these headaches. She was a slim lady with an easy airway and her previous CS had been under general anaesthetic and was uneventful. She was interested in exploring the possibility of a regional anaesthetic for this caesarean delivery. We contacted her neurology and neurosurgical consultants to discuss this option. The neurologist she was seeing was happy that her headaches were not caused by raised intracranial pressure, and her neurosurgeon was in agreement with a regional technique for her CS. However on the day of surgery the patient opted for another general anaesthetic. This proceeded uneventfully.

Discussion: Anaesthesia for patients with VP shunts has included both general and regional techniques. An essential aspect of these cases is discussion between the neurosurgeons, anaesthetists and obstetricians as to the most appropriate mode of delivery and anaesthesia. One study describes a series of 77 pregnancies in 37 women with VP shunts, of those having CS 50% were under epidural, 9% spinal and 41% GA. No patient experienced a complication directly related to the anaesthesia. The worry with regional anaesthesia is the theoretical risk of introduction of infection into the shunt via the regional technique. Prophylactic antibiotics are recommended by some. The potential risk is that of tonsillar herniation with dural puncture. If a spinal is used with a narrow gauge needle the CSF loss will be low and should be compensated for by less flow through the shunt. If the dura is accidentally punctured with a large gauge epidural needle there is a potential sudden drop in CSF pressure. The risk for a general anaesthetic depends on the airway of the individual patient plus the risk of anaesthesia in pregnancy.

References
P99 Congenital absence of the inferior vena cava and the implications for the obstetric anaesthetist

GC Phillips, DA Burkert-St-Laurent, V Victor
Anaesthetics, Royal Gwent Hospital, Newport, UK

Introduction: Congenital absence of the inferior vena cava (IVC) is an uncommon anatomical variation with implications for the obstetric anaesthetist and their practise. We present a case of major obstetric haemorrhage in a 22 year old with a complex maternal and ante-natal history.

Case report: Ms T was a 22 year old woman of 27 weeks gestation who presented with pyrexia and feeling generally unwell. Her past medical history included Factor V Leiden, pulmonary emboli and congenital absence of the IVC. She was grvida 5, para 1+3 with a complex obstetric history. Her previous delivery via caesarean section for failure to progress was converted to a general anaesthetic due to major haemorrhage ensuing in cardiac arrest and transfer to intensive care.

Ms T presented out of hours in septic shock. A diagnosis of chorioamnionitis was made and a plan formulated to deliver via caesarean section. Due to her anti-coagulated state a general anaesthetic was used with an induction of ketamine and sufentanil to maintain cardiac stability. Following delivery of the baby, major haemorrhage ensued with early decision to proceed to hysterectomy. She received blood products and fluids and was transferred to intensive care post-operatively.

Discussion: Congenital absence of the IVC is uncommon with an overall frequency ranging from 0.3-0.6%. Whilst frequently present in conjunction with cardiac malformations, it can occur in isolation. Absent IVC is undiagnosed, often presenting via it’s complications including deep vein thrombosis, or spinal cord compression. The absent IVC leads to the formation of collateral vessels in order to facilitate venous return. The engorgement of vertebral and epidural veins has implications for the anaesthetist. Whilst neuroaxial blocks are not contraindicated, a higher degree of caution is necessary due to the increased propensity for intra-vascular injection and dural tap. It has been suggested that using either highly lipid soluble or adrenaline-containing anaesthetic mixtures may help to prevent a potential increased risk of local anaesthetic toxicity. Smaller doses are employed due to reduction in the epidural space. General anaesthetists in the presence of an absent IVC is also not without complications and the possible implications of IPPV and left tilt needs to be considered and measures taken to improve venous return.

We present this case to illustrate the anaesthetic implications of a rare but potentially complex condition, which could further compound an already serious clinical scenario.

References

P100 Emergency caesarean section on a patient with spastic cerebral palsy

B Skalska-Lisz, A Mathews
Anaesthetics, North Tees and Hartlepool, Stockton on Tees, UK

Introduction: Cerebral palsy is a non-progressive motor condition resulting from injury to the developing brain and affects 1 in 500 babies born in the UK. Advances in medicine have improved survival rates of those born with cerebral palsy and this has resulted in more women with cerebral palsy becoming mothers.

Case Report: A 22 year old primigravida, at 33 weeks gestation, presented in established labour with features suggestive of dehydration secondary to hyper emesis. The patient, a known case of spastic quadriplegia secondary to cerebral palsy, suffered from severe lower limb weakness, spasticity and contractures. She used wheel chair to mobilise at home and was doubly incontinent. Inability to abduct legs made vaginal delivery difficult; decision was made to deliver the baby by emergency caesarean section. Examination of the back revealed significant scoliosis of the thoraco-lumbar spine. Benefits and risks associated with both regional and general anaesthesia were explained to the patient and consent obtained. A 16G intravenous cannula was inserted; fluid resuscitation was initiated with Hartmann’s solution. Standard monitoring was established and the patient was positioned in left lateral position. Lower limb spasticity along with scoliosis rendered patient positioning sub-optimal. However spinal anaesthesia was successfully established with 2.5 ml of 0.5% hyperbaric bupivacaine through a 24G Sprotte needle introduced at L5/L4 inter spinous space. Intrathecal diamorphine was avoided as the patient was allergic to morphine. A healthy baby was delivered. Post operative analgesia was maintained with regular paracetamol, diclofenac and fentanyl patient controlled analgesia regimen.

Discussion: Cerebral palsy poses many challenges to the obstetric anaesthetist. Peri-operative challenges include dehydration, gastro-oesophageal reflux with risk of inhalation of gastric contents, epilepsy, impaired lung function, difficult vascular access and difficult positioning. Response to muscle relaxants is altered with patients more sensitive to suxamethonium, but significant hyperkalaemia is not proven. Non-depolarising muscle relaxants are less potent and have shorter duration of action due to up-regulation of acetyl choline receptors. Regional anaesthesia may be difficult to perform and spread of the block may be unpredictable. Loss of voluntary control makes regional block unsafe in atabothid and diskinetic type of cerebral palsy. Inadequate analgesia may lead to increased postoperative muscle tone and spasm with worsening of pain. Regional anaesthetic techniques are considered beneficial to reduce postoperative pain, muscle spasms and respiratory complications.

References
P101 Epidural dilemma: myotonic dystrophy in early pregnancy
S Sawant, S Petkov, JA Pickett
Department of Anaesthesia, Addenbrooke’s Hospital, Cambridge, UK

Introduction: Myotonic dystrophy (MD) is an autosomal dominant inherited neuromuscular disorder characterised by progressive muscular dystrophy, muscle weakness and myotonia. Parturients with MD have a high incidence of obstetric complications such as miscarriage, preterm labour, uterine atony and postpartum haemorrhage and may require anaesthetic assistance.

Case report: A twenty three year old parturient with genetically proven MD presented with per vaginal bleeding and missed miscarriage at 18 weeks gestation. Her father also had MD and died from cardiomyopathy aged 49. Her paternal uncle and older brother were affected too. She was asymptomatic to date. Following admission to labour ward for misoprostol and further medical management she was assessed by the duty anaesthetic consultant. A comprehensive anaesthetic plan was formulated taking into account particularly the increased risk of obstetric complications and possible need for surgical intervention in these patients. An ECG and all blood results, including coagulation, were normal. Intravenous access was secured and monitoring including heart rate, noninvasive blood pressure, pulse oximetry and temperature was instituted. An epidural was sited and patient controlled epidural analgesia was commenced. She was closely observed and continued to have per vaginal bleeding until total estimated blood loss of 1100 mL. This was associated with a fall in haemoglobin to 8.5 g dL\(^{-1}\) (13.3 g dL\(^{-1}\) on admission) and coagulopathy with a prolonged prothrombin time. She was transferred to theatre for surgical removal of retained products of conception after confirmation by ultrasound scan. Her epidural was topped up with warmed bupivacaine to achieve adequate motor and sensory block. She received warmed intravenous fluids and further active warming to prevent hypothermia. She remained haemodynamically stable. Post operatively she was monitored on the labour ward for 24 hours before discharge home.

Discussion: Issues regarding the anaesthetic management of patients with MD are widely discussed in the literature.\(^2\) This case was especially interesting because it involved early pregnancy. Normally in our unit a patient scheduled to have medical management of pregnancy at 18 weeks gestation would not have received early epidural analgesia. Our obstetric colleagues expressed surprise and felt that epidural analgesia was possibly unnecessary. However we felt that as MD patients can be exquisitely sensitive to opioids, general anaesthesia and muscle relaxants that every effort should be made to avoid these. Indeed twenty four hours after the insertion of the epidural, when our patient needed surgical removal of retained products, she was coagulopathic and the new insertion of an epidural catheter or spinal anaesthesia would have been contraindicated. Hence we believe that the prompt sitting of an epidural catheter was the key to the successful anaesthetic management of this parturient with MD in early pregnancy.

Reference

P102 Influence of maternal deprivation on management of labour and delivery in the west of Scotland
R Junkin, M Shaw
Department of Anaesthesia, Crosshouse Hospital, Kilmarnock, UK

Introduction: Socioeconomic deprivation has an adverse impact on maternal access to antenatal care and maternal mortality\(^1\). The triennial report into maternal death showed a declining trend in the inequalities gap between affluent and more deprived women. We aimed to ascertain degree of deprivation in our obstetric population and identify any differences in anaesthetic and obstetric practice during labour and delivery of mothers across different socioeconomic groups.

Methods: We retrospectively examined a database of 6-months worth of deliveries in our obstetric unit. We ranked the mothers by degree of socioeconomic deprivation according to postcode of residence. The Scottish Government Index of Multiple Deprivation (SIMD)\(^2\) was used to identify the deprivation ranking allowing us to order the patients from most deprived to most affluent. We then grouped the patient by degree of deprivation into deciles and compared these groups against maternal age, body mass index (BMI), epidural rates, caesarean section rates and urgency of caesarean section. Ethical approval was not required by local ethics committee.

Results: We identified 1763 consecutive mothers who delivered over the 6-month period. Our obstetric population represented the full spectrum of socioeconomic status, although the majority came from more deprived areas with 67% of patients residing in the lower ranked half. The most deprived patients, representing the lowest 10% of deprivation scores, had the youngest average age at delivery of 25.8 yrs (SD 6.19), lowest labour epidural rate (26%), lowest overall caesarean section rate (22.7%) and lowest elective caesarean section rate (8.6%). BMI tended to decrease marginally with increasing affluence, with most deprived patients having an average BMI of 26.2 (SD 6.2) and most affluent 25.7 (SD 5.25). Despite the BMI falling, as affluence increased patients were more likely to have a labour epidural. In addition the caesarean section rate tended to increase with affluence and of these a higher proportion were elective. In contrast to the lowest decile for deprivation, the patients from the top 10% most affluent postcodes had an average age of 31.5 years (SD 5.3), the highest epidural rates of 43.1%, an overall caesarean section rate of 31.9% and an elective caesarean section rate of 18.1%.

Conclusion: The more affluent populations tended to have higher requirements for labour epidural analgesia and more intervention for delivery despite a marginally lower BMI. Our results may represent inequalities of access to antenatal healthcare and information for birth planning. It could also represent an altered perception or expectation of labour across different socioeconomic groups.

References
P103 Stridor in pregnancy; thyroid goitre complicated by pre-eclampsia

J Francis, F Subash, S Ridgway
Anaesthetics, Royal Gwent Hospital, Newport, UK

Introduction: Pregnancy is thyrogogenic and thyroid physiology changes significantly during gestation. 1 Thyroid disorders commonly present in pregnancy and thyroid goitres can cause respiratory complications; co-existing pre-eclampsia may cause notable exacerbation and airway compromise. Uncorrected thyroid dysfunction can have significant adverse effects on mother and fetus. 2,3

Case Report: A 38-year-old multi-parous woman presented acutely with increasing breathlessness; she was 30 weeks pregnant at initial presentation. She reported progressive symptoms over recent weeks and described stridulous breathing with moderate exertion; antibiotic and inhaler treatments had had no effect. She was otherwise well with no medical history, regular medications or allergies and she was a non-smoker. A CTPA showed no obvious pulmonary embolus but identified a thyroid goitre. A CT neck confirmed a large multi-nodular goitre involving predominantly the left lobe of the thyroid causing tracheal deviation to the right; there was tracheal stenosis, the narrowest portion measuring 9mm. Thyroid function showed subclinical hyperthyroidism. Following MDT discussion she was planned for elective caesarean section at 38 weeks gestation; subsequent admissions and the onset of moderate pre-eclampsia causing further exacerbation of her respiratory symptoms resulted in caesarean section delivery at 35 weeks gestation under spinal anaesthetic. Following delivery her symptoms eased but remained significant. She underwent a left thyroid lobectomy 5 weeks later (uneventful intubation); symptoms subsequently resolved without complication.

Discussion: Pregnancy may exacerbate symptoms of thyroid disease and is known to be goitrogenic; a normal thyroid gland may increase in size by up to 30%. 4 In the absence of proven carcinoma or worsening respiratory complications thyroid surgery should be delayed until after the puerperium; airway management and ease of intubation is often unrelated to the extent of goitre abnormality. 5 The development of pre-eclampsia in this patient exacerbated her respiratory symptoms prompting earlier caesarean section delivery. In a patient with a thyroid goitre, airway swelling caused by pre-eclampsia may cause significant airway compromise and requires prompt and definitive management; fetal delivery undoubtedly eased the respiratory symptoms of this patient. During pregnancy thyroid physiology can be complicated to interpret and gestational-related reference ranges should be used to aid diagnosis. 3

References


P104 Developing a regional benchmarking audit to assess compliance with national recommendations for providing equity of critical and maternity care for critically ill mothers

SE Marsh, AM Quinn
Anaesthesia, Leeds General Infirmary, Leeds, UK

Introduction: A significant reduction in maternal mortality was shown in the latest Saving Mother's Lives report but areas where care could improve were highlighted. 1 The Maternal Critical Care Working Group has subsequently published recommendations to standardise and improve care received by critically ill pregnant or recently pregnant women. 2 Aided by the West Yorkshire Critical Care Network (WYCCN), a regional multidisciplinary group has been established and a multi-centre benchmarking audit completed across the area to ascertain compliance of 4 institutions against the recommendations.

Methods: The audit standards from "Providing equity of critical and maternity care for the critically ill pregnant or recently pregnant woman" were reviewed by a regional multidisciplinary team (anaesthetists, intensivists, obstetricians, midwives and outreach nurses) over several meetings. Ten standards were selected to collect data against in a snapshot audit completed over 1 day in November 2011. Multiple areas were audited (ante-natal, post-natal, delivery suite and critical care) in 4 regional hospitals. Data collection was performed by all multidisciplines and reported back to the WYCCN for collation and further discussion at the regional meeting.

Results: Compliance was high for completion of physiological observations but calculation of modified early warning scores (MEWS) was poor. Composition of MEWS differed between and within institutions from colour coded to numerical scores, and differed from their general hospital scoring system. A graded response was not always present. Critical care medical discharges were written, otherwise handovers between areas were informal and generally used the SBAR tool (Situation, Background, Assessment, Recommendation). Excluding anaesthetists there was universal lack of critical care competency training, assessment and documentation for staff caring for critically ill mothers with few clinical educators in this area. Documented evidence of multidisciplinary working was poor. Care bundles for sepsis and venous thromboembolism were not universally used. No site had a patient satisfaction questionnaire.

Conclusion: This process of discussion and audit has created passionate debate between specialties. The vulnerability of critically ill patients and the staff caring for them without adequate teaching, training and assessment has been highlighted. The institutions did not attain the majority of MCCWG recommendations, but this will enable us to shape the service regionally for critically ill mothers in the future. A revised widespread audit is planned, with ongoing sharing of information across the region including the development of standardised competencies and educational programmes.

References

2. Providing equity of critical and maternity care for the critically ill pregnant or recently pregnant woman. Maternal Critical Care Working Group. The Royal College of Anaesthetists. 2011
P105  Development of a maternal critical care module
[Midwifery Masters degree, Salford University]
JC Roberts, R Stoeter, B Lomas, R McCarthy,* F Dodd,†
Anaesthetics, North West Deaneary, Manchester, UK.
*Midwifery, University of Salford, Salford, UK, †Anaesthetics, UHSM, Manchester, UK

Background: Around 5% of women require ‘critical care’ [as defined in the Comprehensive Critical Care document] on delivery suites in the UK. The Clinical Negligence Scheme for Trusts (CNST) has stringent assessment criteria for the provision of clinical care with appropriately trained staff in or near the delivery suite. Courses exist to enable midwifery staff to identify the sick patient, but there is limited provision for training in the ongoing patient care in this environment. Midwives are understandably apprehensive about delivering higher level care without adequate additional knowledge and training. We describe the process in developing a module in maternal critical care at a Masters level with Salford University.

The Course: The course accommodates 20-30 midwives with a mixture of ages and backgrounds. The core curriculum and skill set was identified from the collaborative document produced by the maternal critical care working group and the timetable defined by a group comprised of two experienced obstetric anaesthetists along with educators in intensive care and midwifery. A recently developed maternal acute illness management day will focus on recognition of the critically unwell parturient, and the remainder of the module will consist of 14 days over a 4 month period comprising lectures, small group work and practical workshops. Additional time will be spent by each participant as a supernumerary member of staff in their respective general critical care units. Course content will be delivered by a multi-disciplinary team of anaesthetists, critical care nurses, midwives, obstetricians and a pharmacist.

Assessment: Competencies will be gained within the workplace in numerous practical skills including arterial line sampling and pressure transducer set-up. The module will culminate in a dissertation relevant to critical care followed by a viva voce.

Conclusion: We believe the delivery of this course will improve the provision and recognition of critical care within maternity units and anticipate an increase in participants in future years. We also envisage the development of similar courses within other establishments.

References

P106  Maternal critical care in a tertiary referral unit
RJ Kearns, J Wilkinson, T Quasim,* K Litchfield
Anaesthesia, Princess Royal Maternity Unit, Glasgow Royal Infir, Glasgow, UK, *Anaesthesia and Intensive Care Medicine, Glasgow Royal Infirmary, Glasgow, UK

Introduction: Maternal critical care has been the subject of a recent multi-disciplinary review [1]. While a minority of women become critically ill during pregnancy, CEMACE highlights that morbidity and mortality may occur due to suboptimal management [2]. Standardisation and audit is necessary if critical care is to be optimised in this patient group [1]. Using the ICNARC dataset as a guide [3], we aimed to define the critically ill maternal population in a tertiary referral centre.

Methods: This was a retrospective review of data from January 2005 to October 2011 using Wardwatcher, Careview and Protos databases. Anonymised data were collated using a template as suggested by ICNARC, and descriptive statistics calculated using IBM SPSS Statistics data-editor version 19.

Results: Thirty pregnant or recently pregnant women required admission to ICU during the analysed period. This represents 30/39,950 (0.8%) of all deliveries, 30/2889 (1.0%) of all ICU admissions, and 30/455 (6.6%) of ICU admissions of females of childbearing age (16–50 years). 16/30 patients (53.3%) were admitted out of hours (20:00-08:00) and 10 (33.3%) patients had significant pre-existing co-morbidities. Reasons for admission were: postpartum haemorrhage (12, 40%), sepsis (6, 20%), antepartum haemorrhage (4,13.3%), pneumonia (1, 3.3%), cardiomyopathy (1, 3.3%), asthma (1, 3.3%), seizures (1, 3.3%), staphylococcal (1, 3.3%), achondroplasia (1, 3.3%), anaphylaxis/cardiac arrest (1,3.3%), unknown (1,3.3%).

Further data is tabulated:

<table>
<thead>
<tr>
<th></th>
<th>Median, IQR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (median, IQR)</td>
<td>32 (22.8–36.3)</td>
</tr>
<tr>
<td>APACHE 2 (median, IQR)</td>
<td>11 (9.8–16.5)</td>
</tr>
<tr>
<td>%predicted mortality (median, IQR)</td>
<td>12.9 (9.2–28.4)</td>
</tr>
<tr>
<td>ICU stay (median, range)</td>
<td>0.8 (0.1–8.1)</td>
</tr>
<tr>
<td>Discharged to level 2 care (%)</td>
<td>20 (66.7)</td>
</tr>
<tr>
<td>Discharged to level 1 care (%)</td>
<td>8 (26.7)</td>
</tr>
<tr>
<td>Discharged home (%)</td>
<td>1 (3.3)</td>
</tr>
<tr>
<td>Died (%)</td>
<td>1 (3.3)</td>
</tr>
<tr>
<td>Post ICU stay (median, range)</td>
<td>5 (0–23)</td>
</tr>
</tbody>
</table>

Conclusion: Mortality levels remain low within this patient population. On comparison of our data with that of ICNARC; age, APACHE 2 score and ICU stay were similar. Patients who were pregnant or recently pregnant accounted for similar proportions of all ICU admissions (1.04 vs 1.3%, p=0.23), though the proportion of admissions of females of childbearing age was significantly lower in our unit (6.6 vs 11.4%, p=0.0018). The number of ICU admissions per 1000 deliveries was also lower in our unit (0.84 vs 2.5). This may reflect the high volume and level of care provided in our obstetric HDU.

References
3. Female admissions (aged 16–50 years) to adult, general critical care units in England, Wales and Northern Ireland, reported as “currently pregnant” or “recently pregnant”. ICNARC, 2009.
P107 Saving mothers’ lives ......a review of obstetric intensive care admissions over 10 years


Introduction: According to the latest Confidential Enquiry into Maternal Deaths in the UK (CMACE), 1 sepsis, pre-eclampsia and thromboembolism are the leading direct causes of maternal mortality. For every maternal death, there are nine women who develop severe morbidity. We aimed to audit all obstetric intensive care (ITU) admissions in our unit, between January 2002 and December 2011.

Methods: Following R&D approval, we conducted a descriptive, retrospective notes review of all obstetric ITU admissions between January 2002 and December 2011. Cases were identified from ITU admission and discharge records. Information was obtained from individual case note review, ICNARC and the obstetric anaesthetic databases. We have looked at patient demographics, causes, treatments and outcomes.

Results: Over the past decade there has been a 14% increase in yearly deliveries in our unit, with a mean number of deliveries per annum of 4023. There have been 96 maternal ITU admissions over the last 10 years. The incidence of ITU admission is 2.39 per 1000 deliveries. There were 2 maternal deaths during this period. The mean maternal age was 31 years (range 19-46). The graph shows the most common causes of ITU admission across the decade.

Graph 1 Causes of obstetric ITU admissions 2002-2011.

Key: Haemorrhage = black, Sepsis= diagonal stripe, Pre-eclampsia (PET) = white, Thromboembolism = grey, Cardiac = horizontal stripe, Other= spots

Peri and post haemorrhage remains a leading direct cause of admission, with the incidence of PET ITU admissions decreasing. There has been an increase in cases of sepsis, including patients with $H_2N_2$ and biliary sepsis.

Discussion: Our obstetric population has changed over the past decade and we are caring for much older mothers with pre-existing disorders and advanced chronic medical conditions. Despite a 14% increase in deliveries, there remains a low incidence of admissions to ITU. This in part may be due to the development of our obstetric high dependency unit (HDU), multidisciplinary team training and the use of maternity early warning systems. Haemorrhage, sepsis and preeclampsia were still the major causes of morbidity, and many cases were managed successfully in our maternity HDU.

