P89 Skin testing and incremental challenge to evaluate adverse reactions to local anaesthetics in the third trimester of pregnancy is a valuable and safe process

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Introduction: True allergy to local anaesthetics (LAs) is rare (<1%). In the obstetric population, a history of adverse reactions can limit analgesic and anaesthetic options in labour and delivery.

Case report: A 30-year-old primiparous female was referred to the anaesthesia clinic at 30 weeks gestation. She reported experiencing sudden onset abdominal pain and drowsiness for a prolonged period after dental extraction performed under LA in her native Russia. Her medical history was otherwise unremarkable. In collaboration with the immunology and obstetric teams, the patient was admitted to the labour ward at 36 weeks gestation. IV access was established alongside maternal (BP, HR, SpO2) and foetal (intermittent FHR) monitoring. The obstetric team were on standby to assist in the event of maternal instability. Protocolized skin testing and incremental challenge testing of amide LAs was performed uneventfully with no adverse reactions.1 The patient was discharged successfully four hours after testing was completed. The patient presented in labour at term, successfully received epidural analgesia and proceeded to emergency Caesarean section under epidural anaesthesia for delivery of her baby. She reported high levels of satisfaction with the peripartum multidisciplinary care.

Discussion: Many patients are incorrectly labelled as having allergies to LAs. Pregnancy may be considered the wrong time to consider formal allergy testing, for fear of harm to the mother, foetus or both. Allergy testing in pregnancy has been demonstrated safely previously.2 The incremental challenge technique in the third trimester of pregnancy minimises the risks of harm to parturient and foetus and can lead to a greater variety of options for her in labour and delivery. Formal testing requires a comprehensive multidisciplinary approach to achieve maximum benefit for the patient.

References
1. Schatz M. Skin testing and incremental challenge in the evaluation of adverse reactions to local anaesthetics. J Allergy Clin Immunology 1984 74(2): 606-616

 discussion: Our figures show that in our unit, just over 80% (281/344) of women with ADP go on to suffer from PDHP after dural puncture. Under a quarter (63/281, 22.4%) of women with a PDHP went on to have a therapeutic EBP, a relatively low figure in light of recently published evidence.4 The arbitrary <1% ADP rate has been achieved in eight of the last 15 years. The actual cases have been associated with significant maternal morbidity. Although we have not achieved the target throughout the audit period, in the context of the associated morbidity, we question whether we are aiming high enough as a specialty and propose a stricter target of <0.5% ADP.

References
P91 A case series review of pregnant and postpartum patients admitted to general critical care in a large inner city tertiary hospital from January 2007 to August 2013

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Anaesthetics, Glasgow Royal Infirmary, Glasgow, UK

Introduction: While few obstetric patients require admission to intensive care they often have different pathology to general critical care patients and therefore warrant particular attention. This study aimed to review all pregnant and postpartum admissions to ITU at the Glasgow Royal Infirmary.

Methods: After ethical approval a search was made for all patients admitted to general intensive care in Glasgow Royal Infirmary between January 1st 2007 and August 31st 2013, who were coded as “pregnant”, “recently pregnant”, “currently pregnant”, “obstetric” or “gynaecology” in either computer system in use in the unit. Patients subsequently found to be non-obstetric were excluded. An electronic and paper notes review was then undertaken.

Results: 46 patients were identified. This equates to one obstetric admission per 88.3 ICU admissions (1.1%) and 1.1 ICU admissions per 1000 maternities (0.1% of maternities) in this time period. 27 postpartum patients (73%) had undergone caesarean section while four of the six pregnant patients (66%) subsequently had a livebirth delivered vaginally.

Table: Patient Characteristics (Pregnant vs Postpartum)

<table>
<thead>
<tr>
<th></th>
<th>Pregnant (n=9)</th>
<th>Postpartum (n=37)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>27 [25-29]</td>
<td>29 [23-35]</td>
<td>0.618</td>
</tr>
<tr>
<td>Parity</td>
<td>2 [1-2]</td>
<td>0 [0-1]</td>
<td>0.052</td>
</tr>
<tr>
<td>APACHE II</td>
<td>13 [12.5-18]</td>
<td>11 [9-15.5]</td>
<td>0.053</td>
</tr>
<tr>
<td>Mortality in ICU</td>
<td>1 (11.1%)</td>
<td>0</td>
<td>0.04</td>
</tr>
<tr>
<td>Obstetric Diagnosis</td>
<td>1 (11.1%)</td>
<td>32 (86.5%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Haemorrhage Diagnosis</td>
<td>0</td>
<td>25 (67.6%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sepsis Diagnosis</td>
<td>7 (77.8%)</td>
<td>4 (10.8%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Length of ICU Stay (Calendar Days)</td>
<td>3 [2-5]</td>
<td>2 [1.5-2]</td>
<td>0.011</td>
</tr>
<tr>
<td>Pregnancy Resulting in Live Birth</td>
<td>6 (66.6%)</td>
<td>37 (100%)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Data are number (%) and median [IQR]

Discussion: When compared with the most recent national data the GRI ICU obstetric population has fairly similar characteristics. They do however show fewer admissions per maternities and more admissions with haemorrhage, though the reasons for this are unclear. There are also significant differences between pregnant and postpartum patients. Reassuringly mortality in this group is low but only those patients admitted to ITU were analysed so it is possible some cases were missed. Future work should focus on the reasons for the high relative rate of admission with haemorrhage and factors which might reduce admissions overall.

References
1. Maternal Critical Care Working Group. Providing equity of critical and maternity care for the critically ill pregnant or recently pregnant woman. RCOG. July 2011
2. 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”. 1st January 2007 to 31st December 2007. ICNARC. 2009

P92 A cautionary tale: An undiagnosed case of acute fatty liver of pregnancy.

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Introduction: Acute fatty liver of pregnancy is a rare but potentially fatal condition that can be difficult to diagnose until late in its course. We present a case of a low risk pregnancy that had an unexpectedly poor outcome.

Case Report: A 37 year old primigravida was transferred to the delivery suite from the midwifery led care unit requesting an epidural. Her pregnancy had been uneventful and there was no past medical history of note. She looked extremely well and other than a mild tachycardia all her observations were normal. The anaesthetist agreed to cannulate, send a routine full blood count, group and save, and site an epidural. Labour continued and following some fetal decelerations on CTG an urgent trial of instrumental delivery was undertaken under epidural top up. The baby was delivered without difficulty, but in an unexpectedly poor condition, with a cord gas pH of 6.24. The baby required a prolonged resuscitation and was transferred to the neonatal intensive care unit. The mother was transferred to recovery in an extremely distressed state where an increasing tachycardia and a high urine output was noted. Despite this the patient appeared well with no complaints or symptoms. The initial blood results were then reported revealing a white cell count (WCC) of 35 and platelets of 233. Arterial blood gas revealed a lactate of 8, base excess of -126 and a blood glucose of 3.5. A diagnosis of sepsis was made and the standard care bundle was then undertaken and the epidural was removed. Subsequent results followed from the septic screen reporting a rising WCC of 45, a coagulopathy with an INR of 1.9. Her liver function tests were also abnormal showing an ALT of 428 and bilirubin of 96. On detailed questioning the patient reported significant polydipsia drinking around 7 litres of water per day, which she had reported to her GP in the preceding days and had been reassured following a normal urine dipstick. A diagnosis of Acute Fatty liver of Pregnancy (AFLP) was made and she was transferred to ICU for supportive management where she subsequently developed a clinical jaundice, worsening coagulopathy, a transient renal impairment, and required treatment for hypoglycaemia.

Discussion: Acute fatty liver of pregnancy is an extremely rare condition occurring in about 1 in 15000 pregnancies, with a maternal and perinatal mortality of 18% and 23% respectively. It can be extremely challenging to diagnose as it often presents with few very non-specific symptoms that can be difficult to differentiate from other conditions, such as pre-eclampsia, viral hepatitis, or obstructive cholestasis. Liver USS and biopsy can aid diagnosis, however this is relatively contraindicated with a coagulopathy. AFLP is most common in the third trimester and the mainstay of treatment is supportive with expedited delivery of the fetus where possible. Referral to specialist liver unit may be necessary. This case illustrates difficulty in picking up AFLP and making a diagnosis. The patients can look deceptively well with the initial blood tests not revealing the true seriousness of the underlying condition and the potential impending multiorgan dysfunction. The only presenting symptom was polydipsia, itself an even rarer feature, and the patient did not declare herself until after her baby was born, who sadly died at 3 days old.
Our figures show that in our unit, just over 80%, early multidisciplinary care, effective. 3% MBRRACE 5 (0.20%) A pragmatic approach to reduce peri-, Midwifery Courtenay NICE guideline CG55. Intrapartum care: Care of healthy women and. Reassuringly neonatal outcomes are similar. An obstetric obesity 9 [9 - 14 (0.69%)] A mother is considered anaemic and may require . OI symptoms include light 1/day studied. Unpublished Posters: Obstetric Anaesthesia 2015 (Torquay) P1 R Mistry, S Sharafudeen  
Anaesthetics, King’s College ... of venous thromboembolism risk assessment in obstetric postoperative patients at 
Nottingham University Hospitals 29069 deliveries, giving a rate of 4.5 per 1000 births. We 
compared the 2014(dark grey) cohort separately with the 
Results: There were a total of 11402 pregnancies in Glasgow in 2013 with 11589 deliveries. Mean BMI (SD) of the overall population was 26.12 (5.81). 198 patients (1.74%) had BMI ≥40, accounting for 201 deliveries (1.73%). Of those with BMI ≥40, 129 (65.2%) had BMI 40-44.9, 45 (22.7%) BMI 45-49.9, 17 (8.6%) BMI 50-54.9 and 7 (3.5%) BMI ≥55. Where delivery mode was recorded Normal Vaginal Delivery was achieved in 46.0% obese patients versus 54.4% overall patients (p=0.022) and 
Caesarean Section was performed in 47.5% obese patients versus 32.5% overall patients (p<0.001). 41.9% obese patients underwent induction of labour versus 31.0% overall patients (p<0.001). 1.5% obese patients underwent GA at some stage versus 1.8% overall (p=0.793). Of those who laboured 35.5% obese patients received an epidural versus 24.6% overall (p=0.005).

Table: Other characteristics of parturients

<table>
<thead>
<tr>
<th>BMI ≥40</th>
<th>All patients</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>31.5 (5.8)</td>
<td>30.3 (7.4)</td>
</tr>
<tr>
<td>Parity</td>
<td>1 (0.2)</td>
<td>0 (0.1)</td>
</tr>
<tr>
<td>Deprivation Category Vigintile</td>
<td>4 (1-8)</td>
<td>7 (2-13)</td>
</tr>
<tr>
<td>Blood Loss (Vaginal Delivery) (ml)</td>
<td>454 (503)</td>
<td>384 (355)</td>
</tr>
<tr>
<td>Blood Loss (Caesarean) (ml)</td>
<td>900 (582)</td>
<td>771 (579)</td>
</tr>
<tr>
<td>Gestational Age (days from term)</td>
<td>-8.5 (19.4)</td>
<td>-4.1 (15.4)</td>
</tr>
<tr>
<td>Birthweight (g)</td>
<td>3533 (702)</td>
<td>3358 (611)</td>
</tr>
<tr>
<td>Appgar 1 minute</td>
<td>9 [9-9]</td>
<td>9 [9-9]</td>
</tr>
<tr>
<td>Appgar 5 minute</td>
<td>9 [9-9]</td>
<td>9 [9-10]</td>
</tr>
</tbody>
</table>

Data are mean (SD) and median [IQR]  
Discussion: Parturients in Glasgow with BMI ≥40 show significant differences compared with the overall obstetric population. Obese patients undergo more interventions and bleed more at Caesarean Section. This matches previously published data. 1 Reassuringly neonatal outcomes are similar. Future work will look at modifiable factors to reduce these patients’ risk and whether the High Risk Obstetric Anaesthetic Clinic is the most appropriate and effective place to review these women antenatally or if another setting may be more effective in predicting and managing potential problems. 

References  

A novel initiative to improve assessment of parturients with altered neurology after Central Neuraxial Blockade (CNB)

S Younie, N Wharton, H Johnston, N Muchatuta Anaesthetic Department, St Michael’s Hospital, Bristol, UK  
Background: Follow-up of parturients requiring central neuraxial blockade (CNB) to assist with labour or delivery is recommended as best practice. This allows early identification of neural injury and expedites management. 
To improve patient safety, standardise the assessment process, and improve documentation we developed an assessment pro forma for women with neurology after CNB at St Michael’s Hospital University Hospitals Bristol NHS Trust. An accompanying quick reference table with guidance for individual lesions was also attached to the follow-up folder. 
The assessment pro forma prompts users to take a structured anaesthetic and obstetric history and highlights red flag symptoms that require immediate investigation. Neurological findings can be documented in a structured reproducible format to allow future comparison and there is also a section to document advice given and follow-up arranged. 
The quick reference table divides postnatal neurological symptoms according to site of lesion and offers advice on causal factors and subsequent action to be taken, including referral guidance and timelines for follow-up. 
Methods: The pro forma was developed with the help of a neurologist with an interest in Nerve injury and attached to the obstetric follow-up folder. It was piloted over a period of 2 months. To assess validity trainees and consultants that had used the new tool were invited to complete an anonymous online survey after this trial period. 
Results: 13 anaesthetists responded to the questionnaire where they were asked to rate their response using the 5 point Likert scale 
85% of respondents agreed/strongly agreed that the pro forma was a useful addition to their assessment 85% agreed/strongly agreed that it improved confidence in assessing patients 85% agreed/ strongly agreed that it improved patient documentation 70% agreed/ strongly agreed that it improved patient safety 62% agreed/ strongly agreed that the pro forma improved recognition of red flag symptoms 
Conclusion: This novel patient safety initiative was well received and improved the confidence and documentation of assessments in patients with altered neurology after CNB. Participants felt the pro forma was less useful for detecting red flag symptoms, which is likely to be because day 1 follow-up is too late to pick up urgent neurology and anaesthetists are well aware of these signs.

Discussion: This pro forma will continue to evolve, but has standardised what was previously a highly variable assessment and has improved handover and follow-up of these patients. To the authors’ knowledge there are no similar initiatives published in the literature and no commonly agreed strategy for follow-up of these patients exists.

References  
P95 A pragmatic approach to reduce peri-partum transfusion rates

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Introduction: Risks associated with transfusion of blood components have gained focus in the last decade. A transfusion during peri-partum period can also cause haemolytic disease of the foetuses and newborn in later pregnancies. A mother is considered anaemic and may require further haematological evaluation if haemoglobin is less than 110 g/L in pregnancy, or less than 100 g/L after delivery.\(^2\,^3\) Our unit implemented a robust programme in 2009 to reduce our transfusion rates in maternity. Comprehensive antenatal screening tests for anemia, treatment with oral and parenteral iron when required and changes to our transfusion trigger were introduced. We evaluated the effectiveness of these interventions.

Method: Retrospective data was collected from case notes of mothers who received parenteral iron or blood component transfusion over a five year period.

Result: Our unit has approximately 2300 deliveries per annum of which about 35% require operative interventions. Since the introduction of the above changes our red cell transfusion rate has decreased from 3% in 2009 to 1.2% in 2013. Our data also showed that mothers who received parenteral iron were less likely to suffer peri-partum haemorrhage.

Figure: Graph showing reduction in obstetric transfusions

Discussion: Our audit demonstrates that early recognition of anaemia in pregnancy allows effective treatment and reduces the requirement of allogeneic blood. We accepted that transfusion is rarely required in stable mothers with haemoglobin more than 70g/L unless there is active risk of bleeding, and a rapid correction of anaemia can be achieved through intravenous iron in most situations. We recommend these measures to all maternity units aiming to reduce their transfusion rates.

References

P96 A Region Wide Survey: Raising awareness of the obstetric Rapid Sequence Induction. Do trainees have relative inexperience or misplaced confidence?

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*Anaesthetics, Royal Oldham Hospital, Manchester, UK

Introduction: The NAP 5 audit project illustrated that obstetric anaesthesia was associated with a 12-fold over-representation of awareness compared to other specialties. The project identified the use of thiopental during rapid sequence induction as a risk factor for accidental awareness under general anaesthetic (GA).\(^1\)

Methods: We conducted a region wide electronic survey sent to all CT2 to ST7 anaesthetic trainees. Questions related to the experience and techniques trainees use to conduct their rapid sequence inductions (RSI) in an obstetric setting.

Results: 87 responses were gained (42% response rate)

<table>
<thead>
<tr>
<th>Number of GA sections done before doing solo on calls</th>
<th>Percentage of Units (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>14.29</td>
</tr>
<tr>
<td>1-2</td>
<td>45.34</td>
</tr>
<tr>
<td>3-5</td>
<td>26.19</td>
</tr>
<tr>
<td>&gt;5</td>
<td>13.09</td>
</tr>
</tbody>
</table>

As anticipated, almost all trainees (97.67%) use thiopentone for induction and only 2.33% use propofol. A majority of trainees (64.71%) do not calculate the induction dose and instead use a rough estimation. 4.71% always gave the same dose, 17.65% use actual body weight and 12.94% use ideal body weight. All trainees reported feeling confident in using thiopentone for RSI but over 1/3 (36.78%) of trainees were concerned they had given an inadequate dose at induction, even if awareness had not been reported.

Discussion: This survey has highlighted the adherence to traditional RSI techniques in an obstetric setting by relatively inexperienced trainees. Trainees may find it difficult gaining experience of RSI in obstetrics because of the reduced number of caesarean sections performed under (GA) and their restricted working hours. A study has shown many trainees will do one or less RSI for caesarean section per year.\(^2\) Our survey shows that the majority of trainees are not concerned about accidental awareness under GA despite the NAP 5 findings and suggests some confusion and variability in dose calculation of thiopentone. Studies have shown an induction dose based upon lean body weight is the most appropriate.\(^3\) We postulate there may be a misplaced level of confidence amongst trainees in light of our results. Most emergency RSls will be conducted out of hours by on call trainees. Introduction of regular and mandatory simulator workshops to develop skills and situational awareness may improve service. Overall there is a clear need for the NAP 5 project results to permeate through all tiers of training if practice is to change and lead to improved patient safety.

References
P97 A retrospective assessment of the level of care required by mothers admitted to a 'High Dependency' area on labour ward

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Introduction: Since the publication of ‘Providing equity of critical and maternity care for the critically ill pregnant or recently pregnant woman’ by the Maternal Critical Care Working Group in 2011, the subject of maternal critical care services has become of increasing interest. In the UK, the number and characteristics of pregnant women requiring level 3 care are easily determined from current registry projects, namely the Intensive Care National Audit and Research Centre, ICNARC in England and Wales and the Scottish Intensive Care Society Audit Group, SICASAG in Scotland. The cohort of women receiving level 2 or ‘high-dependency’ (HDU) level 1 care; as determined by the level of support and monitoring required, are less well described. This study aimed to characterise the level of care received by critically ill women in the obstetric unit.

Method: Data were collected retrospectively for the period 01/01/14 - 31/12/14, on all patients admitted to a designated high dependency area within the obstetric unit. Several sources of information were examined for each patient and a number of variables extracted. In addition, an assessment was made of the level of care provided and all relevant interventions undertaken were noted. Descriptive analysis was performed and a pre-planned comparison was made between those requiring level 2 and level 1 HDU care. Data is presented as medians (interquartile range). Comparisons were made using the Wilcoxon-Mann-Whitney test or the chi-squared test, as appropriate. P values < 0.05 were assumed to be significant.

Results: In the period studied, the obstetric unit admitted 5995 women, 160 (2.7%) of which were admitted to obstetric HDU beds. The median age was 30 (26-34) years and the majority (82.5%) were admitted postpartum. The most common reasons for admission were post-partum haemorrhage (37.5%), sepsis (26.0%), and pre-eclampsia/eclampsia (20.5%). Of those admitted post delivery, the median gestation was 38 (32-40) weeks and most were first time mothers (50.3%). Half of all patients had undergone emergency caesarean section, 33% under general anaesthesia. Eighty patients (50%) required level 1 care, 61 (38.1%) level 2 care, 4 (2.5%) level 3 care and 15 patients (9.4%) the level of care required could not be determined. Overall average length of stay (LOS) was 24 (16-48) hours. In those admitted after delivery, 68 (42.5%) were able to have their baby stay with them on the unit. Those requiring level 2 care were less likely to have their baby stay (p=0.030) and had a longer LOS (29 vs 23 hours, p=0.039).

Conclusions: In this study we have described a cohort of critically ill obstetric patients who would not normally have been captured by current registry or audit processes. Due to the retrospective collection of data the assessment of the level of care required is likely to have been underestimated. Future planning of services and appropriate training of staff to care for these critically ill mothers needs to be modelled on robust and reliable data that can be collected in real time and managed in national databases. This will also allow reporting of professionally agreed standards and quality Indicators across critical care.

P98 A review of the remifentanil patient controlled analgesia service on our delivery suite

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Introduction: Remifentanil is a safe and effective option for labour analgesia.1,2 The rapid onset/offset of action suits patient controlled analgesia (PCA) and is attractive with regard to side effects.2 Despite this, low uptake and negative perception of remifentanil was noted on our unit. These factors, in addition to equipment issues and recent published case reports, were drivers for review of our remifentanil PCA service.3 Evaluation of such was undertaken having implemented improvement strategies over an 18 month period.

Methods: The number of remifentanil PCAs prescribed for labour analgesia over a 4 week period before and after implementation of improvement strategies was examined. A survey of midwifery staff was undertaken canvassing opinion and training status regarding remifentanil PCAs. These findings were presented at a regional obstetric forum in order to bench mark our service. A literature review was undertaken to provide an evidence base for our revised clinical guideline and we trialled different PCA pumps to improve user interface.

Results: Implementation of improvement strategies increased the number of remifentanil PCAs used for labour analgesia on our unit from 6 to up to 23 per month. Uptake prior to improvements was limited to those with a contraindication to epidural. Now it is incorporated into standard discussions with regard to labour analgesia choice. Revisions to our guideline include: emphasis on 1:1 care, contraindication if intrauterine death, no other opioid within 4 hours, dedicated blue 22 gauge cannula, removal of cannula at end without flushing, 3 minute lockout time and blood pressure cuff on different arm. Our pumps post trials were changed to the Bodyguard® 575 Colour Vision™ PCA pump. These take a 250ml bag reducing need to replace them during labour. 37 completed midwifery surveys were received, 31 (84%) stating that they had received no formal remifentanil PCA training. Consequently we secured funding for an e-learning training package.