Reference

P108 Taking midwives for granted: A survey of critical care skills

JS Campbell, R James
Department of Anaesthesia, Royal Jubilee Maternity Hospital, Belfast, UK

Introduction: With increasing rates of obese mothers, caesarean section and mothers with comorbidities, there is greater demand for critical care skills in midwives. Anaesthetists are told we can safely use invasive monitoring on delivery suite, in “High Dependency” rooms. However, not all midwives have training in these skills, causing confusion over team members’ responsibilities in these patients’ care. We wanted to explore, highlight and address the problem.

Methods: A survey was given to midwives in the unit, asking them to rate tasks from 0-10 according to how comfortably they were to perform the task alone or supervised. (A general and literature search in this area found only surveys of obstetric anaesthetists, rather than midwives themselves.) 12 tasks were listed, to cover airway, breathing and circulation problems as well as others, e.g. set up insulin infusion. Midwives indicated if they had training in each task, and lastly if they had recently cared for a patient with an arterial/central line. The same survey was carried out in theatre recovery for comparison.

Results: 50 questionnaires were completed. Theatre recovery staff average scores were 8.8-10, however midwives average scores ranged 2.9-9.3 according to the task. Lowest average scores (2.9-5.0) were morphine administration, set-up, and use of arterial line, and management of patient with a central line. These 4 tasks also had the lowest number of midwives trained, despite over 70% of midwives having recently cared for an arterial or central line in the past 6 months.

Intervention and Survey: We offered practical training with arterial and central lines in small groups, allowing demonstration and hands-on practice in the 2 high dependency rooms, and time for discussion of principles and common problems. The survey was repeated some time after training, showing scores greatly improved, with averages ranging from 7.2-8.0.

Discussion: Teaching was targetted to problem areas raised by midwives themselves in this survey. There is potential for this training to become regular and include other topics, eg. cricoid pressure, aiming for improvement in patient safety in the unit, and understanding between team members.

Conclusion: We demonstrated a deficiency of critical care skills of midwives in our unit, which anaesthetists had taken for granted when providing post-anaesthetic or high dependency care. Small group practical training improved satisfaction in performing tasks, with potential for use within a regular training programme.

References
P109 High-risk obstetric anaesthesia clinic attendance in a District General Hospital

NNV Taylor, PB Richardson, V Victor
Anaesthetic Department, Royal Gwent Hospital, Newport, UK

Introduction: Previous CMACE reports have highlighted the importance of antenatal anaesthetic assessment for high risk parturients, such as those with body mass index (BMI) > 40.1 However, the obligation for consultant review of all parturients with BMI 40-45 without additional co-morbidities has recently been questioned.2 We therefore decided to investigate our institution's ability to provide this service by conducting a two phase audit.

Method: The first phase of our audit involved a case notes review of all parturients delivering in our Main Delivery Unit (MDU) over an eight week period January - March 2011. We identified all parturients who fulfilled pre-defined criteria for referral to anaesthetic clinic, whether the referral indeed occurred, indication/s for referral, and whether subsequent anaesthetic intervention was required during labour. For the second phase, those attending the clinic during the same period were identified via local database. We again categorised all referrals by indication, and reviewed the appropriateness of each referral against our criteria.

Results: 433 MDU deliveries were recorded in the two month audit period. Of those, 281 (65%) case notes were reviewed. Sixty parturients (21% of notes reviewed) met criteria for antenatal anaesthetic review. However, 36 of these parturients (60% of those with referral indications) were not referred. Of those parturients who should have been referred to clinic and were not, 27 (75%) subsequently required anaesthetic involvement in their labour or delivery. Indication groupings for which referral rates were particularly poor included Obstetric (8/11 not referred), Neurological (6/8), Substance misuse/Psychiatric (7/9), and raised BMI (12/18). Conversely, anaesthetic clinic attendance during the audit period approached service capacity (median 6 parturients/clinic). Of those, 29/36 (80%) had at least one valid indication for referral. However, two (6%) were clearly inappropriate (mild penicillin allergy; contact dermatitis), and a further five (14%) did not match the severity level as described on the referral criteria and were thus also considered inappropriate. Notably, 11 (31%) referrals included raised BMI as a referral indication. However, six (17%) were referred solely for BMI 40-45.

Discussion: Despite the availability of clear local guidelines, 60% of those meeting referral criteria were not referred, and of those who were, one fifth were unnecessary. The most likely reason is failure of non-anaesthetic staff to appreciate the anaesthetic implications of parturients’ comorbidities, for which we have implemented increased education and training as well as greater visibility of our referral proforma. Although running at near-capacity, a significant proportion of consultant clinic time was occupied with patients with isolated raised BMI. Therefore expansion of consultant clinic sessions is indicated. Additionally we recommend the structured introduction of a midwife-led obesity service as previously described2 as a more cost-effective long-term solution for screening this group of patients.

References

P110 Analysis of major obstetric haemorrhage cases over one year period in a university hospital

J Kaur, K Dasgupta, R Pandey, A Joseph
Anaesthesia, University Hospitals of Leicester, Leicester, UK

Introduction: Major Obstetric haemorrhage [MOH] is the leading cause of maternal mortality and morbidity.1 There are reports of increased incidence of postpartum haemorrhage (PPH) from United States, Canada, Ireland and Australia.2 Our institution has seen a 4.5 times increase in major haemorrhage cases over the past 11 years. This increase is a cause of concern, so we decided to analyze our major haemorrhage cases in 2011.

Methods: Retrospective data was collected using our obstetric database and deliveries with blood loss of more than 1500mls were identified. We investigated the causes of haemorrhage, treatment received, mode of delivery, type of anaesthesia and the post-operative care.

Results: There were a total of 6280 deliveries in 2011. MOH was recorded in 2.8% (176) cases. More than 3 litres of blood loss was recorded in 32 cases and 10 mothers bled more than 5 litres. Incidence of MOH with spontaneous vaginal delivery was 1.4%. Instrumental vaginal delivery 4.1%, elective caesarean section 5.4% and in emergency caesarean section 6.6%. Regional anaesthesia was the main mode of anaesthesia (68.8%) whereas 17.6% patients had general anaesthetic.

<table>
<thead>
<tr>
<th>Causes of haemorrhage</th>
<th>Complicating factors</th>
<th>Post procedure care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atonic uterus -82.9%</td>
<td>Preeclampsia/Eclampsia - 2.9%</td>
<td>ITU/HDU - 5.9%</td>
</tr>
<tr>
<td>Traumatic -14.2%</td>
<td>Obesity -2.4%</td>
<td>&gt; 8hrs on delivery suite - 1.4%</td>
</tr>
<tr>
<td>Retained products of conception -2.3%</td>
<td>Sepsis - 1.4%</td>
<td>&lt; 8hrs on delivery suite - 92.7%</td>
</tr>
<tr>
<td>Clotting abnormality - 0.6%</td>
<td>Pyrexia - 12.9%</td>
<td></td>
</tr>
</tbody>
</table>

MOH protocol were followed in all cases. Pharmacological and haematological treatments were given as appropriate. 6 patients underwent a postpartum hysterectomy. Uterine compression sutures and uterine arterial embolization was used in 2 patients.

Discussion: MOH was defined as blood loss of over 1500ml. Both CEMACH and the UK Obstetric Surveillance System emphasize that ergometrine and syntocinon are being withheld inappropriately in obstetric haemorrhage.1,3 The unit, a tertiary referral centre has well established MOH protocol with access to cell salvage, intervention radiology, thromboelastograph and factor VIII. The increased rate of MOH could be because of a rise in complex cases. However it might be appropriate to revisit our protocol and management plan including surgical and pharmacological treatment.

References
3. Specific therapies for PPH.UKROSS Newsletter 26;July 2011
P111 Benefits of an Anaesthetic Information Management System in Massive Obstetric Haemorrhage

D Castillo, P Barclay.*
*Anaesthesia, Liverpool Womens Hospital, Liverpool, UK, Anaesthesia, University Hospital Aintree, Liverpool, UK

Introduction: The Anaesthetic Information Management System (AIMS) has been suggested as an alternative to the traditional, handwritten approach. Anecdotally, uptake in UK Obstetric Anaesthesia has been slow. Our department, in a tertiary centre for Obstetrics and Gynaecology, installed an AIMS (Centricity Anaesthesia, GE) in late 2009. Since that time it has been configured specifically for local requirements, and has been found to be particularly beneficial in Major Obstetric Haemorrhage (MOH). We detail its installation and uptake.

Method: Basic software was locally configured. In particular a dedicated task list for MOH (accessible during any case) was created. It allows: hands free capture of gas and cardiorespiratory data; one touch documentation of intraoperative timings; quick documentation of lines, with boxes to detail site, “ANTT” etc; a template for prescription of uterotonic and common fluids including barcode scanning of blood product numbers; reminders for use of equipment (forced air warmer, temperature probe, cell salvage) and for taking blood tests (FBC, coagulation and thromboelastometry); captures data from syringe drivers (such as Phenylephrine infusions during neuraxial anaesthesia).

Results: The percentage of total cases documented with AIMS has grown steadily (approx. 700-800 cases per month):

Discussion: AAGBI guidelines state that “every anaesthetic machine should be equipped with a computerised anaesthetic record keeping system connected to the patient monitors” and giving a number of arguments for AIMS including: greater data collection and accuracy, reduction in the Anaesthetists’ workload, integration and easy access to other electronic patient records, e.g. PACS, laboratory results. Others have purported improved safety (for example, a prompt to give prophylactic antibiotics) and improved clinical governance, through audit trials. Our experience has been consistent with this - particularly during a rapidly changing clinical situation such as during MOH. It has integrated with departmental guidelines on management of MOH, promoting clinical consistency, providing good quality, legible and reproducible printouts.

References

P112 Blood, sweat, atony and tears........a review of major obstetric haemorrhage intensive care admissions over four years

M Naik, S Wray.*
Anaesthesia, Queen Charlotte’s and Chelsea Hospital, London, UK, *Anaesthesia, Barts and the London Hospital, London, UK

Introduction: Haemorrhage frequently accounts for maternal morbidity in the obstetric population. As a tertiary referral centre with over 4000 deliveries per year, our caseload includes women with placenta praevia, accreta and percreta. We would like to describe our experience of major obstetric haemorrhage requiring intensive care (ITU) admission, over the past 4 years.

Methods: Following R&D approval, we conducted a descriptive, retrospective notes review of all obstetric ITU admissions between January 2008 and December 2011. Cases were identified from ITU admission and discharge records. Information was obtained from individual case note review, ICNARC and the obstetric anaesthetic databases.

Results: There were 25 intensive care admissions following major obstetric haemorrhage between January 2008 and December 2011. We were able to review 23 patient notes. Eleven patients were over 35 years old, with three over 40 years old. Fifteen patients were multipas. Gestation at delivery was 20–40 weeks. Fifteen patients delivered by urgent or emergency caesarean, the others delivered by ventouse, forceps, spontaneous vaginal delivery and one patient had a late termination. Blood loss ranged from 2.5 to 20 litres. Interventional radiology was required in 12 cases and 3 patients developed complications from interventional radiology, including lower limb ischaemia and iliac artery rupture. All complications were treated promptly. Six women had placenta accreta or percreta, only two of whom had had more than one previous caesarean section. Three women had placenta praevia. Five mothers required hysterectomies. The commonest cause of haemorrhage was uterine atony. There were no maternal mortalities from haemorrhage.

Discussion: Peri and post partum haemorrhage is the commonest cause of obstetric admission to our intensive care unit. These women reflect the most severe cases, yet often return to the obstetric high dependency unit within 24–48 hours. We are looking after an older obstetric population with complex medical issues. Our unit works closely with interventional radiology and there is early multidisciplinary input for known complex cases. Three cases had complications from interventional radiology. Major obstetric haemorrhage (MOH) can follow normal vaginal deliveries from atony or tears, and therefore one should place emphasis on the importance of early recognition and robust MOH protocols.

Reference
P113 The common "uncommon" life threatening emergency - peripartum hysterectomy

C Parcha, S Gnanasekaran, P Karkanis, M Wylde
Obstetric Anaesthetic Department, Heartlands Hospital, Birmingham, UK

Introduction: Peripartum hysterectomy is usually undertaken in cases of life threatening obstetric haemorrhage and is therefore considered a 'near miss' event. We describe a multidisciplinary experience in the management of patients that required a peripartum hysterectomy in our institution.

Method: A total of 11 cases of peripartum hysterectomies were identified between December 2010 and December 2011. Permission was obtained from the obstetric clinical governance department to review the cases. Case notes were examined and data was collected using an anaesthetic and an obstetric proforma. We looked at the causes, the anaesthetic and obstetric management of these cases.

Results: Of the 11 cases, seven were caesarean hysterectomies, three had spontaneous vaginal delivery and one had a venous delivery. One was a planned caesarean hysterectomy and rest were emergencies. The mean age of the patients was 32 years (range 25–42 years). Seven patients were gravida 5 or more, two were gravida 4 and two were gravida 3. Eight patients (72%) had a general anaesthetic from the outset and in 3 patients (27%) spinal anaesthesia was converted to a general. Intraoperatively all patients had invasive blood pressure monitoring and seven also had central venous pressure monitoring. The average estimated blood loss was 4250ml per patient and all have received RBC and FFP transfusions. Four also received cell salvaged blood. While 9 out of 11 patients (81%) had undergone at least one previous caesarean section, 4 had more than one. The most commonly identified cause of haemorrhage was uterine atony (73%). Two cases had ruptured uterus and a morbidly adherent placenta was found in one.

Discussion: A total of 7,689 deliveries were recorded between December 2010 and 2011 in our institution. The incidence of peripartum hysterectomy in UK is 40.6 per 100,000 maternities. (95% CI, 36.4–45.4 per 100,000 maternities). All cases were performed by obstetric consultants and nine different consultants performed the eleven peripartum hysterectomies. All the patients were managed with sequentially administered uterotonics agents. Four were managed with an intra-uterine Ruch balloon with a vaginal pack, while none had a B Lynch brace suture. Bilateral internal iliac balloon angioplastic was performed in the planned caesarean hysterectomy. Seven patients required level three care on the general critical care unit Four were successfully extubated at the end of the operation and were admitted to the high dependency unit on the labour ward. There were no case fatalities and all the patients were safely discharged home with an average hospital stay of 7 days.

Conclusion: The decision and management of peripartum hysterectomies was found to be timely and appropriate. Our unit can provide cell salvage in planned high risk patients but it is not guaranteed in emergency due to lack of trained staff. We propose that criteria to recognise at risk patients should be set and all such patients should be seen by a senior anaesthetist in the clinic.

Reference
1. Knight M and UKOSS, Peripartum hysterectomy in the UK: BJOG; 114:1380–1387

P114 The use of uterotonics to reduce post partum haemorrhage after caesarean section

VM Cowie, K Cummins, E Evans
Department of Anaesthesia, St Georges Hospital, London, UK

Introduction: The most common cause of post partum haemorrhage (PPH) is uterine atony, and major risk factors for PPH due to atony include oxytocin use in labour and prolonged labour. RCOG green top guideline 52 recommends the use of 5IU of oxytocin at time of birth for all caesarean sections (LSCS), and there is evidence that the use of an oxytocin infusion in the immediate post partum period reduces the need for second line uterotonics. Uterotonic drugs have a narrow therapeutic range and there few definitive studies looking at oxytocin dosing and second-line uterotonics. We aimed to audit the use of first and second line uterotonics at our hospital in relation to indication for LSCS, prior use of oxytocin and estimated blood loss (EBL).

Method: The notes of 199 patients who underwent LSCS were audited chronologically from 1st January 2011. In addition to demographic data, the use of first and second line uterotonics were recorded and also EBL.

Results: Elective LSCS accounted for 49.7% of patients. Indications for emergency LSCS included failure to progress (38%), foetal distress (31%), antepartum haemorrhage (6%). In the emergency group, 84% were in labour, and of these 73% were on an oxytocin infusion to augment labour. All patients received a bolus dose of oxytocin at time of birth and 89% of patients received an oxytocin infusion following delivery. Estimated blood loss (EBL) of more than 1000mls accounted for 16.6% of patients. 70% of these patients did not receive a second line agent.

Discussion: At our hospital we are routinely giving a bolus of oxytocin at time of birth in line with the RCOG guideline. No patient received a second dose of oxytocin. In line with recent literature our data shows patients in obstructed and augmented labour are more likely to require a second uterotonics agent, and we recommend that clinicians are vigilant to oxytocin receptor desensitisation in these patients. A high number of patients with EBL greater than 1000mls did not receive a second line uterotonics, and we feel this underlines the need for further investigation and the development of guidelines for dosing and drug choice of first and second line uterotonic.

References
P115 Time to transfusion of blood products in major obstetric haemorrhage - striving for improvement

W N Weidenhammer, R O'Connor, E Harrison,* P Stone
Department of Anaesthetics, Southern General Hospital, Glasgow, UK, *Blood Transfusion Services, Southern General Hospital, Glasgow, UK

Introduction: Haemorrhage is a major cause of maternal mortality. Availability of group-compatible blood within 10-15 minutes at blood bank and prompt transport of blood products to the required site is paramount in the successful management of a major haemorrhage. We assessed our local timelines from activation of the major haemorrhage emergency call (MHEC) to the transfusion of blood obtained from blood bank as well as the average product requirement.

Method: 20 major haemorrhages with activation of a MHEC were identified over a one-year period. Times of MHEC, blood product availability and transfusion times of on-site screened O negative (O Neg) blood and blood bank issued blood were reviewed in 18 cases to assess any delays in the time of processing and transporting of blood products. We also reviewed the use of labour suite screened O Neg blood, overall packed red cells (PRC), fresh frozen plasma (FFP) and platelets (PLTS) in our unit during major obstetric haemorrhage.

The results were compared with a survey we undertook in our department's obstetric anaesthetists about the local provision of blood products after a MHEC activation.

Results: In some cases transfusion had already begun before the MHEC, and in one case although a call was made, only one unit of O Neg and one of group compatible blood was given. Excluding these the mean time from MHEC to transfusing blood bank blood was 26 min [range 15-35] in 11 cases. 61% (11/18) of cases used O Neg blood prior receiving blood from blood bank. The mean time from the last O Neg unit to the first unit PRC from blood bank was 16 min [range 5-23]. Two cases of perceived compromised care in the last 2 years due to inadequate supply of on-site O Neg were reported in the survey. 77% (7/9) of consultants wanted to increase the O Neg units available from 2 to 4 units.

All 20 cases required PRC from blood bank, mean 5 units [range 1-12], 70% [14/20] were given FFP, mean 4 units [range 1-8], 25% [5/20] required PLTS, mean 2 pool of PLTS [range 1-3]. 66% [6/9] of our consultant body supports a 'shock pack' with a mean of 5 units PRC, 4 units FFP and 1 pool of PLTS.

Our consultant body agreed on 19 min [range 17.5-20] as a clinically acceptable time, but subjectively felt it takes 31 min [range 30-35] from a MHEC to transfusion of the first unit PRC.

Conclusions: A case can be made for increasing the number of O Neg units available in our labour suite. Awareness of the blood product requirement during a major haemorrhage can guide the introduction of a 'shock pack' and a facility to request this will now be explored in our unit. Knowledge of actual PRC delivery time may lead to improved care by adjusting the trigger for a MHEC, guiding timely requests and exploring strategies to minimise delay.

References
P117 An audit assessing the post dural puncture headache rate in obstetric patients receiving epidural analgesia in a district general hospital.

EA Christie, P Yoxall
Anaesthetics, St Helens Knowsley NHS Hospitals Trust, Liverpool, UK

Introduction: Post dural puncture headaches (PDPH) are a common complication of central neuroaxial blocks. They are debilitating for the new mother and have implications for length of stay, investigations and interventions. National Audit Project (NAP) 3 estimated 25% of labouring women receive epidural analgesia, with 1% sustaining an accidental dural puncture. Previous studies agreed with a rate of 1% for PDPH; 50-80% of these patients subsequently develop a PDPH. Our audit aim was to assess our rate of PDPH against recognised standards and highlight modifiable risk factors.

Method: A prospective audit over a 12 month period assessed all patients who sustained a PDPH from June 2010 to May 2011. All epidural patients were routinely followed up after 24hrs. A suspected PDPH was initially treated with conservative management after a consultant review and if PDPH persisted, a blood patch (BP) was carried out. Data collected included number and timing of blood patches, repeat BP, grade of anaesthetist for the initial epidural and whether further imaging was needed.

Results: 16 patients were diagnosed with PDPH in a 1 year period, after insertion of an epidural or combined spinal–epidural (CSE). During the year approximately 800 epidurals/CSE’s were performed. Consequently our rate of PDPH is 16/800 which is 2%, twice that expected. 15 out of the 16 patients with a PDPH received a BP, 5 required a repeat BP. The initial epidural was carried out by consultants in 4 cases and trainees in 12 cases. 15 patients presented within the first 72hrs after the epidural/CSE. The majority of patients had their blood patches 2-3 days after the initial epidural (10 out of 16 patients). The longest was 8 days. A cluster of PDPH was noted in March, with 4 cases reported in this month alone.

Discussion: Our rate of PDPH after epidural/CSE in the last year was twice that expected in the UK. Our epidural packs contain a long 21G hypodermic needle (45mm cutting needles) and no loss of resistance syringe. Infiltration of local anaesthetic may have lead to unnoticed dural punctures. Trainees rotate between multiple hospitals using a variety of epidural packs and their experience may impact on the rate of dural punctures. Peaks in PDPH may coincide with rotation of trainees unfamiliar with the epidural packs presented to them. The incidence of PDPH is inversely related to the experience of the anaesthetist. Rising obesity in obstetric patients makes epidurals technically more difficult, multiple attempts may increase the risk of PDPH. Recommendations include removal of green hypodermic needle from the packs, and use of loss of resistance syringe. Trainees new to obstetric anaesthesia have rigorous training ideally in a continuous teaching block/module and increased use of ultrasound.

References
3. Turnbull DK, Shepherd DB. Post dural puncture headache. Anaesthesiologist's recognition and treatment. British Journal of

P118 Cerebral venous sinus thrombosis as a complication of dural puncture

AE Kavanagh, L McWhirter, R Laird
Anaesthetics, Altnagelvin Hospital, Londonderry, UK

Introduction: We describe a case of cerebral venous sinus thrombosis presenting as persistent headache following accidental dural puncture during epidural insertion.

Case report: An 18 year old primigravida in spontaneous labour at term had a suspected catheter dural puncture during insertion of an epidural. She had a vacuum-assisted delivery of a live male infant a few hours later. The patient developed a severe, postural headache the day after delivery, with associated photophobia, nausea and vomiting. An epidural blood patch was performed with immediate easing of the headache, although the patient was not completely pain-free. The patient’s headache worsened again 24 hours after the blood patch was performed. Neurological examination was normal. There were no features of meningism, rashes or seizure activity. A CT brain scan showed suspicion of pathology in the region of the point of origin of the straight sinus. MRI confirmed straight sinus thrombosis, as well as generalised thickening and enhancement of the dura felt to represent intracranial hypotension. The patient’s headache gradually resolved over several weeks, and she did not develop any neurological sequelae. No evidence of thrombophila was found on screening. The patient was warfarinised for twelve months, and advised to avoid oestrogen-containing oral contraceptives. A follow-up MRI/MR venogram at 4 months showed no evidence of residual thrombus. Regarding future pregnancies, it was recommended by a haematologist that the patient commence prophylactic low molecular weight heparin throughout pregnancy, and that there were no contraindications to epidural or spinal anaesthesia.

Discussion: Cerebral venous sinus thrombosis (CVST) is an uncommon type of stroke with an incidence of 3 to 4 per million people per annum. CVST in pregnancy occurs in 11.6 per 100,000 deliveries, most commonly occurring in the 3rd trimester and puerperium. Clinical features include headache, focal neurological deficits, visual disturbance, seizures and altered level of consciousness. 4.5% of all CVST is associated with a mechanical precipitant such as dural injury. Our patient had risk factors corresponding to all components of Virchow’s triad: pregnancy-associated hypercoagulability, endothelial damage as a result of intracranial hypotension and stretching of blood vessels, and stasis of intracerebral blood flow as a result of compensatory venous vasodilatation. The headache associated with CVST can mimic a post-dural puncture headache, and there may be a dual diagnosis. Investigation for CVST should be considered in any patient with post-dural puncture headache which persists or intensifies after an initial plateau.

References
1. St J. Thrombosis of the cerebral veins and sinuses. NEJM 2005;352:1791-8
P119 Management of post dural puncture headache in a maternity unit: Retrospective review and new guideline

YM Nawaz, S Arava, S Mulvany, K O'Connor, M Rea
Anaesthesia, Craigavon Area Hospital, Portadown, UK

Introduction: Obstetric patients are at particular risk of post dural puncture headache (PDPH) due to their gender, age and the widespread use of neuraxial anaesthesia in this population. We reviewed the management of PDPH in our maternity unit with emphasis on treatment and patient follow up.

Methods: We retrieved clinical information about all PDPHs and epidural blood patches (EBP) between 1999 and 2011 from our obstetric anaesthesia database and patient notes.

Results: Seventeen patient notes were accessed from 35 recorded cases of PDPH. Twelve cases followed an epidural and five followed a spinal.

![Number of patients vs. Epinephrine](image)

Figure: Treatment prescribed for patients with PDPH

Twelve patients were successfully treated with an EBP although two had a recurrent dural puncture and one was readmitted with a recurrent headache. Three out the five patients managed conservatively had symptom resolution at the time of discharge. No means of follow up were documented for 14 patients (82%).

Discussion: Many treatments in current use have a limited evidence base. Thirteen patients (76%) received caffeine, which is more effective than placebo in treating PDPH. 35% of patients were advised to have bed rest and 18% were prescribed additional IV fluids however a recent cochrane review found no evidence of benefit from either strategy. All 12 patients who underwent therapeutic EBP experienced improvement and this treatment is known to be more effective than conservative management. This review demonstrated inadequate follow up of patients who have a PDPH in our unit despite the risk of serious morbidity and even death.

Therefore we have devised a new local guideline for PDPH management including a patient information leaflet, daily in-patient review by a senior anaesthetic trainee and a telephone follow-up by a consultant anaesthetist 4-6 weeks post discharge.

References

P120 Novel demonstration of epidural pressures during blood patch

KA Parsons, O Mateszko, JJ Wrench
Anaesthetics, Royal Hallamshire Hospital, Sheffield, UK

Introduction: Despite previous studies looking at changes in epidural pressures during local anaesthetic injection, never before has this been reported during the placement of a blood patch. This pilot study was designed to generate data and increase understanding of a previously unstudied area.

Methods: This data is taken from the first patient involved in an ethically approved observational pilot study looking at obstetric patients undergoing blood patch for treatment of post dural puncture headache (PDPH). The patient had classical PDPH symptoms, a history consistent with inadvertent dural puncture and gave written consent. Epidural pressures were measured using a standard invasive pressure transducer and recorded electronically.

Results: During continuous manual injection of 20mls of autologous blood over 50 seconds epidural pressure rose steadily to 39mmHg. This pressure returned quickly to baseline after 20 seconds (Fig. 1). At no point did the patient experience any discomfort. This blood patch was successful in relieving the patients’ symptoms and did not need to be repeated.

![Epidural pressure vs. Time](image)

Fig. 1 Change in epidural pressures following injection of 20ml of autologous blood.

Conclusion: This is the first patient in our pilot study. From this and subsequent patients we hope to establish whether there are differences between successful and unsuccessful procedures and whether high epidural pressures are associated with pain.

References
P121 Postpartum review after accidental dural puncture
K O’Connor, F Bryden, K Lithfield
Department of Anaesthesia, Princess Royal Maternity Hospital, Glasgow, UK

Introduction: Delayed presentation of post dural puncture headache (PDPH) following discharge before symptoms manifest can be successfully managed by late epidural blood patch.1 After treating two such patients we developed a follow up service to review parturients with suspected accidental dural puncture (ADP).

Methods: Suspected ADP parturients over one year were invited to anaesthetic clinic for consultation. A questionnaire documented headache, associated symptoms, future labour analgesia preferences and maternal satisfaction issues (assessed by visual analogue scales). ADP audit forms were retrospectively reviewed for additional data.

Results: Fourteen of 39 parturients invited attended - twelve suffered PDPH. Mean time to review was 5 months (range 2-9). Seven mothers were primiparous and five multiparous. Deliveries were by LUSCS (9), SVD (2) and instrumental (1). Three patients consulted primary healthcare professionals regarding headache prior to clinic. One attempted but was unable to contact anaesthetic services. At clinic six reported current headache. Four described classic symptoms of PDPH. Associated symptoms included photophobia (4), earache (2), back pain (2), nausea (1) and low mood (2). Mean duration of symptoms was 5.5 days (range 1-42). Seven patients received epidural blood patch (four after discharge). Neuroimaging was performed on three patients - one after anaesthetic follow up. One patient was referred to obstetrics and five have continued anaesthetic follow up. Seven would avoid epidural in future. Table 1 summarises satisfaction scores (low score correlates high satisfaction).

<table>
<thead>
<tr>
<th>Maternal scale</th>
<th>Visual analogue score</th>
<th>0-2</th>
<th>2-4</th>
<th>4-6</th>
<th>6-8</th>
<th>8-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max headache pain</td>
<td>n (%)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>2 (17)</td>
<td>10 (83)</td>
<td></td>
</tr>
<tr>
<td>Daily tasks</td>
<td>n (%)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (8)</td>
<td>3 (25)</td>
<td>8 (67)</td>
</tr>
<tr>
<td>Care for baby</td>
<td>n (%)</td>
<td>0 (0)</td>
<td>2 (17)</td>
<td>1 (8)</td>
<td>2 (17)</td>
<td>7 (58)</td>
</tr>
<tr>
<td>Bonding</td>
<td>n (%)</td>
<td>5 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>5 (42)</td>
<td>2 (17)</td>
</tr>
<tr>
<td>Conservative management</td>
<td>n (%)</td>
<td>1 (8)</td>
<td>1 (8)</td>
<td>0 (0)</td>
<td>4 (33)</td>
<td>5 (42)</td>
</tr>
<tr>
<td>Epidural blood patch (n=7)</td>
<td>n (%)</td>
<td>7 (100)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Overall ADP management</td>
<td>n (%)</td>
<td>5 (42)</td>
<td>1 (8)</td>
<td>1 (8)</td>
<td>2 (17)</td>
<td>4 (33)</td>
</tr>
<tr>
<td>Childbirth experience</td>
<td>n (%)</td>
<td>1 (8)</td>
<td>3 (25)</td>
<td>3 (25)</td>
<td>3 (25)</td>
<td>2 (17)</td>
</tr>
</tbody>
</table>

Discussion:
Dural punctures may go undetected at epidural insertion.1 Most PDPHs resolve in seven days but headache can persist for several years.1 Undiagnosed problems after ADP are detrimental to quality of life with potentially disastrous consequences.1 This service provides essential anaesthetic follow-up to this small but important group of patients. Our experience reflected evidence that information and emotional support during consultation improves maternal satisfaction.2

References

P122 The incidence of postdural puncture headache and neurological sequelae following neuroaxial blockade in obstetric anaesthesia: a five year study
K Bruce-Hickman, D Gordon, L Wee
Department of Anaesthesia, University College Hospital, London, UK

Introduction: Neuroaxial blockade is common practice in obstetric anaesthesia. Our aim was to evaluate the rate of postdural puncture headache (PDPH) and neurological sequelae following neuroaxial blockade in a busy London obstetric unit. We also looked at our conversion rate to general anaesthesia for surgery.

Methods: Anaesthetists performing neuroaxial blockade in obstetrics documented each procedure and any adverse effects. Routine follow up of patients the next day allowed us to collect information about further complications. These results were collected over a 5 year period between 2004-2008.

Results: A total of 11456 cases of neuroaxial blockade were performed. The results are shown in Table 1. Overall incidence of PDPH was 0.777% and neurological sequelae was 0.471%. The conversion rate of neuroaxial blockade to general anaesthesia for surgery was 1.292%.

Table 1. Incidence of PDPH and neurological sequelae

<table>
<thead>
<tr>
<th></th>
<th>5 Year Total</th>
<th>Epidural</th>
<th>Spinal</th>
<th>CSE</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDPH</td>
<td>7369</td>
<td>1158</td>
<td>2929</td>
<td>11456</td>
<td></td>
</tr>
<tr>
<td>PDPH %</td>
<td>50</td>
<td>14</td>
<td>25</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>Neurological sequelae</td>
<td>0.679</td>
<td>1.209</td>
<td>0.854</td>
<td>0.777</td>
<td></td>
</tr>
<tr>
<td>Neurological sequelae %</td>
<td>43</td>
<td>1</td>
<td>10</td>
<td>54</td>
<td></td>
</tr>
</tbody>
</table>

Discussion: Our incidence of PDPH for epidurals compares favourably to published data of 1% - 1. Our incidence of neurological complications is very high compared to published rates of 1 in 15000.2 However, our follow up was in the immediate post procedural period which included patients with temporary residual neurological symptoms. The lack of long term follow up prevented us from differentiating between those with permanent neurological damage. Of note is the fact that spinals had the highest incidence of PDPH but the lowest incidence of neurological complications; although the number of spinals performed were fewest. This could be due to the fact patients receiving top ups with an epidural or CSE would experience prolonged block which is then picked up by our follow up the next day. Conversion to general anaesthesia compares favourably with published results of 1.2% for spinal and 4.3% for epidural anaesthesia.3 This audit provides comparison data on some adverse effects following different types of regional anaesthesia in obstetrics; but is limited by the lack of long term follow up in patients with neurological complications. We are planning to improve our long term follow up for this group of patients.

References
P123 A telephone survey of the use of skills and drills in twenty London obstetric units...could Maternity Unit Multidisciplinary Skills (MUMS) help?

M Naik, K Bexon, G Stocks, H Bohjar, C Sadler, Anaesthetics, Queen Charlotte's and Chelsea Hospital, London, UK, *Anaesthetics, Barts and the London Hospital, London, UK

Introduction Following the most recent CMACE report, some of the problems highlighted included poor team work and failures to recognise the critically unwell patient. Skills and drills can be an excellent way of addressing this. In 2002, an OAA survey was conducted reviewing the use of skills and drills in maternity units. The aim of this telephone survey is to evaluate and compare the use of skills in obstetric units in London in 2012 with those previous survey results.

Methods We conducted a snapshot telephone survey of maternity units in the London deanery. We spoke to one of the consultant obstetric anaesthetists in each department. We asked a series of 12 questions about the use, content and frequency of multidisciplinary skills and drills as well as the use of simulation and other methods to promote team working.

Results We spoke to 20 consultant obstetric anaesthetists. 19/20 maternity units performed skills and drills on their labour wards and 4 units ran drills on antenatal wards.

<table>
<thead>
<tr>
<th></th>
<th>2002 n=203</th>
<th>2012 n=20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing skills and drills</td>
<td>45%</td>
<td>95%</td>
</tr>
<tr>
<td>Frequency of skills (&gt;3 times year)</td>
<td>39%</td>
<td>75%</td>
</tr>
<tr>
<td>Scenarios used</td>
<td>Haemorrhage</td>
<td>84%</td>
</tr>
<tr>
<td></td>
<td>Eclampsia</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>Maternal cardiac arrest</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Use of simulation</td>
<td>5%</td>
</tr>
</tbody>
</table>

One institution ran skills once every month. 16 centres had run a scenario within the last 3 months. 12 units directed their drills towards the multidisciplinary team and 4 units specifically directed the teaching to midwives. Similar factors in 2002 still prohibit skills and drills in 2012. These include the lack of time, staff, protected teaching and resources. Ninety percent of respondents felt that access to pre-prepared scenarios would be useful.

Conclusion Our survey suggests that there is an enthusiasm for skills and drills with an increase in units performing them on their units in London 2012. Although access to simulation centres is easier, there is great value in performing scenarios in ones working environment in terms of teamwork, knowledge of workplace and identifying areas of improvement. In a time of financial constraints, limited time, staff and resource, the challenge is to make this easier. We have developed Maternity Unit Multidisciplinary Skills (MUMS). 14 prerepared scenarios covering obstetric and medical emergencies based on cases described in the latest CMACE report with assessment checklists. We have been using them for training in two teaching hospitals and aim to pilot them locally and potentially nationally as an online resource.

References

P124 Anaesthesia and obstetric e-debate: an interactive educational virtual cafe

J Boss, J Teare, E Evans, P Hughes
Anaesthetics, St Georges Hospital NHS Trust, London, UK

Introduction: A busy labour ward provides a rich environment for first-hand learning. Challenges to delivering safe, timely training in Obstetric Anaesthesia include fast turnover of patients, shift work and service pressure. Sound educational principles support computer-mediated communication to reinforce adult learning. As today’s trainee has regular Internet access and checks e-mail daily we aimed to explore how to offer a non-judgmental ‘space’ for interactive group learning and development of reflective practice, supporting e-Portfolios.

Methods: E-debates ran using group e-mail monthly from May to December 2011. A supervised trainee provided an anonymised scenario then asked key practical questions regarding a clinical dilemma which they faced. Scenarios were mapped to the curriculum for Obstetric Anaesthesia for ST3-4 in order to provide relevant discussions. Forum members responded using the ‘reply-all’ function on their e-mail accounts. Each debate rounded up with a scenario summary and discussion including learning points highlighted by Anaesthetic and Obstetric Consultants. In addition trainees were directed to useful resources such as relevant evidence based guidelines and research publications. A questionnaire was distributed to participants via Survey Monkey to explore the level of participation, functionality, relevance of topics, and to encourage forum development.

Results: 95 individuals participated in 7 e-Debates; 4 anaesthetic consultants, 4 obstetric consultants, 58 anaesthetic trainees and 25 obstetric trainees. The survey demonstrated the educational usefulness of this mode of learning. Comments included: ‘found process very useful’, ‘thought provoking’, ‘diverse and relevant’, ‘things I had not considered’, ‘excellent idea’, and ‘even for those like me...just following...there were good learning tips’.

Discussion: Within the NHS, time and finance are at a premium. We identified an opportunity to optimise the learning potential of a rich clinical environment despite these constraints. A virtual learning ‘café’ offers trainees the opportunity to invest in their own learning, share ideas and ask questions in a non-judgmental setting. ‘Modeled’ participation is an effective way of enhancing learning in this context. Relevance of discussion topics and ensuring that participants have a social presence and can comment without intimidation, has been key to this project’s success. Developing complexity of ongoing scenarios can widen the network of e-learning to include senior trainees and non-obstetric anaesthetists with on-call commitment to labour ward.

References
**P125 Is there any effect of job rotation among trainees on the outcome of patient care? An analysis of 7 years data.**  
A Tufchi, G Vickers  
Anaesthetics, Royal Oldham Hospital, Oldham, UK  

**Introduction:** Traditionally job rotation among trainee doctors and nurses have been shown to improve the organisational and clinical skills of the trainee. However there have been speculations about the quality of care delivered to the patients by continual rotation of doctors. In most of the hospital across NHS, doctors change hospitals in the month of February and August each year.  

**Methods:** We collected the data from year 2004 to 2010 on our maternity unit where on the average we conduct about 3200 deliveries each year. We analysed the follow up data of all emergency caesarean sections in that period (2672 cases) by the month they were performed in, and looked at the trends in the anaesthetic management.  

**Results:** We found that the incidence of emergency caesarean sections decrease in the month of February from the monthly average of 227 to 199 cases. The incidence of foetal distress leading to emergency caesarean section increased in the month of August from the monthly average of 19.5 to 30. The incidences of emergency GA sections were found to be 21.1% and 22.13% in February and August respectively while the monthly average was 16.42%. On the contrary, the incidence of emergency caesarean section performed under spinal block seem to trough in February and August to 61.80% and 56.14% respectively as compared to the average of 64.48%.  

**Conclusion:** We have noticed that there seems to be higher incidence of general anaesthesia and lower incidence of spinal anaesthesia performed in August and February for emergency caesarean sections. Although these results may be influenced by many other factors, we think that these findings are interesting considering that spinal anaesthesia is usually safer than general anaesthesia in emergency caesarean section and the data analysed is from seven years. The rotation of trainee doctors may influence the quality of care given to the patients.  

**References**  

**P126 Organising a novice obstetric anaesthetists’ course: conception to completion and beyond**  
BM Daly, EM McGrady  
Anaesthetics, Princess Royal Maternity Hospital, Glasgow, UK  

**Introduction:** Going on an on-call obstetric rota for the first time can be a daunting experience. A previous RCoA 2009 survey regarding this, identified areas of particular concerns for trainees. In order to facilitate a smoother transition to working on a busy delivery suite, we decided to implement a hybrid theoretical teaching/simulation course aimed at CT2 trainees about to commence their basic obstetric block. The primary aim of the course was not only to increase participants’ knowledge, but also to increase confidence in dealing with the practical aspects of regional anaesthesia and analgesia on labour ward. This involved specific teaching on trouble-shooting common clinical problems.  

**Methods:** All CT2 (ST2) trainees, prior to commencement of their basic obstetric block in the West of Scotland were invited to attend a one day course. A programme was devised based on the Royal College of Anaesthetists’ curriculum. Faculty included Consultant obstetric anaesthetists and senior registrars with simulation experience. Multiple teaching techniques were employed. Formal lectures covering a range of topics provided theoretical knowledge. A practical workshop involved the previously validated dural puncture Simulator MK2 (M43B) for spinal/epidural analgesia and anaesthesia. Clinical scenarios were demonstrated with high fidelity simulator sessions using SimMan 3G. These scenarios incorporated anaesthetics non-technical skills teaching.  

**Table 1. Usefulness of session: 0=not useful, 4=Very useful**

<table>
<thead>
<tr>
<th>Session</th>
<th>Median (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical aspects of regional anaesthesia/general anaesthesia for LSCS</td>
<td>4 (4)</td>
</tr>
<tr>
<td>Trouble shooting on labour ward</td>
<td>3 (3–4)</td>
</tr>
<tr>
<td>Medico-legal aspects</td>
<td>3 (3–4)</td>
</tr>
<tr>
<td>Neuraxial blockade on dural puncture Simulator MK2</td>
<td>3 (3–4)</td>
</tr>
<tr>
<td>Clinical scenarios with SimMan 3G</td>
<td>4 (4)</td>
</tr>
</tbody>
</table>

**Results:** The overall feedback after the course was very positive. Five months later, 5 of the 7 trainees who had since completed their obstetric block were asked to complete another survey. This survey asked how confident they felt with certain procedures/scenarios after the course, and since they had now completed their block, how useful the sessions had actually been in practice. The participants were reasonably confident with key scenarios/procedures they had been taught. We asked trainees to score usefulness with a Likert scale ranging from 0–4 (see table).  

**Discussion:** These results demonstrate that candidates had found the course quite useful in actual practice. As a result of the success of this pilot course, we aim to offer this course to more participants beyond the region. We also hope that we can develop it further to facilitate assessment of basic obstetric competencies prior to being on-call for obstetrics.  

**References**  
2. Royal College of Anaesthetists.CCT in Anaesthesia Basic Level Annex B Aug 2010 BS6–BS8  
P127 Truly a 24 hour service - distribution of labour epidural requests over the 24 hour period and impact on response times

C E Armstrong, A J Putland
Anaesthetics, Royal Bolton Hospital, Bolton, UK

Introduction: Many anaesthetists working within the obstetric environment hold the perception that a disproportional number of labour epidurals are requested out of hours, causing significantly increased workload at times of minimum staffing and potentially unacceptable delays in epidural response times (now subject to national standards). Our delivery suite located within a busy district general hospital has undergone a programme of expansion in response to the reconfiguration of maternity and child health services in Greater Manchester. The annual delivery rate is expected to rise from 4000 to over 6000 by 2013. This audit was conducted to evaluate the pre-expansion distribution of epidural workload and response times thereby allowing some insight into the potential impact of the anticipated increase in deliveries.

Methods: Data concerning all labour epidurals over a 12 month period was extracted from a local obstetric anaesthetic database. The distribution of epidural requests over the 24 hour period was analysed. Epidurals associated with a delayed response time of over 30 minutes were identified and the distribution of request times for this subset also reviewed.

Results: 862 epidurals were documented over a 12 month period (01/09/2010 - 31/08/11). There was an almost even distribution of requests over the 24 hour period with 50% of requests occurring during the 12 hour night shift (20:30-08:29). 29% of epidurals were requested within "normal working hours" (weekdays 08:30 - 17:00). 39 (4.5%) epidurals were recorded as incurring a delayed response time of over 30 minutes (range 35-225 minutes) and of these, 19 were delayed by over 60 minutes. Of the 39 delayed epidurals 19 (49%) were delayed during the 12-hour night period and 13 (33%) of delays occurred during "normal working hours" Interestingly, when considering the subgroup of epidurals delayed by over 60 minutes, 13 (69%) requests occurred at night.

Discussion: Within our unit, the relatively even distribution of epidural requests over the 24 hour period did not support the popular perception of disproportionate epidural requests out of hours. However, only 29% were requested within "normal working hours" and while this remains in proportion (normal working hours account for 25% of hours in the week) is does highlight the truly 24-hour nature of the epidural service. Only 39 (4.5%) of epidurals were recorded in our database as having a delayed response time of over 30 minutes, although unexpectedly, 33% of these delays occurred during normal working hours when staffing levels are supposedly at their best. Of those experiencing the longest delays (over 60 minutes) 69% occurred at night, suggesting that there is already some pressure on the service out of hours. Since the audit period there have been several changes in preparation for the re-configuration including, 3 sessions days for consultant anaesthetists during the week, an extra tier of on-call consultant anaesthetist at night and 5 elective section sessions per week. We plan to re-audit 6 months after reconfiguration.

Reference

P128 A modified sitting position for regional anaesthesia in the morbidly obese parturient

D Rangarajan, TA Tanqueray, H Mulchandani
Anaesthetics, Homerton University Hospital, London, UK

Introduction: With the prevalence of obesity rising, obstetric anaesthetists continue to encounter a range of difficulties when positioning obese women for regional anaesthesia. We describe a novel position which we have found helpful.