Discussion: Issues with our remifentanil PCA service were preventing women receiving adequate choice regarding labour analgesia. Midwifery training and negative opinion were certainly contributory factors. Evaluation of our service shows improvement in numbers per month having introduced and publicised a transparent and safety centred clinical guideline combined with a user-friendly PCA pump. Sharing our findings regionally allowed us to forge links with other departments and learn from their experiences. Further improvements will include pre-filled remifentanil bags and a new obstetric anaesthesia database to provide a robust audit trail for follow up. The e-learning package is to be produced and hosted on the E-learning for Healthcare website freely accessible nationally.4

References
P99 A survey of anaesthetic practice for laser ablation in Twin-Twin Transfusion Syndrome
J Goude, JT Paul, Y Poonaowala
The Selwyn Crawford Department of Anaesthesia, Birmingham Women’s Hospital, Birmingham, UK

Introduction: Twin-twin transfusion syndrome (TTTS) complicates approximately 15% of monochorionic twin pregnancies. Abnormal placental vascular anastomoses leads to inter twin blood exchange from one (donor) fetus to the (recipient) fetus. Treatment is with Fetoscopic Laser Coagulation (FLC).

Method: At our institution, we maintain an ongoing anaesthetic database of all cases performed; recording patient demographics, anaesthetic technique and any associated complications. We reviewed the last 5 years data to compare the side effects associated with the two forms of anaesthesia currently offered; spinal anaesthesia and remifentanil sedation.

Results:

<table>
<thead>
<tr>
<th></th>
<th>Spinal Anaesthesia</th>
<th>Remifentanil Sedation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cases</td>
<td>124</td>
<td>23</td>
</tr>
<tr>
<td>Mean gestation (weeks)</td>
<td>19.5</td>
<td>20.5</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>29.7</td>
<td>30.6</td>
</tr>
<tr>
<td>Mean operating time (minutes)</td>
<td>43.3</td>
<td>43.2</td>
</tr>
<tr>
<td>Mean dose (mg/kg/min)</td>
<td>12.2</td>
<td>0.27</td>
</tr>
<tr>
<td>Number requiring rescue analgesia</td>
<td>6 (4.8%)***</td>
<td>5 (21.7%)</td>
</tr>
<tr>
<td>Therapeutic vomiting</td>
<td>120 (97%)</td>
<td>none</td>
</tr>
<tr>
<td>Other side effects</td>
<td>8 (6.45%) cases of bradycardia 3 (2.4%) cases of maternal movement 1 case of severe hypertension</td>
<td>1 case of muscle rigidity (Remifentanil dose 0.32 mcg/kg/min) 3 cases of pruritus</td>
</tr>
</tbody>
</table>

* 61 cases (49%) had spinal Fentanyl (mean dose 17.74mcg). I case had spinal Diamorphine (300mcg). **All cases received Lignocaine infiltration to the port sites (mean dose 194.8mg).*** 3 cases (50%) had Fentanyl in the spinal.

Discussion: In both groups, no procedure was abandoned due to inadequate anaesthetic conditions. The use of Remifentanil renders the patient haemodynamically stable, with no nausea and vomiting and no maternal movement. However, a larger number (21.7% vs 4.8%) required rescue analgesia. Spinal anaesthesia is associated with more side effects including hypotension, bradycardia and nausea and vomiting, with a higher likelihood of maternal movement. Our data suggests Remifentanil may be the preferred choice of anaesthetic to offer this group of patients.

Reference

P100 A treatment conundrum; diabetic ketoacidosis in a pre-eclamptic mother
R M Jones, J Gorst
Anaesthetic Department, Morriston Hospital, Swansea, UK

Introduction: Diabetic ketoacidosis (DKA) in pregnancy is associated with high morbidity and mortality. In the CEMACE report pre-eclampsia (PET) was the second commonest cause of death. We present a case of a parturient presenting to the emergency department (ED) with both conditions.

Case report: A 38-year-old lady (GIPO) of 32 weeks gestation presented to ED with 72 hours of feeling unwell with headaches, anorexia and vomiting. She had recently been discharged having received steroids for fetal lung maturation for her "large for dates" baby. She was a known type 2 diabetic on insulin. On examination, she was tachypnoeic, tachycardic and hypertensive (200/90.) A blood gas revealed a metabolic acidosis (pH 7.06 pCO2 1.2 kPa Base XS -25), a blood sugar of 18.2 mmol/L and a high blood ketone level. A urine dipstick revealed ketones 4+ and protein 2+. A diagnosis of concurrent DKA and PET was suspected. Further lab results confirmed this with a protein:creatinine ratio 153mg/mmol. It was at this point, on our arrival, that the realisation of how to manage this patient would be challenging. In essence, the treatment of DKA is insulin and aggressive rehydation while PET is hypertension control and fluid restriction. Having arrived in ED the patient had already received a 500ml bolus of fluid further raising the blood pressure. Multidisciplinary advice was sort at this point from obstetricians (in a distant hospital), endocrinologists and critical care. Blood pressure control was refractory to oral labetolol and so treatment was successfully switched to an infusion achieving a systolic blood pressure below 150mmHg. This allowed further fluid resuscitation and a continuous insulin infusion to be commenced. The insulin infusion was titrated to ketone levels irrespective of blood sugar levels. As her blood sugar levels fell, and ketones remained high, a 10% glucose infusion was started allowing insulin infusion rates to remain high. Several hours later in high dependency a midwife attended and confirmed a normal fetal heart rate. After resuscitation with four litres of normal saline, 120mmol of potassium and a labetolol infusion the patient was deemed fit enough to transfer to the obstetric partner hospital. Insulin infusion rate remained at 13 units/hour despite a falling blood sugar as ketones remained high. On arrival, to the obstetric unit the CTG was stable but deteriorated later on and an uneventful emergency caesarean section was performed for an atypical trace under a spinal. Postpartum recovery was uneventful.

Discussion: PET is more common in diabetics but there is nothing in the literature of a simultaneous presentation of DKA and PET. DKA alone is associated with a perinatal mortality of between 9-85% which emphasises the seriousness of this case. The importance of blood pressure control was paramount to allow aggressive DKA management. The endocrinologist, said the only reason the baby survived was the aggressive nature the DKA was treated.

References
P101 An audit cycle of initial management of sepsis in the maternity unit of a district general hospital
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Introduction: Genital tract sepsis was the leading cause of maternal mortality in the triennial report of 2006-2008. Recognition of sepsis and aggressive treatment in the first hour (‘golden hour’) offers the best hope of recovery. Each hour of delay in antibiotic administration is associated with measurable increase in mortality. A six step management in the first hour of diagnosis called the ‘sepsis six’ is generally advocated. This audit cycle looks at compliance with identification criteria for sepsis and prompt management.

Methods: Data was collected retrospectively from the maternity services wards. Septic patients were diagnosed based on the criteria provided by the ‘surviving sepsis campaign’. The first audit was conducted in Feb-Mar 2014 and the second audit to close the loop in Oct-Nov 2014. In each audit 9 cases were collected. Sepsis six steps included oxygen administration, taking blood for culture, administering antibiotics, measuring lactate, giving intravenous fluids and measuring urine output.

Results: Identification of sepsis was based on correct criteria from early warning score charts and the suspicion of infection. All suspected cases were duly escalated to senior staff. The compliance with all the steps of sepsis six were however variable as shown in the following chart.

Discussion: The most reassuring finding was that the crucial step of antibiotic administration was 100% both times. Fluid administration and urine output measurement had improved but there was a fall in oxygen administration, taking blood for culture and lactate measurement. After the first audit, several measures had been undertaken to improve management of sepsis. A guideline on sepsis had been implemented, a poster on sepsis was displayed in the maternity wards including the labour ward and sepsis was included in the topics of the monthly midwives teaching update days. Although the number of cases were too low to do any hard statistics, the impression was that there was still a lot of work to be done to achieve 100% compliance. Continuing education and increasing awareness were identified as the keys to success. It was also suggested to have leads on sepsis among obstetricians, obstetric anaesthetists and midwives.

References
1. Saving Mothers' lives: Reviewing Maternal Deaths to make Motherhood Safer; 2006 - 2008
2. Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock; Critical Care Medicine 2008
3. Bacterial Sepsis in Pregnancy: Green-top Guideline No. 64a; Royal College of Obstetricians and Gynaecologists

P102 An audit of accidental dural puncture, post-dural puncture headache and epidural blood patch rates at Queen Charlotte’s and Chelsea Hospital
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Introduction: Accidental dural puncture (ADP) is a recognised complication of epidural anaesthesia/analgnesia, and most will lead to the patient developing a debilitating post-dural puncture headache (PDPH). An epidural blood patch (EBP) is the gold standard for treating PDPH. The aim of our audit was to compare our ADP, PDPH and EBP rates with audit standards published by the Royal College of Anaesthetists (RCoA).  

Methods: The RCoA has published audit standards for regional analgesia/analgnesia techniques in obstetrics:  
1. <1% of epidurals should have an ADP;  
2. <0.5% of spinal anaesthesia should be followed by severe PDPH.

We audited our obstetric regional procedures for the year 2013 and compared our ADP and PDPH rates with the RCoA’s audit standards. We also audited our use of the EBP.

Results: 3,348 obstetric regional procedures (3,283 epidurals/CSEs and 65 spinals) were performed in our unit during 2013. The overall ADP rate was 0.46%. 86.7% of parturients who had an ADP developed a PDPH and all went on to have an EBP. 78.6% of parturients required only one EBP; the remainder required two EBPs. One patient had who had a spinal developed a PDPH (1.5%) and required an EBP.

Discussion: Our ADP rate of 0.46% remains well below the RCoA’s standard of less than 1%. This may be partly explained by the seniority of anaesthetic trainees working on our unit (ST5-7 and clinical fellows). It may also be related to our use of the CSE as neuraxial technique of choice for the following reasons:
1. If uncertain of the location of a Tuohy needle during a CSE, a spinal needle can ‘look’ for CSF. If CSF is seen, the anaesthetist is warned not to advance the Tuohy needle any further;  
2. Increased experience of the CSE by our anaesthetists may reduce the incidence of complications from the technique;  

Our results for EBP follow previously reported trends. We believe our high rate of PDPH following spinal anaesthesia is an anomaly because of the low number of spinals performed in our unit.

References
P103 An audit of the duration of the second stage of labour in women receiving epidural analgesia

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Introduction: In May 2014, NICE published updated guidelines regarding the management of parturients receiving regional analgesia. These contain a time-critical recommendation that is not widely recognised: ‘after diagnosis of full dilatation in a woman with regional analgesia, agree a plan with the woman in order to ensure that birth will have occurred within 4 hours regardless of parity’. This standard has been retained in the most recent NICE guidelines on intrapartum care, published in December 2014. We undertook an audit at our institution to evaluate whether we were meeting the above standard and identify potential areas of concern.

Methods: The audit was registered with our local audit department. All parturients receiving epidural analgesia on our labour ward during a three month period, from January to March 2014, were identified using an electronic database (Euroring©) and the information was corroborated using the anaesthetic departmental logbook. The outcome noted was the time elapsed between diagnosis of full dilatation and delivery, using the time of birth of the youngest child in multiple pregnancies.

Results: Data was collected on 334 women during this period. Complete data was obtained in 319/334 cases hence 15/334 were excluded from further consideration. In the remaining 319 cases, 86 women underwent emergency caesarean section prior to reaching full cervical dilatation. Of those who reached full dilatation, 99% (231/233) were delivered within four hours in accordance with the NICE guideline.

The remaining 1% (2/233) women delivered beyond four hours of full cervical dilatation. In both cases, the parturients experienced a delayed second stage during planned home birth. They were transferred into hospital for further management and delivery took place on the labour ward after epidural analgesia had been established.

Discussion: Delay in the second stage is an important consideration in labour, since it may lead to increases in both maternal and neonatal morbidity. Our evaluation demonstrates that this risk is being appropriately addressed in our maternity unit, in accordance with national guidance. However, this important issue requires ongoing vigilance to avoid potential increases in maternal and neonatal morbidity.

References
2. NICE 2014, http://www.nice.org.uk/guidance/eg190

P104 An audit on the management of accidental dural punctures and the use of epidural blood patches in the North West of England

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Introduction: Accidental dural puncture (ADP) occurs in ~1% of epidurals and can result in a post dural puncture headache (PDPH). Epidural blood patch (EBP) is the gold standard for treating PDPH however there is ongoing debate on its use. The aim of the audit was to determine the incidence within the North West (NW) of:
1. ADP from labour epidurals
2. EBP in patients with PDPH from central neuraxial blocks (CNB)
3. Follow up after EBP

This was compared with RCOA standards and national data.

Method: Hospitals within the NW with a consultant led delivery unit were invited to take part in the audit. We retrospectively identified and reviewed case notes of all obstetric patients that had either a suspected ADP during epidural insertion and/or an EBP over a 12 month period. For each patient a generic proforma was completed and results collated.

Results: 5 hospitals were included. 49 patients were identified from 20678 deliveries, 8003 CNB, including 4064 epidurals. 36 patients had an ADP, 28 required an EBP. See Table 1.

Table 1. Incidence of ADP, EBP and follow up in NW compared with RCOA standards and NOAD data (actual numbers given in parentheses)

<table>
<thead>
<tr>
<th></th>
<th>NW</th>
<th>NOAD</th>
<th>RCOA</th>
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</thead>
<tbody>
<tr>
<td>ADP incidence from epidural (%)</td>
<td>0.9 (36/4064)</td>
<td>1.2</td>
<td>&lt;1</td>
</tr>
<tr>
<td>EBP incidence from CNB (%)</td>
<td>0.3 (28/8003)</td>
<td>0.9</td>
<td>-</td>
</tr>
<tr>
<td>Documented follow up after EBP (%)</td>
<td>18 (5/28)</td>
<td>-</td>
<td>100</td>
</tr>
</tbody>
</table>

Outpatient follow up after EBP was arranged in 79% of patients, however in only 18% of patients who had had an EBP was this follow up documented.

Discussion: Within the NW we are meeting the RCOA standard for ADP and have lower rates of ADP and EBP than reported nationally. However our rate of follow up after EBP is not meeting set targets, and documentation of follow up occurs infrequently. This is of concern as it may mean we are missing serious pathology and opportunities for communicating with other disciplines as highlighted in the recent MBRRACE-UK report. We suggest that for all patients with suspected ADP, or EBP outpatient follow up should be arranged, the outcome documented, and primary care must be informed.

References
2. Ruckledge OMWM. All patients with a postdural puncture headache should receive an epidural blood patch.Int J Obstet Anesth 2014;23:171-174
P105 An audit into the use of the epidural component of combined spinal and epidural anaesthesia during elective and emergency caesarean section

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Aim: To investigate the use of the epidural component of combined spinal and epidural anaesthesia (CSEA) during elective and emergency caesarean section (CS).

Methods: We retrospectively analysed obstetric anaesthetic records of elective and emergency CS at our institution over a three month period.

Results: We conducted 230 caesarean sections. Of these 11% were Category 1, 34% Category 2, 22% Category 3 and 33% Category 4. 14% were conducted under spinal anaesthesia (SA), 52% CSEA, 30% epidural top-up and 3.5% general anaesthesia. 99% of Category 4 CS were under CSEA, compared with 4% of Category 1, 21% of Category 2 and 55% of Category 3.

The epidural component of the CSEA was used in 14.6% of cases, the majority of which were for anticipatory pain relief rather than actual discomfort. There were no conversions to general anaesthesia. We found no association between the spinal anaesthetic dose and use of the epidural component. 80% of cases of intra-operative use of the epidural component were in situations of pre-operative predicted surgical difficulty. We found 'strong indicators' for CSEA in around 52% of the patients who received a CSEA such as predicted major haemorrhage, predicted surgical difficulty, and predicted difficult airway.

Discussion: Trends in anaesthetic management of both elective and emergency CS have changed dramatically over the past few years, with a growing trend towards CSEA, although not universally. CSEA have certain advantages over SA in that there is an option for intra-operative delivery of RA, important in cases of predicted surgical difficulty, high likelihood of major haemorrhage and risks of difficult intubation. In our audit we found that the epidural component was only used in 14.6% of cases; and nearly all cases of intraoperative use were predictable. The risks of CSE include increased incidence of post-dural puncture headache, use of an untested epidural component, and increased risk of epidural haematoma and overall permanent harm. One UK study has found that the rates of intra-operative pain were higher in CSEA compared with SA (18% vs 6%), and other benefits of SA can be speed of insertion, and reduced cost.

Conclusion: Both neuraxial techniques have a place in emergency and elective settings, but each case should be assessed on an individual basis, and real consideration taken as to the risks and benefits, including those of cost and training.

References

P106 An evaluation of current skin to skin practice during caesarean section

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Introduction: The pledge to provide 'excellent care with compassion' is one of our hospital's key organisational values. A vital element of this for those having elective caesarean is that mother and baby should have a positive experience, which for many includes bonding and early skin to skin (STS) contact. Early STS is widely practiced after vaginal delivery and has been shown to have positive effects on breastfeeding rates and duration, cardiorespiratory stability and neonatal thermoregulation and blood glucose levels. During elective caesarean however the practice is less widely accepted with just over half (53%) of UK units initiating STS in the operating room. We have undertaken an evaluation of rates of STS and timings of visual and physical contact between mother/birth partner and baby during elective caesarean birth at our hospital.

Methods: Timing observations were made during elective caesarean by either the ODP or anaesthetist for the case and recorded on a proforma sheet. The proforma also requested information on reason for caesarean, complications, events prior to physical contact and occurrence of STS contact in theatre.

Results: Timings were recorded for 20 cases. In 10 of the 20 cases visual contact between mother and baby was immediately after birth. For those who did not have immediate visual contact however, the mean time was 7.11 minutes for the mother and 5.33 minutes for the birth partner. The mean time for physical contact was 26.75 minutes (range 1-72) for the mother and 10.4 minutes (range 2-21) for the birth partner. STS contact was achieved in 5 of the 20 cases, 3 initiated by the midwife, one by the anaesthetist and one by maternal request. Events that occurred regularly prior to physical contact included labelling of the newborn (9), weighing (11), full examination (11), vitamin K injection (8) and swaddling (7). 7/20 babies had 4 or more of these interventions prior to physical contact with the mother. Fetal complications was the only factor recorded as preventing physical contact and this happened in only 2 cases. There were no cases in which shivering, nausea/vomiting, maternal complications or anaesthetic complications prevented physical contact.

Discussion: Our results demonstrate that visual and physical contact between mother and baby is an important part of the birth process which is often not prioritised within the theatre environment during elective caesarean. We plan to use this information to raise awareness of this issue and effect some small and simple changes to practice and theatre layout which we hope will lead to significant improvements in these timings and in rates of STS. Whether such changes would in fact improve the patient experience and contribute to enhanced recovery and early discharge would be interesting areas for further study.

References
P107 Anaesthesia for EXIT: a case series of evolving practice

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Introduction: The ex utero intrapartum therapy (EXIT) procedure involves maintaining the fetus on placental circulation while the airway is secured at caesarean delivery in the presence of an anterior neck mass or other airway compromise. We present the management of the first 4 EXIT procedures performed at our institution over the last 18 months which we believe to be the largest published UK series.

Case series: All 4 cases were managed by a skilled multidisciplinary team (MDT) of obstetricians, fetal medicine specialists, obstetric anaesthetists, neonatologists, paediatric anaesthetists, ENT surgeons and specialised nursing staff. A detailed team brief was undertaken before and after each procedure. All cases were conducted under general anaesthesia using modified rapid sequence induction with thiopentone, fentanyl and rocuronium. Anaesthesia was maintained with oxygen, air and sevoflurane, achieving minimum alveolar concentrations (MAC) within the range 1.6-2.0 until the EXIT procedure was completed. Maternal cardiac output and placental perfusion was optimised in each case using invasive arterial blood pressure and oesophageal Doppler monitoring (ODM) in addition to vasopressors and intravenous fluids. Cardiac output data from these four cases shows a significant increase in stroke volume on delivery of the fetal head and shoulder as aortocaval compression was reduced. During the procedure, fetal wellbeing was monitored with pulse oximetry. The first 3 cases received morphine patient controlled analgesia post-operatively and the fourth case received a lumbar epidural.

Discussion: Our management of EXIT procedures has refined with successive cases. Where possible there is a consistency of staff involved and team briefing has played a vital role in helping us learn and adapt our practice. Anaesthetic goals for EXIT are uterine relaxation, an anaesthetised fetus, optimum placental perfusion and limiting the inherent increased risk to the mother. Despite using a lower MAC compared with published data we have achieved favourable operative conditions without the need for additional tocolytics. Nonetheless, maternal haemorrhage in our case series was common, despite proactive use of uterotonic. Haemorrhage must be managed promptly and cell salvage was performed in all cases. We have found fetal oximetry to be relatively unreliable. ODM has been a useful tool to help ensure adequate placental perfusion. Epidural analgesia may prove to be a superior choice for post-operative analgesia for mothers at a stressful and uncertain time.

Conclusion: EXIT is a novel procedure at our institution, our practice is continually evolving through review and reflection to improve both the patient experience and clinical outcomes.

Reference

P108 Anaesthetic management of a parturient with long QT syndrome

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Introduction: Congenital long QT syndrome (LQTS) can often present as malignant tachyarrhythmias, syncopal episodes or sudden cardiac death in women in the reproductive age group. It includes a group of hereditary ion channelopathies of which LQTS type 1, 2 and 3 are more common. We present the case of a woman with LQTS type 3 fitted with an implantable cardiac defibrillator (ICD) who was induced and proceeded to have a normal delivery.