Case Report: A 29-year-old primiparous woman required caesarean section for transverse lie and proteinuric hypertension at 36 weeks gestation. Weighing 190kg, she had a BMI of 62 and a history of asthma. We decided to use a Combined Spinal Epidural technique. Prior to anaesthesia, we laid the patient supine on the operating table in order to ensure that the width extenders on the table were sufficient and to assess the need for panniculus retraction. Maneuvering the woman between the supine and sitting positions was difficult and time-consuming. This made us reconsider our approach. We had concerns about the safety of moving her after central neuraxial blockade. It also seemed likely that such a delay in repositioning would result in sacral pooling of the intrathecal hyperbaric bupivacaine solution, limiting the cephalad spread of sensory blockade. Rather than using the traditional sitting position (sitting perpendicular to the length of the table, with feet on a stool), we sat the patient with legs resting along the length of the table and knees extended. Hence, as soon as the epidural was sited, she could lie straight back into the supine, tilted position.

In the absence of bony landmarks, the L4/5 interspace was visualised using ultrasound. The epidural space was located at a depth of 8cm on the first pass and a needle-through-needle technique used to deliver 12.5 mg heavy bupivacaine and 300mcg diamorphine intrathecally. An epidural catheter was threaded promptly before the patient was lain flat. Despite having seen good flow of CSF, the spinal block which developed was patchy. The caesarean section was then successfully performed under epidural blockade.

Discussion: This modified sitting position does not appear to have been detailed in the medical literature, but had been witnessed in use, by one of the authors, at a busy maternity unit in Uganda, as a way of increasing speed and theatre throughput. We found that it was well-tolerated by a morbidly obese patient and led to a helpful flattening of her lumbar lordosis. However we did not demonstrate the successful spread of spinal blockade we had hoped for.
P129 Audit of the seniority of anaesthetists available during the labour and delivery of patients with a body mass index (BMI) ≥40 in a tertiary maternity centre

CS Hawe, U Carabine
Department of Anaesthesia, Royal Jubilee Maternity Hospital, Belfast, UK

Introduction: A recently published guideline states ‘an anaesthetist at specialty training year (ST) 6 and above, or... equivalent...should be informed and available for the care of women with BMI ≥40 during labour and delivery’. If such cover was intended to be immediately available (interpreted as ‘in house’: as stated for the obstetric consultant) this could require significant changes to current out of hours rota provision within our regional maternity centre.

Methods: Over a 12 month period from 1st January - 31st December 2011, a retrospective review was conducted on the seniority of available anaesthetic personnel and the timing of any required intrapartum intervention on two sub-sets of patients: 1) those with BMI ≥40 at booking; 2) those with booking BMI 35-39.99 (expected to have BMI ≥40 at time of delivery). This data was obtained from department rosters and the regional audit system (in which recording of anaesthetic procedures had occasional inconsistencies).

Results: There were 5524 patuents who delivered during this period. From data on the 4812 (87.1%) who had their BMI recorded, 335 (7.0%) had a known or expected BMI ≥40. Of these, over half delivered out of hours (BMI ≥40: 77/121 (63.6%); BMI 35-39.99: 111/214 (51.9%).

Table: Anaesthetic provision for obese patuents

<table>
<thead>
<tr>
<th>BMI ≥40</th>
<th>Analgesia in hours</th>
<th>Analgesia out of hours</th>
<th>Anaesthesia in hours</th>
<th>Anaesthesia out of hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 (100%)</td>
<td>22 (31.8%)</td>
<td>38 (100%)</td>
<td>14 (35.7%)</td>
<td></td>
</tr>
<tr>
<td>BMI 35-39.99</td>
<td>8 (100%)</td>
<td>8 (24.2%)</td>
<td>73 (100%)</td>
<td>10 (29.4%)</td>
</tr>
</tbody>
</table>

*08:00-18:00 Monday - Friday: consultant immediately available
†18:00-08:00 weekends / public holidays / trainee (≥CT2) immediately available

Discussion: Within normal weekday hours of 08:00-18:00 the unit was able to meet the proposed standard. However out of hours only 25% of the rostered resident anaesthetic cover was provided by trainees ≥26, despite over half of deliveries to patuents with known or expected BMI ≥40 occurring during these hours. This staffing provision would not provide immediate cover of the seniority required by the guideline for approximately two thirds of women who had interventions out of hours. To improve compliance a significant reorganisation of the rota to ensure senior trainee onsite presence out of hours or compulsory attendance of the on-call consultant anaesthetist when these women are labouring would be required. This would have workforce planning and cost implications. It is likely other units would also struggle to be fully complaint without significant change to working patterns: especially for consultants. The intended interpretation of this guideline requires discussion within the anaesthetic fraternity.

References

P130 Body habitus as a predictive factor of difficult epidural block in parturients?

LM Charco, PC Cuesta, B Garcia, VE Ortíz, F Carpintero, MR Calero, U Vicente, D Martínez-Peñalver
Anaesthesiology and Intensive Care, General University Hospital, Albacete, Spain

Introduction and objectives of the study: Epidural anaesthesia is being increasingly used to provide anaesthesia for labor pain. We often presuppose that obesity will increase neuraxial technique difficulty. With the current prevalence of obesity in parturients in spain maternity units, we performed a prospective, observational study to establish the effect of the body habitus as a predictive factor for difficult epidural block.

Method: This is a prospective and observational study in term pregnant women. We collected the following patient data: age, body mass index (BMI; weight/height squared, kg/m2) and spinal anatomy (normal or deformed, subjectively from inspection and palpation). Patients were classified in normal body habitus if BMI<29.9 or obese if BMI≥30. The technique was done by anaesthesiology residents with prior experience of at least 120 epidural blocks. Difficult epidural block was considered if placement of the catheter requires more than a puncture in the skin or one puncture on the skin, but more than a change of direction of the needle in the interspinous space. The technique is considered adequate if after 20 minutes of the initial dose the patient reported visual analogic scale of pain ≤3 than before. We also recorded numbers of complications. Results: We collected data from 120 parturients, ASA I-II. Ages ranged from 15 to 41 years old, BMI was medium 32 ± 3.44. Were obese 60% of patients (72 cases). Most epidural catheters were successfully placed at the first attempt being difficult to puncture under the criteria of the study in 36.67%, in this cases only 40% had BMI≥30. We found an incidence of 50% difficult puncture in patients with BMI ≥ 30. The incidence of epidural re-puncture was 6 cases (5%), 4 of these were obese patients. Spinal anatomy had effect on the number of attempts, in deformed spinal anatomy the incidence of difficult puncture was 33.3%.

Table 1: Effect of body habitus on the difficulty of puncture.

<table>
<thead>
<tr>
<th>Body Habit</th>
<th>No difficulty</th>
<th>Difficult</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (IMC &lt; 30)</td>
<td>46/95.83%</td>
<td>24.16%</td>
<td>48</td>
</tr>
<tr>
<td>Obese (IMC &gt; 30)</td>
<td>36/50%</td>
<td>36/50%</td>
<td>72</td>
</tr>
</tbody>
</table>

Conclusions: Our data collection procedures in 120 obstetric patients in labor concluded that body habitus had no significant effect as a predictive factor for difficult epidural block in the obstetric patient. Some obese patients have surprisingly easy neuraxial block placements. The most reliable method to determine in advance the possibility of a technical difficulty for epidural block in the obstetric patient is an examination of the patient’s back to identify the quality of anatomical landmarks and obvious deformity of the spine.

Reference
Is booking BMI an adequate risk stratification for identifying the risks associated with raised BMI in pregnancy?

E Ingram, D MacKin, V Cording, P Yoxall,*
Department of Obstetrics, Whiston Hospital, Prescot, UK,
*Department of Anaesthetics, Whiston Hospital, Prescot, UK

Introduction: Maternal obesity is a common risk factor in obstetric practice with a prevalence of 16-19%. Obesity, a BMI of 30 or more, is associated with adverse obstetric outcomes. A prospective pilot audit was undertaken to investigate whether booking BMI was a good stratification tool for identifying risks associated with raised BMI in pregnancy.

Method: Women attending our fetal medicine assessment unit beyond 37 weeks gestation, between November 2010 and January 2011, were weighed and data obtained was inputted onto a proforma. This included booking BMI, BMI at term, past obstetric history, pregnancy outcome, obstetric complications and infant weight at delivery.

Results: Data on 45 patients was obtained. At booking, 28 had a normal BMI, 10 had a BMI between 30-35, and 7 had a BMI greater than 35. Mean weight gain was 12.28kg (-0.6kg – 28.5kg). Fourteen patients with a normal booking BMI had a BMI greater than 30 by term and 2 had a BMI greater than 35 at term. Four patients in the BMI 35-40 group achieved a BMI greater than 40 by term. Women who crossed into the higher BMI group by term were found to have increased risk of - induction of labour; pre-eclampsia; polyhydramnios; and Caesarean section. Increased incidence of gestational diabetes was identified despite not qualifying for GTT at 28/40, based on BMI. Only 25% (4/16) women who crossed from the normal BMI group into the BMI greater than 30 category by term received appropriate thromboprophylaxis postnataally.

Conclusion: NICE guidelines on the management of obesity in pregnancy have been established. Our data suggest that excessive weight gain in pregnancy can result in a subset of women crossing into a high risk BMI category. Do these women need to be identified in order to reduce their risk of complications during pregnancy and postnataally?

Relationship between patients BMI, depth to epidural space and its effect on epidural success

N Airey, E Docker
Department of Anaesthesia, Arrowe Park, Wirral, UK

Introduction: Epidural analgesia is a common and popular method of pain relief in labour. However, the incidence of obesity is rising and may make this choice of analgesia more difficult to achieve. We decided to carry out a retrospective analysis of all the epidurals performed in our hospital over a 2 month period, looking at the relationship between the patients BMI and the depth of the epidural space. We also investigated if there was a relationship between the patients BMI and the success of the epidural. Other outcomes investigated included the rate of instrumental or caesarean delivery, the incidence of complications and patient satisfaction with the epidural.

Methods: Patients who received an epidural between 1st November and 31st December 2011 were included. Data was collected from the hospital computer system and then cross checked against the birth and theatre registers on labour ward. The patients BMI were calculated from the measurements at the booking clinic. The results were analysed using SPSS software.

Results: A total of 148 patients received epidurals (total of 573 deliveries, 25.8%). The mean BMI was 26.74 (95% CI 25.95-27.53). The mean depth to the epidural space (DOS) was 5.22cm (95% CI 5.07-5.37). A strong correlation was found between the patients BMI and the DOS, r=0.731

In total 44 of the epidurals failed to work effectively (29.1%).

<table>
<thead>
<tr>
<th>BMI</th>
<th>No. of failures</th>
<th>Total no. of epidurals</th>
<th>Failure rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>2</td>
<td>9</td>
<td>22.2%</td>
</tr>
<tr>
<td>20-25</td>
<td>12</td>
<td>52</td>
<td>23.1%</td>
</tr>
<tr>
<td>25-30</td>
<td>15</td>
<td>48</td>
<td>31.3%</td>
</tr>
<tr>
<td>30-35</td>
<td>12</td>
<td>31</td>
<td>38.7%</td>
</tr>
<tr>
<td>&gt;35</td>
<td>3</td>
<td>8</td>
<td>37.5%</td>
</tr>
</tbody>
</table>

65 patients required an instrumental or caesaranean delivery of whom 36(55.4%) successfully received an epidural top-up. Complications included 8(5.4%) patients requiring a re-site and 2(1.4%) dural punctures. On a follow up questionnaire 114 (77%) reported feeling satisfied with the epidural.

Conclusion: There appears to be a strong positive and statistically significant correlation between the patients BMI at booking and the depth to their epidural space. There also appears to be a positive association between the patients BMI and the rate of epidural failure.

References
P133 Remifentanil sedation to facilitate awake fiberoptic intubation for caesarean delivery in a parturient with spinal muscular atrophy

MJP Drake, MA Minehan
Department of Anaesthesia, National Women’s Health, Auckland City Hospital, Auckland, New Zealand

Introduction: A parturient presenting for caesarean delivery with spinal muscular atrophy (SMA) can present many challenges for the obstetric anaesthetist. SMA is associated with respiratory impairment, bulbar dysfunction, musculoskeletal deformities including scoliosis, and an abnormal response to drugs acting at the neuromuscular junction.1 We present a patient requiring caesarean section who, in addition to SMA with severe scoliosis, had very limited mouth opening, and was successfully managed by awake fiberoptic oral intubation (AFOI) facilitated by remifentanil sedation.

Case Report: Antenatal anaesthetic review revealed a previous very difficult AFOI with mouth opening mechanically limited to under 2cm. A marked scoliosis was present despite Harrington rod fixation. Her already limited respiratory function deteriorated further during pregnancy so delivery was planned for 32 weeks’ gestation. Surgical access was expected to be difficult due to flexion deformities of the hips. With concerns of prolonged surgery, expected difficulties with neuraxial anaesthesia and anticipated difficult direct laryngoscopy, we opted for general anaesthesia following AFOI.

The airway was initially topicaled with nebulised 4% lidocaine solution and 10% lidocaine spray. Sedation was provided with midazolam 0.5mg and a titrated infusion of remifentanil between 0.05 and 0.1mcg/kg/min. A size 9 Berman airway was passed between her incisors. A fiberoptic ‘scope was passed through the Berman airway. The larynx and vocal cords were visualised and topicaled with 4% lidocaine injected through an epidural catheter in the suction channel of the ‘scope. An endotracheal tube was passed easily into the trachea with minimal cough. Anaesthesia was induced without neuraxial blocking agents and maintained with desflurane in air/oxygen and remifentanil. The surgery was uneventful. With spontaneous tidal volumes of over 300mls at the end of the case, we elected to extubate the patient awake in the sitting position. An initially weak cough improved throughout the day and she was discharged home ten days later. The patient had recall up to the point of induction of anaesthesia but did not find the experience unpleasant.

Discussion: Remifentanil’s use is established for labour analgesia2 however we are not aware of any published reports of its use for AFOI in obstetrics. Its anti-tussive effects, short half life, availability of pharmacological antagonists, and established fetal safety make remifentanil an ideal adjunct for AFOI in obstetrics, particularly in patients where it is preferable to avoid neuraxial blocking agents.

References

P134 Audit of conversion of epidural labour analgesia to anaesthesia for caesarean section

AO Packham, E Hart
Department of Anaesthesia, University Hospitals of Leicester NHS Trust, Leicester, UK

Introduction: Successful conversion of epidural labour analgesia (ELA) to surgical anaesthesia for caesarean section (CS) can save time in an emergency and avoids the risks to the mother of a second regional anaesthetic or of a general anaesthetic. We performed an audit to determine the success rate of epidural top-up in our two obstetric units.

Method: The audit covered all deliveries in a three month period. Data were obtained from the obstetric department database for all 176 women who received ELA and subsequently delivered by CS. Paper casenotes were reviewed for all 30 women who received additional anaesthetic procedures in labour or for delivery and 71 randomly selected women who appeared to have an uncomplicated epidural top-up for CS.

Results: Regional anaesthesia for CS was attempted for all 176 women. 13 women (7%) were subsequently converted to GA, 7 before and 6 after the start of surgery. Epidural top-up was attempted in all except 8 cases and was the sole technique in 155 (88%) of cases. Of the 3 women who had their last epidural catheter pulled back in labour for poor analgesia, 2 had successful epidural top-ups for CS. A further 6 women had unscheduled anaesthetist top-ups in labour without catheter manipulation and all subsequently had an alternative anaesthetic technique for caesarean section. Comparisons between the two units are shown in the table.

<table>
<thead>
<tr>
<th>Unit A</th>
<th>Unit B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>98</td>
</tr>
<tr>
<td>% done by consultant</td>
<td>14</td>
</tr>
<tr>
<td>% done by ST3-7</td>
<td>86</td>
</tr>
<tr>
<td>% done by CT2</td>
<td>51</td>
</tr>
<tr>
<td>% epidurals resisted in labour</td>
<td>0</td>
</tr>
<tr>
<td>Drugs used for epidural top-up</td>
<td>L/A/B ± Fent</td>
</tr>
<tr>
<td>Mean time to effective top-up (mins)</td>
<td>14</td>
</tr>
<tr>
<td>% converted to GA</td>
<td>7</td>
</tr>
</tbody>
</table>

L/A/B - Lidocaine, adrenaline and bicarbonate. Fent - fentanyl. Bup - Bupivacaine

Discussion: 93% of our patients receiving ELA underwent CS under regional anaesthesia. This falls short of the proposed RCOA standard of 97%1 but is similar to the rate achieved in a large UK cohort2. An epidural top-up was attempted in 75% of cases. 71% of these had an entirely successful top-up (no alternative anaesthetic, no supplemental analgesia and no reports of pain during CS). This compares with 76% in a large UK cohort2. We recommend that success rates are quoted when advising women (for example the very obese) to have ELA to reduce the possible need for GA at CS. Our results indicate that if a catheter requires additional unscheduled top-ups during labour it should not be topped up for CS. However if an epidural catheter has been manipulated during labour and is then working well it can be topped up for CS.

References
P135 Checking adequacy of spinal anaesthesia for elective caesarean section with a forceps skin pinch - is this really necessary?
S Gibb, P Hersey, S Thomas
Department of Obstetric Anaesthesia, Royal Victoria Infirmary, Newcastle upon Tyne, UK

Introduction: Prior to skin incision at lower segment caesarean section (LSCS) obstetricians often check the adequacy of regional anaesthesia by pinching the woman's abdominal skin using toothed forceps. The documentation of adequate block height by anaesthetists has become a medico-legal standard of care1. We therefore speculated whether this forceps skin pinch by obstetricians is necessary in the setting of elective LSCS under subarachnoid block (SAB).

Methods: We surveyed obstetricians to find out if they perform a forceps skin pinch before skin incision at elective LSCS under SAB. We asked them to mark the upper dermatomal level at which they pinch the skin on a diagram. We surveyed anaesthetists to find out if they requested the obstetrician to check block adequacy with a forceps skin pinch. We asked both groups whether they had ever noted a woman to feel pain on pinching the skin and to comment on whether they thought the test was useful.

Results: In total 7 consultant obstetricians, 10 trainee obstetricians, 10 consultant anaesthetists and 10 trainee anaesthetists were surveyed. 5/7 consultant and 10/10 trainee obstetrician always perform a forceps skin pinch prior to commencing elective LSCS under SAB (2/7 consultants sometimes). The dermatomal level marked varied from T6 to T12 (median T8, mode T7). The majority of anaesthetists considered the forceps skin pinch in the setting described unimportant with only 20% of consultants and 30% of trainees requesting it. 41% of obstetricians (7/17) and 20% of anaesthetists (4/20) had witnessed a woman experience pain on forceps skin pinch after SAB. The forceps skin pinch was considered useful by 65% of obstetricians but only 25% of anaesthetists.

Discussion: Russell has demonstrated that absence of touch sensation up to and including T5 is the most reliable predictor of a pain free LSCS and that using pin-prick to assess block adequacy may be misleading2. A toothed forceps skin pinch is more comparable to pin-prick than light touch and is therefore an unreliable predictor of a painless LSCS. In addition this survey has demonstrated that the highest level this test was performed was T6 (2/17 obstetricians) with 50% pinching three or more dermatomes below the required T5. Confirmation of adequate block height prior to commencing LSCS under SAB is expected of all anaesthetists and so the skin pinch should be unnecessary. Worryingly 30% of those surveyed had noted a women to experience pain on forceps skin pinch suggesting that either block height had not been tested adequately by the anaesthetist or that it is a useful final test of SAB. This may explain why the majority of obstetricians and a quarter of anaesthetists believe this to be a useful test despite the evidence described above. As the forceps skin pinch is quick and low risk it will be interesting to see if the results of this survey change obstetric or anaesthetic practice locally.

References

P136 Effect of speed of injection of local anaesthetic on haemodynamic parameters of women undergoing elective caesarean section
EJ Jackson, J Slee, TF Cox, A Banerjee
Anaesthesia, St Helens & Knowsley NHS Trust, Prescot, UK,
*Biostatistics, Liverpool University, Liverpool, UK,
†Anaesthesia, Royal Liverpool University Hospital, Liverpool, UK

Introduction: Spread of local anaesthetic (LA) in the subarachnoid space is effected by various factors, including baricity, dose, volume and specific gravity of the solution, as well as CSF volume, patient position and level of injection. The effect of altering the rate of delivery of LA has been investigated with conflicting results. We investigated in an audit of obstetric patients whether a relationship exists between the speed of injection of LA and any variation in mean arterial pressure (MAP) and heart rate (HR).

Methods: 42 ASA I-II patients scheduled for elective caesarean section were included sequentially between May - July 2011. The standard LA solution used at the Trust was 0.5% heavy bupivacaine, with the addition of either fentanyl 25 mcg (n=21) or diamorphine 300 mcg (n=21) to total 2.5 ml. The operating department practitioners were asked to record the speed of injection of spinal anaesthetic given by the anaesthetist and the number of times barbotage was performed. Relevant information was collected from the anaesthetic charts by a single investigator, including level of injection, sensory level of block to cold, difference in maximum (max) and minimum (min) MAP, BP and HR, dose of phenylephrine, use of vagolytic, presence of nausea or vomiting, and intravenous fluid volume administered. Summary statistics and regression analyses were used to investigate the factors affecting change in MAP, BP and HR.

Results: All spinal blocks were performed with the patient in sitting position. All patients had an estimated spinal level of injection at L3/4, except one which was estimated at L4/5. Patients had similar profiles of sensory blocks of between T2-T5. Blood pressure and HR were documented every 2 minutes. Time for injection varied from 20 to 90 seconds. The regression analyses showed that the time for injection was not significantly related to differences in MAP, BP or HR. Significant regression factors were found for opiate and MAP, (max - min MAP diamorphine 32.3 mm Hg, fentanyl 17.1 mm Hg; P <0.001), opiates and level of sensory block (P=0.008), and level of sensory block and change in MAP (P=0.015).

<table>
<thead>
<tr>
<th>Median (Interquartile range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time for injection (seconds)</td>
</tr>
<tr>
<td>Initial MAP (mm Hg)</td>
</tr>
<tr>
<td>Maximum MAP (mm Hg)</td>
</tr>
<tr>
<td>Minimum MAP (mm Hg)</td>
</tr>
<tr>
<td>Max -min MAP (mm Hg)</td>
</tr>
<tr>
<td>Initial MAP - min MAP (mm Hg)</td>
</tr>
</tbody>
</table>

Conclusion: This audit suggests that a slower rate of injection does not improve haemodynamic stability or reduce requirement for vasopressor in women having a spinal anaesthetic for caesarean section. Data on this relationship is lacking, and a large well conducted randomised controlled trial is needed.

Reference
P137 Elective caesarean section in a patient with a spinal cord cavernoma
P J Morris, N Redfern, S Thomas, J Nissen,*
Department of Anaesthesia, Royal Victoria Infirmary, Newcastle upon Tyne, UK, *Department of Neurosurgery, Royal Victoria Infirmary, Newcastle upon Tyne, UK

Introduction: A 21 year old primigravida presented for elective caesarean section at 37 weeks gestation with a diagnosis of a spinal cord cavernoma at C4/5. She presented with intermittent upper limb neurological symptoms at 13 weeks gestation and an MRI scan revealed the lesion (see below). No imaging of her thoracic or lumbar spine was undertaken.

Figure:

Background: A spinal cord cavernoma is a venous lesion which only occurs in the cord itself and not elsewhere in the spinal canal. The background annual risk of haemorrhage into the cavernoma in non pregnant patients is quoted at 0-4%, average 2.5%. A literature review (case reports only) suggested that pregnancy increases the risk of haemorrhage in cavernous malformations.

Discussion: Rises in systolic pressure are unlikely to disrupt a cavernoma as it is a venous lesion. However there were concerns that changes in transmural pressure might, in theory, be more problematic. A bleed could potentially be catastrophic with risks of spinal cord syndrome including tetraplegia.

After a multidisciplinary discussion, it was decided to deliver the lady by elective caesarean section to avoid risks of haemodynamic changes resulting in haemorrhage into the cavernoma during labour.

Several factors were taken into account in deciding on the safest mode of anaesthesia for elective caesarean section.

Even if she had a further cavernoma lower in her spinal cord, the risk of causing a perforation with a spinal needle at L2/3 or L3/4 would only exist if her spinal cord terminated unusually caudally. However, it was theoretically possible that a dural puncture followed by a dural leak might result in disruption of the cavernoma and subsequent haemorrhage. Therefore it was felt that a spinal would present a greater theoretical risk than a general anaesthetic. General anaesthesia was uneventful and a male baby was delivered in good condition. It was decided to administer a slow intravenous infusion of syntocinon at delivery to avoid sudden rises in venous volume.

Perioperative ultrasound guided local anaesthetic transversus abdominis plane blocks were performed and intravenous opioid analgesics administered. Oral analgesics and morphine patient-controlled analgesia were used postoperatively. Postoperative low molecular weight heparin was omitted and instead, compression stockings, lower limb sequential compression devices and early mobilisation were relied on for thromboembolism prophylaxis. She recovered well and was discharged home on post operative day 3.

Reference
P139 Emergency category one caesarean sections - do checklists help?
RD Miskelijn, GA Goulding
Anaesthesia and Perioperative Medicine, Royal Brisbane & Women's Hospital, Brisbane, Australia

Introduction: Emergency category one general anaesthetic caesarean sections are rare events even at a large teaching hospital. They quite often happen out of hours without a supervising consultant present and are very stressful for anaesthetists. Numerous tasks need to be performed with time pressure and team management making it easy to omit vital steps. Checklists have been used to increase safety in the aviation industry and we aimed to see if the use of a checklist would improve performance and safety in a simulated emergency category one caesarean section. The checklist would be used by trainees, consultants and anaesthetic assistants to prepare for the section. It was designed to increase safety during induction of general anaesthesia with a focus on Plan A - Assessment, Aspiration, Awareness and Airway.

Methods: As this was a pilot study to see whether the checklist was useful, no ethical approval was sought. Two different teams consisting of anaesthetic, surgical, nursing, midwife and support staff were exposed to a simulated emergency caesarean section in a regular operating theatre using a mannequin as the patient. The scenario simulated an immediate threat to life of fetus. It started when the labour room trolley was pushed through the operating complex doors and was completed with initial skin incision by obstetricians. The anaesthetic team consisted of a registrar, anaesthetic assistant and senior registrar as support. The control group were able to perform the simulation using their current best practice while the intervention group was exposed to a checklist prior to the simulation and this was made available throughout the simulation. Comparisons were made by looking at total time taken to complete the simulation and also the number of steps that were completed from a checklist. This was differentiated into registrar or senior registrar initiated. All participants were debriefed at the end of the scenario.

Results: The two groups differed in total time taken to complete the scenario. The control group took 6 min 26 sec while the intervention group completed the scenario in 4 min 58 sec. The control group picked up 18 out of 28 items on the checklist with the registrar initiating 10 and the senior registrar 8. The intervention group picked up 28 out of 28 items with the registrar initiating 22 and the senior registrar 6. Observers noted that the intervention team demonstrated better team behaviours; task allocation, verbalisation and cross checking. Verbal feedback on ease of use of checklist was very positive.

Discussion: In this small pilot study, the use of a checklist dramatically improved the performance of the anaesthetic team. They were able to perform the scenario in a faster time and completed all steps during the scenario. Further study would be needed to identify whether the checklist would have a greater impact for an anaesthetic trainee on their own. The result suggests that a larger study may be warranted and that a checklist with education may improve patient safety during an emergency category one caesarean section especially for junior staff. Our plan is to use the checklist in a poster form in the emergency obstetric theatre and also develop a pocket sized laminated version that could be used as a lanyard card or a smart phone app for easy access.

P140 The use of the Surgical Safety Checklist and thromboprophylaxis prescribing following caesarean section: completing the audit cycle
VE Barlow, D Boregowda, K O’Brien
Dept of Anaesthesia, St Mary's Hospital, Manchester, UK

Introduction: Venous thromboembolism remains a significant direct cause of mortality in the obstetric population. In line with RCOG guidelines our unit uses low molecular weight heparin (LMWH) as part of post operative thromboprophylaxis for patients undergoing caesarean section (CS). Our unit participated in an NPSA pilot study of an obstetric specific Surgical Safety Checklist (SSCL). This had a specific prompt to prescribe thromboprophylaxis as part of the ‘Sign Out’. An audit was performed before and after the introduction of the SSCL (6th June-5th August 2010). The introduction of the SSCL resulted in an increase in LMWH prescribing, but fewer correct prescriptions. We introduced a number of changes as a result: increasing awareness of the guidelines with laminated prescribing information in theatres and recovery, guidance on LMWH prescribing was emphasised during the induction of all new anaesthetic and obstetric trainees and asking the recovery staff to ensure LMWH was prescribed prior to discharge from recovery.

Method: After these changes had been put in place, a prospective audit was performed on patients undergoing CS for the month of April 2011. Data was collected on 68 out of 86 patients undergoing CS (79%).

Results: Following the new interventions, 97% of CS patients had LMWH prescribed before they left recovery. The proportion of correct LMWH prescriptions increased from 24.5% to 51%.

<table>
<thead>
<tr>
<th>Audit</th>
<th>Prior to SSCL use</th>
<th>Using SSCL</th>
<th>Using SSCL and new interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of patients</td>
<td>57/65 (88%)</td>
<td>43/45 (95.6%)</td>
<td>66/68 (97%)</td>
</tr>
<tr>
<td>LMWH prescribed correctly</td>
<td>17/65 (26%)</td>
<td>11/45 (24.5%)</td>
<td>35/68 (51%)</td>
</tr>
<tr>
<td>Missing drug charts/no data</td>
<td>8/65 (12%)</td>
<td>2/45 (4.4%)</td>
<td>2/68 (3%)</td>
</tr>
</tbody>
</table>

The majority of incorrect prescriptions were due to late prescribing of the first post-operative dose, however 89.7% (61/68) prescriptions were within 6 hours of the recommended time frame.

Conclusions: A specific maternity SSCL reminds medical personnel of the need to prescribe LMWH following CS, but further measures are needed to ensure it is prescribed correctly. Recovery staff are a valuable asset in this process, as are suitable aide memoirs in and around the theatre complex. We strongly recommend the use of a LMWH ‘check’ prior to discharge from recovery; this also ensures that midwifery staff are aware of the administration time.

References
P141 A survey of antibiotic prophylaxis for caesarean section in South-West England

DJ Portch, D Thorp-Jones
Anaesthetics, Plymouth Hospitals NHS Trust, Plymouth, UK

Introduction: NICU guidance recommends prophylactic antibiotics given at caesarean section are administered prior to knife to skin (KTS) and that co-amoxiclav is avoided. We were concerned that alternatives would provide adequate cover and that evidence concerning neonatal complications was not relevant to our standard work as it related to premature or high risk neonates and courses rather than single doses. We sought to identify current and future practice in our region.

Method: We carried out an online survey which was distributed to members of our regional obstetric anaesthetic group and anaesthetic departments at each institution. We also contacted consultant obstetricians at our institution. The survey consisted of eight questions relating to grade, place of work, knowledge of NICU guidance, current practice, and decision making processes regarding any completed or planned changes to policy.

Results: We received 74 responses in total with at least one from an obstetric anaesthetic consultant from each hospital in the region. Interestingly of the obstetric anaesthetic consultants surveyed who worked in units who had changed policy as a result of NICU guidance (n=9), two still administered antibiotics after delivery and seven still used co-amoxiclav. In only two of the five hospitals with more than one response from an obstetric anaesthetic consultant, was there universal agreement on choice and timing of antibiotic. In the eight hospitals in total, co-amoxiclav was used by all obstetric anaesthetic consultants in four, two of which planned to change their policy.

Table: Grade of anesthetist and awareness of and compliance with NICU guidelines.

<table>
<thead>
<tr>
<th>Grade of responder</th>
<th>Aware of guideline</th>
<th>Co-amoxiclav avoided</th>
<th>Antibiotics given pre KTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstetric Anaesthetic Consultant</td>
<td>20 (95%)</td>
<td>4 (19%)</td>
<td>17 (81%)</td>
</tr>
<tr>
<td>(n=21, 28%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthetic Consultant</td>
<td>17 (71%)</td>
<td>3 (13%)</td>
<td>18 (90%)</td>
</tr>
<tr>
<td>(n=24, 32%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obstetric Consultant</td>
<td>4 (100%)</td>
<td>0 (0%)</td>
<td>3 (75%)</td>
</tr>
<tr>
<td>(n=4, 5%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Consultant Care Grade (NCCG)</td>
<td>5 (100%)</td>
<td>2 (40%)</td>
<td>5 (100%)</td>
</tr>
<tr>
<td>(n=5, 7%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trainee (n=19, 26%)</td>
<td>14 (74%)</td>
<td>6 (32%)</td>
<td>18 (95%)</td>
</tr>
</tbody>
</table>

Discussion: This survey has identified considerable variation in current and future practice between and within different institutions in our region. Whilst the majority of those surveyed were aware of the NICU guidance, it appears that there is either a lack of understanding or disagreement with the guidance particularly with regard to antibiotic choice. At present half of the hospitals are using co-amoxiclav of which half have no plans to change. It is interesting to note that the lowest rate of giving antibiotics pre KTS out of all grades was by consultant obstetric anaesthetists, whilst the highest rates of compliance with NICU guidance were observed with trainees and NCCGs.

Reference

P142 A survey of pharmacological uterotonic use for caesarean sections at a district general hospital

S Saha, R West, J Mukherjee
Department of Anaesthesia, Barnet General Hospital, Herts, UK

Introduction: Our hospital has no standardised protocol for the administration of pharmacological uterotonics for caesarean sections. The aim of the survey was to assess whether this would reflect wide variability amongst different clinicians.

Methods: Over an eight week period, the attending obstetric anaesthetists were requested to complete a proforma for each caesarean section performed. Data collected included grade of delivery, uterotonics administered and by which route.

Results: Data was collected from 94 cesarean sections (25 elective, 69 emergency). The commonest uterotonics used were 5 units of syntocinon intravenous (IV) bolus, 40 units of syntocinon (40) as an infusion at 10 units/hour and intramuscular (IM) syntometrine 5/500 (SM). Numbers of patients in each category are given below.

<table>
<thead>
<tr>
<th>Synto5</th>
<th>Synto5+40</th>
<th>Synto5+40+SM</th>
<th>SM+40</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>48</td>
<td>13</td>
<td>9</td>
<td>18</td>
</tr>
</tbody>
</table>

The combinations of uterotonics falling into the “other” category were varied. Twelve used a 5 unit bolus of syntocinon followed by the syntocinon infusion in combination with other uterotonics: ergometrine 500 mcg IM was used 4 times, haemabate IM twice, syntometrine with haemabate intrauterine (IU), syntometrine with haemabate IM, syntometrine with haemabate IU and misoprostol, syntometrine with haemabate IM and misoprostol, syntometrine and misoprostol and just misoprostol in addition to the 5 units syntocinon and infusion were all given once. Syntometrine IM with the syntocinon infusion and other uterotonics was used 5 times: thrice with IM haemabate and once each with haemabate IM followed by IU and haemabate IU alone. Once a 10 unit bolus of syntocinon was followed by the infusion.

Conclusion: The results of the survey suggest that uterotonics prescribing following caesarean section is inconsistent both in terms of type of drugs and route of administration. The high rate of administration of IM drugs vs. IV as first line has the disadvantage of a slower onset of action for both pharmacological and physical (opportunity to delve under the drapes at a suitable moment) reasons which may result in requests for additional uterotonics. Syntometrine may cause more side effects than syntocinon alone and its routine IM administration results in unnecessary additional injections. Syntocinon as an IV bolus together with IM syntometrine was given to 18 patients with various other uterotonics. This combination results in a high syntocinon bolus dose which is no longer recommended except in extreme circumstances. Following the results of the survey the obstetric and anaesthetic teams have introduced a joint local guideline for the use of pharmacological uterotonics for caesarean sections. It takes a stepwise, standardised approach to uterotonics management allowing for optimised drug administration and improved preparedness of the team for management of poor uterine tone.

Reference
P143 Antibiotic Timing at Caesarean Section, Multidisciplinary Opinion

KR McIlmoyle, S Young
Anaesthetics, Glasgow Royal Infirmary, Glasgow, UK

Introduction: Traditionally, caesarean section prophylactic antibiotics are administered post-cord clamping, to avoid antibiotics being transmitted to the fetus. Recently the International Journal of Obstetric Anaesthesia published an editorial, and NICE and the American College of Obstetricians and Gynaecologists produced guidelines advocating antibiotics should be given pre-skin incision [1,2]. In the West of Scotland the majority of hospitals still give antibiotics post-cord clamp. We sought the opinion of neonatologists, anaesthetists and obstetricians to administering antibiotics pre-incision.

Methods: We surveyed consultant obstetric anaesthetists, obstetricians and neonatologists in three maternity centres that cover Greater Glasgow and Clyde and approximately 15,000 births.

Results: 69 consultants surveyed, 15 neonatologists, 26 obstetricians and 28 anaesthetists.

Table 1: Consultants opinion to antibiotic timing

<table>
<thead>
<tr>
<th>Anaesthetists</th>
<th>Obstetricians</th>
<th>Neonatologists</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>Pre-incision</td>
<td>41</td>
<td>62</td>
<td>7</td>
</tr>
<tr>
<td>Post-cord clamp</td>
<td>31</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>No strong view</td>
<td>24</td>
<td>12</td>
<td>67</td>
</tr>
</tbody>
</table>

Reasons consultants chose post-cord clamp (more than one answer could be chosen):

- Harm caused to neonate by antibiotics - 50%
- Masking sepsis in neonate - 50%
- Anaphylaxis while fetus still intra-uterine - 39%
- Thiopentone drug error risk - 33%
- Too busy pre-incision - 28%

Discussion: There is still major opposition to pre-incision antibiotic administration. Only 42% of consultants actively support the new pre-incision guidelines. Most consultants who did not have a strong view stated there was not enough evidence to prove pre-incision antibiotics were superior, but some were unable to comment due to lack of knowledge. Most resistance was from neonatologists who do not believe enough research has been done with the available antibiotics to determine the possible short and long-term effects of antibiotics on neonates. The three commonest reasons for opposing pre-incision antibiotics were neonatal complications. Unsurprisingly, the obstetricians, who deal with the complications of caesarean section infection were most positive towards a change in protocol, however, 27% still opposed a change and 12% were undecided on current evidence. From this survey it appears many consultants still have reservations to pre-incision antibiotics, many seek further research with the available antibiotics, and their short and long-term effects on the neonate.

References

P144 A case of post-partum meningitis following combined-spinal epidural: could the use of septic screening tool have prevented this?

SJ Wilson, A Sabharwal, GM Stocks
Department of Anaesthesia, Queen Charlotte’s and Chelsea Hospital, London, UK

Introduction: Meningitis is a rare complication of regional analgesia but the recognised presence of systemic sepsis is a relative contra-indication. We report a case of a seemingly well patient who underwent a combined spinal epidural (CSE) in late labour and subsequently developed meningitis. Further questioning post diagnosis, revealed our patient had 3 ‘red flag’ symptoms for developing sepsis which in hindsight may have deterred us from using a CSE technique.

Case: A 31yr old, 35/40 week pregnant multiparous woman presented to the labour ward having had a spontaneous rupture of membranes (SRM) at home 2hrs earlier. Her baseline observations were unremarkable. A CSE was performed under full asepsis (hat, gown, mask, gloves and chlorhexidine 0.5% spray). She delivered 10 minutes later. 14hrs later, she complained of a headache, neck stiffness and shoulder pain and later became pyrexial. Bloods and a septic screen were performed and intravenous (IV) antibiotics started, in accordance with hospital protocol. 7hrs thereafter, she vomited, developed neck stiffness and had a fluctuating level of consciousness. There was a high suspicion of meningitis and IV Ceftriaxone was commenced. Computer tomography (CT) scan of her head was normal and a lumbar puncture performed revealed turbid cerebrospinal fluid (CSF) containing gram positive cocci.

Further questioning revealed that she had suffered with diarrhoea and vomiting the week before and had woken with a sudden onset occipital headache prior to labour, which had not resolved.

Both the blood cultures and CSF grew Streptococcus salivarius and despite a rapid clinical improvement within 24 hrs, she continued to have refractive headaches and intermittent pyrexia, resulting in a 2 week hospital admission, after which was discharged.

Discussion: The routine use of CSE in labour is controversial due to the potential introduction of bacteria into the CSF. However, in this scenario with imminent delivery, the spinal component may have been adopted by many anaesthetists. With the benefit of hindsight this patient had 3 ‘red flag’ symptoms- diarrhoea, vomiting and sudden onset headache- which, if a septic screening tool had been used, may have prevented the use of a CSE and subsequent meningitis.

Strep salivarius is a known commensal in the oral cavity, gastrointestinal and genitourinary tract. It is often dismissed as contaminant when isolated from culture but has been found to cause a full-blown purulent meningitis within 7-24hrs of introduction into the CSF. The exact source of the organism is unknown in this case. In view of the strict aseptic technique used and the presence of prodromal symptoms in the preceding week, it is possible that the origin of the Strep. was from the patient’s own bloodstream.

References
1. Reynolds F. Infection as a complication of neuraxial blockade. IJOA (2005) 14, 183-188
P145 A survey of level of awareness of the diagnosis and treatment of maternal sepsis in a medium sized maternity unit

T B Livingstone, A Shetye, K Srinivas
Department of Anaesthesia, University Hospital Lewisham, London, UK

Introduction: The Confidential Enquiries into Maternal Deaths (2006-2008) highlighted that sepsis is now the commonest cause of direct maternal death in the UK. The report made specific recommendations for professionals aimed at improving identification and treatment of sepsis. In response to this we conducted a local survey to ascertain the level of awareness about sepsis during pregnancy in our maternity unit of 4000 deliveries per year.

Method: A questionnaire was designed with questions assessing knowledge of various aspects of sepsis during pregnancy based on the critical factors presented in the 'Saving Mothers' lives' report. It included the most common source of sepsis, signs and symptoms, timing and route of antibiotics and information given to patients. It was completed by all grades of midwives, obstetricians and anaesthetists.

Results: In total, 57 questionnaires were completed with a 100% response rate. The table below outlines the correct responses for knowledge about the leading cause of death and source of sepsis.

<table>
<thead>
<tr>
<th>Correct response</th>
<th>Obstetricians (n=17)</th>
<th>Anaesthetists (n=19)</th>
<th>Midwives (n=21)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leading cause of death</td>
<td>10 (58%)</td>
<td>16 (84%)</td>
<td>10 (47%)</td>
</tr>
<tr>
<td>Leading source of sepsis</td>
<td>13 (76%)</td>
<td>12 (63%)</td>
<td>6 (28%)</td>
</tr>
</tbody>
</table>

The ability of participants to correctly identify symptoms and signs consistent with maternal sepsis was similar in all participant groups. Less than 10% mentioned diarrhoea, vomiting and abdominal pain as symptoms suggesting a diagnosis of genital tract sepsis. With regards to abnormal observations, 42% recognised that a blood pressure < 90mmHg and heart rate > 100bpm, a respiratory rate > 20 (54%) and hypothermia (19%) would be compatible with sepsis during pregnancy. Encouragingly, 89% of participants would give intravenous antibiotics within one hour of a diagnosis of possible sepsis.

Discussion: The results of this survey indicate that our knowledge of maternal sepsis is less than satisfactory, which we feel is likely to be the case nationwide. The survey was done approximately six months after the report was published and suggests there are issues with the assimilation of it's key findings and guidance at a local level. As an initial response to the findings of our survey we intend to deliver a multidisciplinary teaching program focusing on the trainee doctors and midwives who have first contact with our patients. We also intend to produce robust local guidelines on the diagnosis and management of maternal sepsis. This questionnaire can be used as an audit tool to evaluate an improvement in future.

Reference

P146 Admissions to intensive care of peri-partum women: a retrospective case review with a focus on sepsis

CG Jones, RE Collis
Dept of Anaesthetics, University Hospital of Wales, Cardiff, UK

Introduction: Genital tract sepsis was the most common cause of direct maternal death in the triennium 2006-2008 report of the confidential enquiry into maternal deaths in the UK and substandard care was found in 70%. International guidelines for the management of severe sepsis and septic shock have been widely embraced and the needs of pregnant or peri-partum critically ill women have been highlighted. A retrospective audit was performed to identify the total number of pregnant or peri-partum women admitted to the intensive care unit (ICU) over a nine year period and a case-notes review undertaken in those admitted with a primary diagnosis of sepsis.

Methods: From January 2003 to December 2011 maternity admissions were identified from the ICU admissions database and cross-referenced against the maternity database. Case notes for all women admitted to ICU as a result of sepsis (puerperal and chest) were then scrutinised against surviving sepsis guidelines.

Results:
91 women were admitted to the ICU whilst pregnant or in the peri-partum period. Of these, 16 were admitted as a result of sepsis either genital tract or chest (including H1N1), making infection the second most common reason for admission. Two women died, one of chest and one genital sepsis. Examination of case notes found that the two most common problems in treatment were late recognition of septic shock with fewer patients having an early serum lactate and fluid resuscitation without central venous monitoring which may have contributed to pulmonary oedema and respiratory failure.

Discussion: Whilst admissions to ICU as a result of sepsis are small, examination of the case notes has highlighted difficulties in the diagnosis and subsequent management of this group. More prompt and frequent determination of serum lactate and earlier instigation of CVP monitoring is required to achieve early goal-directed resuscitation. There is limited evidence that surviving sepsis guidelines have been instituted and this must be a priority to reduce morbidity and mortality in our hospital.

References
2. Surviving sepsis campaign www.survivingsepsis.org
3. Providing equity of critical and maternity care for the critically ill pregnant or recently pregnant women July 2011
P147 Streptococcus endocarditis following evacuation of retained products of conception

B Shukla, A Surendran
Anaesthetics Department, The Queen Elizabeth Hospital, King’s Lynn, UK

Introduction: Evacuation of retained products of conception (ERPC) are performed routinely with few complications. We report a rare and serious case of endocarditis following ERPC.

Case report: A 39 year old primiparous woman presented with a history of non specific symptoms and pyrexia two weeks after ERPC for a missed miscarriage. Raised inflammatory markers with sinus tachycardia suggested infection and broad spectrum antibiotics were commenced. Neurological deficits manifested clinically prompting an urgent MRI, which showed an acute pontine infarct. Subsequent transoesophageal echocardiography confirmed aortic root vegetation and root abscess with a bicuspid aortic valve (figure 1). Group G streptococcus was grown from blood cultures. An intense course of antibiotics and rehabilitation has improved her neurological deficit although speech and motor functions remain impaired.