Case Report: A 19 year old G2P1 with long QT type 3 syndrome and a proven SCNSA mutation presented at 39 weeks for induction of labour. She was asymptomatic and otherwise fit and well. Her sister had syncopal episodes as a child which led to the patient’s diagnosis. Due to high risk of tachyarrhythmias she was fitted with an ICD at age 11 but had never needed a shock from it. She was initially treated with atenolol but had stopped taking it for several months prior to presentation. She had undergone previous uneventful general anaesthetics. The obstetric team decided to induce labour with prostaglandin gel, artificial rupture of membranes and an oxytocin infusion. She was counselled to have an early epidural which was sited when established labour commenced. Her ICD was temporarily deactivated using a magnet strapped over it to prevent accidental misfiring. Her magnesium, potassium and calcium levels were within normal limits. The QTc was prolonged at 509ms. She was looked after in our obstetric high dependency unit with continuous cardiac monitoring. She laboured uneventfully and proceeded to have a normal vaginal delivery. She had a third degree tear which was repaired in theatre. A low dose spinal anaesthetic was performed which resulted in a saddle block with minimal cardiovascular instability. Postnatally, she developed diarrhoea and was kept in hospital for 4 days but remained stable from a cardiac point of view.

Discussion: LQTS is an inherited ion channelopathy affecting ventricular repolarisation. It can present as syncope and arrhythmias triggered by certain states or drugs prolonging QT interval and can cause sudden death. The LQTS Subtype 3 affects Na channels and dysrhythmias such as polymorphic ventricular tachycardia (torsades de pointes) can commonly occur during rest or sleep in contrast to other subtypes where exercise, auditory stimuli or anxiety are more likely triggers. A clear management plan, senior input and good communication helped our management of this patient. Our main aims were to allow her to labour in a calm, monitored environment with an early epidural to minimise catecholamine surges and avoid drugs that prolong QT interval. In the postnatal period there is an increased risk of developing dysrhythmias in these women and regular follow up and support after discharge is recommended.

References
P109 Anaesthetic management of a parturient with postural orthostatic tachycardia syndrome

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Introduction: Postural orthostatic tachycardia syndrome (POTS) is defined as the development of orthostatic intolerance (OI) upon standing, accompanied by an increase in heart rate of at least 30 beats min⁻¹. OI symptoms include light-headedness, nausea, headache, fatigue, palpitations, precordial pain and syncope.₁ We present a case of elective caesarean section in a patient with severe POTS.

Case report: A 30-year-old woman (G2P1) attended our high risk anaesthetic clinic at 20 weeks’ gestation. Her past history included a diagnosis of POTS and previous caesarean section. Her symptoms included palpitations, light-headedness, syncope and chest pain. These would often be provoked by a change of position but could occur at any time. Episodes were self limiting and she was on no treatment. Her previous caesarean section was performed under spinal anaesthesia, invasive blood pressure monitoring and 1000ml pre-load of crystalloid and was complicated by a failed combined spinal epidural (CSE) and a sensory block to cold of C5. On this occasion standard monitoring (ECG, pulse oximetry, non-invasive blood pressure (NIBP) measurement) was applied with the patient in the sitting position. A CSE was placed at the L3-4 inter space and 1.6mls of 0.5% hyperbaric bupivacaine with 15mcg fentanyl was injected intrathecally. The patient was then placed supine with left lateral tilt. Fluid co-loading with 500ml of crystalloid was started and NIBP measured every 2.5 minutes. A phenylephrine infusion was commenced at 2mg/hr. A total of 10mls 0.75% ropivacaine was injected incrementally down the epidural catheter until a sensory level to T4 bilaterally to cold was achieved. A healthy baby boy was delivered 15 minutes later. The patient remained cardiovascularly stable throughout. The maximum heart rate was 120 beats min⁻¹ when the patient was sat up for placement of the CSE and she remained asymptotic at this time. When supine her heart rate remained between 60 and 95 beats min⁻¹ and her systolic arterial pressure stayed between 100 and 130mmHg. The phenylephrine infusion remained at 2mg/hr until delivery when it was rapidly weaned off. The patient did not experience any POTS related symptoms at any time. She remained well post-operatively and was discharged on day 4.

Discussion: To our knowledge this is only the second report in the literature describing CSE for a caesarean section in a patient with POTS.₂ A low dose spinal component was used which was then augmented by slow titration of epidural ropivacaine until the desired block height was achieved. We employed this technique successfully without the need for fluid pre-loading or invasive blood pressure monitoring. Cardiovascular stability was maintained throughout and vasopressor use was within normal limits.

References


P110 Anaesthetic management of platelet pool storage disorder in parturient women

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Introduction: Platelet pool storage diseases are disorders of platelet function arising from defects in platelet granule content or secretion and affecting platelet aggregation.¹ They give rise to mild to moderate bleeding diatheses. Pregnant patients with such disorders present a potential challenge for the anaesthetist due to the higher risk of obstetric haemorrhage combined with limitations on performing neuraxial blockade. We present two cases of parturient women with known platelet pool storage disorder.

Case 1: A 29 year old nulliparous woman with platelet pool storage disorder attended the delivery suite at 42 weeks gestation for induction of labour. She had a history of haematoma formation following ENT surgery. She was planning a normal vaginal delivery.

Full blood count showed haemoglobin 14.6 g.dL⁻¹ and platelet count 185,000 mL⁻¹. Following an uneventful induction of labour and an augmented second stage she delivered vaginally, but required suturing of a 2 cm degree tear. Tranexamic acid (TXA) was given intravenously every eight hours from the onset of labour and analgesia was provided by TENs and Entonox. Estimated blood loss was 350 mL.

Case 2: A 33 year old nulliparous lady with gestational diabetes attended the delivery suite at 37 weeks gestation in spontaneous labour. She had platelet pool storage disorder and had previous episodes of major bleeding following ectopic pregnancy, adenolectomy and dental extraction. Her full blood count showed haemoglobin 12.6 g.dL⁻¹ and platelet count 211,000 mL⁻¹. Clotting studies were normal but no additional platelet function tests were performed.

During labour she received intravenous remifentanil patient controlled analgesia, TXA and desmopressin (DDAVP). Emergency caesarean section was performed under general anaesthesia as the cardio-teroscopy trace became suspicious during labour. The estimated blood loss was 1500 mL and post-operative bloods showed haemoglobin 8.2 g.dL⁻¹ and platelet count 176,000 mL⁻¹.

Conclusion: Platelet count alone is unhelpful in this disorder and standard clotting studies add little. TXA and DDAVP are recommended to reduce bleeding, although they can increase the thrombotic risk. Platelet transfusion may therefore be preferred in the event of obstetric haemorrhage. Spinal and epidural anaesthesia are contraindicated so alternative techniques for labour analgesia and anaesthesia need to be planned.

Reference

P111 Anaesthetic record-keeping for Caesarean sections: elective vs emergency
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Introduction: The GMC guidance on good medical practice directs clinicians to maintain accurate, legible and contemporaneous records. The RCOA¹ audit recipe book recommends auditing anaesthetic records and sets out a minimum essential data set for recording. The OAA² recommends an exhaustive list of data but does not stipulate an essential data set for obstetric anaesthesia. After local agreement amongst colleagues an essential minimum data set of twenty parameters was generated to audit the standard of documentation in obstetric anaesthetic records.

Method: After gaining approval from the hospital clinical governance department and the Caldicott guardian, sixty anaesthetic records of caesarean sections (30 elective and 30 emergency) were obtained from a period predating the local agreement on the minimum data set. A 100% completion of the minimum agreed dataset was the standard against which the records were compared.

Results: All caesarean sections were conducted under regional anaesthesia. A 100% standard was achieved for recording consent and anaesthetic plan for all elective sections as opposed to 96% for emergency sections. The table below shows the percentage achieved for data specific to obstetric anaesthesia.

<table>
<thead>
<tr>
<th></th>
<th>Elective cs%</th>
<th>Emergency cs%</th>
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<tbody>
<tr>
<td>Machine check</td>
<td>76.6</td>
<td>76.6</td>
</tr>
<tr>
<td>Times</td>
<td>90</td>
<td>93.3</td>
</tr>
<tr>
<td>Aseptic precautions for neuraxial block</td>
<td>96.6</td>
<td>93.3</td>
</tr>
<tr>
<td>Height of block</td>
<td>96.6</td>
<td>96.6</td>
</tr>
<tr>
<td>Intraoperative pain/comfort</td>
<td>80</td>
<td>83.3</td>
</tr>
<tr>
<td>Minimum monitoring</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Discussion: An anaesthetic machine check was equally poorly documented in both groups. This may be due to complacency as regional anaesthesia was used in all cases without needing to use the machine. Pain during caesarean section is one of the commonest reasons for complaints and litigation in obstetric anaesthesia and recording the state of intraoperative comfort is strongly recommended³. Despite this it was equally poorly documented in both groups. Although formal analysis was not done documentation in both groups was of an apparently equal standard. A recent study⁴ showed significant deficiencies in intraop documentation in emergency cases and for patients only having regional anaesthesia. After presenting this data to our department and reagreeing on a minimum data set we intend to use a scoring system by allocating a score to each parameter. Data will be collected again over 6 months and analysed statistically to look for improvement in our standard of documentation.

References
2. OAA Suggested dataset for obstetrics (These guidelines first displayed in April 2010)

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P112 Anaesthetists non-technical skills during perimortem caesarean delivery
T Reynolds, N Borgeaud, M Naik, M Razzak
Department of Anaesthetics, Royal London Hospital, London, UK

Introduction: Maternal cardiac arrest is one of the most terrifying and demanding situations an anaesthetist will face. We present a case of a maternal cardiac arrest where anaesthetists non-technical skills (ANTS) played a crucial role in the successful outcome for mother and baby. ANTS or crisis resource management training focuses on the skills of dynamic decision-making, interpersonal behaviours and effective team management¹.

Case report: A 30-year-old, 31-week gestation (G3P2) woman presented with a short history of breathlessness. She had gestational diabetes, raised BMI and pre-eclampsia. She had a history of chronic hypertension treated with ramipril prior to pregnancy. In the early hours of the morning whilst on the antenatal ward she became acutely breathless and was transferred to the high dependency unit for closer monitoring. On arrival she became extremely agitated and hypertensive (systolic BP >200mmHg) with episodes of desaturation despite facemask oxygen. She was moved to theatre for stabilisation.

Senior anaesthetic and obstetric assistance were summoned. An arterial line was sited. She was given loading magnesium sulphate 4g, and furosemide 40mg intravenously. Attempts to provide non-invasive ventilation via a Mapleson C circuit proved unsuccessful. She continued to desaturate so was intubated, uneventfully. She then became increasingly difficult to ventilate and a decision for delivery was made. Ten minutes after induction of anaesthesia she became bradycardic and lost cardiac output. CPR commenced, surgery continued, and a live neonate was delivered. Four separate cycles of CPR were undertaken over a 30-minute period. Her condition stabilised once an inotrope infusion commenced. Both mother and baby spent short periods in intensive care and made good recoveries.

Discussion: The cardiac arrest was attributed to pre-eclampsia on a background of a possible hypertensive cardiomyopathy. CT-pulmonary angiogram was negative for thromboembolism. Transthoracic echocardiography and cardiac stress MRI both revealed a non-dilated left ventricle with mild systolic impairment and evidence of left ventricular hypertrophy. A number of non-technical elements in this patient's management contributed to a successful outcome. These included early recognition of the unwell parturient, anticipation, clear communication, early transfer to HDU and theatre, early escalation for senior help, early use of invasive arterial monitoring and prompt decision making to deliver the baby for maternal welfare. Good leadership and followership were demonstrated by all staff involved. Debriefing the event was felt to be important and beneficial. In summary, healthcare professionals in obstetrics need to appreciate the significant non-technical challenges present when managing a critically unwell parturient. The care of these patients tests us to achieve the best team working possible. This can be accomplished with regular in-situ simulation, skills and drills and actively debriefing situations to enhance individual and team learning.

Reference
P113 Assessing the demand for / opportunities for peripherally inserted central venous catheters in parturients with poor venous access

C Dowse, SM Kinsella
Department of Anaesthesia, St Michael's Hospital, Bristol, UK

Introduction: The need for repeated venous access in the obstetric population is common. Certain women may predictably be difficult to establish venous access such as those with damaged veins (intravenous drug user [IVDU], previous chemotherapy) or deep veins (increased body mass index [BMI]), and in these cases a peripherally inserted central catheter (PICC) may be a solution. We wished to estimate the incidence of problematic venous cannulation on our Central Delivery Suite.

Method: We contacted the Bristol Specialist Drug & Alcohol Service (BSDAS) to estimate the annual number of pregnant IVDU clients. We analysed our Maternity Data system to give number of women with a BMI > 50. We surveyed ten midwives, ten obstetricians and ten anaesthetists who performed intravenous cannulation on our Central Delivery Suite.

Results: Our unit has 5,800 deliveries per annum. In the past year there were 20 women with BMI > 50. BSDAS usually has 20-30 pregnant IVDU clients (most currently not using) on their caseload at any time. In 2014 there were five referrals of women with predicted difficult venous access to the obstetric anaesthetic department (two IVDU, three other).

<table>
<thead>
<tr>
<th>Staff group</th>
<th>IV cannulation practice</th>
<th>Last failure</th>
<th>Was failure predicted?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midwives</td>
<td>1/week - 8</td>
<td>In last month - 2</td>
<td>Yes - 8</td>
</tr>
<tr>
<td>(n=10)</td>
<td>1/month - 2</td>
<td>In last 3 months - 6</td>
<td>Yes - 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In last 6 months - 2</td>
<td></td>
</tr>
<tr>
<td>Obstetricians</td>
<td>1/day - 10</td>
<td>In last 3 months - 10</td>
<td>Yes - 8</td>
</tr>
<tr>
<td>(n=10)</td>
<td></td>
<td>In last 3 months - 10</td>
<td></td>
</tr>
<tr>
<td>Anaesthetists</td>
<td>1/day - 10</td>
<td>In last 3 months - 10</td>
<td>Yes - 10</td>
</tr>
<tr>
<td>(n=10)</td>
<td></td>
<td>In last 3 months - 10</td>
<td></td>
</tr>
</tbody>
</table>

The anaesthetists had placed on average two central lines each in the past year for difficult intravenous access; all were in IVDU patients.

Discussion: Cases of predicted very difficult intravenous access occur at a rate of > 1 /week in our unit. All staff groups experience failed cannulation at least once a month. Failure was predicted in the majority of cases. PICC insertion is an option in parturients with difficult peripheral venous access who require long-term access as long as there is suitable expertise with insertion and management, 1,2 and major haemorrhage is not predicted.

References

P114 Awareness about remifentanil PCA - Survey of midwives in a tertiary maternity unit in the UK

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Introduction: Royal Stoke University Hospital has a tertiary care maternity unit with annual birth rate of 6500. Remifentanil PCA for labour analgesia is used in our centre primarily when epidural is contraindicated or not feasible1. The associated risks of administering remifentanil PCA are well known in the form of respiratory and cardiac arrest2,3. This survey was undertaken to determine the understanding of our midwifery staff about the regimen.

Methods: Anonymous questionnaire was handed over to midwifery staff to fill in and the data was analysed.

Results: A total of 32 responses were obtained. The results from the analysis are as follows:

- 62% of midwives had looked after parturients with remifentanil PCA before but only 12% had any training on it.
- 50% of midwives were confident to look after parturients on remifentanil PCA.
- 62% knew that remifentanil should be administered via dedicated cannula which is according to our protocol.
- 68% would not apply BP cuff on the same arm of remifentanil PCA administration.
- 18% did not know that parturients had to have one to one care.
- 69% identified respiratory depression as the commonest side effect.
- 50% of midwives expressed interest for more training.

Discussion: Many UK maternity units use remifentanil for labour analgesia but much less frequently than epidural. Although 62% of midwives have used it, our data shows that only a few midwives have been trained on it. It appears that about a third of midwives are not fully aware of the side effect profile or monitoring requirement as instructed by the department protocol. Our data shows requirement for training the midwives on the use of remifentanil although the administration of the medicine is directly under the supervision of anaesthetists in our unit.

References
Pi15 Caesarean delivery under neuraxial anaesthesia for a patient with a large mediastinal mass

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Introduction: Mediastinal mass in pregnancy is rare. We present a woman admitted in her third trimester with severe orthopnoea, dysphonia and dysphagia who had an emergency caesarean delivery under neuraxial anaesthesia.

Case report: A 26-year-old Afro-Caribbean woman (G1P0) of 37+5 weeks gestation presented with sudden onset of dyspnoea when lying flat and dysphagia following a two week history of hoarse voice. Medical and obstetric history was unremarkable. Examination showed a bulky neck and no stridor. Nasendoscopy demonstrated left-sided vocal cord palsy. Oxygen saturations and respiratory rate when sitting were normal. Blood tests were unremarkable. Sitting bedside echocardiogram showed no vessel compression. PA CXR showed an abnormality of the left upper mediastinal contour consistent with an anterior mediastinal mass. A CT was advised after delivery.

Given her worsening symptoms and orthopnoea, a multidisciplinary team decision (MDT) led to category 3 caesarean delivery. She had a combined spinal and epidural (CSE) in the sitting position (intrathecal dose of 2ml plain bupivacaine 0.5% with 300mcg diamorphine). Block height was adequate and no epidural top up was required. The operative procedure took place in a 30-degree head up position with both consultant anaesthetist and obstetrician present. There was minimal blood loss and the patient remained asymptomatic throughout. The post-operative period was uneventful and investigations were consistent with lymphoma, which was treated with chemotherapy.

Discussion: Mediastinal mass remains an anaesthetic challenge with variable clinical presentation ranging from lack of symptoms to severe cardiorespiratory compromise. General anaesthesia can lead to loss of muscle tone and tumour compression syndrome obstructing the mediastinum causing either airway obstruction or reduction in venous return and loss of cardiac output with sudden cardiac arrest. We decided on neuraxial anaesthesia to avoid these risks. Inability to lie flat is often cited as a contraindication to regional anaesthesia for caesarean delivery however both good operating conditions and patient comfort were achieved in a 30-degree head up tilt using CSE anaesthesia with plain bupivacaine. An MDT approach is required for these rare complicated patients.

Reference

Pi16 Can debriefing after elective and emergency cases in obstetric theatre improve safety and efficiency?

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Introduction: Debriefing can enhance teamwork and communication skills, which are of paramount importance in obstetric theatres. Combined with regular team review of captured issues, debriefing could improve patient safety by identifying and addressing issues that threaten care quality and safety culture. However, little is published on captured debriefing with assessment of multiple outcomes in obstetric theatre. We aimed to: 1) establish debriefing after all elective and specific emergency cases in obstetric theatre, 2) determine the impact on safety culture, efficiency and the addressing of safety issues, and 3) gain staff perceptions of the process.

Methods: The types of obstetric emergency warranting a debrief were agreed by local experts, who also developed a form to help standardize debriefs for both elective lists and the specified emergencies. Both were tested using ‘Plan, Do, Study, Act’ cycles. Stakeholders were educated in debriefing and the recording of issues. Multidisciplinary meetings reviewed and attempted to address any identified issues. The Safety Attitudes Questionnaire (SAQ) was administered to theatre staff before, and seven months after the establishment of debriefing and pre-post scores were compared by two-sample t tests. Elective list start times were recorded for six months before and seven months after the intervention and underwent statistical process control analysis. Staff perceptions were evaluated using a locally developed questionnaire. The hospital ethics committee classified this study as ‘quality improvement’ not requiring ethical approval. It was registered and supported by the hospital audit committee.

Results: Compliance with debriefing was significantly higher for elective cases (79%) than emergency cases (41%) (P<0.001). Three multi-disciplinary meetings over seven months addressed 18 safety issues, mostly related to care processes. ‘Teamwork’ as measured by the SAQ improved significantly (n=67, P<0.05). All other SAQ domains exhibited non-significant increases, except ‘stress recognition’ which paradoxically decreased (P<0.05). Mean anaesthetic start time for elective lists was significantly earlier (22.7 min, P<0.05) following the introduction of debriefing. The process was highly regarded by staff (n=28), with ‘agree’ being the median response as to whether safety, morale, efficiency, teamwork and communication had improved. 96% of staff felt debriefing should continue.

Discussion: Captured debriefing with follow-up of issues is feasible and valid in obstetric theatre, and can enhance the teamwork and safety culture, which have been linked to improved outcomes for patients and staff. Debriefing has also improved efficiency, potentially saving our Trust £56 400 p.a.

References
P117 Causes of mortality in Eclampsias admitted into ICU at the University College Hospital; a 4 year review

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Introduction: Eclampsia is a clinical condition seen in obstetrics. It is a combination of Pre-eclampsia and seizure. Its an obstetric emergency that occurs in 1.7/1000 birth in this part of the world.1 Mortality is quite high, accounting for 25% of maternal mortality.

This is a retrospective study which evaluated obstetric patient admitted into the ICU with Eclampsia. The objective is to identify the causes of mortality and interventions within ICU.

Method: Patients that were diagnosed with Eclampsia and were admitted into the ICU over a 4 year period April 2011 - April 2014 were evaluated using their case note. Variables considered include biodata, if Eclampsia was antepartum or postpartum, Ante natal booking status, Parity, Glasgow coma scale at admission in the ICU. Outcome of ICU intervention was divided into two viz Death or Discharge. Causes of mortality was analysed and autopsy report was evaluated where applicable.

Result: A total of 83 patients were admitted, 62(74.6%) had antepartum eclampsia, 21(25.4%) had postpartum eclampsia. 60 (72.3%) patients were discharged to the ward while 23(27.7%) died. It was commoner in the unbooked and in the age group 20-30 years (44.6%). Admitting GCS was 3-8in 46.2%, 9-12 in 32.7% and 13-15 in 19.2%. 40.4% had parity of less than 2 while 57.6% had parity of 2-6. 61.5% were transfused with PCV<25%.

Conclusion: This study shows the trend of Eclampsia in Nigeria women. It shows the high mortality rate of Eclampsia as alarming despite specialised care. Mortality was higher in patients admitted into the ICU with low GCS. Centers are advised to draw protocols to determine ICU admission and research should continue into reducing mortality.

Reference

P118 Cerebral vein thrombosis after delivery

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Introduction: Headache is a relatively common problem after delivery.1 There is a well described list of possible differential diagnoses.2 The clinical features may not always easily elucidate the cause. There may be more than one cause present and changes in the nature of the headache should alert a clinician to the possibility of a more sinister cause.

Case report: A 22 year old primiparous woman requested epidural analgesia in labour. An epidural was sited at the L3/4 lumbar interspace but an accidental dural puncture occurred. The needle was removed and the epidural resited at the same lumbar interspace uneventfully. She received standard low dose top-ups in labour and the epidural provided effective pain relief. She had a vaginal delivery four hours later. On day 1 after delivery she developed a fronto-occipital headache that was relieved by lying down. She was otherwise well, being apyrexial with no focal neurology. She was offered an epidural blood patch but declined. She was therefore managed conservatively. The headache improved slightly and she was discharged on day 3 postpartum. Eighteen days after delivery she attended an optician because of persisting eye pain, worse on the left. The optician noted papilloedema and referred her to an ophthalmologist, who excluded an ocular cause for her papilloedema. She was referred back to hospital. She underwent a brain CT which was reported as normal. Following neurologist review the next day she underwent MRI scan which revealed a left transverse sinus thrombosis extending down into the jugular vein. She was managed with low molecular weight heparin prior to commencing warfarin and the pain resolved. Further recovery was uneventful.

Discussion: Cerebral vein thrombosis has been estimated to have an incidence of 8.9 cases per 100 000 deliveries.3 The majority of cases occur in pregnant women or women taking the oral contraceptive pill and occur within the second or third week postpartum. The aetiology is not clear but the hypercoagulable state of pregnancy is thought to be a predisposing factor with traumatic damage to the endothelial lining of vessels during the second stage of labour and relative intracranial hypotension after dural puncture also thought to be contributory factors. Affected patients may present with a variety of symptoms including headache, nausea and in severe cases with neurological localising signs. The headache may be postural and can be falsely assumed to be a post-dural puncture headache. In the most recent maternal confidential death enquiry there was one death in a woman who suffered accidental dural puncture and who developed cerebral vein thrombosis. In headaches that do not resolve or become atypical, there must be a low threshold for radiological investigation with a recognition that MRI may be more useful than CT scanning.

References
P119 Choice of epidural dressing to prevent catheter displacement during labour

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*Anaesthesia, Northampton General Hospital, Northampton, UK, Anaesthesia, Addenbrookes Hospital, Cambridge, UK

Introduction: There is limited published literature on the most effective method to reduce the risk of displacement of an epidural catheter inserted for labour analgesia.1,2 This is despite a variety of dressings being commercially available and used in practice. We conducted an audit of dressings commonly used in our delivery unit to secure an epidural catheter for labour analgesia and we recorded the incidence of catheter displacements which necessitated replacement of the epidural to maintain effective labour analgesia.

Methods: We undertook a prospective review of all labour epidurals inserted in our delivery unit over a four month period. A proforma was used to collect data on the type of dressing used and other relevant information (patient BMI, length of catheter at skin at time of insertion, time at which the displacement was recognised and the sites of catheter displacement other than at the skin).

Results: We obtained data for 66 epidurals of which 7 (11%) catheters became displaced. There were 4 displacements between the skin and dressing, the other displacements occurred between the catheter and filter or connector. Three dressings were used: "Lock-it Plus with Tegaderm" (52% of epidurals), "Epifix" (39%) and "Steristrips with Tegaderm" (9%). The number of displacements between the dressing and skin is shown in figure below. The Lock-it Plus dressing had no displacements between the dressing and skin whilst using the Steristrip method 33% catheters became displaced.

Discussion: The findings suggested that the Lock-it Plus dressing was the most effective at reducing the risk of catheter displacement between the dressing and skin. Following our review, the Lock-it Plus was made mandatory for all labour epidurals in our delivery unit. A subsequent retrospective audit 12 months later of 186 epidurals found only one report of catheter displacement (0.5%).

Conclusion: The choice of epidural dressing may have significant influence on the number of women who experience failed epidural analgesia due to a displaced catheter and who may require a repeat epidural insertion. This has implications for quality of care, patient safety and clinical workload.

References

P120 Comparing the provision of post-caesarean section analgesia in regional hospitals in the UK and Nepal

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Introduction: Adequate analgesia after caesarean section (CS) is a key determinant of maternal well-being. Whilst national guidelines outline recommended protocols for post-CS analgesia in the UK1, no such guideline exists to direct this medical practice in Nepal. This study compares the provision of post-CS analgesia in regional hospitals in both the UK and Nepal, and considers appropriate recommendations in each context.

Methods: Samples compared were all women undergoing caesarean section in a UK district general hospital over a 2-week period (n=29) and in a Nepali mission hospital over a 5-week period (n=26). Data collected included intraoperative and postoperative medications administered, frequency of postoperative observations and indices of patient satisfaction with pain management on postoperative days 1 and 2.

Results: Routine analgesia for CS in the UK hospital consisted of intraoperative intrathecal diamorphine, postoperative diclofenac suppository and oral paracetamol, diclofenac and oral morphine. In the Nepali hospital, routine post-CS analgesia consisted of postoperative intravenous or subcutaneous morphine, and oral paracetamol and ibuprofen. Postoperative observations were both more regular and more comprehensive in the UK hospital compared to the Nepali hospital. Indices of patient satisfaction with pain management on postoperative day 1 were lower in the Nepali hospital than the UK hospital (61.5% and 96.3%, respectively), but were higher in the Nepali hospital than the UK hospital on postoperative day 2 (92.3% and 80%, respectively).

Conclusions: This study indicates that women experienced a greater burden of post-CS pain on postoperative day 1 in the Nepali hospital than in the UK hospital. Contributing factors may include more limited options for post-CS pain management and a lower frequency of postoperative observations. Possible explanations for the reduced patient satisfaction with pain management on postoperative day 2 in the UK hospital are also outlined. Recommendations to improve practice and patient satisfaction in each hospital are described.

Reference
P121 Does transcutaneous haemoglobin monitoring have a role in massive obstetric haemorrhage?

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Department of Anaesthetics, Cambridge University Hospitals
NHS Foundation Trust, CAMBRIDGE, UK

Introduction: The most recent MBRRACE report highlighted the difficulties in estimating blood loss during major obstetric haemorrhage (MOH) with the pitfalls of relying on a single haemoglobin (Hb) estimation and the importance of serial measurements stressed. Interest in minimally invasive cardiac output monitoring and continuous Hb estimation has led to limited trials in obstetric settings but not in MOH. We present a case of placenta accreta associated MOH at elective caesarean section in which plethysmographic pulse variability index (PVI) monitoring (Masimo Rainbow) and stroke volume (SV) estimation by arterial pressure contour analysis (LiDCOrapid) assisted fluid resuscitation with the Rainbow also providing continuous Hb estimation.

Case summary: An elective caesarean section in a 33 year old was carried out at term under general anaesthesia for placenta accreta. Standard monitoring, CVP, intra-arterial blood pressure and regular arterial blood gas measurements were used. The LiDCOrapid provided real time values of cardiac output (CO), SV and cardiac index (CI) with the Rainbow being used part way through to provide continuous Hb estimation and PVI. A hysterectomy was required and in addition to use of a cell saver, 57 units of packed red cells were transfused. She was extubated on ITU and had an otherwise uncomplicated post-operative stay. Data are plotted below.

Discussion: Both plethysmographic PVI and arterial contour analysis technology require proprietary algorithms. The additional value of these technologies compared to intra-arterial blood pressure and heart rate monitoring was uncertain as the trends were similar. Given that CO, SV and CI are derived values, it is unclear whether they gave us any earlier guidance of the requirement for fluid therapy. However, continuous Hb estimations appeared to correlate well with the measured values from arterial blood sampling.

Conclusion: There may be value for continuous transcutaneous Hb estimation in the case of a brisk MOH, as although arterial blood sampling gives additional information, it is intermittent. In cases of unanticipated MOH, the minimal set up time for the Rainbow device may prove advantageous.

References
1. MBRRACE-UK. https://www.npeu.ox.ac.uk/mbrrace-uk

P122 Epidural Usage in CSE for Cesarean Section

E CB Harty, F Mazzola, C Papageorgiou
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Introduction: NOAD data shows that single shot spinal anaesthetics are performed for the majority (59.2%) of Caesarean sections (CS). The anaesthetic technique of choice in our centre is combined spinal epidural (CSE). The epidural component of the CSE is not routinely used. A service evaluation was set up to examine if this was the case.

Method: Our service evaluation was registered with the audit department. Retrospective analysis was made of 40 patients, selected at random, who underwent CS between September 2013 and May 2014. The following parameters were noted: parity of mother, grade of CS urgency, composition of spinal component, composition of epidural top ups.

Results: Five patients (12.5%) were nulliparous; 35 patients were multiparous. No patients underwent a category 1 CS; three (7.5%) had a category 2 CS; four (10%) a category 3 CS and 33 (82.5%) a category 4 CS. 28 (70%) patients received fentanyl in their spinal; 10 patients (25%) received diamorphine in their spinal. Two patients did not have their spinal opiates recorded.

The epidural component was used in 22 patients (55%). Six (27.3%) of these patients required a top up with bupivacaine; the remainder (72.7%) received diamorphine alone. In the 28 patients who received spinal fentanyl, the epidural was topped up with bupivacaine in 6 (21%); in the 10 patients who received spinal diamorphine none received epidural bupivacaine. The graph below illustrates the difference in epidural use between patients who received fentanyl and those who received diamorphine in their spinal. There was a statistically significant (p<0.01) increase in the need for epidural bupivacaine if fentanyl was used in the spinal (chi squared test).

Conclusion: The majority of patients had their epidural used, and those who had received fentanyl in their spinal anaesthetic required epidural bupivacaine more frequently. This service evaluation supports the use of a CSE, especially in those patients where fentanyl is the opiate of choice in the spinal component.

Reference
P123 Estimated blood loss: Does the exact amount matter?
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Introduction: Estimation of blood loss in obstetric practice is known to be inaccurate. Under-estimation can impact upon maternal and neonatal well-being, and increase length of stay in hospital. This review compares subjective estimation of blood loss during obstetric procedures with objective measurement of haemoglobin decrease in an attempt to determine whether estimation of exact amounts is necessary.

Methods: Data was examined retrospectively for 680 patients undergoing elective caesarean section. Estimated blood loss (EBL) was obtained from the theatre database (ORMIS) and change in haemoglobin level was calculated using routine pre- and post-operative measurements from the laboratory system (ICE). Quantity of estimated blood loss was grouped into 100ml intervals to aid comparison. Mean and standard deviation falls in haemoglobin were calculated for each group.

Results: Broadly speaking, the degree of post-operative fall in haemoglobin increased in a linear manner with increasing EBL, as would be expected. However, closer analysis suggests more discrete groupings of data. If EBL is 500ml or less, the average post-operative fall in haemoglobin is 10.5g/L (SD8.6). This value is similar regardless of whether EBL is 100ml or 500ml. A similar effect occurs between 600ml and 1000ml EBL, with a mean decrease in haemoglobin of 14.2g/L (SD9.9). A t-test comparing these values gives a P-value less than 0.001, a highly significant difference.

Over 1000ml blood loss, the fall in haemoglobin is more dramatic at 23.6g/L (SD 9.1) although this is a much smaller group (18 cases) with a wider range of estimated losses.

Conclusion: These results suggest that although surgical estimation of blood loss in our unit is still quite inaccurate, if estimated using grouped ranges (500ml or less, 500-1000ml and >1000ml), more clinically relevant information is obtained. We postulate that rather than worrying whether the loss is 600ml or 700ml, blood loss should be estimated as minor (<500ml), moderate (500-1000ml) and major (>1000ml), and we will be recommending this within the department.

References
2. Gupta A, Wrench IJ, Feast MJ, Alderson JD. Use of the HemoCue near patient testing device to measure the concentration of haemoglobin in suction fluid at elective caesarean section. Anaesthesia 2008;63:531-4

P124 General anaesthesia for caesarean section: audit of practice compared to NAP5 recommendations
L Nicholls, H Khetani, N Patel
Anaesthetics, University College Hospital, London, UK

Introduction: The 5th national audit project (NAP5) studied accidental awareness under general anaesthesia (AAGA). Although the overall incidence was reassuringly low (1/19,000), general anaesthesia (GA) for caesarean section (CS) was highlighted as particularly high-risk with an estimated incidence of 1/670. We audited our practice against the recommendations of NAP5.

Methods: We performed a retrospective analysis of the case notes of all CS cases performed under GA during the 18 months prior to the publication of NAP5 (identified from our anaesthetic database). Data included indication for CS, anaesthetist’s grade, drugs and doses used, maintenance agents and reversal.

Results: 24/40 (60%) of GA cases were performed outside of working hours and 25/40 (62.5%) without consultant presence. 15/40 (37.5%) were for Category 1 CS and 24/40 (60%) occurred after failure of regional anaesthesia. Sevoflurane was used by 25/40 (62.5%) vs isoflurane by 4/40 (10%) and no agent documented in 11/40. End tidal anaesthetic concentration or MAC was not documented at all in 15/40 (37.5%).

<table>
<thead>
<tr>
<th>Drug Used</th>
<th>Number of cases (%)</th>
<th>Mean dose (range) mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiopentone</td>
<td>36/40 (90%)</td>
<td>6.1 (4.0 - 8.0)*</td>
</tr>
<tr>
<td>Propofol</td>
<td>4/40 (10%)</td>
<td>2.4 (1.5 - 3.2)</td>
</tr>
<tr>
<td>Suxamethonium</td>
<td>35/40 (87.5%)</td>
<td>1.7 (1.2 - 2.5)</td>
</tr>
<tr>
<td>Rocuronium</td>
<td>5/40 (12.5%)</td>
<td>0.8 (0.6 - 1.1)</td>
</tr>
<tr>
<td>Nitrous Oxide</td>
<td>11/40 (27.5%)</td>
<td>- - -</td>
</tr>
</tbody>
</table>

*8/36 (22%) used thiopentone at doses less than 5 mg/kg.

A supplemental dose of muscle relaxant was given in 16/40 (40%); 10/40 (25%) used a reversal agent. Neuromuscular monitoring (NMM) was documented in 1/40 (2.5%). There was no written evidence of consent for AAGA and there were no cases of awareness documented.

Discussion: Our audit showed similar trends to NAP5 with the majority of cases performed out of hours by trainee anaesthetists. Thiopentone and rapid sequence induction without opiates was the preferred technique. Although the mean dose of thiopentone reflects the higher values recommended in NAP5, 1 in 5 cases appeared to receive less than this. The debate about thiopentone usage versus the more familiar agent propofol continues in our department and elsewhere. Surprisingly documentation of theatre timings, as well as the anaesthetic agents used and the MAC values at the various time points was poor. Our audit clearly highlighted that the obstetric anaesthetic chart could be improved and as such we are revising them to include prompts for these. Nitrous oxide was underutilised but encouraged in this scenario by NAP5 and our unit guidelines. We have encouraged the routine use of NMM and reversal if indicated, to avoid accidental awareness at emergence. We have introduced a ‘surgical pause’ to ensure the target MAC has been achieved prior to incision. Re-audit is planned.

Reference
P125 IgA deficiency and long QT syndrome: a balancing act
SJ Slimm, L Beale, O Adekaneye
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Introduction: The presence of either cardiac or haematological pathology at the time of delivery can prove a challenge to the obstetric anaesthetist. We present a case of a woman with both who suffered a postpartum haemorrhage (PPH). The management of which necessitated balancing the differing demands of each condition.

Case Report: A 41-year-old, G2P1 woman at 38/40 presented for an elective caesarean section due to placenta praevia. She had a history of congenital long QT syndrome (LQTS) and IgA deficiency; the latter diagnosed following acute anaphylaxis to packed red blood cells (PRBC) following the delivery of her first child. Specialist haematology advice was to only administer IgA-deficient blood products if required, with the caveat that products may still be immunogenic and therefore should only be given on consultant advice.

At caesarean section, the woman’s pre-operative haemoglobin (Hb) was 126 g/L with a normal clotting profile. Anaesthesia was achieved with a combined spinal-epidural technique. In an attempt to reduce the likelihood of needing to transfuse blood products, cell salvage was used and 1 g of tranexamic acid along with a syntocinon infusion commenced at delivery. A reduced syntocinon infusion (1 unit/hour) was used to balance the benefit in preventing uterine atony against further prolonging the QT interval. To further stabilise the myocardium, 5 g of magnesium and 5 mg of metoprolol were given. The patient suffered a 1.3 L PPH secondary to uterine atony and surgical trauma. Despite 248 mL of cell salvaged blood being transfused, the postoperative Hb fell to 76 g/L, resulting in a tachycardia and thus one unit of IgA-deficient PRBC was transfused without incident. The woman recovered well and was discharged home on her third post-natal day.

Discussion: IgA deficiency is the most common human immunodeficiency (1:875) and defined as IgA levels <0.07g/L in the presence of normal levels of other immunoglobulin subtypes.1 Most individuals are asymptomatic, though a proportion develop anti-IgA antibodies predisposing them to anaphylaxis on transfusion of blood products containing trace amounts of IgA.1 All steps should be taken to prevent haemorrhage but in the event of acute haemorrhage, only IgA-deficient blood products should be used and given in the presence of full resuscitation facilities due to the potential for remaining immunogenic material. LQTS in contrast requires the anaesthetist to avoid drugs (syntocinon, ephedrine and phentylephrine) and conditions (tachycardia) which could prolong cardiac repolarisation and predispose the patient to tachyarrhythmias or sudden death.2 Combining these conditions proved challenging. A balance had to be struck in giving a drug contraindicated in LQTS against the need to prevent uterine atony induced haemorrhage. Furthermore, once haemorrhage occurred, transfusing blood products which could provoke anaphylaxis had to be balanced against the need to limit hypovolaemia induced tachycardia which could predispose to dysrhythmia and death.

References

P126 Improving patient satisfaction during obstetric preassessment clinics, using a photobook to enhance information delivery and closing the loop
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Introduction: Patient satisfaction is a commonly used indicator for measuring the quality in health care. The obstetric population is younger, information seeking and wants choice. Studies have shown that ‘continuous information and opportunity to ask questions reduces patients’ anxiety’. Anxiety can lead to postpartum negative mood and interfere with maternal-infant bonding. We assessed patient satisfaction with current practice of verbal and written information given during the pre-assessment clinic for elective caesarean section and whether visual information can help women feel more prepared for the procedure.

Method: Patients completed a questionnaire during their pre-assessment clinic. Data was collected over 6 weeks June-July 2013, no exclusion criteria. Changes were implemented according to findings. The information leaflet was updated and a photobook was created with multidisciplinary staff members illustrating the patient journey for an elective section specific to Frimley. A re-audit was carried out from June-July 2014 using a modified questionnaire.

Results: Initial audit had 46 responses and the reaudit 51. Both audits showed an even mix between first attenders and those who had previous sections. Forty nine percent of women strongly agreed that the information leaflet was useful. 35% of women would have preferred visual information. In the reaudit, overall satisfaction remained high at 98%. However 61% strongly agreed that enough information was provided to prepare them for a section (76% previously). Eighty-nine percent of women strongly agreed or agreed the photobook and the information leaflet were useful. Of these, 60% of women strongly agreed the photobook was useful compared to 47% for the information leaflet.

Discussion: The initial audit recommended improving the information leaflet and providing a visual form of information. Despite changes to the leaflet, no significant difference was seen in the reaudit regarding its usefulness. The photobook was well received and favoured above the information leaflet, especially by women who had a previous section. This could be because they were familiar with the process and found the pictures a useful refresher. There was an overall drop in how prepared women felt for their procedure in the reaudit. This could be a reflection of the drop in satisfaction with their discussion with the anaesthetist in the reaudit.

Preassessment clinics were conducted by anaesthetists of varying experience and training, so the verbal information provided was difficult to standardise. A further questionnaire done on the morning of surgery after having had more time to process the information might give a more accurate measure. High overall rates of satisfaction were seen in both audits. This reflects the hard work and quality of services provided as well as utilising a multi-modal approach to information provision.

References
2. Weisman O, Granat A, Gilboa-Schechtman E et al. The experience of labour centred accommodation of the infant and the mother’s
**P127 Improving safety: A remifentanil PCA bundle**

A Clark, KW Tan*, R Junkin
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Remifentanil patient controlled analgesia (PCA) is increasingly popular for labour analgesia. However, a recent editorial highlighted safety concerns noting critical incidents are rare but potentially life threatening. Standardised operating procedures (SOPs) and checklists have successfully improved safety. We sought to implement this for remifentanil use in labour.

**Methods:** Approval was granted by the local audit lead. Forty-four subsequent parturients who used remifentanil PCA were reviewed. Twenty-two before and following the introduction of a remifentanil safety bundle: a checklist sticker for entry in the labour record.

**Results:** The safety bundle was well received by staff with 100% compliance. Prior to its establishment, documentation of consent and safety checks was poor. Midwives had documented a consent / safety discussion between the parturient and anaesthetist in three instances and only once had an anaesthetist documented a discussion. This was greatly improved with the safety bundle (figure 1). The bundle was completed 86% of the time by a trainee or staff grade and 59% of the time out with normal working hours.

![Figure 1: Documentation pre and post remifentanil safety bundle introduction.](image)

**Discussion:** The introduction of a remifentanil safety bundle has achieved two goals: improved documentation of consent (a recommendation for all off label therapeutics); and provision of an SOP to improve safety. The observation that remifentanil is most often commenced out of hours and initiated by trainee or staff grade anaesthetists (who frequently rotate through specialties) emphasises the importance of this SOP. Following this success the bundle has been adopted by two further obstetric centres.

**References**

P129 Inadvertent dural puncture and post dural puncture headache in obstetrics: a regional survey of anaesthetists

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Introduction: The incidence of inadvertent dural puncture (DP) in obstetrics is 1% and 75% will develop post dural puncture headache (PDPH). The aim of this survey was to find out current practice in Northern Ireland.

Methods: Two surveys, on inadvertent DP and on PDPH in obstetrics, were sent via Survey Monkey® to all consultant anaesthetists covering obstetrics and anaesthetic trainees ≥ST3 in Northern Ireland.

Results: Response rate for the survey on inadvertent DP was 39.7% (69/174 responses). Upon DP, 66.7% would run an intrathecal catheter during labour and 47.7% would leave 2.2 cm catheter in situ. Catheter removal would occur immediately post delivery and 24 hours from DP by 33.9% and 47.7% respectively. Follow-up would include daily review by anaesthetist whilst an inpatient by 78.9%.