Figure 1: Echocardiogram showing aortic root abscess (A) and aortic vegetation (V) on a bicuspid aortic valve (B).

Discussion: Sepsis continues to remain a major cause of maternal deaths.1 The main organisms implicated are commensals of the female genital tract. Cardiac disease is the leading cause of maternal deaths in the United Kingdom.2 Bicuspid aortic valves present in 1-2% and often undetected, remain the single most important cardiovascular risk factor.2 Endocarditis remains a rare yet potentially fatal complication of instrumentation for ERPC. Current guidelines recommend antibiotic prophylaxis for women requesting abortions,3 or those considered high risk.4 We propose the need for thorough antenatal screening and consideration for routine antibiotic prophylaxis for all ERPCs to minimise the risk of sepsis and occurrence of untoward sequelae.

References
3. Royal College of Obstetrician and Gynaecologists. The care of women requesting induced abortion. Evidence-based clinical guideline 7: RCOG 2004

P148 Airway assessment on the labour ward

N Alexander, C A Theodosiou
Simpson Centre for Reproductive Health, Royal Infirmary, Edinburgh, UK

The infrequent use of general anaesthesia in obstetrics coupled with the increased incidence of difficult intubation in this patient population require the anaesthetist to be as prepared as possible for potential intubation.1 2 Time is often limited in situations where general anaesthesia is required. At our institution a full anaesthetic assessment including detailed airway assessment should be performed for all patients seen by an anaesthetist on labour ward, whether administering labour analgesia or anaesthesia. This information is recorded on one chart with sections for anaesthetic assessment, labour analgesia, theatre and recovery.

Methods: We reviewed the anaesthetic charts of all patients who had undergone any anaesthetic intervention on the labour ward. We collected data on patient demographics, ASA grade, anaesthetic intervention, delivery details, medical history, body mass index at booking and details of airway assessment. We rated the adequacy of airway assessment as “nothing recorded”, “scant”, “moderate” or “comprehensive” according to how many of the six areas were completed. Data was collected over a one month period and was analysed using Microsoft excel.

Results: The anaesthetic charts for 103 patients were reviewed. Most patients were ASA grade 1 or 2. Average body mass index at booking was 25 Kg/m2 (range 18.5-52). First anaesthetic intervention was an epidural for labour analgesia for 44 cases (43%), spinal anaesthesia for 52 (50%), combined spinal epidural anaesthesia for two (2%) and a general anaesthetic for five (4.8%). Twelve patients (11.7%) had a predicted potentially difficult intubation.

Table: Adequacy of airway assessment

<table>
<thead>
<tr>
<th>Airway assessment</th>
<th>Number of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nothing recorded</td>
<td>9 (9)</td>
</tr>
<tr>
<td>Scant</td>
<td>3 (3)</td>
</tr>
<tr>
<td>Moderate</td>
<td>19 (18)</td>
</tr>
<tr>
<td>Comprehensive</td>
<td>72 (70)</td>
</tr>
</tbody>
</table>

Discussion: This audit demonstrates that a high proportion of patients in our institution undergo a comprehensive airway assessment by an anaesthetist at the earliest opportunity on labour ward and that a significant number of patients are potentially difficult intubations. This allows a strategy to be planned ahead of time should intubation be required during the course of labour, delivery or postpartum. The use of a single chart allows this information to be readily accessed by anaesthetists involved at any later stage on labour ward. In our institution we aim to introduce a tutorial for all new obstetric anaesthetists and then re-audit our airway assessments. We would recommend that all patients undergo an anaesthetic assessment including a comprehensive airway assessment at the point of first interaction with an anaesthetist on labour ward.

References
P149 An audit to monitor the adherence to local guidelines for aspiration prophylaxis of parturients determined to be high risk of emergency caesarean section in labour ward

A Mehta, L Emanuel-kole, A McG Glenn
Anaesthetics, Royal Free Hospital, London, UK

Introduction: Parturients are at increased risk of aspiration which may lead to fatal consequences. Although use of regional anaesthesia in obstetrics has increased mortality and morbidity continues to feature (CEMACE 2006-2008 “Saving Mothers Lives”(UK) ). Currently aspiration prophylaxis is only provided in high risk parturient according to local guidelines. These guidelines comprise of dietary restrictions and administration of H2 receptor blocker (Ranitidine) 150 mg orally every six hours.

Methods: A prospective audit was carried out in the maternity unit of our hospital from 1st July 2011 to 1st August 2011. Patients stratified as high risk were identified through standard criteria: BMI>35, previous caesarean section, diabetes mellitus, suspicious CTG, previous anesthetic problem, pre-eclampsia, hiatus hernia. Data was collected on pregnancy details, feeding status, prescription of acid prophylaxis, mode of delivery, type of anesthesia and whether acid prophylaxis regime was corrected followed. Elective caesarean section were excluded.

Results: Out of 200 patients screened (Normal vaginal delivery, instrumental delivery, emergency caesarean section) 34 high risk patients were identified. 8/34 (23%) had ranitidine, 20/34 (58%) had dietary restrictions which suggest poor compliance with existing guidelines.

Of the high risk identified, 11/34 (32%) had emergency LSCS, 5/34 (14%) instrumental delivery, 1/34 (2.9%) manual removal of placenta. 17/34 (50%) normal vaginal delivery. Emergency general anaesthesia was undertaken in 2 patients due to failure of epidural top-up, of whom only one was prescribed ranitidine.

Conclusion: While pulmonary aspiration in parturient undergoing general anaesthesia is rare, it is potentially fatal and life threatening condition. Effort is warranted by all involved in the care of these women to ensure 100% compliance. Re-education of maternity staff regarding aspiration prophylaxis and early anesthetic involvement is recommended in high risk groups

Reference

P150 Iatrogenic tracheal rupture following elective caesarean section - surgical repair or conservative treatment?

DM Dabrowska, A Alfonso, P Kukreja, K Aravindh
Department of Anaesthesia and Intensive Care, West Middlesex University Hospital, Isleworth, UK

Introduction: Tracheal rupture is a very rare but potentially life-threatening lesion and a delay in the diagnosis and treatment leads to a poor outcome. We present a case of a morbidly obese obstetric patient who suffered an iatrogenic tear of the trachea following an intubation during an elective caesarean section.

Case Report: A 40 year old multigravida was admitted to our labour ward in preparation for an elective caesarean section. She was morbidly obese with BMI of 51 and suffered from diabetes and essential hypertension. Despite being fully advised of all the risks related to general anaesthesia, the patient strongly refused a neuraxial block and opted for a general anaesthesia instead. Rapid sequence induction with thiopentone, sux methonium and cricoid pressure was performed. Two attempts of the tracheal intubation with gum elastic bougie were made by a junior anaesthetist with no success, followed by a successful attemp by a supervising senior anaesthetist. Apart from an initial drop in oxygen saturation, the patient remained stable throughout the procedure and was extubated uneventfully and transferred to the postnatal ward. Eight hours later she became hypoxic, tachycardic and had two episodes of hemoptysis. The working diagnosis of pulmonary embolism was established and a V/Q scan was arranged. However, after the patient was assessed by another senior anaesthetist, a clinical suspicion arose that an iatrogenic tracheal injury had occurred. This was rapidly confirmed by a CT scan, which revealed a 1cm long tear in the anterior tracheal wall and the presence of the pneumomediastinum. The patient was promptly referred to the cardiothoracic surgeon who suggested conservative treatment. Subsequently she made a good recovery with no further episodes of hypoxia or hemoptysis and after a second scan confirmed that the pneumomediastinum had resolved, she was discharged home.

Discussion: Iatrogenic tracheal tear is a rare complication of orotracheal intubation and is associated with high morbidity and mortality. Often the clinical manifestation is not immediately obvious, and presentation can mimic that of the other conditions1. An early diagnosis, confirmed by bronchoscopy or imaging leads to a better prognosis. Early surgical repair of the lesion is considered the mainstay of treatment, however there is a growing evidence that conservative treatment should be a treatment of choice in cases of ruptures less than 2 cm long in patients with non-progressive symptoms2. We believe that because of the limited exposure of the trainees to general anaesthesia in obstetrics, it is vital that junior anaesthetists became familiar and undergo regular training in failed intubation drills. This can be facilitated by the use of a simulator.

References
P151 A positive effect of the audit loop. Patient safety has increased as a result of auditing the monitoring standards against NICE guidelines for patients receiving intrathecal diamorphine for caesarean section

P Yoxall, MC Entwistle
Department of Anaesthesia, Whiston Hospital, Liverpool, UK

Introduction: In 2008 we began to evaluate observations recorded for patients undergoing caesarean section with intrathecal diamorphine analgesia. The standard of monitoring was judged against that recommended by NICE guidelines (2004), which is also the blueprint for the trust policy. Notably, the side effect of respiratory depression is the key side effect which prompts the minimum monitoring standards. In 2009 the audit was repeated, and once again in 2011. Patient safety has undoubtedly been increased as year on year the monitoring standards have improved.

Method: All categories of caesarean section were evaluated for each of the audits for the years 2008, 2009 and 2011. For each audit around 40 cases were reviewed (randomly allocated, or by assessing a period of one month). Pulse rate, blood pressure, respiratory rate (RR) and oxygen saturation (SpO2) taken at 5 minute intervals for 30 minutes in recovery then half hourly for 2 hours and hourly for 10 hours on the ward(1) constitute the minimum requirements (more frequent observations as per clinical need), as such overall compliance to hospital policy were assessed.

Results: Withdrawal of diamorphine from intrathecal use ensued after overall ward monitoring compliance rates (ranges for all obs) exceeded no more than 0 to 26% and 0 to 55% respectively in 2008 and 2009. Results for the recovery area 76 to 83% and 2 to 80% respectively. Efforts to educate staff and an introduction of a three page observation chart specific for those patients who have received intrathecal diamorphine, with guidance on its application, resulted in the re-introduction of diamorphine thereafter. The 2011 audit was anxiously awaited. 42 patients in December 2011 had diamorphine spinals, 38 sets of notes were available for review. Compliance rates are now in the range of 69 to 100% on the maternity ward. Charts revealed a number of features, 10% of charts have absent observations around 20:00 hours, and ticks are often used instead of numbers for documenting RR and SpO2. Respiratory rates are the least likely to be documented of any observation.

Conclusion: The audit loop can be valuable. With this particular audit the fallout from embarrassing results lead to a degree of inter-disciplinary tension. According to NICE guidelines for caesarean section, 0.3 to 0.4mg of diamorphine should be given with sub-arachnoid block as it reduces the need for supplementary analgesia (2). With the positive impact of education and usable clinical tools, patient safety ultimately was improved and patients can receive what is perceived to be the optimum method of pain relief for caesarean section in this trust. Education on the correct filling out of observation charts continues. Good, simple audit can be effective.

References
1. NICE guideline CG 132 caesarean section, section 1.6.2.2
2. NICE guideline CG 132 caesarean section, section 1.6.3.1

P152 Enhanced recovery in obstetrics

D Mallabar, J Rajagopalan, S Vause, K O’Brien, K MacLennan
St Mary’s Hospital, Central Manchester Foundation Trust, Manchester, UK

Introduction: Enhanced Recovery After Surgery (ERAS) has been shown to reduce length of stay and complication rates in open colorectal surgery without compromising patient safety. There is evidence that these benefits are transferable to other surgical settings. At present there is no published data on ERAS in obstetric practice.

Method: We conducted a survey of patients following caesarean section (CS). Data was collected on pre-operative fasting times, first oral intake, time of urinary catheter removal and mobilisation. We also documented maternal attitudes towards mobilisation, desired oral intake and expected length of stay (LOS).

Results: 51 responses were obtained from patients undergoing emergency CS (63%) and elective CS (37%). Mean fasting times were 8.5 hours for elective CS and 4.4 hours for emergency CS. The time to first oral intake was 4.3 hours for elective and 6.7 hours for emergency CS. 53.1% of emergency and 36.8% of elective CS patients felt that they could have resumed their oral intake earlier. The mean time to urinary catheter removal was 22.7 hours for elective and 25.9 hours for emergency CS patients. The time to first mobilisation was 24.6 hours for all CS patients. 17.6% of respondents felt they could have mobilised sooner. 63% of respondents requested additional analgesia with 18% reporting that it did not arrive as quickly as they wanted. The expected LOS was 3.25 days for elective and 3.56 days after emergency CS. Actual LOS was 5 days for all CS patients.

Discussion: Our survey identified several areas where ERAS principles can be applied. A dedicated midwife provides elective CS patients information leaflets which have been amended to include details of required fasting times, the theatre process, post-operative oral intake, catheter removal, mobilising, self medicating and expected discharge at 48hrs. The expectation is that patients become partners in their own care and are involved in working towards planned discharge at 48 hours. Patients are now provided with a snack box on return to the ward. The delay in post-operative mobilisation was related to urinary catheter removal. Catheters are now routinely removed 6 hours post CS. Physiotherapy involvement begins on the first post-operative day. Self medication packs have been provided to ensure adequate and timely analgesia. We hope our interventions result in improved patient experience, better clinical outcomes, reduced LOS, improved use of resources and ultimately reduced costs.

References
P153 Hypotension following transfer to recovery post caesarian section

JN Moore, S Kanakarajan
Dept. of Anaesthesia, Grampian University Hospitals NHS Trust, Aberdeen, UK

Introduction: All patients currently undergoing LSCS under spinal anaesthesia in Aberdeen Maternity Hospital are commenced on a Phenylephrine infusion, the rate of which is adjusted according to systolic blood pressure (SBP). Following completion of LSCS patients are transferred to recovery and this period of transfer is unmonitored. This study assessed phenylephrine requirements, the performance of unmonitored periods during patient transfer and factors associated with hypotension post transfer.

Methods: Data was collected by anaesthetic and recovery staff for a random selection of patients undergoing elective LSCS. Details regarding the surgery, anaesthetic technique and the final three blood pressure recordings in theatre and first three recordings in recovery were recorded.

Results: Data was collected for 44 patients undergoing elective LSCS under spinal (Mix 20mg Levobupivacaine + 0.5mg Diamorphine; 40/44 received 3mls; block T2-T4 (T2=8, T3=34, T4=2)), with mean age 32 years (21-44) and mean BMI of 28 (20-39), operating time 70 minutes (40-75), average blood loss 566mls (100-1600mls), and fluid infusion 1500mls crystalloid (800–2500mls) with 1 patient receiving colloid. All patients received Phenylephrine 100mg/ml infusion with a mean requirement of 2.4 mg (0.5-7mg) to maintain blood pressure. This was discontinued on average 19 minutes prior to discontinuation of monitoring for transfer. Unmonitored time during transfer ranged between 8 and 20 minutes with a mean of 13 minutes. A drop in SBP>10% post transfer was noted in 30% (13/44). Average drop in SBP was 13%. Blood loss (526mls: 275-850mls), fluid infused (1300mls crystalloid, range 800mls-1500mls), Phenylephrine discontinuation time (21 minutes; 5-50mins) and unmonitored transfer time (15 minutes) in these patients were similar to overall. Average BMI was higher (34 v 28) and drop in SBP post transfer and increasing phenylephrine requirements intra-operatively to maintain SBP correlated with a higher BMI (Figure 1).

| Body Habitus (BMI) | No. of Patients | Mean Phenylephrine Requirements (mg) % Patients with drop SBP (No. Patients) |
|-------------------|----------------|------------------------------------------------|-----------------|
| Normal (<25)      | 12             | 1.7                                           | 0 (0)           |
| Overweight (25-29)| 14             | 2.1                                           | 21 (3)          |
| Obese (30-34)     | 13             | 3                                             | 38 (5)          |
| Morbidly Obese (>35) | 5             | 3.6                                           | 100 (5)         |

Figure1. Reduction in SBP following transfer to recovery and phenylephrine requirements by BMI.

Conclusions: Unmonitored periods for transfer to recovery are typically less than 20 minutes. Approximately 1/3 of patients will have a reduction in SBP following transfer, of usually 10-15%. The likelihood of a reduction in SBP following transfer is associated with an increased BMI and Phenylephrine requirements to maintain SBP during LSCS under spinal anaesthesia also increase with increasing BMI.

P154 Length of hospital stay after intrathecal diamorphine for caesarean section: an impact study.

RK Puttaswamy, B Das, M Hodges, R Hodgson, P Moore
Anaesthetics, Birmingham Womens Hospital, Birmingham, UK

Introduction: Intrathecal fentanyl and diamorphine are both widely used for caesarean section (CS). The National Institute of Clinical Excellence (NICE) recommends the use of diamorphine due to its enhanced postoperative analgesic effect compared with fentanyl [1]. However, the length of hospital stay after each drug has not been extensively investigated. A change of standard technique from using intrathecal fentanyl to intrathecal diamorphine after all CSs at Birmingham Women’s Hospital in November 2011 provided the opportunity to perform an impact study examining length of postoperative hospital stay. Data was also collected on time to first mobilisation and urinary catheter removal, total morphine consumption in the first 24 hours and rates of nausea, vomiting and pruritus.

Methods: Data was prospectively collected for sequential elective and emergency CSs carried out between Monday and Thursday for a period of 7 weeks immediately before and after the change of practice. Procedures on a Friday and at the weekend were all excluded due to data collection issues. In order to avoid bias, the time of hospital discharge was extracted in a standardised way from the records kept by the midwives, who were unaware of the audit. The fentanyl group (F) included a total of 112 cases. Data collection is still in progress for the diamorphine group (D), with 36 cases completed at the time of abstract submission and the full sample expected to include approximately 100 women.

Results:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Fentanyl (n=112)</th>
<th>Diamorphine (n=36)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean time for Mobilisation</td>
<td>20.98 Hrs (0.89)</td>
<td>20.43 Hrs (0.85)</td>
</tr>
<tr>
<td>Mean time for Catheter</td>
<td>21.24 Hrs (0.88)</td>
<td>20.75 Hrs (0.86)</td>
</tr>
<tr>
<td>Mean time for Discharge</td>
<td>74.10 Hrs (3.13)</td>
<td>57.77 Hrs (2.41)</td>
</tr>
<tr>
<td>24 hour Morphine</td>
<td>70.18 mg</td>
<td>53.61 mg</td>
</tr>
<tr>
<td>Nausea</td>
<td>10.7%</td>
<td>20%</td>
</tr>
<tr>
<td>Vomiting</td>
<td>8.9%</td>
<td>17.14%</td>
</tr>
<tr>
<td>Pruritus</td>
<td>16.9%</td>
<td>82.8%</td>
</tr>
</tbody>
</table>

Discussion: Our finding of a reduced hospital stay of 0.72 days after intrathecal diamorphine may have important implications for units still using intrathecal fentanyl. Although non-randomised, the effect of confounding variables would be expected to be less in an impact study than a normal audit, and our result suggests that further research into this effect is warranted. We conclude that the use of diamorphine as the standard intrathecal opioid after CS is already justified by the longer duration of post operative analgesia and reduced opioid requirement in the first 24 hours[2], but our finding of an earlier hospital discharge also has implications for hospital productivity.

References
1. NICE Guidelines: Clinical Guidelines 13; April 2004
2. C M Cowan, J B Kendall. Comparison of intrathecal fentanyl and diamorphine in addition to bupivacaine for caesarean section under spinal anaesthesia. BJA 2002; 89(3); 452-8.
P155 Pain scores are higher when doing a formal evaluation than on routine follow up

R Goyal, C Meer, IJ Wrench
Department of Anaesthesia, Sheffield Teaching Hospitals
NHS Trust, Sheffield, UK

Introduction: The provision of high quality post operative analgesia is an imperative peri-operative goal for anaesthetists and for patients.1 To ensure that patients receive optimal analgesia, it is necessary to continuously update and assess practice. In many obstetric centres, including ours, this is done by routine follow-up. However, pain assessment is often just one part of this follow-up. Our aim was to carry out a service evaluation that assesses pain alone, and to compare the results with those from the routine follow-up.

Methods: For our service evaluation we saw 135 patients over a period of 6 months. We asked them to rate their average post operative pain as nil/mild/moderate/severe (as for our routine follow up). We compared this data with that collected separately by routine follow-up over the same period.

Results: We found that pain scores from the service evaluation were significantly higher than those at routine follow-up. (p<0.001, Chi square).

Figure 1: Post operative pain scores as assessed by routine follow-up and a service evaluation.

Conclusions: Routine follow-up under estimates the amount of pain patients experience after caesarean section. If this information is used to guide pain management, practice may be sub-optimal. Our service evaluation of pain has provided us with a more accurate picture and informed changes in our pain management practice.

Reference

P156 Post caesarean section shoulder tip pain

R Vedantham, R Ayyash, M Mushambi
Department of Anaesthetics, Leicester Royal Infirmary, Leicester, UK

Introduction: Pain is a problem after caesarean section. The Royal College of Anaesthetists recommends that > 90% of women should have a pain score of ≤ 3 and should be satisfied with their pain management.1, 2. During routine postoperative follow up of patients who underwent a caesarean section, it became apparent that shoulder tip pain is a common complaint. We therefore undertook a survey in our unit to determine the incidence and severity of post caesarean-section shoulder tip pain.

Material and methods: We carried out a prospective survey on all patients who had a caesarean section between 1st May 2011 and 15th July 2011. Patients were followed up post operatively and those who complained of shoulder tip pain were provided with a questionnaire. Patients with musculoskeletal pain were excluded from the survey. Patients were followed up on a daily basis until they were pain free and those who were discharged home with shoulder pain had a weekly telephone follow up.

Results: A total of 311 patients were surveyed (115 electives and 196 emergencies). 22 patients (7%) complained of right-sided shoulder tip pain. Onset was intraoperative in 4 patients and on the first postoperative day in 18. Pain resolved on the second postoperative day in 15 patients and on the third postoperative day in 4. In 3 patients, pain subsided over a period of one week. 11 patients (50%) experienced mild pain with worst pain scores of ≤3 (on a VAS scale of 0-10) and eight patients (36%) had moderate pain with scores of 4-6. Three patients (14%) had severe pain with scores of ≥7. Six patients were dissatisfied with their pain management, resulting in delayed discharge in 2 patients. Twenty mothers (90%) were unaware of this complication following caesarean section, while two (10%) had read about this on Internet forums.

Discussion: Our survey found that post-caesarean shoulder tip pain is a problem, with 3.5% of patients experiencing moderate to severe pain. These patients required multimodal analgesia. Shoulder tip pain is common after laparoscopic surgery3 and also occurs in conditions causing intraperitoneal bleed such as ruptured ectopic pregnancy. Following caesarean section, shoulder tip pain may be due to irritation of the diaphragm by air, blood or amniotic fluid. The small survey population and lack of information on intraoperative patient positioning (apart from left lateral tilt) have limited the findings of our survey.

Conclusion: The incidence of shoulder tip pain after caesarean section is 7% in our unit. Although moderate to severe pain is not common (3.5%), when it does occur, it can be very distressing for the patient and can prolong their hospital stay. We recommend that patients and clinicians should be made aware of this complication to allow early recognition and treatment. We feel that there is scope for further research on various aspects of shoulder tip pain, which may help minimise occurrence and improve management of this complaint.