Response rate for the survey on PDPH was 36.8% (64/174 responses). Upon diagnosis the following were advised/available: simple analgesia (100%), oral fluids (93.9%), caffeinated drinks (78.5%), bed rest (67.7%), thromboprophylaxis (47.7%), opioids (41.5%), intravenous fluids (27.7%), caffeine tablets (24.6%) and intravenous caffeine (0%).

Epidual blood patch (EBP) would be considered at 24 and 48 hours from DP by 50.8% and 40.0% respectively. EBP would be performed with the patient in the sitting position by 82.5%, at the same space (33.3%) or space below (49.2%) initial DP. Injection of blood would cease after injection of 10-20ml (66.1%). If headache recurs after first EBP 69.5% would carry out a second EBP but consult a neurologist before third EBP. Review at day 0 and day 1 post EBP would occur in 75.8%.

A guideline on management of inadvertent DP and PDPH was reported to be available by 56.3% and 48.4% respectively.

Discussion: The use of an intrathecal catheter may reflect evidence suggesting a reduction in PDPH. There was a diverse response to conservative management of PDPH and timing of EBP. Systems for follow-up appear to be in place despite the absence or lack of awareness of management guidelines.

References

P130 Intra operative cell salvage in obstetrics- Our experience

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Introduction: The use of Intra operative cell salvage in obstetrics has become standard practice for patients with high risk of bleeding. We describe our experience of using cell salvage in 1461 patients who had caesarean sections.

Method: Data was collected prospectively for a period of 18 months. Cell salvage technique used was single sucker technique and no leuco depletion filter s were used for re-transfusion.

Patients who had blood loss of over a litre were studied and Logistic regression model was used to calculate the probability of receiving donor blood for patients who received cell salvaged blood and those who did not receive cell salvage.

Results: Cell salvage was used in 1461 patients who had caesarean sections. 99 (6.7%) patients had the blood processed and re-transfused, without the use of leucodepletion filters. Non of the patients had any complication.

In patients who had blood loss over a litre, the probability of receiving donor blood, for those who received cell salvaged blood is 0.14, and the probability of receiving donor blood for the patients who did not receive cell salvaged blood is 0.22. Based on the adjusted model (Table)

Table 1: Results of logistic regression Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Parameters</th>
<th>estimate</th>
<th>SE OR(95%CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted</td>
<td>Donor blood</td>
<td>-0.236</td>
<td>0.339 0.790 0.487</td>
<td>0.59</td>
</tr>
<tr>
<td>Unadjusted</td>
<td>Donor blood</td>
<td>-0.683</td>
<td>0.403 0.505 0.0905</td>
<td>0.03</td>
</tr>
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<td>blood lost</td>
<td>0.145</td>
<td>0.039 1.156 0.026</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td>pre op Hb</td>
<td>-0.666</td>
<td>0.151 0.514 &lt;0.0001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

SE: Standard error OR; Odds Ratio CI: confidence interval

Conclusion: If we assume that donor blood receipts typically receives one unit of donor blood, then if cell salvage blood transfusion is done, for every 100 patients 8 (22-14) donor blood units are saved. On the other hand if we assume that donor blood receipts typically receives two units of donor blood, then if cell salvage blood transfusion is done, for every 100 patients approximately 16 (44-28) donor blood units are saved.

We also show that no complications have risen by not using a leuco depletion filter in caesarean section in our institute.

References
1. AAGBI Guideline on Cell salvage
2. Intra operative blood cell salvage in obstetrics(IJP144) November 2005
P131 Intrapartum intravenous fluid therapy with epidural analgesia: a gateway to maternal morbidity?

R Mistry, M Oliver, V Skelton
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Introduction: Current guidelines state that intravenous fluid is no longer routinely indicated in conjunction with low-dose epidural solutions for analgesia in labour. Fluid prescribing practices amongst anaesthetists, obstetricians and midwives in labouring women can vary markedly from this guidance. This audit aimed to determine if fluids were given with epidural analgesia, how much fluid was given in labour prior to delivery, the rationale for fluid prescribing and whether women were receiving fluid therapy despite maintaining oral intake.

Methods: Using written intrapartum patient notes and electronic prescribing records, a retrospective audit was performed on 100 women receiving epidural analgesia in labour. All intravenous fluid administered from the time of patient admission to either spontaneous vaginal delivery or decision to transfer to theatre was recorded. Additional data collection included maternal booking weight, documented reasons for intravenous fluid, if oral intake was maintained and the mode of delivery. Fluid administered in theatre and oral fluid intake was not included.

Results: 67 women had 1L Hartmann’s (not prescribed by an anaesthetist) commenced by a midwife in preparation for insertion of an epidural. 33 women had fluid prescribed by obstetricians for abnormal cardiocotograph traces or maternal pyrexia/tachycardia. 98 women maintained an oral fluid intake in addition to intravenous fluids. Total fluid given pre-delivery ranged from 1-6 litres of Hartmann’s solution over a labour duration of 1-22 hours respectively. A longer duration of labour corresponded with a greater total mL/kg fluid administration, peaking at 83mL/kg. 37 spontaneous deliveries, averaging 26.4mL/kg crystalloid, 42 instrumental deliveries, averaging 28.6mL/kg crystalloid and 21 Caesarean sections, averaging 33.7mL/kg crystalloid. There were no cases of pulmonary oedema. There was no formal documentation of fluid balance by the midwifery team during the labour and the electronic prescribing system did not accurately reflect the actual amount of fluid given.

Discussion: Traditionally held beliefs that epidural analgesia in labour must be accompanied by intravenous fluid therapy are still practiced in our labour ward. Fluid is prescribed by different practitioners for indications such as foetal tachycardia, without regard for the amount of fluid already administered. Intrapartum fluid administration can reach potentially harmful levels, especially when not documented clearly. Poor understanding of the rationale for IV fluids is a major contributing factor amongst all practitioners in obstetrics. Quality improvement measures that are currently being implemented include: cyclical multidisciplinary education programs for all members of the labour ward team, mandatory fluid prescription chart completion and protocolised fluid administration via infusion pumps. We are collaborating with four centres (both tertiary centre and district general hospitals) locally to identify variations in practice between institutions.

Reference
1. Intrapartum care: Care of healthy women and their babies during childbirth. NICE https://www.nice.org.uk/guidance/cg55.
P133 Labouring the cost: the cost of labour for administering midwifery ‘top-up’ epidural analgesia regimen

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Introduction: Patient-controlled epidural analgesia (PCEA) is recommended by NICE as one of the preferred methods for administering labour epidural analgesia. In response to the mandatory use of non-interchangeable epidural connectors, we conducted a service evaluation to purchase PCEA equipment to replace our current midwifery-administered epidural bolus regimen. As part of the appraisal process we evaluated the midwifery labour costs of our current regimen.

Methods: The evaluation took place over a ten-day period after approval from the Hospital Audit Committee. The number of boluses administered for each epidural was recorded after initial test dose by the anaesthetist. Basic demographic data and pain scores were collected to enable future evaluation. Our standard midwifery bolus is 15 mL of 0.1% bupivacaine with fentanyl 2 μg/mL drawn up from two ampoules of ‘ready-mix’ solution. Timings were recorded for each stage: initial request by parturient; finding the keys for the controlled drug cup board; checking drugs with a second midwife; drawing up and then administering the bolus witnessed by the second midwife. Primary outcome was time taken to administer the bolus from initial request by the parturient to enable cost calculations.

Results: Data from 15 parturients were evaluated giving a total of 37 midwifery boluses. The midwifery labour costs are for two midwives using the midpoint of the pay scale.

Table: Timings and costs for administering midwifery boluses

<table>
<thead>
<tr>
<th>Time taken for stages</th>
<th>Mean per bolus (min)</th>
<th>Maximum per bolus (min)</th>
<th>Grand total (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time taken for stages</td>
<td>02:36</td>
<td>13:00</td>
<td></td>
</tr>
<tr>
<td>Drugs drawn to admin</td>
<td>03:09</td>
<td>12:00</td>
<td></td>
</tr>
<tr>
<td>Total time from request</td>
<td>10:24</td>
<td>25:00</td>
<td>6.25</td>
</tr>
<tr>
<td>Midwifery labour cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Band 6 midwife</td>
<td>£5.26</td>
<td>£12.68</td>
<td>£195.32</td>
</tr>
<tr>
<td>Band 7 midwife</td>
<td>£6.28</td>
<td>£15.14</td>
<td>£233.18</td>
</tr>
</tbody>
</table>

Discussion: Midwifery-administered epidural boluses are extremely time consuming with each one taking an average of 10 min, up to a maximum of 25 min during busy periods because a second midwife is required. The biggest delay is finding a second midwife to check and witness the administration of drugs. It is likely that not all boluses were recorded but one PCEA giving set with a 250 mL bag of 0.1% bupivacaine with fentanyl 2 μg/mL is cheaper than two midwifery-administered boluses in terms of drug and labour costs, thereby adding additional economic justification for PCEA in the delivery suite. The time saved by using PCEA can be better spent improving the quality of care the parturient receives.

References


P134 Liddle’s syndrome in pregnancy: difficulties in diagnosis and management

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Introduction: Liddle’s syndrome is a rare genetic disorder that typically presents with hypertension, hypokalaemia and metabolic alkalosis. We report a case of Liddle’s syndrome in a parturient and the difficulties in the diagnosis and management.

Case report: A 34-year old 20-week primigravida of south Asian origin presented with raised blood pressure. She had a 2 year history of essential hypertension and was on doxazosin. Previously, amiodipine and ramipril had been ineffective. Chest X-ray, echocardiogram, 24 hour urinary catecholamine levels, renal ultrasound, CT scan, MRI scan and renal angiography had been normal. While on ramipril, she had a high renin-aldosterone ratio (1:1700) with low renin and normal aldosterone that was not diagnostic of Liddle’s syndrome. Her brother in Australia was on amiloride and amlopine for early onset hypertension. Routine blood tests at initial presentation were normal except for mild hypokalaemia (3.2 mmol/L). Mild proteinuria (+) was present. She was switched to labetalol until 400mg qds and kept under close follow-up. She remained hypertensive; leading to the addition of methyldopa 500mg qds and slow release nifedipine 90mg od. At 24 weeks of gestation, a trial of eplerenone was unsuccessful, but there was a marked response to a trial of amiloride. In light of the family history, a clinical diagnosis of Liddle’s syndrome was made. Regular amiloride 10mg od was started and other antihypertensives were gradually reduced. Serial foetal ultrasound showed persistent intrauterine growth retardation. Three weeks later, she was admitted with hyperkalaemia (7 mmol/L) and a normal anion gap metabolic acidosis. Amiloride was stopped. At 28 week gestation, she had an emergency caesarean section under general anaesthesia after developing severe pre-eclamptic toxaemia and a pathological cardiocograph. Post-operatively, she received magnesium sulphate and nifedipine in the high dependency unit and remained hypertensive.

Discussion: Liddle’s syndrome is a rare autosomal dominant disorder. A mutation on chromosome 16p12.2 results in constitutive activation of the renal epithelial sodium channel (ENaC) and excessive resorption of salt and water from the distal nephron. Early onset and often severe hypertension, hypokalaemia metabolic alkalosis, low renin and suppressed aldosterone are characteristic. Drugs that affect the renin-angiotensin pathway may result in false negative results and delay diagnosis. ENaC antagonists like amiloride and triamterene alomging with restriction of dietary sodium intake are effective but mineralocorticosteroid receptor antagonists like spironolactone are ineffective. The hypertension can worsen and become difficult to manage during pregnancy with increased risk of pre-eclampsia.

References

P135 Management of a parturient with retrosternal goitre and tracheal compression
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Department of Anaesthesia, Royal London Hospital, London, UK

Introduction: There is limited information available to guide management of pregnant patients at risk of airway obstruction. We present the case of a pregnant woman with a large thyroid goitre causing tracheal compression.

Case Report: A 36 year-old multiparous woman was diagnosed with a benign multinodular goitre (MNG) but conceived before proceeding to surgery. Computed tomography (CT) scanning at 24 weeks gestation showed an increase in goitre size with retrosternal extension; the tracheal cross-sectional area at C7 had almost halved from 85 mm² to 45 mm². She remained euthyroid. Early in the third trimester, she was twice admitted to hospital with stridor associated with viral upper respiratory tract infection. A multidisciplinary meeting was held at 29 weeks to discuss her care. While no further increase in goitre size was expected, the risk of acute obstruction secondary to intercurrent illness or nodule rupture remained. Elective caesarean section (CS) was scheduled for 32 weeks to allow fetal maturation, with a plan for total thyroidectomy four weeks later. She was admitted to hospital at 31 weeks gestation for daily review by the multidisciplinary team. In the event of airway compromise during this time, first line management would include the use of Heliox, steroids, and adrenaline nebulisers. She remained asymptomatic until her delivery date. Her CS was to be performed under regional anaesthesia. General anaesthesia using a standard rapid sequence induction was reserved for complications such as major haemorrhage. Airway assessment predicted easy face-mask ventilation. Supraglottic anatomy was normal with no tracheal deviation, suggesting direct laryngoscopy would be straightforward (Plan A). Considering the CT images, a 5.5mm internal diameter reinforced endotracheal tube and a 5.0mm microlaryngoscopy tube were prepared. A secondary intubation plan (Plan B) was inappropriate given the low probability of its success. Plan C was a second generation laryngeal mask airway. Difficult oxygenation or ventilation would prompt escalation to Plan D, which was rigid bronchoscopy and jet ventilation. Front of neck access was not a viable option for this patient. Given the relative isolation of obstetric theatres, all requisite equipment was prepared, with a named ENT consultant on standby. Following effective combined spinal epidural anaesthesia, she underwent an uneventful caesarean section. She is currently awaiting total thyroidectomy.

Discussion: Early multidisciplinary care, effective communication and a clear plan for all potential outcomes contributed to the successful management of this patient. Knowledge of the natural history of MNG in pregnancy was imperative to balance the risks to the fetus of early delivery with those of potential maternal airway compromise. Regional anaesthesia is invaluable in such cases. Although intubation is likely to be uncomplicated, preparation for difficulty is essential for a good outcome.

References

P136 Management of a patient with Goldenhar syndrome, difficult airway, placenta accreta and intraoperative hypotension secondary to cell salvage blood
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*Anaesthetics, Glasgow Royal Infirmary, Glasgow, UK

Background: Goldenhar syndrome, also known as oculo-auriculovertebral dysplasia, was first described in 1952. It is a rare congenital abnormality characterised by unilateral incomplete development of the ear, nose, soft palate and mandible. When these occur with spinal abnormalities it is known as Goldenhar syndrome. Treatment is usually confined to surgical interventions to help the child develop.

Case: 28 year old para 2+0, 2 previous caesarean sections(CS) under spinal anaesthesia, with Goldenhar syndrome was diagnosed with probable placenta accreta on ultrasound. She was unable to have an MRI due to the presence of extensive spinal metalwork. Airway examination revealed marked facial asymmetry, mallampati grade2, receding jaw and limited neck extension. Her most recent general anaesthetic was at 13 years old for mandibular advancement. The decision was made to perform an elective CS at 35 weeks under a general anaesthetic. Her blood tests were unremarkable.

Interventional radiology inserted bilateral iliac balloons under local anaesthetic prior to incision. Her airway was secured with an awake fibreoptic intubation and then she was induced with propofol 200mg. A radial arterial line was inserted and cell salvage was available. Visual inspection of the uterus revealed placental invasion through the uterine wall but not into any adjacent structures. A live baby boy was delivered through a vertical uterine incision. Due to the fixation of the placenta it was decided to perform a hysterectomy. Blood loss was 1500ml in total and we returned 600ml via cell salvage. Twice during this the patient experienced profound hypotension which resolved with phenylephrine and stopping the infusion.

Picture 1-Heart rate, SpO2 and Intra-arterial blood pressure trend over 20 minutes during cell salvage transfusion

This has been reported previously in the literature and is thought to be due to the use of a leucocyte depletion filter2. We performed bilateral TAP blocks prior to emergence and provided a morphine PCA. Post-operatively the patient went to the obstetric HDU and made a good recovery.

Discussion: This patient provided a number of anaesthetic and obstetric challenges. Her care mandated the involvement of a multi-disciplinary team, which resulted in a good outcome for both mother and child. This case highlights the benefits of effective multi-disciplinary care. Furthermore, it also illustrated the potential hypotensive response to cell salvage autotransfusion via a leucocyte depletion filter.

References
P137 Management of Patient with Type 1 Diabetes Mellitus and Autonomic Dysfunction During Pregnancy

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Introduction: One of the most common complications of type 1 diabetes mellitus is that of autonomic neuropathy. 1 We present the case of a patient with type 1 diabetes and erratic glycaemic control.

Case Report: A 39 year old primigravida presented during her second trimester with debilitating paroxysms of hypotension, bradycardia, nausea, vomiting and chest pain. The diagnosis of diabetic autonomic neuropathy was made. Magnetic resonance imaging of her head showed an old cerebellar infarct and an echocardiogram demonstrated a patent foramen ovale. Anaesthetic involvement was sought should one of these paroxysms necessitate delivery. In addition, there was multidisciplinary input from the diabetes, cardiology and neurology teams in order to provide optimal care for the patient. The patient ultimately progressed to term and had her baby delivered by caesarean section with the careful use of a combined spinal epidural technique. Management was challenging due to the various complications caused by her medical conditions and their concomitant impact on anaesthetic and surgical technique.

Discussion: Autonomic neuropathy is dysfunction of the autonomic nervous system and as such is characterised by an array of symptoms such as postural hypotension, bladder dysfunction, gastroparesis and abnormal sweating. 2 It is also associated with intraoperative instability. 3 It is of particular concern in the parturient due to the dependent nature of the fetal blood supply and its inability to compensate adequately in the presence of maternal hypotension. High quality management of the diabetic parturient with autonomic neuropathy is therefore clearly paramount. In our patient, delivery was ultimately by elective caesarean section, with anaesthesia provided by a combined spinal epidural. In the absence of evidence in the literature, this was judged to be the safest technique since it afforded the opportunity to use a low dose spinal component with carefully titrated epidural top-ups as required. The patient's management was also influenced by the presence of a patent foramen ovale, which presents additional risks of thrombogenesis and paradoxical embolic events. 4 Therefore, extra care was taken to reduce thrombi formation through the use of intermittent calf compression and bathing the uterus in saline, as well as paying meticulous attention to intravenous lines. The successful management of our parturient also relied on efficient multidisciplinary teamwork. In addition to her obstetric care, input from the diabetes, cardiology and neurology teams ensured that the patient received appropriate antenatal and intrapartum care.

References

P138 Maternity WHO checklist, closing the audit loop

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Introduction: The WHO surgical safety checklist has been effective in reducing surgical morbidity and mortality. 1 Our trust is using maternity WHO checklist since NPSA released it in 2011 and a separate simple checklist for category I LSCS since 2013. We audited the practice of maternity WHO checklist use in April 2014, implemented some changes and re-audited it in August 2014.

Methods: In April, over a period of one week, we evaluated the practice of use of WHO checklist and conducted a multidisciplinary survey regarding staff attitude towards it. Based on the results, we designed 2 new forms. White form titled as “category 4 LSCS and all other elective procedures” and pink form reads “category 1, 2, 3 and all other emergency procedures”. Responsible personnel were mentioned at the top and a signature box was added at the bottom of each of 3 sections to validate the practice. Staff was educated through audit presentations, Labour Ward Forums and by coordinators. Practice was re-audited in three months time, in August, over one week period.

Results: Maternity WHO checklist compliance

<table>
<thead>
<tr>
<th>Cases</th>
<th>Elective</th>
<th>Emergency</th>
<th>Total</th>
</tr>
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<td>April</td>
<td>9(100%)</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>August</td>
<td>14(100%)</td>
<td></td>
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<tr>
<td>Sign in</td>
<td>April</td>
<td>9(100%)</td>
<td>22(91%)</td>
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<tr>
<td></td>
<td>August</td>
<td>14(100%)</td>
<td>36(100%)</td>
</tr>
<tr>
<td>Time out</td>
<td>April</td>
<td>8(88%)</td>
<td>24(100%)</td>
</tr>
<tr>
<td></td>
<td>August</td>
<td>14(100%)</td>
<td>33(91%)</td>
</tr>
<tr>
<td>Sign out</td>
<td>April</td>
<td>6(66%)</td>
<td>18(75%)</td>
</tr>
<tr>
<td></td>
<td>August</td>
<td>11(78%)</td>
<td>34(94%)</td>
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<td>April</td>
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<td>NA</td>
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<tr>
<td></td>
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<td>0(0%)</td>
<td></td>
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</tbody>
</table>

In April, total 35 cases had 2 empty forms and 4 incomplete checklists. Survey reflected staff’s disengagement, resistance, time pressures especially during emergencies and confusions regarding who completes particular section of the checklist and which form to be used for procedures other than category 1 and elective LSCS. In August, audit results were quite encouraging. WHO checklists were completed in all 50 cases. Sign In and Sign Out compliance improved from 94% to 100% and from 78% to 90% respectively. Team brief was done in all elective cases though Team debrief still needed to be worked on.

Discussion: Amended, easy to use forms and increased staff awareness through audits, multidisciplinary meetings have been helpful in bringing a positive change in staff attitude and improving the existing practice of use of maternity WHO checklist.

References
P139 Monitoring Intrapartum Temperature: A Survey of Knowledge and Practice Amongst Obstetricians

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Introduction: Monitoring temperature is an integral part of maternal care during labour as pyrexia is associated with adverse maternal and neonatal outcomes. It is imperative that all members of the labour ward team can recognise and effectively treat intrapartum pyrexia (IP) to reduce morbidity and mortality associated with it. The aim of this survey was to evaluate knowledge about monitoring intrapartum temperature amongst obstetricians.

Methods: We invited members of the British Maternal & Fetal Medicine Society (BMFMS) to take part in an online questionnaire about monitoring intrapartum maternal temperature. Participants had 6 weeks to complete the survey, after which results were collated and analysed.

Results: Of 670 members, there were 75 responses (11% response rate). Most responses (n=68, 91%) were from consultant obstetricians. The National Institute of Health and Care Excellence (NICE) recommendations(1) of 4 hourly temperature monitoring during the 1st and 2nd stages of labour were only recognised by 67% and 27% of respondents respectively. The complete and accurate definition of IP (as per NICE) was identified by 7% of respondents (Figure 1).

![Figure 1: Showing how our respondents defined intrapartum pyrexia](image)

Only 35% would advocate more frequent observations once IP is diagnosed, despite pyrexia being a cardinal sign of sepsis. 73% felt appropriate management of IP involved a combination of blood cultures, paracetamol and antibiotics. Body site used to monitor intrapartum temperature varied amongst hospital, with most (80%) using tympanic membrane. Other methods included sublingual (16%) and axillary (4%).

Discussion: Awareness amongst practicing obstetricians of the current recommendations about monitoring intrapartum temperature, especially during the 2nd stage of labour is poor. These inaccuracies may lead to misdiagnosis and delayed treatment. Identifying and managing IP was also suboptimal amongst our respondents, with 26% not performing a combination of blood cultures, paracetamol and antibiotic therapy. Education for all labour ward staff, together with regular audit about management practices are needed to improve knowledge and treatment of intrapartum maternal pyrexia.

References
2. MBRAUCE-UK: Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK, 2014 www.npeu.ox.ac.uk/mbrauce-uk

P140 No win no fee claims

O Lo, P Banago*, H Boja
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Anaesthetics Department, Tunbridge Wells Hospital, UK

Introduction: A review of the claims on the NHS Litigation Authority database with an incident date between 1st April 2000 and 31st March 2010 identified 172 maternity claims involving anaesthetic issues, with an estimated total value of £19 million. 94 of those were during caesarean sections (CS), claiming £12 million.1 We review a case very familiar to obstetric anaesthetists: pain under regional anaesthesia during an out of hour emergency CS in a non-English speaker.

Case Report: A non-English speaking patient presented for category 2 CS in the middle of the night. Spinal anaesthesia was performed by the duty anaesthetist. After a sensory block to T5 was achieved, the operation commenced. The patient showed no reaction to the initial incision, but complained of ‘pain’ after delivery of the baby. This was clarified as ‘pressure’ by her sister, who was present throughout. General anaesthesia was repeatedly offered but declined. Entonox was given. Although the discomfort settled initially, the patient continued to complain of ‘pain’ intermittently, for which the anaesthetist administered intravenous diamorphine, paracetamol and diclofenac. Local anaesthetics were infiltrated into the wound. Prior to discharge, a full explanation was given to the patient and all events were documented.

3 years later, the Trust received a letter from a law firm well known from TV advertisements, detailing 15 separate particulars of negligence: from failing to achieve a T4 sensory block to a delay in treating pain. Independent expert opinion was sought, whose only criticism was that there ‘appeared to have been a delay in administering analgesic adjuncts, which might be construed as a ‘breach of duty of care’’. The case hinged around a perceived 5 minute delay in treatment, as documented in the casenotes. The expert rejected all other points raised by the lawyer.

Discussion: The above scenario is far from uncommon in obstetric anaesthetic daily practice. Clear documentation serves as a legal record. However, we identified several issues:

1) It is widely agreed that attending to patient’s pain and discomfort is the paramount duty of the anaesthetist. Documentation has to be done retroactively therefore cannot be accurate, especially if one is single-handed.

2) Anaesthetic charts do not allow minute to minute documentation. In addition, it is not uncommon to find discrepancies between timepieces in theatre.

3) Communication with the patient undergoing CS is vital: how is effective communication achieved in an emergency when faced with patients with limited or no command of English? It was felt in our Trust that the duty anaesthetist handled the difficult clinical situation well and documented adequately but expert opinion suggested otherwise. The case was settled out of court for £8000. It is difficult to pinpoint what should have been done differently: choose timely documentation above patient care? Or resort to a general anaesthetic, possibly even before surgery? We have concerns that this type of claim may lead to defensive note writing and/or delivery of suboptimal anaesthetic care.

Reference
P141 Obstetric critical care: what it takes to get it right
S Lantz-Dretvik, C Romer*, E Evans
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Introduction: Intensive Care Unit (ICU) admission is necessary in 1.4/1000 deliveries1. While standards of care for critically ill parturients are clearly defined2, mothers in ICU are often separated from their babies leading to what research describes as an ‘awful’, ‘unbearable’ and ‘emotional’ event. Experience of motherhood following a complicated delivery and ICU admission is enhanced by autonomy, being allowed to keep baby close and being kept up to date3. An obstetric high dependency unit (OHDU) is better able to offer this environment than a general ICU (GICU) despite the challenges to delivering high quality critical care that include lack of nursing experience in direct entry midwifery and lack of critical care skills in obstetricians. If unnecessary admissions to ICU could be avoided patient experience would improve and maternal psychological morbidity minimised. There is no current integrated care pathway for parturients at St Georges to define and guide best practice in obstetric critical care. Our objective was to establish the utilisation and pattern of GICU admission of our parturients, to identify potentially unnecessary admissions to ICU and address barriers to providing high quality obstetric critical care by proposing models of care for parturients on ICU and OHDU.

Methods: Parturients admitted to GICU between 2012-2013 were identified from maternity databases. Known level 3 patients were excluded. Data was collected from notes and a decision whether care could have been provided for the remaining level 2 patients on OHDU based on current expectations of care.

Results: 30 patients were identified. The three most common reasons for admission were massive haemorrhage, PET/HELLP syndrome and sepsis. Maternal age > 35 years was an independent risk factor present in almost 50% of admissions. 8 admissions received level 2 care supporting a single organ, a majority having arterial lines in situ, receiving blood transfusions or infusions of anti-hypertensives and were deemed avoidable.

Discussion: We conclude that an OHDU provides better holistic care from midwives, obstetricians and anaesthetists while retaining the opportunity of early bonding with babies for critically ill mothers. Barriers to care include lack of critical care skills amongst midwives and obstetricians. We suggest that unnecessary maternal admissions to ICU could be avoided through integrated care pathway development, new models of care including use of critical care outreach teams and creation of OHDU-specific midwifery teams rotating through GICU to maintain skills in recognising and caring for critically ill mothers. Further admissions will be audited to improve our service.

References
1. Saravanakumar K et al. High dependency care in an obstetric setting in the UK. Anaesthesia 2008; 63 (10): 1081-6
2. Providing equity of critical and maternity care for the critically ill pregnant or recently pregnant woman, RCoA 2011

P142 Obstetric post-dural puncture headache: A three-year audit of one tertiary centre’s management pathway
AH Carter, K Khazan-Singh, WL Allen, J Allam
Magill Department of Anaesthesia, Chelsea & Westminster Hospital, London, UK

Introduction: Accidental dural puncture (ADP) after regional anaesthesia (RA) is associated with significant morbidity, e.g. post-dural puncture headache (PDPH), and mortality, as recently described by MBRRACE.1 We must then correctly identify, manage and follow-up these patients. Despite work on therapeutic interventions for ADP/PDPH, there is no consensus on the overall patient management and follow-up pathway. The Royal College of Anaesthetists (RCoA) proposes <1% ADP rate. We aimed to assess our incidence of PDPH/ADP, and to evaluate the effectiveness of our current system and pathway for managing these patients.

Method: Data was retrospectively collected from patients identified as having an ADP/PDPH after RA between 2011-2013. Pertinent data was collected via four sources: 1) obstetric anaesthetic paper diary 2) maternity electronic database 3) patient medical records and 4) ‘LastWord,’ our trustwide electronic information system. Collated information included type of RA performed, duration of PDPH, treatment modality, imaging, specialist referrals and timing and method of follow-up.

Results: There were 17, 286 deliveries, with 70% receiving RA. We identified 102 PDPHs overall (0.85% PDPH rate).

Table 1. Incidence of ADP and PDPH related to type of RA

<table>
<thead>
<tr>
<th>Type of RA</th>
<th>RA number (proportion)</th>
<th>Incidence of ADP (95% CI)</th>
<th>Incidence of PDPH(95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidual</td>
<td>5754 (47.9%)</td>
<td>1.15% (0.87-1.43)</td>
<td>0.99% (0.73-1.25)</td>
</tr>
<tr>
<td>Combined spinal</td>
<td>1574 (13.1%)</td>
<td>1.27% (0.72-1.82)</td>
<td>1.21% (0.67-1.75)</td>
</tr>
<tr>
<td>Spinal</td>
<td>4695 (39.1%)</td>
<td>-</td>
<td>0.64% (0.41-0.87)</td>
</tr>
</tbody>
</table>

The median (IQR [range]) duration of PDPH was 3 (2-4[1-25]) days. Epidural blood patch (EBP) was performed in 67.6% of patients. Out-patient anaesthetic appointments were booked in 58.4%, but only 33.3% of patients attended. The median interval to clinic follow-up was 6 (6-7 [3-13]) weeks. Four patients were referred to other specialties, 8.0% underwent imaging and 3.5% of patients had no record of any in-patient, phone or clinic follow-up.

Discussion: Our RA intervention rate remains high, with an ADP rate marginally above the RCoA standard. PDPH duration is short and time to out-patient follow-up complies with our local standard. However, follow-up arrangements are heterogeneous, poorly documented and incomplete, with evidence of GP correspondence in only 19%. Low follow-up rates are a concern given our ADP/PDPH and EBP rates. We suspect our heterogeneity in management exists in other units, as evidenced by the dural puncture guidelines submitted to the OAA2 which lack clear and complete pathways. MBRRACE has reported neither death attributed to PDPH was follow-uped or referred to the GP.1 We propose to improve our data capture and follow-up rates by creation of a proforma encompassing all aspects of the management pathway.

References
1. Saving Lives, https://www.npeu.ox.ox.ac.uk/mbrace-uk/reports
2. OAA, http://www.oaa-anaes.ac.uk/ui/content/content.aspx?id=195
P143 Opiate requirements following elective caesarean sections - The effect of MHRA guidelines

M Fleet, L Whitefield, E Evans
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Introduction: Multi-modal analgesia is more effective than single agents in providing postoperative pain relief following caesarean section (CS). Post CS our guidelines recommend regular paracetamol, a non-steroidal (NSAID) with Oramorph for breakthrough pain. In response to the Medicines and Healthcare products Regulatory Agency (MHRA) safety alert June 2013 diclofenac was replaced with Ibuprofen 400mg tds.

Methods: We retrospectively evaluated the impact of this change by auditing the administration of opiates for breakthrough pain in uncomplicated elective CS. Notes were sequentially chosen from either side of the changeover date.

Inclusion criteria:
- Elective CS under neuroaxial blockade (NAB) with blood loss <1000ml
- Regular paracetamol administered in conjunction with the NSAID and a diclofenac suppository post CS

Results:

<table>
<thead>
<tr>
<th>% of cases receiving</th>
<th>Diclofenac (n=35)</th>
<th>Ibuprofen (n=38)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oramorph</td>
<td>45.7%</td>
<td>42.1%</td>
</tr>
<tr>
<td>Mean time (hrs) of first Oramorph dose post NAB</td>
<td>20 hrs, SD 11</td>
<td>18 hrs, SD 20</td>
</tr>
<tr>
<td>Combining the data:</td>
<td>18% (n=13) of women required multiple doses of Oramorph</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion: We found no significant difference in the number of women receiving Oramorph post the guideline change to low dose ibuprofen. The number of women receiving opiates analgesia was larger then expected in both groups. 42% of women received Oramorph for pain using our current multi-modal regimen. This compares to previous audits giving a figure of 16.5%. Differences in patient population, neuroaxial technique and variances in hospital culture may account for this. Both sets of data suggest that MHRA recommendations are having a direct effect upon postoperative analgesia. As a secondary finding, opiate prescriptions varied greatly between anaesthetists (5mg 4 hourly to a maximum of 20mg 2 hourly PRN of Oramorph). There are minimal recommendations in the literature regarding dosages and timing of opiate administration for post CS pain. We suggest this could be the focus of a future multi-centre research project.

References
2. MHRA Drug Safety Update June 2013 vol 6, issue 11

P144 Oral intake in labour: an audit of current practice in a district general hospital

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Introduction: Eating and drinking during labour has traditionally been restricted due to concerns about risk of gastric aspiration under general anaesthesia. Gastric aspiration is now a rare event. A recent Cochrane review advocates clear fluids for all women, and light diet if low risk, as does guidance from the National Institute of Clinical Excellence (NICE). The aim of this audit was to determine whether current practice matched national guidance.

Methods: A prospective audit was conducted over 1 month in 2014. Women in labour delivering on labour ward/labour ward theatres were questioned within 24 hours of delivery. Deliveries within 1 hour of arrival were excluded. Advice about oral intake in labour, if advice changed and an estimate of the time they ate and drank before delivery was recorded. Patients’ notes were reviewed to identify possible risk factors for operative delivery. An online internal staff survey via surveymonkey was sent to anaesthetists, obstetricians and midwives to discover what advice they typically give.

Results: 76 women were questioned. 95% drank in the 2 hours before delivery; 58% had no restrictions on oral intake; 25% were allowed only water; 35% last ate more than 12 hours before delivery. Of 13 women with no identifiable risk factors, 12 (92%) had no restrictions on oral intake. 22 women had 1 risk factor, and 16 of them (73%) were allowed to eat and drink. 17 (41%) of 41 women with 2 or more risk factors had no restrictions. 33 staff replied to the survey: 15% routinely advise no food in labour, 50% said their advice depended on the situation, such as presence of risk factors. For a patient with risk factors for operative delivery, 62% advise no food, while 21% advise clear fluids. More staff advise water only in this situation (36%, vs 8% routinely). A majority of staff consider each of the following as high risk for operative delivery: previous caesarean section (79%), pre-eclampsia (79%), morbidity (90%), multiple pregnancy (79%), intrauterine growth retardation (79%), failure to progress (79%). Only 34% consider having an epidural as a risk factor.

Discussion: Most women in labour are allowed to eat and drink with restriction. Low risk women have no limits placed on them. Those with risk factors receive variable advice; having risk factors does not necessarily lead to increased restrictions. Staff looking after these patients give different advice. It is reassuring that most women drink up to delivery but advice on what they can drink can be improved. There is some risk stratification, but advice given to a ‘high risk’ woman is not uniform. This highlights inconsistency with current guidance. There is debate about what constitutes a risk factor, but as a consequence of presenting these results to the obstetric multidisciplinary team, lead members will clarify this and standardise local guidance. It was agreed that women may not want to eat or drink during labour but they should have the option to do so if it is considered safe. Through education and re-audit it is anticipated that the experience of a labouring woman in this institution will improve.

References
2. NICE guideline CG55. Intrapartum care: Care of healthy women and their babies during childbirth Sept 2007
P145 Outcomes in morbidly obese parturients following the introduction of a designated obesity clinic
A Hobbs, C Wai, P Zuokumor, S Khizar, C Hewitt*
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**Introduction:** Obese parturients have worse obstetric 1,2, anaesthetic 1 and neonatal 3 outcomes. An obesity obstetric clinic was introduced after an audit at our institution 4 of 29 women with body mass index (BMI) ≥50 showed high Caesarean section (CS) and induction of labour (IOL) rates.

**Methods:** We searched referrals to the obstetric anaesthetic clinic for patients with booking BMI ≥45 between 01/01/2013 - 31/12/2013 and retrospectively collected data via Catica Maternity Information System 5th (CMS). Recall 6th electronic anaesthetic chart and K2MS Guardian 7th labour monitoring, comparing to overall data for the same year.

**Results:** Fifty women had BMI ≥45, comprising 0.57% of all parturients. Means were: BMI 48.3 (range 45-60); age 30; parity 1.3; gravidity 3.1; gestation at delivery 39 weeks. Four women (8%) did not complete pregnancy, 43 had live singletons and 3 had live twin deliveries. All were offered low molecular weight heparin (LMWH), in line with RCOG guidance, but only 38% used it antenatally, compared to 78% at discharge postnatally. None had thromboembolic complications, to our knowledge, or were admitted to ICU. Other outcomes are in the table:

<table>
<thead>
<tr>
<th>Local data (all BMIs)</th>
<th>Local 4 (BMI ≥50)</th>
<th>UK 7 (BMI ≥55)</th>
<th>US 8 (weight ≥136kg)</th>
<th>Current audit (BMI ≥45)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOL</td>
<td>40%</td>
<td>33%</td>
<td>35%</td>
<td>22%</td>
</tr>
<tr>
<td>Preterm delivery</td>
<td>3%</td>
<td>6%</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>Vaginal delivery</td>
<td>80%</td>
<td>72%</td>
<td>55%</td>
<td>45%</td>
</tr>
<tr>
<td>CS</td>
<td>17%</td>
<td>21%</td>
<td>37%</td>
<td>50%</td>
</tr>
<tr>
<td>PPH &gt; 1L</td>
<td>5%</td>
<td>5%</td>
<td>22%</td>
<td></td>
</tr>
</tbody>
</table>

BMI was strongly associated with CS (p<0.001) but not instrumental delivery (p=0.19). Morbidly obese women were no more likely to have epidurals (p=0.89). A third of regional anaesthetics were difficult and in a quarter, ultrasound was used. There were no conversions from regional anaesthesia (RA) to general anaesthesia (GA). One patient required a GA, for cord prolapse, and she was easy to intubate. All operative deliveries were attended by senior clinicians, in keeping with RCOG and RCoA guidance. Birthweights were significantly higher, in either term (p=0.009) or preterm neonates (p=0.498) and neonates were no more likely to need NICU admission (p=1), in contrast to national statistics.

**Discussion:** Obesity clinic management ensures low morbidity and mortality, despite increased numbers of parturients. The absence of conversion from RA to GA indicates that epidurals were effective. Future planning should anticipate high rates of CS and post partum haemorrhage and target LMWH.

**References**
1. CEMACE. Maternal Obesity in the UK: Findings from a National Project. London; 2010
2. CEMACE. Saving Mothers’ Lives. BJOG 2011; 118 (Suppl 1), 1-203
3. Kristensen J, Vestergaard M, Wisborg K et al Pre-pregnancy weight and the risk of stillbirth and neonatal death. BJOG 2005;112:403-8

P146 Patient priorities for care during LSCS: comparison between different populations and development of strategies for shared learning
SL Cooper, D Abell*, S Sharafudeen*, D Horner Anaesthetics, Bradford Royal Infirmary, Bradford, UK, *Anaesthetics, King’s College Hospital, London, UK

**Introduction:** We have recently introduced a successful enhanced recovery programme for women undergoing elective Caesarian section. This programme has reduced length of stay and improved patient satisfaction. Patient involvement and shared decision making is one of the five P’s - the fundamental principles underpinning good quality care pathways 9. Therefore, identifying the aspects of care our patients value the most was a crucial part of our care pathway development.

**Method:** We identified all patients listed for elective LSCS between 09/02/14 and 09/05/2014. We then invited them to complete a pre-operative survey to collect information about demographic factors and care priorities. The audit was registered prospectively with our Trust Clinical Audit Online Database.

**Results:** In total, 40 patients completed the questionnaire. We compared our results with an identical study carried out at a large teaching hospital in a different city. The data are presented in figure 1.

In both centres, women wanted minimal fasting time and early return to normal diet, bowel and bladder function. They attached high importance to good analgesia to enable them to mobilise early and care for their babies. Early discharge (even on the first postoperative day) was a priority especially among multiparous women.

**Discussion:** Despite socioeconomic and ethnic differences between the two groups, women at the two hospitals had very similar priorities for care. This suggests that similar pathways in other units may be acceptable to women regardless of ethnicity and socioeconomic status. We have shared our findings with other units who are considering the introduction of an enhanced recovery pathway. Through round table discussion, written resources on the website of a regional society for obstetric anaesthetists and in conjunction with our Regional Improvement Academy, we aim to share learning on this topic and improve the provision of enhanced recovery for women undergoing elective Caesarian section in our region.

**Reference**
P147 Perimortem cesarean section on coronary care unit.

AE Low, C Brennan
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Introduction: Infective endocarditis is rare during pregnancy, with a quoted incidence of 0.006%1. The sequelae for both mother and foetus are serious, with reported mortality of 33% and 29% respectively2.

Case Report: A 28 year old multigravida woman presented at 26 weeks gestation, with worsening shortness of breath and pyrexia. She was an intra-venous drug user with a notable right groin abscess and known hepatitis C. She was admitted to our Medical High dependency unit for respiratory support and monitoring. Initial bloods revealed raised inflammatory markers (CRP 309 mg/l), anaemia/thrombocytopenia (Hb 71 g/l, Platelets 78 x10^9/L) and an acute kidney injury (Creatinine 109 μmol/L). A murmur prompted an urgent trans-thoracic echocardiogram, revealing a large, mobile vegetation on the native tricuspid valve, with significant tricuspid regurgitation. Staphyllococcus aureus was cultured from blood and anti-microbials tailored accordingly.

Following stabilisation, the patient was transferred to coronary care unit for ongoing management, with a Hickmann line in situ and outreach support from the obstetric team. On day 8 she had a sudden episode of massive haemoptysis leading to hypoxia induced cardiac arrest. Following return of spontaneous circulation, the obstetric theatre team and on call neonatal team attended and an emergency perimortem cesarean section was undertaken on coronary care unit. A live female neonate was delivered, intubated and transferred to the neonatal unit. The patient was anaesthetised with a ketamine infusion, resuscitated with blood products and then transferred to ITU via the CT scanner. CT chest revealed multiple pulmonary collections (secondary to septic emboli) and we postulate that a collection had resulted in erosion of a pulmonary vein causing the haemoptysis. She was extubated uneventfully and discharged from ITU within 48 hours. Due to clinical need, her daughter had been transferred to a different neonatal intensive care unit, and so arrangements were made to transfer her to the same institution for ongoing care.

Discussion: Risk factors for infective endocarditis in pregnancy are intravenous drug abuse, congenital heart disease and rheumatic heart disease3. Our case illustrates some of the complexities of managing a patient with infective endocarditis during pregnancy, and important lessons in human factors when performing emergency surgery on a medical ward. Regular review of the patient by the obstetricians and obstetric anaesthetists meant that both were aware of the patient when called by the Medical Emergency Team and attended anticipating the potential need for emergency cesarean section.