References
P157 Subcutaneous cannula for morphine administration after lower segment caesarean section - more trouble than it's worth

I Kanellopoulos, R Goyal, IJ Wrench
Department of Anaesthesia, Jessop Wing Hospital, Sheffield Teaching Hospitals, Sheffield, UK

Introduction: In our unit we use spinal and epidural diamorphine in theatre and regular post operative NSAIDs for analgesia post caesarean section. We also (as with other units) use morphine administered via an abnormally sited subcutaneous cannula (SCC) for breakthrough pain. Our rationale in using an SCC is to save the discomfort of repeated intramuscular injections. There was some anecdotal evidence that this was not the benign method of drug administration that we had believed it to be. We therefore performed a service evaluation to assess the incidence of problems.

Methods: We interviewed seventy-six mothers who had undergone caesarean section with only a minority being under general anaesthesia. We enquired regarding SCC related discomfort and frequency of use. We also examined the cannula sites for evidence of local inflammation such as erythema.

Results: The SCC was not used in 60 (79%) cases. In all, there were 48 women (63%) who had either pain (usually mild) or erythema related to the SCC as shown in the Table.

<table>
<thead>
<tr>
<th>SCC related symptoms and signs</th>
<th>Number (% of women)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythema</td>
<td>22 (29%)</td>
</tr>
<tr>
<td>Pain on touch or pressure</td>
<td>37 (48%)</td>
</tr>
<tr>
<td>Pain at rest</td>
<td>8 (10%)</td>
</tr>
</tbody>
</table>

Table: Problems at SCC insertion site.

Discomfort from the SCC caused 26 women to ask for it to be removed and a further 7 requested removal as it was no longer needed.

Discussion: It has been suggested that subcutaneously administered morphine is superior to intramuscular for post caesarean pain relief. However; we have found that the SCC is rarely needed and produces many signs of local inflammation and/or maternal discomfort. We would not recommend this form of pain relief for units using a similar multimodal analgesic regime.

References

P158 Warming for all in obstetric theatres

DM Mallaber, RJ Rajagopalan, K Maclean
St Mary's Hospital, Central Manchester Foundation Trust, Manchester, UK

Introduction: Peri-operative hypothermia is known to increase the risk of surgical site infection (SSI), cardiac morbidity, prolonged hospital stay and reduced patient satisfaction. Pregnant women are not included in the NICE inadvertent peri-operative hypothermia (IPH) guidelines, however they are an at risk group undergoing major surgery. Fluid warming is the standard warming intervention in our obstetric theatres.

Method: A prospective audit (May-Aug 2011) was performed to assess the incidence of IPH. A proforma was completed by recovery staff on 236 obstetric cases. Information collected included ambient theatre temperature, procedure and anaesthetic type, estimated blood loss (EBL), temperature on arrival and departure from recovery and warming interventions in theatre and recovery.

Results: Mean ambient theatre temperature was 22.3°C in keeping with NICE recommendations (>21°C). 41% of patients were hypothermic with tympanic temperatures of < 36°C on arrival in recovery. 72% of these patients were hypothermic despite active warming in theatre where 60% had fluid warmers (FW), 5% had FW and upper body forced air warmers (FAW) and 7% had only upper body FAW. In recovery, 46% of hypothermic patients received no warming intervention, 27% were given an extra blanket and 22% received a full body FAW. 65% of elective caesaeran section (CS) patients and 37% of emergency CS patients arrived in recovery with tympanic temperatures <36°C. 50% of hypothermic patients had suffered an EBL of 1500 ml or more.

Conclusion: Despite acceptable theatre temperatures and 72% of patients receiving active warming in theatre, we have demonstrated a high incidence of IPH. FAW has a number of disadvantages in the obstetric setting. To allow obstetrician adequate access upper body warming is practical but noise pollution affects communication and blankets hinder access to patient and contact with baby. Clinical evidence suggests that under patient warming mattresses (Inditherm®) are similarly effective as FAW at maintaining core body temperature >36 °C in the non obstetric surgical population. The additional benefits are - it is silent, warms only patient without warming the environment and is more energy efficient than FAW devices. Quoted rates of SSI post CS range from 6-8%. The additional cost to the NHS per SSI has been estimated at £716. As such, our unit would have spent £65,413 in the last year treating SSIs. A business plan for the procurement of customised under patient warming mattress has now been accepted, following the presentation of this audit to the local clinical effectiveness committee. Taking into account the anticipated reduction in wound infection, cost of FAW consumables, a potential reduction in red cell transfusions and length of hospital stay, this change in practice is also expected to produce financial savings.

References
P159 Warming intravenous fluids decreases perioperative shivering during neuraxial anaesthesia in parturients: an observational study

KK Kurzatkowski, DJ Jeevatnam
Department of Anaesthesia, Peterborough and Stamford Hospitals NHS Trust, Peterborough, UK

Background: Shivering which usually occurs as a response to cold is also a common phenomenon after neuraxial anaesthesia in parturients. Although shivering may possess beneficial metabolic effects it can be very disrupting for the family-oriented birth-sharing experience in the operating room. It has been noted that shivering alone is the main symptom regarded as unacceptable part of the birth experience for both parturient and spouse. As one of the reported mechanisms of shivering is central hypothermia due to core body heat redistribution, we evaluated whether warming IV fluids decreases incidence of shivering in obstetric theatre setting.

Methods: We performed prospective analysis of 47 consecutive women undergoing both elective and emergency obstetric procedures under either spinal or epidural anaesthesia. Intraoperatively 24 patients received room temperature Hartmann’s solution for management hypotension and blood loss and 23 received the same IV fluids warmed up to 38.5°C. Incidence of shivering in both groups was compared.

Results: The incidence of shivering was 63% in group receiving room temperature IV fluids compared to 14% in group receiving warmed fluids. Shakes were more likely to occur in an emergency than elective obstetric procedures and where epidural top-up was the anaesthetic to facilitate the operation. The incidence of shivering was also greater where 1200ml or more of unwarmed IV Hartmann’s solution was administered (83%) compared to 41% receiving up to 1000ml of the same IV fluids.

Discussion: Warming IV fluids can reduce the incidence of perioperative shivering after neuraxial anaesthesia in parturients undergoing both elective and emergency obstetric procedures, and improve patients’ outcome. As intra-operative forced-air warmers was reported not to be beneficial and pre-warming patients is not always feasible in emergency settings, administering warmed IV fluids appears to be an effective method reducing shivering.

References

P160 Why many audits fail to improve clinical practice: lessons from a post-caesarean section analgesia re-audit

S J Ciechanowicz, J Johannessson, T Nicoli, J Rudiger
Anaesthetics Department, Queen’s Hospital, Romford, UK

Introduction: Clinical Audit is the component of clinical governance that offers the greatest potential to assess quality of care in the NHS. However, many audits fail or only lead to minor changes in local clinical practice. This review reflects upon a post-caesarean section analgesia re-audit. The disappointing results lead to a critical analysis of the reasons for the failure to improve clinical practice.

Methods: In prospective interviews and case note reviews of 103 women in 2010 (initial audit) and 2011 (re-audit), drug administration, pain scores at rest and on movement, side effects and satisfaction following caesarean section were recorded. The literature on clinical audit barriers was reviewed using Pubmed, Cochrane and other sources.

Results: A small improvement in morphine administration was found with re-audit but no improvement in pain scores or associated side effects despite clearly defined goals and action plan after initial audit. We identified our pitfalls as broadly being due to people or data.

Discussion: Little is known about the detail of how to use audit and feedback most effectively. The main barriers are: Lack of implementation of changes - inadequate dissemination, hence most trainee audits go unnoticed. Change is more likely if part of complex interventions, in a supportive organisation with enthusiastic leaders. Greater multi-disciplinary involvement is needed. Flawed methodology - trainees should receive formal training in audit and have access to a central obstetric database. Frequency of audits - less imposed frequency of audit on trainees may improve quality, with incentives for successful implementation encouraged. Senior support - consultants/statisticians/audit departments should be available throughout.

References
P161 Local anaesthetics for perineal suturing - a survey of midwives and obstetricians knowledge
K Horner, R Bartlett, N El-Wahab, E Robson, N Lucas
Anaesthesia, Northwick Park Hospital, Harrow, London, UK,
*Anaesthesia, University College Hospital, London, UK,
†Anaesthesia, Chelsea & Westminster, London, UK

Introduction: In the UK perineal trauma sustained during delivery is sutured by midwives and obstetricians. The aim of this survey was to investigate the knowledge of these groups of healthcare professionals regarding appropriate local anaesthetic drug doses and clinical features of local anaesthetic toxicity.

Methods: Midwives and obstetricians at three busy obstetric units were asked to complete a short questionnaire assessing their knowledge of safe local anaesthetic doses and clinical features of local anaesthetic toxicity. All responses were anonymous.

Results: Fifty-five questionnaires were completed.

---

Table: Correctly identified 3 mg/kg as maximum safe dose without adrenaline

<table>
<thead>
<tr>
<th>Question</th>
<th>Midwives (44)</th>
<th>Obstetricians (11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correctly identified 3 mg/kg as maximum safe dose without adrenaline</td>
<td>1 (2%)</td>
<td>2 (18%)</td>
</tr>
<tr>
<td>Correctly identified 20 ml lidocaine 1% equivalent to 200 mg</td>
<td>17 (38%)</td>
<td>2 (18%)</td>
</tr>
<tr>
<td>Correctly identified at least one feature of LA toxicity</td>
<td>24 (54%)</td>
<td>5 (45%)</td>
</tr>
<tr>
<td>Recognition that addition of adrenaline has an increased maximum safe dose</td>
<td>3 (7%)</td>
<td>1 (9%)</td>
</tr>
</tbody>
</table>

Conclusion: This survey demonstrates that in these units midwifery/obstetric knowledge about safe use of local anaesthetics and recognition of local anaesthetic toxicity was poor. Lidocaine is commonly used in the labour ward and is exempt from the general Medicines and Healthcare Regulatory Agency prescribing rules. The majority of respondents gave a fixed volume dose per patient regardless of the patient’s weight. National Institute of Clinical Excellence (NICE) guidelines state a dose of up to 20 ml of 1% lidocaine can be given. One in eight respondents stated a maximum safe dose of lidocaine of up to twice the limit recommended by NICE. Knowledge of converting percentage solutions to mg/ml was also poor. We plan to introduce specific training and guidelines to address this issue.

References
2. NICE clinical guidelines 55 - Intrapartum care 2007

P162 A cautionary tale: intravenous fluid management in labour.
R Barr, C Curry, M Molloy
Anaesthetics, Royal Jubilee Maternity Hospital, Belfast, UK

Introduction: Serious problems caused by iatrogenic hyponatraemia associated with intravenous (IV) fluid administration are well documented. A previously healthy primigravida patient was referred to our obstetric anaesthetic team 36 hours postpartum with significant neurological deficit following epidural analgesia. Urgent MRI ruled out epidural haematoma and confirmed central pontine demyelination. This was most likely secondary to IV fluid administration during the course of labour. Serum sodium was 135 mmol/L at this time. There are very few cases reported of central pontine demyelination in the obstetric population. A Swedish observational study reported the possibility of unrecognised hyponatraemia in labour. They noted sodium levels of less than 130 mmol/L in patients after 2.5L of intravenous (IV) fluids in labour. After review of this case we carried out an audit to look at IV fluid prescribing and oxytocin infusion regimes on our labour ward and to review our current guidelines.

Methods: We carried out a prospective audit of patients presenting for induction of labour over a one month period. We included only patients who received IV fluids during the course of labour and delivery. We collected data on oxytocin infusion rates and volume, other IV fluid administration and indication, fluid prescribing, documentation on fluid balance charts and monitoring electrolytes, if any.

Results: 50 patients received on average 2.1L (0.5–4.5L) of IV fluids following induction of labour, either as oxytocin infusion and/or IV fluids administered with epidural, to prevent dehydration and ketosis, or given during operative delivery. The oxytocin regime used in our unit could result in high volumes of fluid infused. IV fluids are advised with epidural analgesia but without guidance on rate or volume. Only in pre-eclampsia are maximum hourly rates of IV fluids suggested. Incomplete calculation of fluid balance was noted in half of the patients. It is not usual to have electrolytes checked in labour, however a third of the patients had electrolytes checked at some stage during their pregnancy. The average plasma sodium was 136 mmol/L (135–141 mmol/L).

Conclusions: The patient made a full neurological recovery. Central pontine demyelination was assumed to be due to unrecognised hyponatraemia during labour secondary to IV fluids. Hyponatraemia could have been further potentiated by the anti-diuretic effect of oxytocin particularly if the sodium level may have been at the lower end of normal range during pregnancy as we found in our audit results. We have made recommendations for education updates on fluid balance and IV fluid prescribing for medical and midwifery staff. We have proposed guidelines on controlled rates of IV fluid infusion during labour and changing oxytocin infusion regimes to reduce the volume of fluid administered. We suggest electrolytes could be measured when prolonged infusion of IV fluids are administered in labour or if large volume of fluids have been given. We plan to re-audit the in the near future.

Reference
P163 A closed loop audit of skin antiseptic for neuraxial blockade in obstetrics

A Kapoor, W Wight
Anaesthesia, Royal Victoria Infirmary, Newcastle, UK

**Introduction:** The aim of an ideal skin antiseptic prior to central neuraxial block (CNB) is to achieve effective, rapid and persistent asepsis; a colouring agent to mark where the skin has been cleansed would be advantageous. There are no established clinical guidelines or consensus among obstetric anaesthetists regarding best skin antisepsis beyond a communication from the authors of the NAP3 report. The aim of this audit was to establish local practice in skin preparation, and how this may have changed following this advice.

**Methods and Results:** The practice of skin antiseptic was audited in our obstetric unit over a 2 week period in 2009 and re-audited in 2011; additionally we extended this second audit to anaesthetists across the Northern Deanery.

<table>
<thead>
<tr>
<th>Skin antiseptic for neuraxial procedures</th>
<th>2009 Total 37 responses (%)</th>
<th>2011 Total 37 responses (%)</th>
<th>Deanery-online 167 responses (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2% Chlorhexidine (CHG)</td>
<td>18 (49)</td>
<td>0</td>
<td>51 (31)</td>
</tr>
<tr>
<td>0.5% CHG</td>
<td>4 (11)</td>
<td>36 (98)</td>
<td>106 (64)</td>
</tr>
<tr>
<td>10% Povidone iodine (PI)</td>
<td>15 (40)</td>
<td>1 (2)</td>
<td>5 (3)</td>
</tr>
<tr>
<td>Combined PI&amp; 0.5%CHG</td>
<td>1 (0.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The antiseptic was applied by spray in 95% of respondents in our unit compared to 44% in the Deanery where an applicator was commonly used (54%).

**Discussion:** Despite initial wide variations, the findings from re-audit are consistent with a change in practice of skin antiseptic use in our unit from 2% CHG or 10% PI to 0.5% CHG. Although less marked, the situation across the deanery also reflects adoption of 0.5% CHG. The NAP 3 report made a recommendation that CHG be used for skin preparation prior to CNB, but it was only in subsequent correspondence that the authors defined the concentration, stating that 0.5% CHG in 70% isopropyl alcohol is the optimal solution.

The rationale for this advice is two fold: firstly there is clear evidence that CHG offers superior skin asepsis when compared to PI. However, evidence from animal studies suggests greater concentration of CHG is associated with neurotoxicity. Hence, the weakest concentration of CHG that remain clinically effective is recommended. The emphasis should focus on waiting for the antiseptic to be fully dry and avoiding any splashing or contamination of anaesthetic equipment. The change from PI to CHG in our unit has resulted in the loss of a clear indication of where the skin has been cleansed, as the CHG does not stain the skin. A potentially ideal (and widely available) pre-tinted preparation of 2% CHG within a disposable applicator which reduces contamination by splashing (Chloraprep®) is therefore ruled out by this advice. In summary, our unit and much of the Northern Deanery has changed its use of skin preparation prior to CNB on the recommendation of the NAP3 authors, despite limited high quality evidence in support. The impact of this change on rates of septic or neurotoxic complications have not yet been made apparent.

**References**


---

P164 Sprotte Surety critical incident during an elective caesarean section

A Babic, E Morgan, M Turner
Anaesthetics, Royal Gwent Hospital, Newport, UK

**Introduction:** The National Patient Safety Agency (NPSA) have stated, ‘By April 2012 healthcare organisations should have completed actions to ensure that all spinal (intrathecal) bolus doses and lumbar puncture samples are performed using syringes, needles and other devices with connectors that cannot connect with intravenous equipment’. Currently these needles should not be available to clinicians working in NHS Wales. We would like to report a critical incident involving incorrect, early distribution of a box of non-luer lock spinal needles to our hospital.

**Critical incident:** A Sprotte Surety needle (non-luer lock) was used to perform a subarachnoid block to achieve anaesthesia for elective caesarean section. It was only when the stylet was removed and CSF obtained that the non-luer connector was identified. Due to the unavailability of compatible syringes the procedure had to be repeated with a conventional luer lock Sprotte. The rest of the procedure was uneventful. A critical incident form was completed and reports sent to MHRA and NPSA.

**Incorrect labelling:** A box of 25g Sprotte Surety (Pajunk) needles were delivered to obstetric theatres. The box was incorrectly labelled with a sticker detailing the reference number for the ‘conventional luer lock.’ 25g Sprotte needle (021151-29A) not the Sprotte Surety (021152-29A). This incorrect labelling was handwritten and covering the original correct reference number. We are unsure why this box of Sprotte Surety was distributed to our hospital. Secondly we are unsure at which point in the chain of supply the incorrect label was stuck on the box, although it was likely to be either at the distributor or at local hospital stores, not at the manufacturing site.

During preparation of equipment for a subarachnoid block a Sprotte Surety needle was placed on the regional trolley by an experienced ODP. The luer lock Sprotte and the Sprotte Surety look very similar with the stylet in position, especially if seen in isolation. It is only when the stylet is removed that the non-luer connector becomes obvious (Figure below:).

As a result of this incident the MHRA performed a root cause analysis and Pajunk have now amended their packaging.

**Conclusion:** We want to highlight that during the transition period from luer lock to non-luer lock needles, the presence of both types of needles may result in patient harm and not patient safety. As a result we have changed our practice and ensure we check our connections each time we prepare for a regional technique.

**References**

P165 Category 1 caesarean section: Failure of communication and its effect on the decision to delivery interval.
S P B Kasa, R Goyal, A Galimberti, I Wrench
Anaesthetics, Obstetric Unit, Jessop Wing, Royal Hallamshire, Sheffield, UK
*Obstetrics, Obstetric unit, Jessop Wing, Royal Hallamshire, Sheffield, UK

Introduction: Clear channels of communication are vital in cases requiring emergency caesarean section. We investigated communication between the anaesthetist and the obstetric teams for category 1 caesarean sections and its impact on the decision to delivery interval.

Methods: In our unit emergency caesarean sections are audited every day by the obstetricians who note the category of urgency and decision to delivery interval. This data was compared with the category of urgency entered by the anaesthetist into our anaesthetic database for a 15 month period (September 2010 - November 2011).

Results:

![Percentage of category 1 caesarean sections with >30 minutes decision to delivery interval](image)

<table>
<thead>
<tr>
<th>Misrecorded as 'Cat 2' by anaesthetists</th>
<th>Recorded as 'Cat 1' by anaesthetists</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>11%</td>
</tr>
</tbody>
</table>

P = 0.02 Fisher’s exact test

Conclusion: We have demonstrated that failure of communication for category 1 caesarean sections is associated with a prolonged decision to delivery interval. To address this issue in future the daily obstetric audit will include anaesthetic staff and the assessment of efficiency of communication.

Reference

P166 Delays to the elective caesarean section list due to inadequate group and save
JF Smythe, J Maclean, L Angus, J Porter
Anaesthetics, St Thomas’ Hospital, London, UK

Introduction: At our busy tertiary referral centre which sees 6000 births per annum and where the emergency caesarean section list runs parallel to the elective, there are often many delays. Local protocol is that all mothers-to-be should have two group and save samples: one sample has no date restriction whereas the second must be within a week. This is in contrast to other hospitals where only one sample is often required and the National Institute of Clinical Excellence (NICE) guidelines which stipulate that low risk caesarean sections do not require a group and save. NICE did not identify any study looking at whether women having caesarean sections should have group and save preoperatively.

We wanted to look at delays to the elective list due to waiting for a group and save sample, and also whether women proceed to theatre without two valid samples. This was a complete audit cycle as we implemented changes to improve the list’s efficiency before closing the loop.

Methods: This was a retrospective audit looking at three separate months of elective cases using the Healthcare database. The audit started in May 2010. A designated midwife for preoperative management of elective caesarean sections was implemented shortly afterwards and the audit was repeated in January 2011. The audit loop was finally closed in November 2011 following: email reminders to new obstetric and anaesthetic trainees shortly after joining the trust; and posters in theatres reminding staff to ensure two valid group and save samples.

All women who had an elective section were identified, and details of their group and save with dates and times were then obtained from the electronic patient record (EPR). The elective section book was referred to as this details elective list order, and when delays are due to ‘inadequate bloods’.

Results:

<table>
<thead>
<tr>
<th></th>
<th>May 2010</th>
<th>Jan 2011</th>
<th>Nov 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of pts</td>
<td>67</td>
<td>48</td>
<td>44</td>
</tr>
<tr>
<td>x2 valid G+S</td>
<td>46 [68.7]</td>
<td>38 [79.2]</td>
<td>40 [90.1]</td>
</tr>
<tr>
<td>Proceed without x2 G+S</td>
<td>7 [10.4]</td>
<td>2 [4.2]</td>
<td>2 [4.5]</td>
</tr>
</tbody>
</table>

Conclusions: Our audit shows a reduction in the number of cases delaying the elective caesarean section list due to inadequate group and saves. This can be assumed to be due to the designated midwife and the increased awareness through posters and emails. Although there was an initial reduction in sections without adequate group and saves [10.4% to 4.2%], this reduction was not sustained. Interestingly both the cases in the third audit were private patients, and this has been raised with the Consultants involved.

Our audit shows the benefit of designated personnel to improved theatre efficiency by ensuring that patients are adequately prepared preoperatively in addition to simple methods of increasing awareness.

Reference
P167 Does the anaesthetic for a category 1 caesarean section for presumed fetal distress effect neonatal outcomes?

M Beckmann, S Calderbank,* Obstetric and Gynaecology, Mater Health Services, South Brisbane, Australia, *Anaesthesia, Mater Health Services, South Brisbane, Australia

Introduction: Birth by emergency caesarean section (CS) is common and often considered urgent (category 1). In the UK over half of all category 1 CS are performed under general anaesthesia (GA). In this setting, little is known about the effect of the method of anaesthesia on the newborn.

Method: A retrospective cohort study was performed using routinely collected de-identified data from Mater Health Services, Brisbane, Australia. The primary outcome measure was a composite outcome of short-term neonatal morbidity comprising: Apgar score less than 7 at 5 minutes; need for Neo-puff or bag/mask ventilation for longer than 60 seconds; need for intubation; need for external cardiac massage; admission to neonatal critical care nursery. In addition to the composite outcome of short-term neonatal morbidity (primary outcome measure), the following statistically significant confounders were included in the final model: maternal age, parity, public/private, decision-to-delivery interval and cord blood arterial pH.

Results: Of 533 term babies born by category 1 CS for presumed fetal distress between 2008 and 2011, 81 women were delivered by GA and 452 by regional anaesthesia (RA). Compared with a category 1 CS under RA, the decision to delivery interval for a GA CS was almost 8 minutes faster (24.7 vs 32.6 minutes; p<0.001). When adjusted for confounders, babies born by category 1 GA CS were significantly more likely to experience short-term neonatal morbidity (aOR 2.30; 95%CI 1.27-4.17; p=0.006).

Table 1: Method of anaesthesia and its effect on neonatal outcomes (multivariate logistic regression analysis adjusting for confounders)  

<table>
<thead>
<tr>
<th>Outcome</th>
<th>n=452</th>
<th>n=81</th>
<th>OR (CI) adj P</th>
<th>aOR (CI) adj P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite measure</td>
<td>99(21.9)</td>
<td>32</td>
<td>2.32 (1.42-3.83)</td>
<td>2.30 (1.27-4.17)</td>
</tr>
<tr>
<td>Apgar &lt;7 at 5 minutes</td>
<td>8(1.8)</td>
<td>6(7.4)</td>
<td>4.44 (1.50-13.16)</td>
<td>6.89 (1.79-26.55)</td>
</tr>
<tr>
<td>NeoPuff/Bag &amp; Mask &gt;60 seconds</td>
<td>50(13.5)</td>
<td>20</td>
<td>1.18 (1.33-4.38)</td>
<td>1.86 (1.13-4.84)</td>
</tr>
<tr>
<td>Intubate</td>
<td>19(4.2)</td>
<td>4(4.9)</td>
<td>0.39 (0.38-3.58)</td>
<td>0.764 (0.52-6.71)</td>
</tr>
<tr>
<td>Admission to critical care nursery</td>
<td>66(14.6)</td>
<td>24</td>
<td>1.43 (1.43-4.24)</td>
<td>0.001 (1.16-4.31)</td>
</tr>
</tbody>
</table>

Discussion: General anaesthesia effects short-term neonatal morbidity of term babies born by category 1 CS for presumed fetal distress, despite enabling a more rapid delivery of the baby. This data should help inform the discussion between anaesthetist and obstetrician, in balancing the risks and benefits of the method of anaesthesia.

P168 Efficient running of the independent elective caesarean section list: a re-audit

AV Williams, CE Brennan Anaesthetics, Dudley Group NHS Foundation Trust, West Midlands, UK

Introduction: An independent elective caesarean section (LSCS) list was introduced in April 2010 to run three mornings per week with the aims of reducing delays to elective cases, to prevent postponement to out of hours when staffing is minimal, and to reduce delays to obstetric emergencies, such as removal of retained placenta.1 Our maternity unit has a steady rise of deliveries (increasing to 4800 last year), with a consistent LSCS rate (28%). The efficiency of the list was initially audited (mid April 2010 - mid July 2010) and it was identified that the list often did not start on time, that it over ran and that delays occurred between cases. Recommendations were made to recruit more midwives, to improve patient preparation, and to have greater obstetric and anaesthetic consultant input to the running of the list. The list was re-audited (July 2011-September 2011) based on set audit standards of; on 100% of occasions the list should start on time; no delay greater than ten minutes between cases; the list to finish by 1 pm.

Method: Data was collected on an audit proforma with collaboration from the theatre register and theatre team event diary. The data collected was; list date, number of elective cases booked, start delay per case, reason for delay per case, and start and end of theatre session. The results were compared with the previous audit.

Results: Data was collected from thirty nine elective LSCS lists (equivalent to last audit).  

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of days with elective LSCS</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>Mean number of LSCS per list</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>% days with first case delays</td>
<td>44</td>
<td>64</td>
</tr>
<tr>
<td>% cases with delays between cases (excl 1st case)</td>
<td>23</td>
<td>49</td>
</tr>
<tr>
<td>% days list finished after 1300hrs with x3 LSCS</td>
<td>44</td>
<td>57</td>
</tr>
</tbody>
</table>

Discussion: None of our audit standards were met. Results were worse in all areas compared with the previous audit, although on average each list contained one additional patient compared to the previous audit period. The main reasons for delay in the start of the list were; midwifery availability, poor patient preparation and bed availability. Delays between cases were due to midwife and bed availability. Over-running of the list had an impact on theatre and medical staff’s afternoon duties. Despite additional midwifery recruitment and increased consultant input the list remains inefficient. With this audit the new problem of bed availability was identified and this has been exacerbated in the last year due to the regional reorganisation of obstetric services that led to a dramatic increase in our annual deliveries (up by 300) with no expansion of our delivery suite capacity.

References
P169 Implementing an obstetric ‘Perfect Operating Theatre’
C Farrell, L Parks, C McAllister
Anaesthetics, Craigavon Area Hospital, Portadown, UK

Introduction: We audited the fasting times of women for elective caesarean section in our hospital. On review of the results we identified excessive fasting, due not only to poor adherence of published guidelines, but inefficiencies within the delivery of an elective caesarean section service. With interest developing in ‘perfect operating theatres’ this was an opportunity to introduce change within an obstetric unit.

Methods: We conducted a prospective audit from November to December 2010 to assess fasting times and document reasons for prolonged fasting and delays in theatre activity. Following this initial data collection changes were agreed upon by a working group. We wanted to streamline the service and so introduced the computerised theatre management system (TMS). Staff were educated regarding fasting guidelines and parturients provided with carbohydrate drinks to be consumed the evening prior to, and at 6am on the morning of surgery. Parturients then attended at 6.30am, documents and blood work were completed and processed ready for anaesthetic review at 8am, with the intention of being in theatre for 8.30am and ‘knife to skin’ before 9am.

To achieve this senior staff supervised, while surgery alternated between two theatres to reduce down-time and ensure readiness of a second theatre in the event of a time-critical emergency.

Continuous audit cycle methodology was utilised, allowing a dynamic process to occur with positive or negative effects to be documented from the point of change.

Results: A total of 71 patients were audited for baseline data and 55 during the subsequent changes. Average fasting times reduced from 12.6 to 5.97 hours for liquids, while remaining similar at 12.9 and 13.7 hours for solids. It was not our intention to reduce the fasting times of solids as we provided carbohydrate drinks as replacement. Changing the order of the list and/or delays occurred in 35% of cases during the baseline collection, and in 18% of cases subsequent to the changes.

Conclusion: Within our institution the fasting policy had evolved to nil by mouth from ten o’clock. Combined with inefficiencies within the working of theatre this led to excessive fasting times for the parturients involved. A Cochrane review suggests local fasting policy should be easily followed, enhance the safety and well being of patients, while allowing the smooth running of operating theatre.

We feel the changes implemented as a result of our audit process achieve each of these aims.

Reference
1. Brady MC, Kimm S, Stuart P, Ness V. Preoperative fasting for adults to prevent perioperative complications. Cochrane Database of

---

P170 Improving trends of conversion rate of anaesthesia for caesarean section: 8 years of audit experience in a teaching institution.
O Farooq, M Purva
Anaesthetics, Hull Royal Infirmary, Hull, UK

Introduction: Current opinion suggests that the use of Regional Anaesthesia (RA) should be maximised for caesarean sections (CS) as almost all maternal deaths have followed general anaesthesia (1).

Method: We retrospectively analyzed the type of anaesthesia for CS for the period from July 2010 to July 2011 and compared this against 7 years of our previous audit data.

Results: We analyzed the reasons for the failed regional blocks which numbered 32 (2.66% of all LSCS) of which 12 were due to failed spinals, 2 of which had inadequate block and 10 had technical difficulties; 20 due to failed epidural top ups of which 1 was due to lack of time for top up to work, 13 due to inadequate block post top up and 6 were under functioning epidurals in labour.

Conclusions: We reduced the conversion rate of emergency CS from RA to GA from 6% in 2009 to 5.1% in 2010 to 4.1% in 2011. Notable factors which may have helped this trend include the following: factors.

Introduction of a grade 1 CS bleep resulting in faster team communication and more time available to top up epidurals and place spinals.

Proactive resting of epidurals in labour so that fewer epidurals failed in theatre following top up.

Ongoing policy to top up epidurals in the room, providing more time for the top up to work

One worrying trend, however, was that 83% of the failure to site spinals occurred in Grade 1/2 CS and this may have implications for the future if proportion of CS performed as grade 1 increases.

Reference
1. RP Russell: Technique of anaesthesia for Caesarean Section. Royal College of Anaesthetists - Raising the standard - A compendium of audit recipes, February 2000, 6-8
P171 Mobile Phone Application: Aiding quality health care
to the Non/Limited English speakers

H Aayte, S Hussain, K Lonsdale
Anaesthetic Department, University Hospital of Wales,
Cardiff, UK

Introduction: Maternal and infant mortality are higher among
ethnic minority groups\(^1\). Multifactorial causes of increasing
morbidity and mortality in the migrant population; such as
language and trans-cultural barriers contribute to poor
perinatal health outcomes and brings new challenges for the
maternity services\(^1\). These disparities extend their influence on
overall quality of healthcare. Translation services are often
unreliable or unavailable out of hours making it more complex
during emergencies.

| Ethnicity and births in England and Wales\(^2\) |
|-------------------|-----------------|
| White British     | 64.5%           |
| Asian or Asian British | 9%        |
| Black or Black British | 5%         |
| Mixed ethnicity   | 3.5%            |

Case Report: A 26-year-old Primiparous Chinese woman
resented to the delivery suite in spontaneous labour; with
limited antenatal information and a very poor understanding of
English. She requested epidural analgesia and informed
consent proved difficult to obtain due to the language barrier.
Besides the urgency of the case an additional mode of
communication was vital. We embarked on a novel approach of
utilising the iphone translating application which translated
key English phrases into Mandarin thus facilitating effective
communication with the woman and her partner during the
epidural through to the caesarean delivery. Post-natal follow
up feed back by the mother stated she was happy, satisfied
and felt assured of the care provided.

Discussion: Recent survey identified >300 languages spoken
in the UK and with increasing international migration;
disparities in health care inequalities persist in ethnic minority
groups. Effective communication is essential to impart
information concerning medical procedures and vital for
obtaining informed consent. Although the Obstetric
Anaesthetists Association provides leaflets in different
languages, due to the time constraints in critical circumstances
it is difficult to access. In such similar crisis, we found this
translator to be a timely solution in an exceptionally stressful
situation. We retrospectively validated the translations with the
Trust’s interpreter. Despite a huge expend of £55 million
for translational service costs paid by NHS annually\(^1\),
adequate interpretation services and language concordance
have been under-resourcing and difficult to access in time.

Conclusion: Iphone itranslator application provides a cheap
convenient, contemporaneous, user friendly multi-language
translation service. This particular case report clearly
demonstrates an innovative way to overcome the barriers
of communication and may aid in reducing cross-cultural
health disparities making quality of care accessible to all.

References
1. CEMACH, Saving mothers’ lives – reviewing maternal deaths to
2007.
2. Moser, K. Birthweight & gestational age by ethnic group, England &
3. Easton, M., Cost in translation, in BBC News, B.h. editor, Editor.
2006.

P172 Re-audit of epidural response times at a tertiary
maternity unit following the initial phases of local
maternity service reconfiguration

VE Barlow, AM Arch, A Howells
Dept of Anaesthesia, St Mary’s Hospital, Manchester, UK

Introduction: Response times to epidural requests for labour
analgesia were audited at our institute in 2008; there appeared
to be room for improvement with the majority of delays
attributable to other unit activity. ‘Making it Better’\(^1\) (MiB) is
an ongoing project, including the reconfiguration of maternity
services in Greater Manchester. The aim being to concentrate
specialist consultant led obstetric care in specific centres, with
more widespread provision of midwifery led care. By early 2010
the initial phase of MiB had begun, with the closure of a local
maternity unit. We assessed the impact of these early changes on
our epidural response times.

Method: We asked anaesthetists working on delivery suite to
complete a proforma for all patients requesting epidural
analgesia between March-April 2011. Note was made of the
response time and reasons for delays of over 30 minutes. We then assessed the responses against RCoA\(^2\) and
AAGBI/OAA\(^3\) standards.

Results: The initial audit in 2008 took place over 79 days,
whereas the readaudit period was 35 days. This gave an average
birth rate of 14.6 per day in 2008, increasing to 17.8 per day in
2011.

<table>
<thead>
<tr>
<th>Number of deliveries in</th>
<th>Audit</th>
<th>10 May - 28</th>
<th>1 Mar - 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>July 2008</td>
<td>Apr 2011</td>
</tr>
<tr>
<td>Standard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of proformas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>completed: epidurals sited</td>
<td></td>
<td>88:258</td>
<td>115:120</td>
</tr>
<tr>
<td>Standard 1: Response</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>time &lt;30 mins</td>
<td>≥ 80%</td>
<td>65/88 (74%)</td>
<td>73/115 (63%)</td>
</tr>
<tr>
<td>Standard 2: Response</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>time &lt;60 mins</td>
<td>100%</td>
<td>78/88 (89%)</td>
<td>91/115 (79%)</td>
</tr>
</tbody>
</table>

Before reconfiguration commenced 80% of delayed responses
were due to other unit activity requiring anaesthetic services.
This figure was similar (81%) in 2011, however epidural
response times had worsened. It is likely that this is due to
increased workload of the unit, but the small amount of data in
the original audit may limit our conclusions.

Conclusions: The early phase of maternity service
reconfiguration suggests that specialist units have and will
become increasingly busy. This impacts greatly upon
anaesthetic service provision, and appropriate staffing levels
need to be addressed at units providing specialist care.

References
   www.makingitbetter.nhs.uk
2. Royal College of Anaesthetists. Raising the Standard: A
   compendium of audit recipes, RCoA 2006.
   www.rcoa.ac.uk/index.asp?PageID=125
3. Association of Anaesthetists of Great Britain and Ireland and
   Obstetric Anaesthetists’ Association. Guidelines for Obstetric
P173 WITHDRAWN FROM PRESENTATION: Starvation for elective LSCS: breaking the breakfast rule!!!

U M Belliappa, I Ahmed
Department of Anaesthetics, Hull Royal Infirmary, Hull, UK

P174 Supraventricular tachycardia during caesarean section: what is the way forward?

R Natarajan, MI Bhatti, S Dinesh, K Das (O&G)
Anaesthetics, Heartlands Hospital, Birmingham, UK

Obstetric patients can develop supraventricular tachycardia (SVT) during the C/S (caesarean section) with or without prior history of rhythm problems. A proactive approach is needed with the obstetric patients with history of SVT. SVT can occur at the time of induction or in the intraoperative phase. Intervention is guided by the presence or absence of hemodynamic stability.

Case 1: A 26 year old anxious pregnant lady presented for urgent caesarean section. One month previously she was seen by the cardiologist for SVT which was treated with Flecaïnide. She was managed successfully intraoperatively but her C/S was complicated by blood loss for which she needed transfusion. She was continued on Flecaïnide postoperatively.

Case 2: A 31 yr old previously fit & well lady presented for elective caesarean section. She developed SVT post spinal anaesthetic with resultant hypotension. Carotid sinus massage was performed followed by adenosine 3mg with no success. Adenosine 6mg was given which treated the SVT. C/S was postponed and she was operated two days later with no problems.

Discussion: The management is directed by the time at which the SVT has occurred, the stage of the pregnancy and the current treatment of SVT if already instituted.

If the patient is found to have SVT in the antenatal period, immediate referral to the cardiologist is needed. Different drugs are recommended depending upon the cardiac status and stage of pregnancy. Calcium channel blockers have been used in pregnant patients suffering with SVT and presenting with preterm labour. Calcium channel blockers on one hand help to control the SVT and on the other hand work as tocolytics. No major side effects have been reported after their usage.

Use of antiarrhythmics drugs like Disopyramide can lead to the initiation of painful uterine contractions and accidental haemorrhage. Caution should be used during Disopyramide administration and invasive monitoring is recommended. Amiodarone has been used in treating arrhythmias but avoided if possible due to its teratogenic effects.

Adenosine is used for sudden onset SVT during institution after epidural or in the intraoperative or perioperative period. Repeated doses may have to be used as in Case 2. Adenosine is considered to be a safe drug to use in these scenarios because of its safety profile in both mother and foetus. Moreover it is favourable because of its lack of hypotensive effect as seen with Verapamil. A series of case reports have supported the use of adenosine in pregnant patients with supraventricular tachycardia.

Synchronized direct current cardioversion is considered to be the next line treatment in pharmacologically refractory supraventricular tachycardia. There have been no ill effects reported for both the mother and foetus after cardioversion. It is recommended that there should be a thorough knowledge of different techniques of cardioversion before embarking on this procedure.

Reference

P175 Theatre transfer times for patients undergoing emergency caesarean section 1 and 2 caesarean section

C L Griffith, G Massolini, C Carvalho
Anaesthetics, Milton Keynes General Hospital, Milton Keynes, UK

Introduction: The nationally accepted standard for decision to delivery interval (DDI) is 30 minutes for category 1 and 2 lower section caesarean sections (LSCS). Research has suggested that minimising the time taken to transfer mothers to theatre is crucial in achieving this target. 1 It has been suggested that a transfer time of less than 10 minutes from decision will significantly increase chance of meeting these targets. 2

Method: A prospective audit was completed over a three month period for emergency category 1 or 2 caesarean sections. The supervising anaesthetist was asked to complete a standardised proforma, documenting the times from decision through to delivery. The primary aim was to audit the transfer time of the mother to theatre. Our audit standard was a transfer time of 10 minutes, with a DDI of 30 minutes

Results: 76.7% of transfers took greater than 10 minutes, with the mean time being 40.6 minutes. Of the cases that achieved a transfer time of less than 10 minutes, 86% delivered within the target of 30 minutes. This compares to only 4% in those whose transfer was longer than 10 minutes. The median DDI of all mothers was 67.2 minutes.

Additional data analysis noted the indication cited for these category 1 or 2 sections was ‘failure to progress’ (without documented foetal distress) in 47%.

Discussion: The results of our audit reflected previous research, that transfer time is a powerful clinical predictor of achieving delivery targets in emergency caesarean sections. 1 It raises a need for improvement in transferring patients to theatre promptly.

To address these issues, we held a multidisciplinary teaching session, presenting our findings and introduced a new ‘10 minute target’ as a departmental standard. We instituted simple measures including a laminated list of team members to be immediately contacted at the time the decision is made and emphasised the importance of anaesthetic presence for transfer.

Additionally we highlight potentially inappropriate categorisation of emergency caesareans, which may have been reflected in the delays in transfer. Previous studies have shown that the rigid 4 class system may be clinically inappropriate, however a recent study has shown that modification of the wording did not improve consistency of the application. 3 It promotes discussion on the introduction of the ‘modified lucus classification’ of caesarean section within general hospitals.

References
1. Classification of urgency of caesarean section - a continuum of risk. Royal College of Obstetricians and Gynaecologists, Good Practice No. 11

P176 Use of ultrasound for obstetric regional anaesthesia

R Pandey, K Berwal, E Hart
Anaesthesia, University Hospitals of Leicester NHS Trust, Leicester, UK

Introduction: Use of ultrasound (US) is common in anaesthetic practice. Research has shown a higher success rate (1) and superior quality central neuraxial blockade (CNB) with US use (2). NICE guidelines stress the importance of training when using US (3). We wanted to evaluate the training opportunities and the experience in the use of US for CNB by trainees.

Methods: Retrospective data was collected from our obstetric database between the period Jan 2009 to May 2011. The total number of CNBs performed, the use of US with indications and the grade of anaesthetist performing the US were recorded. A questionnaire based survey was also sent to all the trainees in the Leicester School of Anaesthesia.

Results: US was used in 335 (2.3%) cases of CNB in the 29 month period. It was performed by a consultant (23%), trainee (30%) and consultant with trainee (47%). Indications for US use were obesity (71%) spinal deformity (7.4%), previous difficulty (4.4%), failed attempt (4.4%) and teaching (12.8%). Only 1.5% of all regional block cases were used for training in the use of US. The response rate for the survey was 51% (71/139) and was almost equal in the three groups CT1-2, ST3-4 and ST5+ trainees.

Survey Questions Ultrasound: US, Central neuraxial block:CNB Yes % No %
---
Have you observed the use of US for CNB? 85 15
Have you received training in the use of US for CNB? 72 28
Have you independently used US for CNB? 34 66
Have you been formally assessed for competence in its use? 0 100
Do you feel competent to use US for CNB independently? 18 82
Would you like further training in its use? 92 8

Conclusion: There is huge potential to increase the training opportunities in the use of US for CNB in obstetric anaesthesia. There is a lack of formal training in its use and the vast majority of trainees would like further training in order to feel competent. There may be a role for a formal assessment process in the use of US for CNB.

References
3. Ultrasound guided catheterization of the epidural space. Interventional procedure guidance 249. NICE, Jan 2008
Unpublished Posters: Obstetric Anaesthesia 2012 (Liverpool)

P40

Does the anaesthetic for a category 1 caesarean section increase the risk of maternal hypocalcaemia?

I Kanellopoulos†, JN Moore, and A Kapoor

Anaesthetics, Obstetric Unit, Jessop Wing, Royal Gwent Hospital, Newport, UK
†Anaesthesia, Chelsea & Westminster, London, UK
*Anaesthesia, University College Hospital, London, UK,

Introduction:

Our finding of a reduced hospital stay of 0.72 (95% CI 0.51-0.97) day (p = 0.001) was statistically significant. The average time for each step is shown in Table 1. The differences in mean time (95% CI) were statistically significant for documentation before transfer (p = 0.007) and for documentation after transfer (p = 0.003). The time for documentation after transfer was significantly lower in the lower fasting group (mean 22.4 minutes; 95% CI 18.3-26.5) than in the higher fasting group (mean 63 minutes; 95% CI 59.3-66.7), p = 0.001.

Discussion:

The Confidential Enquiries into Maternal Deaths in the United Kingdom report that hypocalcaemia is the leading cause of maternal deaths in the United Kingdom (1). A survey of maternity units in the United Kingdom found that 71% of units have a formal protocol in place for the management of women with hypocalcaemia, and that 93% of units have a protocol for the management of hypocalcaemia in parturients following caesarean section. However, there is no consensus on the optimal management of hypocalcaemia in parturients following caesarean section. The optimal treatment of hypocalcaemia in parturients following caesarean section is unknown.

Conclusion:

Our study found a significant difference in the time for documentation before and after transfer. These findings highlight the need for further research into the optimal management of hypocalcaemia in parturients following caesarean section. Further research is needed to determine the optimal management of hypocalcaemia in parturients following caesarean section.

Table: Adequacy of airway assessment

<table>
<thead>
<tr>
<th>Step</th>
<th>Adequacy</th>
<th>Lower Fasting (n=100)</th>
<th>Higher Fasting (n=100)</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>100%</td>
<td>100%</td>
<td>98%</td>
<td>0.65</td>
<td>0.51</td>
</tr>
<tr>
<td>2.</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td>3.</td>
<td>100%</td>
<td>100%</td>
<td>98%</td>
<td>0.65</td>
<td>0.51</td>
</tr>
<tr>
<td>4.</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td>5.</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td>6.</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td>7.</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td>8.</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td>9.</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>0.00</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Figure 1: Mean time (95% CI) for documentation before and after transfer.