References

P148 Peripartum cardiomyopathy: a diagnostic dilemma

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Introduction: Peripartum cardiomyopathy (PPCM), a form of dilated cardiomyopathy of unknown origin, presents as an acute life threatening heart failure in late pregnancy or early puerperium. It can be present with other comorbidities and the overlapping clinical features can make the diagnosis challenging. We describe the case of a young parturient presenting with chest infection and dyspnoea and discuss the diagnostic dilemma posed by her presentation and the anaesthetic management.

Case report: A healthy, 17-year old girl presented at 38 weeks of gestation with pleuritic chest pain and dyspnoea for two days. Physical examination and routine bloods were unremarkable. Arterial blood gas indicated type I respiratory failure and CTPA revealed bibasal consolidation. A presumptive diagnosis of chest infection was made and intravenous antibiotics were started. The following day she became tachycardic, tachypnoeic and hypoxic with SpO2 of 88% despite high flow oxygen. Emergency LSCS was performed under spinal anaesthesia to improve mechanical respiratory compromise. Post-operatively she was transferred to ITU, where she remained hypoxic and required intubation. Chest radiograph revealed cardiomegaly and fluid overload. She became hypotensive and oliguric and was started on inotropes and furosemide infusion. Blood, sputum and urine analysis for viral and bacterial PCR and culture including atypical antigens were negative. Transthoracic echocardiogram showed severe left ventricular systolic dysfunction with an ejection fraction of 14%. Cardiologists reviewed her and a diagnosis of peripartum cardiomyopathy was made. Spironolactone and ramipril were started. She was extubated after 36 hours in ITU. She was then transferred to coronary care unit where she continued to have ventricular arrhythmias, which were treated with beta-blockers. She recovered over the next two weeks before being transferred to the ward.

Discussion: Peripartum cardiomyopathy has an incidence of only 0.1% but has a high mortality rate of up to 30%1. It occurs frequently in women at extremes of child bearing age. PPCM has a recurrence rate of 30% in future pregnancies. Careful assessment of risk factors can help in prevention of PPCM.2 In this patient, type I respiratory failure with lung consolidation lead us to a provisional diagnosis of chest infection. However transthoracic echocardiogram done in the postpartum period showed a severely dilated heart and impaired systolic function with essentially normal valves, which characterises an intrinsic failure of ventricular contractility seen in PPCM.3 Lateral thinking and heightened suspicion help in prompt diagnosis, which is important for appropriate management and advising lifestyle modifications for future pregnancies.

References
P149 Persistently improved obstetric anaesthetic training in the West of Scotland

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*Anaesthetics, Crosshouse Hospital, Kilmarnock, UK

Introduction: Procedural success and complication rates in obstetric anaesthesia have been demonstrated to improve with practice. It had been shown previously in our deanery that SpR5 trainee logbook numbers at their final ARCP showed up to a six fold difference in obstetric procedural experience. Furthermore, a comparison between year5 SpRs completing training in 2010 and ST7s completing training in 2012(2007 curriculum) had shown a highly significant increase in logbook numbers across all obstetric procedures. Since then there have been changes to anaesthetic training at both a national and local level. We wanted to quantify any impact this may have had on obstetric anaesthetic experience.

Method: We examined the logbook numbers from ST7 trainees completing training in 2014(2010 curriculum) to identify if this increase in numbers had been maintained or continued to increase. We recorded all obstetric procedures for the2010,2012 and 2014 cohorts: labour epidurals and caesarean sections(CS) performed under spinal, epidural, combined spinal epidural(CSE) and general anaesthesia(GA).

Results: We examined the logbooks of 31 SpR5s, 37 2012 ST7s and 12 2014 ST7s (Fig 1).

We compared the 2014(dark grey) cohort separately with the 2012(light grey) and 2010(white) cohorts using an unpaired T-test. There was a highly significant difference between the 2014 and 2010 in favour of the 2014 cohort (p<0.001). There was no significant difference between the 2014 and 2012 cohorts except for labour epidurals in favour of the 2012 cohort(0.03).

Discussion: There have been many changes made to medical training and specifically the European working time directive has raised concerns regarding the quality and quantity of trainee’s experience. Recent changes to the anaesthetic curriculum mandate a compulsory basic and intermediate obstetric block. Additionally all trainees in our deanery now complete a higher block. Together with rising CS rates we can show there has been persistent increase in trainee procedural experience in obstetric anaesthesia. Trainee experience should continue to be monitored at both deanery and national levels to ensure that training requirements are being attained.

Reference

P150 Phaeochromocytoma presenting in pregnancy

N Bourgeaud, N Usman
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Introduction: Phaeochromocytoma is a rare catecholamine releasing tumour that typically presents with headache, hypertension and sweating. Signs and symptoms risk being confused with pre-eclampsia, and if undiagnosed maternal and fetal mortality is around 50%1. We present a case of phaeochromocytoma diagnosed in the second trimester.

Case report: A 27-year old Bengali woman (G3P0+1) presented at 18-weeks gestation with hypertension (220/110mmHg). She reported intermittent flushing but was otherwise asymptomatic. She had a history of one previous pregnancy in Bangladesh complicated by hypertension of unknown cause, and stillbirth at 27 weeks. Under our care she was initially treated for pregnancy induced hypertension. Phaeochromocytoma was diagnosed following identification of elevated urine catecholamine metabolites. MRI demonstrated a 5x5x6cm right sided adrenal mass. We planned for elective caesarean delivery at 37 weeks, followed by postpartum adrenalectomy. Further investigation included echocardiography showing no evidence of catecholamine induced cardiomyopathy. The patient was alpha-blocked with phenoxybenzamine, and propranolol was subsequently added. Prior to surgery blood pressure remained stable and orthostatic hypotension was present indicating adequate alpha blockade. On the day of surgery she received oral premedication with ranitidine and metoclopramide. Arterial and central venous access were sited. Blood pressure was notably elevated (systolic >200mmHg), and intravenous sodium nitroprusside (SNP) commenced at 20-40mcg/min. Hypertension may have been anxiety related, or possibly contributed to by use of metoclopramide. Anaesthesia was established using a combined spinal and epidural with 2.0mg hyperbaric levobupivacaine and 300mcg diamorphine. A magnesium sulphate bolus (1g) was given i.v and SNP continued throughout surgery. Blood pressure remained stable. A healthy male infant was born with Apgar scores of 9/10/10. Post operatively SNP was withdrawn and oral antihypertensives re-established. Our patient made an uneventful recovery. Adrenalectomy was successfully performed three months post-partum.

Discussion: Our case highlights the key points for management of phaeochromocytoma in pregnancy. The importance of early recognition in reducing fetal and maternal mortality cannot be overemphasised. Gestation plays a critical role as beyond 23-weeks fetal size precludes safe adrenalectomy. Caesarean delivery with regional or general anaesthesia is recommended and is associated with lower risk of complications than vaginal delivery. Multiple precipitants risk a hypertensive crisis, including some common medications, and this needs to be recognised. In summary phaeochromocytoma should not be overlooked as a cause of maternal hypertension, and obstetric anaesthetists must appreciate the challenges posed in managing this unpredictable condition. Close liaison with an experienced endocrine and surgical team ensured a successful outcome.

References
P151 Re-audit of Major Obstetric Haemorrhage management in two tertiary obstetric units
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Introduction: We completed the audit cycle by re-auditing our management of major obstetric haemorrhage (MOH) which had previously been audited in 2008. Our objectives were to assess compliance with recommendations from previous audit, and to ensure compliance with Guidelines for the Management of MOH in Leeds Teaching Hospitals NHS Trust produced in January 2011.

Methods: We identified parturients delivering in 2 tertiary maternity units between Jan 2011 and Dec 2013 whose estimated blood loss (EBL) was ≥2400ml using our local Matsy database. We examined the medical notes and MOH proforma which had been designed during the previous audit. We obtained laboratory results from the time of delivery and transfusion data from all parturients during the triennium. We identified risk factors and will report our findings.

Results: We identified 133 parturients experiencing MOH from 29069 deliveries, giving a rate of 4.5 per 1000 births. We obtained complete audit data on 112 cases, completion rate of 84%. Only 41 cases had a MOH proforma completed. Consultant obstetrician was present/contacted in 79 cases whilst consultant anaesthetist was only present/contacted in 48 cases. Statistical analysis of haematological variables revealed that EBL correlated with drop in Hb and drop in platelet count. Interestingly, EBL was accurate whether swabs were weighed or not. Hysterectomy reduced in occurrence from 10% (n=3) to 6% (n=7). Four cases required radiology involvement, 7 hysterectomies were performed, and cardiac arrest occurred in 3 cases. There was one mortality. Patient monitoring was improved, with 107 cases receiving HDU care, of which 33 remained for ≥24 hours post operatively. Local transfusion guideline was followed accurately except from administration of tranexamic acid, only given in 21%. Cell salvage was only used in 9 cases, and TEG monitoring used in only one case, despite being immediately available on one of the delivery suites.

Discussion: Identification of MOH cases improved in this re-audit from 40 to 133 cases. However, our audit did not identify 45 patients receiving ≥4 units of red blood cells +/- blood products. The remit of the proforma and future re-audit will be changed to include these conditions. Completion of MOH proforma was poor, although may have been overlooked in gradual cases. Encouraging audible declaration that MOH has occurred, in order to clarify the situation is recommended. Tranexamic acid is recommended in 100% in local protocol, based on evidence for use in major haemorrhage in trauma in the CRASH 2 trial1, and further evidence is awaited regarding its use in MOH. Inadequate staff training is the main reason behind the undertreatment of cell salvage and TEG. National guidance on standards of cell salvage use will help guide funding for increased training of staff.

Reference

P152 Redesigning the maternity WHO surgical safety checklist - a quality improvement approach
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Introduction: Theatre surgical safety checklists (SSC) have significantly improved patient safety. A recent survey of our practice demonstrated checklist completion below 20% during all caesarean sections (CS), with 0% complete during Grade 1 CS. We present our experience using quality improvement (QI) methodology2 to improve checklist completion rates.

Methods: Following theatre staff surveys and using a driver diagram (Fig. 1) we highlighted factors to improve checklist completion. Our original checklist comprised of two sections; one completed preoperatively on the ward and the second in theatre. Next, we process-mapped Grade 1 CS to highlight critical steps which would improve completion in a timely fashion.

Results: Our new modified checklist amalgamated the Trust checklist with the maternity World Health Organisation (WHO) checklist. Using a Plan-Do-Study-Act (PDSA) approach, we tackled issues identified in the driver diagram and streamlined the entire checklist avoiding repetition and irrelevant questions for maternity. We further reduced the intraoperative checklist items to an essential 14 items from a total of 26 for Grade 1 CS acknowledging the need for brevity. Mock Grade 1 sections were used to trial and test the new checklist which finally obtained official Trust approval.

Discussion: The feedback from users has been excellent and we believe a repeat survey will show a significant improvement. QI methodology allows a multidisciplinary and systematic approach to quality issues. We believe that the maternity WHO checklist can be further adapted to improve compliance for grade 1 CS.

References
P153 Responding to epidurals in a timely manner - experience from a large Australasian teaching hospital

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Introduction: We aimed to determine whether labour epidural response time best practice standards are being met at a tertiary centre in New Zealand with over 7000 deliveries per year and an epidural rate of over 50%.

Methods: Following research office approval, we identified 100 patients with labour epidurals sited by the public anaesthesia service over two consecutive epochs immediately before and after a change in anaesthetic registrar rotation. Data regarding the time taken from epidural request to anaesthetist attendance, time of first injection into the epidural catheter, time and type of day (weekday or weekend), lead maternity carer (public or private obstetrician or midwife), grade of anaesthetist and any documented reasons for delay were obtained from their notes and compared against published standards (over 80% of requests attended within 30 minutes, and over 90% within 60 minutes).1

Results: Requests for epidurals were responded to within 30 minutes in 76% of patients, with 96% of requests met within 60 minutes. Response times longer than 60 minutes occurred only with after hours’ requests (Figure 1). Median response times were the same in both registrar groups (20 minutes) with mean time to response 22 minutes in the first registrar group and 26 minutes in the second. The range in time from anaesthetist attendance to first epidural injection was larger for registrars than consultants (65 versus 37 minutes respectively). A slightly greater proportion of requests were met on time on a weekday when compared to a weekend. Patients under private obstetric care had a lower proportion of delayed responses than those under midwifery care.

Discussion: Requests for epidurals at our institution are mostly being fulfilled in an acceptable timeframe, regardless of registrar experience. Results were limited, however, by some poor documentation of epidural request and attendance times, and reasons for delay. As a result the preprinted epidural insertion record forms are being updated to capture this data more accurately. We intend to repeat this audit at different times of year to allow for seasonal fluctuation in birth rates.

![Figure 1: Box and whisker plot of time between epidural request and anaesthetist attendance by time of day. Box is median +/- interquartile range; whiskers denote range.](image_url)

Reference


P154 Retrospective audit of venous thromboembolism risk assessment in obstetric postoperative patients at Nottingham University Hospitals

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Introduction: The recent MBRACE report (Saving lives. Improving mother care. 2009-2012) once again confirms that thrombosis and thromboembolism is a leading cause of direct maternal death with maternal mortality rate of 0.79 per 100000 maternities. Pregnancy is a prothrombotic state and all women are at increased risk of venous thrombolism (VTE) during pregnancy and puerperium. At our institute the local guidelines recommend that risk assessment must be performed for all women at antenatal booking visit using the risk assessment tool. This must be repeated at each antenatal admission, in labour and postnatally. Women at risk of VTE should receive low molecular weight heparin (enoxaparin) in dose calculated based on maternal weight. TEDS (anti-thrombolism stockings) and this should be clearly documented in notes.

Methods: The aim of this audit was to assess if the VTE risk scoring was performed and enoxaparin prescribed as per guidance. This audit was performed over a period of six months (February 2014- September 2014). We reviewed case notes (n=70) of women who had undergone obstetric surgical procedures. Proforma sheet was used to collect data for analysis.

Results: A marked discrepancy was found between the VTE score and administration of enoxaparin. 12/70 (17%) , 22/70 (31.4%) and 36/70 (51%) women were not assessed for VTE risk at booking, antenatal and postnatal visits respectively. TEDS were not prescribed for 7/10 (70%) with postnatal score was equal to or greater than 3. Caesarean section was performed in 54/70 women and further 16 had other procedures (manual removal of placenta, instrumental delivery in theatre and repair of perineal tear. In 12/70 (17%) women there was no indication for administering enoxaparin and the rest 48/70 (68%) recieved enoxaparin as per guidance. Suboptimal dose of enoxaparin was prescribed in 5/70 (7%) cases.

Discussion: This audit has highlighted that there was inadequate use of the VTE risk assessment tool and adherence to local guidance for thromboprophylaxis in pregnancy. The most common finding in this audit was an assumption that all women who had elective caesarean section should have enoxaparin during post operative stay in hospital irrespective of VTE score. We concluded that there was a need to encourage midwives to use VTE risk assessment tool at each visit and this could be implemented by reinforcing the local VTE guideline as a part of teaching and induction programme for doctors and midwives. We have also suggested that the postoperative thromboprophylaxis plan should be a part of WHO (World Health Organisation) check list and the VTE risk assessment tool should form a part of hand held notes.

References


**P155 Rotational thromboelastometry (ROTEM) in preeclampsia: a pilot study**

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**Introduction:** Coagulopathy associated with preeclampsia (PET) can increase the risk of peripartum haemorrhage and have implications for anaesthesia, yet standard coagulation tests are relatively slow and limited. 1 Rotational thromboelastometry (ROTEM) examines real-time whole-blood clotting and could potentially provide faster, more accurate results allowing more rapid, targeted management. 1 Peripartum ROTEM studies consistently demonstrate the hypercoagulable state of pregnancy. However, there has been very little research into the use of ROTEM in PET. We therefore aim to increase understanding of PET-associated coagulopathy using ROTEM, and assess the feasibility of a larger study of routine ROTEM use in PET.

**Methods:** Ethics approval and local funding for a 9-month recruitment period aiming to recruit 50 patients with PET was obtained. Patients consented for a single blood test to run a full ROTEM coagulation profile using INTEM, EXTEM and FIBTEM reagents. Routine platelet count and clotting screen results were also recorded. Data were also collected on patient demographic, PET severity and treatment, and ROTEM equipment and processing issues. All maternity theatre staff were trained to use the ROTEM machine.

**Results:** Although recruitment is ongoing, initial findings indicate that the majority of patients (n=5/9) were hypercoagulable on ROTEM testing when using standard reference ranges, whereas only 2 patients were hypercoagulable when using proposed peri-partum reference ranges. One patient had a hypercoagulable ROTEM as indicated by a low maximum clot firmness on EXTEM and INTEM tests using both ranges.

**Discussion:** Early findings from this study demonstrate that many of the PET patients have a hypercoagulable ROTEM, consistent with ROTEM studies in healthy parturients. Possible explanations for this include: a true hypercoagulable state, non-severe PET with no demonstrable coagulopathy, or perhaps inability of ROTEM to detect PET-associated coagulopathy. Recruitment to the study has been challenging due to low numbers of PET patients being managed in in-patients. Furthermore, ROTEM machine breakdown caused an additional delay but this has since been addressed. With further progress we hope this study can contribute towards establishing ROTEM values in PET, important for the safe and effective management of these patients.

**References**

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**P156 Spinal anaesthesia for caesarean section in a patient with von Hippel-Lindau disease following negative magnetic resonance imaging of the spine**

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*Anaesthetics, Guy’s and St Thomas’ NHS Trust, London, UK

**Introduction:** Von Hippel-Lindau (VHL) is an autosomal dominant condition associated with the development of multiple tumours including central nervous system haemangioblastomas. During pregnancy new haemangioblastomas can form and the size of the existing ones may increase. 1 Historically neuraxial anaesthesia has been contraindicated in these women. However with the increased availability of magnetic resonance imaging (MRI), screening during pregnancy can be used to guide the choice of anaesthetic technique. We wish to present a case of a pregnant patient with known VHL disease undergoing urgent caesarean section under spinal anaesthesia following MRI screening.

**Case Report:** A 29-year old gravida 2 para 1 presented for category 3 caesarean section due to intrauterine growth restriction. Past medical history was significant for von Hippel-Lindau disease that required prior surgical interventions. No neurological symptoms or signs were present on history or examination. An urgent MRI scan was organised on admission in order to identify potentially asymptomatic spinal tumours that would preclude the use of central neuraxial anaesthesia. The MRI showed no spinal cord lesions, therefore, we opted to provide central neuraxial anaesthesia in the form of spinal anaesthesia with 0.5% bupivacaine (heavy) 2.5 ml and 0.3 mg of diamorphine. Caesarean section and postoperative course were uneventful.

**Discussion:** VHL is caused by mutations of the VHL tumour suppressor gene, resulting in the formation of highly vascular tumours. During pregnancy oestrogen stimulates stromal haemangioblastoma cell growth and progesterone may increase venous distensibility, resulting in an increase in the size of haemangioblastomas. General anaesthesia has been traditionally advocated for caesarean section in these patients due to the potential for asymptomatic spinal cord and brain involvement. In the presence of spinal lesions there is the risk that the spinal or epidural needle will be directed through the haemangioblastoma resulting in a spinal canal haematoma. In the presence of brain involvement central neuraxial anaesthesia carries the risk of dural puncture and cerebrospinal fluid leak predisposing to herniation in the presence of raised intracranial pressure. However, general anaesthesia poses the risk of hypertensive response during laryngoscopy that may result in bleeding of the haemangioblastoma with potentially serious consequences. Whilst VHL disease remains uncommon there are a few case reports of using neuraxial anaesthesia and analgesia, although there are no recommendations on the safest mode. Neuraxial techniques have been safely performed in the presence of central nervous system lesions when there is no hydrocephalus and the site of needle insertion is distant from the lesion. We are keen to highlight that the accessibility of MRI has greatly improved and therefore women with VHL should be routinely scanned prior to delivery even in the absence of symptoms.

**Reference**
P157  Spinal anaesthesia for LSCS in patient with Arnold-Chiari and benign raised intracranial pressure

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Introduction: Arnold-Chiari is a malformation of the cerebellar tonsils resulting in herniation through the foramen magnum. This can alter CSF flow and thus altered intracranial pressures having significant implications in the anaesthetic management of affected parturients. We present a case also complicated by benign raised intracranial pressure and placenta praevia.

Case report: A 28 year old lady presented with a singleton pregnancy for LSCS due to placenta praevia. She had been admitted at 35 weeks gestation with an antepartum haemorrhage, and also suffered with cholestasis. Medical history included Arnold-Chiari type 1 malformation, benign raised intracranial pressure and transverse sinus thrombosis. She had had therapeutic CSF drainage on 2 occasions, her last LP with normal ICP a year prior. Drug history included acetazolamide 250mg OD. Her first pregnancy was an uncomplicated vaginal delivery at term.

On advice from her neurologist and neurosurgeon, any anaesthetic technique was deemed acceptable. Given the posterior nature of the placenta praevia, normal coagulation and patient wishes following risk discussion, consent for spinal anaesthesia was obtained.

At 36 weeks elective LSCS was performed. Spinal anaesthesia was administered in the sitting position with a 25G Sprotte needle at the L3/4 interspace using the landmark technique with 2.5ml 0.5% heavy bupivacaine and 500µg diamorphine in a total volume of 2.7ml. Cardiovascular stability was maintained with a phylephrine infusion. A sensory block to T4 noted prior to incision. Caesarean was completed uneventfully with delivery of a live female 2720g, apgar scores of 9 and 10 at 1 and 5 min. 5 units oxytocin was administered post cord clamping and 40 unit infusion over 4hrs commenced. Estimated blood loss was 500 ml.

The patient was observed for 24 hours on HDU. She had an uncomplicated post-partum recovery. She was reviewed day 2 by the anaesthetic team and discharged home day 3 with no neurological symptoms.

Discussion: Increasing numbers of patients with complex comorbidities are presenting in pregnancy and represent challenges for the obstetric anaesthetist with little consensus on best practice. In particular the perceived risks of altered CSF mechanics with dural puncture and exacerbation of neurological symptoms. There is a growing evidence base to support the safe use of neuraxial anaesthesia in patients with neurological disease 1 2 and this report adds to this with safe and effective management in this case with Arnold-Chiari type 1 and benign raised intracranial pressure.

References

P158  Spread of epidural boluses in an experimental model: effect of catheter size and flow rate

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Introduction: Distribution of solutions in the epidural space in human cadavers is non-uniform and directed between structures according to pressures by which they were compressed. 3 Boluses delivered at higher pressure could result in higher spread of solution associated with improved analgesia. Previous in vitro work has suggested that flow rate has little effect on the area of distribution. 2 We hoped to demonstrate a difference in spread using three different flow rates and two different catheter sizes in an experimental epidural model.

Methods: Local research and ethics committee approval was waived. A multi-orifice unfiltered Portex© epidural catheter was secured between two perspex sheets and a plastic sheet containing air-filled hemispheres. Five millilitres of dye impregnated saline were delivered at three pre-set flow rates (250, 500 and 1000 mls/hr) via a CME Bodyguard 545© epidural pump through 18G and 20G catheters. A bolus was delivered thirteen separate times with each catheter at each flow rate with the primary outcome measured being the total height of spread of each bolus. We also measured the maximum flow rate achieved by the pump whilst delivering the bolus. The data were analysed using two-sample t-test. A p value of less than 0.05 was considered significant.

Results:

<table>
<thead>
<tr>
<th>Catheter size and flow rate</th>
<th>Total height of spread (mm)</th>
<th>Maximal flow rate achieved (mls/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18G 250 mls/hr</td>
<td>89.69 (13.34)</td>
<td>250 (0)</td>
</tr>
<tr>
<td>18G 500 mls/hr</td>
<td>80.92 (17.53)</td>
<td>495 (14.50)</td>
</tr>
<tr>
<td>18G 1000 mls/hr</td>
<td>71.23 (10.68)</td>
<td>748 (47.05)</td>
</tr>
<tr>
<td>20G 250 mls/hr</td>
<td>71.08 (10.44)</td>
<td>241 (7.60)</td>
</tr>
<tr>
<td>20G 500 mls/hr</td>
<td>82.31 (15.02)</td>
<td>369 (13.82)</td>
</tr>
<tr>
<td>20G 1000mls/hr</td>
<td>70.31 (12.38)</td>
<td>455 (35.26)</td>
</tr>
</tbody>
</table>

Data are mean(SD)

The results show a reduction in spread through the 18 gauge catheters as the flow rate was increased. The reduction was statistically significant between 250mls/hr and 1000mls/hr (p=0.03). In the 20 gauge catheters, spread was significantly greater in the 500mls/hr group when compared to the two other flow rates (both p<0.03), although the preset flow rate was never actually achieved.

Discussion: Our model is not a true representation of the epidural space, but is reproducible and allowed us to compare the effect of flow rate and catheter gauge on the spread of a bolus of solution. High flow rates were not achieved secondary to in-built flow rate compensation with pressures higher than 19 psi. The greatest spread seemed to be with lower flow rates and wider catheters. A possible reason for this finding may be differential flow from the three orifices in the multi orifice catheter with lower flow rates. 4

References
P159 Super morbidly obese parturients: Review of practice
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Introduction: Obesity in pregnancy is associated with increased risks including gestational diabetes (GDM), pre-
 eclampsia and operative delivery. In 2010 the prevalence of super-
 morbid obesity (Body Mass Index (BMI) ≥ 50 kg/m²) was 0.19% of all pregnant women in the UK.2 Ours is a tertiary
 referral obstetric unit with 6400 deliveries/year and a caesarean
 section rate of 25%. It has two high risk obstetric anaesthetic
 clinics per week. We wished to review anaesthetic care and
 maternal outcomes of super-morbidly obese women delivering
 in our unit.

Methods: We carried out a retrospective survey of parturients
 with a BMI > 50 who were delivered in our unit during 2013.

Results: Eighteen patients with a median BMI of 52.02 (50.29 –
 54.24) were identified for the survey. Ten patients (56%) had
 a normal delivery, one (6%) a forceps delivery (FD) and seven
 (39%) had a caesarean section (CS).

Table: Outcomes in parturients with BMI > 50

<table>
<thead>
<tr>
<th>Anaesthetic Intervention</th>
<th>CS category</th>
<th>Anaesthetist</th>
<th>Anaesthetic Complications</th>
<th>Estimated Blood Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal for CS</td>
<td>2</td>
<td>Consultant</td>
<td>nil</td>
<td>500 mls</td>
</tr>
<tr>
<td>Spinal for CS</td>
<td>4</td>
<td>Consultant</td>
<td>nil</td>
<td>500 mls</td>
</tr>
<tr>
<td>Spinal for CS</td>
<td>4</td>
<td>Consultant</td>
<td>3 attempts</td>
<td>700 mls</td>
</tr>
<tr>
<td>Spinal for CS</td>
<td>4</td>
<td>Consultant</td>
<td>nil</td>
<td>1000 mls</td>
</tr>
<tr>
<td>CSE for CS</td>
<td>2</td>
<td>Consultant</td>
<td>nil</td>
<td>1200 mls</td>
</tr>
<tr>
<td>CSE for CS</td>
<td>3</td>
<td>Consultant</td>
<td>ADP*</td>
<td>700 mls</td>
</tr>
<tr>
<td>CSE for CS</td>
<td>4</td>
<td>Registrar</td>
<td>Difficult CSE</td>
<td>500 mls</td>
</tr>
<tr>
<td>Spinal for FD</td>
<td>-</td>
<td>Consultant</td>
<td>nil</td>
<td>200 mls</td>
</tr>
<tr>
<td>Labour epidural</td>
<td>-</td>
<td>Registrar</td>
<td>ADP* PDPH Epidual blood patch</td>
<td></td>
</tr>
</tbody>
</table>

* ADP = Accidental Dural Puncture; § PDPH = Post Dural Puncture Headache

All patients attended a consultant led obstetric anaesthetic
 clinic, however no additional investigations or interventions
 were deemed necessary. In the antenatal period 6/18 patients
 (33%) were diagnosed with GDM and 3/18 (17%) with
 pregnancy induced hypertension. One half (2/4) of
 epidural/CSE procedures resulted in an ADP. Intraoperative
 blood loss > 1000 mls was observed in 2/7 (28.6%) of patients
 during CS.

Discussion: Our results showed that super-morbidly obese
 parturients are at substantial risk of GDM, operative delivery
 and ADP complicating epidural insertion. National guidelines
 recommend that women with a BMI >40 should be reviewed
 antenataly by an experienced anaesthetist to identify and
 manage the increased level of risk.1 However it is difficult to
 prove that outcomes for these parturients are improved by
 attendance at an obstetric anaesthetic clinic. With the
 increasing prevalence of morbid and super morbid obesity we
 question whether the routine antenatal anaesthetic review of
 these women in the absence of other significant comorbidities
 represents an effective use of precious resources.

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P160 Survey of obstetricians, midwives and anaesthetists
 about the safe use of local anaesthetic drugs on
 delivery suite
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Introduction: Local anaesthetic drugs (LA) may be
 administered on Delivery Suite by non-anaesthetist healthcare
 professionals. Previous incidents where accidental
 intravenous administration of LA resulted in the death of a
 parturient1 further highlight the need for all those using LA to
 have a thorough understanding of the effects and the
 potential consequences. Our aim was to see whether there was
 a need to improve education on the subject, with our ultimate
 objective being to ensure a high level of knowledge about LA
 management among all Delivery Suite professionals.

Methods: In April 2014, a paper questionnaire was sent to all
 midwives, obstetricians and anaesthetists working in our unit to
 ascertain their level of knowledge about local anaesthetic
 drugs in use on Delivery Suite including toxicity. Our target
 was guided by the Royal College of Anaesthetists’
 recommendations on local anaesthetic drugs, identification of
 LA toxicity, and its management in relation to the AAGBI
 guidelines.2

Results: n=33; 11 anaesthetists, six obstetricians and 16
 midwives. Our findings revealed many gaps in knowledge
 regarding the safe use of LA drugs and identification and
 treatment of LA toxicity, especially among midwives and
 obstetricians. In particular 88% of the midwives could not
 select the correct safe dose of 1% lidocaine, which they
 frequently administer in near-toxic doses; 50% of the
 obstetricians and 94% of the midwives were unaware of the
 use and location of Intralipid, which would hinder their ability
 to assist the anaesthetist in the event of an emergency.

Discussion: Our results highlighted the need for better
 education in this area. It was felt an online e-learning module
 would be an appropriate tool, and this has now been
developed. The module addresses all of the subject matter
 from the original survey and is strengthened by an assessment
 quiz; this tool confirms the standard of learning as well as aids
 ongoing audit. The module is available to all staff for self-
 assessment purposes or as a “refresher”, and it is being
 incorporated into mandatory training for staff working on
 Delivery Suite.

References
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11/11/14)
P161 Tea and training - a novel way of updating midwives about obstetric analgesia

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Introduction: Analgesia is a major part of our role as obstetric anaesthetists. Midwives are also involved to a great extent and they can influence analgesic choices, outcome and patient safety. Patient controlled epidural analgesia (PCEA) pumps were newly introduced to our unit, and there have been recent safety concerns over remifentanil patient controlled analgesia (PCA). Therefore, a quick and practical method was devised to ensure that midwives on labour ward were given the opportunity to learn about important safety issues and different modes of analgesia for labour and after delivery.

Methods: A ten minute powerpoint presentation on various topics was produced. This was delivered over a one month period during labour ward shifts with the agreement of the midwife in charge. Tea and biscuits were provided to encourage an informal atmosphere and promote discussion and questions. A pre- and post-session survey was completed by each attending midwife.

Results: 39 survey forms were received in total. 23 (59%) were very satisfied (scoring 8 or 9 on a scale of 1-10) with their knowledge regarding obstetric analgesia. 31 (79.5%) felt confident (scoring 7-8) or very confident (scoring 9-10) looking after PCEA but less so (26, 66.7%) with remifentanil PCA (Figure 1).

(97.4%) indicated that they wanted to know more about obstetric analgesia, and 39 (100%) felt that they knew more after the session, that the presentation was clear, and that they had the opportunity to ask questions. 33 (84.6%) felt they would be more confident looking after patients using remifentanil PCA.

Discussion: Quick, focused yet informal small group training sessions are an effective way of increasing understanding of this important topic in midwives, who are keen to learn more, but are often occupied with clinical commitments in busy labour wards. This may lead to improved information giving and patient safety.

References

P162 The anaesthetic antenatal clinic: A review of 7 years experience at Liverpool Women’s Hospital

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Introduction: The number of women with pre-existing comorbidities is thought to be increasing. Early referral of the pregnant woman to the anaesthetic antenatal clinic allows the early identification of problems and formulation of plans for pregnancy and delivery. Many aspects of care can be discussed at the clinic, along with referral to other specialists such as cardiologists and neurologists.

Methods: Data was collected from 2007 to 2013 inclusive. Data was collected about patient age, BMI and reason for referral.

Results: A total of 1779 patients were seen in the anaesthetic antenatal clinic during the time period. The number of patients seen per year has steadily risen from 238 in 2007 to 286 in 2013. The most frequent indication for referral to the clinic was for high BMI. Average BMI steadily increased to 35.3 in 2013. The highest BMI of 69 peaked in 2010 and plateaued to 58 in 2013. The second most common reason for referral was spinal/backache issues or issues with a previous regional technique such as failure to insert epidural/spinal or inadequate block. Other common indications for referral included neurological disease, cardiac disease and problems with general anaesthesia in the past.

Discussion: The OAA/AAGBI guidelines for obstetric anaesthetic services, published in 2013, suggest that timely antenatal anaesthetic assessment services should be provided for women who:

- might present difficulties should anaesthesia or regional analgesia be required
- are at high risk of obstetric complications
- have a BMI greater than 40 at booking
- have had previous difficulties with or complications with regional or general anaesthesia
- have significant medical conditions

The prevalence of obesity in pregnancy is increasing, rising from 9-10% in the early 1990s to 16-19% in the 2000s: this has been shown by the data presented here. Obesity in pregnancy poses particular problems that puts these patients at a higher risk of complications such as increased risk of aspiration of gastric contents under general anaesthesia and difficult endotracheal intubation. Therefore it is of paramount importance that these patients have a solid plan for labour to help avoid these problems, such as an early epidural or operative delivery in an elective situation. Locally agreed criteria for referral to the anaesthetic antenatal clinic should be in place and followed. In our institution we have alerts on the electronic system which flag up if the patient needs to be referred to an anaesthetist. Reviewing pregnant women antenatally allows for communication between obstetric anaesthetists, obstetricians and other specialists as required, to enable planning for the safe provision of anaesthesia for high risk women.

References
1. OAA/AAGBI guidelines for obstetric anaesthetic services. June 2013
Title: - Do we really know what we are doing on Labour ward? - A survey of the differences between perceptions and reality for epidural therapy in a tertiary centre

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Introduction: We were interested in finding out how the major stakeholders on our maternity unit perceived the anaesthetic workload. In particular we wanted to assess opinions on how women receiving epidural analgesia fare in their labour.

Method: An electronic survey about Epidurals was sent to the Obstetricians, Midwives and Anaesthetist at Kings college Hospital. Core questions focused on the perceptions of some anaesthetic interventions on the maternity unit and the perceived quality of outcomes after epidural analgesia was performed. There were after establishing professional identity 6 non constrained questions asking to score the percentages of an intervention.

The data generated was then compared with our 2013 data that had been extracted from Anaesthetic, Theatre and Midwifery data audit tools. In particular data was compared for mothers actually in labour on Labour ward.

Results: A total of 68 completed questionnaires were returned over a 1 month period. These were from Obstetricians (31%) Midwives (41%) Anaesthetists (29%)

This data is presented below with Actual figures, the total from survey then sub group data. All data shows mean % and one standard deviation of mean

<table>
<thead>
<tr>
<th>What % of women total in labour LSCS Rate?</th>
<th>% Primips in labour have an epidural</th>
<th>% all mothers having Anaesthetic intervention</th>
<th>% mothers labouring with epidural who go to theatre</th>
<th>% of mothers rate their epidural as satisfactory or better</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual 26% 34%</td>
<td>51%</td>
<td>44%</td>
<td>43%</td>
<td>94%</td>
</tr>
<tr>
<td>Total 26% 37% sd=5 sd=17</td>
<td>51%</td>
<td>45%</td>
<td>36%</td>
<td>81%</td>
</tr>
<tr>
<td>Midwives 27% 34% sd=16 sd=17</td>
<td>44%</td>
<td>39%</td>
<td>40%</td>
<td>83%</td>
</tr>
<tr>
<td>Obstetricians 25% 46% sd=3 sd=17</td>
<td>59%</td>
<td>56%</td>
<td>34%</td>
<td>81%</td>
</tr>
<tr>
<td>Anaesthetics 26% 33% sd=10 sd=15</td>
<td>50%</td>
<td>41%</td>
<td>35%</td>
<td>78%</td>
</tr>
</tbody>
</table>

Discussion: The average percentages in the responses of the groups surveyed were close to the actual values. However The high degree of variability between individual estimates reflects a lack of knowledge about anaesthetic practices on the maternity unit amongst all stakeholders. There is a general trend of underestimating our interventions and outcomes. This was particularly striking in the opinions on the questions on how many mothers have an anaesthetic intervention and how many mothers come to theatre having had an epidural. All groups underestimated the efficacy of epidurals compared with our follow up data especially the anaesthetic group. Midwives underestimated the proportion of epidural outcomes. Midwives can be considered to be the gatekeepers to a woman in labour. This may have a negative influence on establishment of appropriate labour analgesia
P165  To much blood? An audit of transfusion practice in a large obstetric unit
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Introduction: Royal College of Obstetricians and Gynaecologists guidance states ‘there are no firm criteria for initiating red cell transfusion’. However a recent editorial highlighted that, in obstetric patients, recommended triggers for transfusion are often not followed, and post-transfusion haemoglobin (Hb) levels are greater than recommended standards. Moreover, The British Committee for Standards in Haematology guidance is that single unit transfusion should be more widely implemented. Our aim was to quantify blood transfusion in our unit, assess compliance with recommended transfusion triggers, and determine if single unit transfusion could be more widely utilised.

Method: All obstetric patients receiving blood were identified over a 12 month period (April 2013-14). Women with major obstetric haemorrhage (blood loss >2000mls) were excluded. Pre and post-transfusion Hb (g/L) and the number of units of blood transfused were identified from the hospital pathology database. Standards were: (i) all women should have post-transfusion Hb ≤100 if >1 unit blood transfused; (ii) women with pre-transfusion Hb ≥70 should have repeat assessment of Hb prior to transfusion of a second unit.

Results: Seventy women were transfused 150 units of blood; 60 had 2 or more units and 70% had a pre-transfusion Hb ≥70. Overall 23% of women had a post-transfusion Hb ≥100; this rose to 28% amongst those who had ≥2 units transfused. Of 49 women with pre-transfusion Hb ≥70, repeat Hb was performed in only 2 cases prior to administration of a second or subsequent unit of blood.

Table 1: Pre and post-transfusion Hb according to units transfused

<table>
<thead>
<tr>
<th>Number of units transfused</th>
<th>Mean pre-transfusion Hb (range)</th>
<th>Mean post-transfusion Hb (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (n=10)</td>
<td>82 (68-101)</td>
<td>90 (78-113)</td>
</tr>
<tr>
<td>2 (n=49)</td>
<td>77 (62-130)</td>
<td>95 (80-139)</td>
</tr>
<tr>
<td>3 (n=8)</td>
<td>67 (58-81)</td>
<td>97 (80-128)</td>
</tr>
<tr>
<td>&gt;3 (n=3)</td>
<td>71 (58-80)</td>
<td>120 (111-135)</td>
</tr>
</tbody>
</table>

Conclusions: The majority of women received 2 units of blood (70%) which appeared to be largely independent of pre-transfusion Hb. Only 10/70 women received single-unit transfusion and Hb was checked in only a few women prior to commencement of a second or subsequent unit. Consequently, a number of women had a post-transfusion Hb exceeding the recommended target of 100g/L. Recommendations to improve patient safety and also reduce cost include a transfusion trigger of Hb<70 unless clinically symptomatic or ongoing bleeding, and single unit transfusion if Hb ≥70 with interim Hb assessment before further units. Alternatives to allogenic blood transfusion, such as increased use of cell salvage and parenteral iron, particularly in patients with pre-transfusion Hb ≥70 should be considered.

References
3. BCSH Guideline on the administration of blood components. Avoidance of transfusion associated circulatory overload (TACO) and problems associated with over-transfusion. August 2012

P166 Undiagnosed noncompaction cardiomyopathy in pregnancy
U Devadoss, J Jill Homewood
Department of Anaesthetics, Southmead Hospital, Bristol, UK

Introduction: Left ventricular non compaction cardiomyopathy is caused by the arrest of normal embryogenesis of the endocardium and myocardium. The classic triad of complications are heart failure, arrhythmias and systemic embolic events.

Case Report: A 29 year old primigravida with 36 weeks gestation, uncomplicated pregnancy was admitted to the Emergency Department with sudden onset of shortness of breath and palpitations. Her past medical history included mild asthma and colitis. She had family history of atrial fibrillation and sudden cardiac death. On examination her heart rate was 140-160/min, BP 130/80 and oxygen saturation 97% on air. Her ECG showed atrial fibrillation with a ventricular rate of 150 bpm. Troponin was 27ng/L and magnesium level was 0.63mmol/L. Thyroid function tests were normal. There was no compromise in the CTG monitoring. US Dopplers and CTPA were normal. Echocardiography showed biaxial dilatation, mild concentric LVH, no LVOT gradient, mild apical hypertrophy, normal RV, LV function and normal PAP. Pharmacological cardioversion to sinus rhythm was successful with amiodarone 300mg, magnesium and bisoprolol 2.5mg B.D. Propylactic cleaxane was administered. A provisional diagnosis of early cardiomyopathy or other infiltrative cardiomyopathy was considered. A category II caesarean section was performed the following day using a CSE with arterial blood pressure monitoring. Defibrillator pads were placed before the start of surgery. The patient was stable throughout the procedure with an estimated blood loss of 500 mls and an oxytocin infusion postoperatively. The patient was monitored postoperatively in the HDU for two days and then moved to the postnatal ward. Bisoprolol and cleaxane was continued. The patient developed chest tightness, shortness of breath on the fifth postoperative day. Chest Xray showed features of pulmonary oedema and was treated. Echocardiography showed good LV systolic function and normal RV. The patient was admitted to the cardiac ward. Cardiac MRI showed left ventricular noncompaction cardiomyopathy. Patient was treated with warfarin, enalapril 2.5mg O.D. bisoprolol 2.5mg B.D and needs a cardiology assessment with a repeat cardiac MRI in three months to confirm the diagnosis. A referral to the adult congenital heart disease team has been made.

Discussion: Pregnancy and child birth can usually be managed successfully in these patients, as in other cardiac conditions, if the diagnosis is made early and appropriate interventions are performed. The hemodynamic challenges of pregnancy, labour and delivery pose unique risks which can result in clinical decompensation with overt heart failure, arrhythmias and rarely maternal death. A multidisciplinary team approach and a controlled delivery are crucial.

Reference
P167 Variations in obstetric emergency calls across London hospitals
JJ Hoyle, A Carter, SM Yentis
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Introduction: In 2004 the National Patient Safety Agency produced an alert advising all hospitals to adopt a standard telephone number for ‘crash’ calls,1 since having different numbers may cause confusion and delay amongst staff and so present a risk to patient safety. However, there has been no standardisation of the calls themselves. Many states in America have adopted state-wide standardisation of calls in response to previous errors.2 We looked at the type and distribution of obstetric-related calls in use in hospitals in London.

Methods: We carried out a telephone survey in Dec. 2014 of all London acute NHS Trusts with maternity services. Hospital switchboards were contacted and asked which emergency calls they currently used, and for a list of the people who received each call.

Results: 24 Trusts covering 32 sites were surveyed, and information was provided for 17 sites (62.5%), of which 7 (41.2%) had a specific maternal cardiac arrest call and 15 (88.2%) had a major obstetric haemorrhage (MOH) call. Of the latter, 13/15 (88.7%) included either the haematologist or the transfusion services. The median (IQR [range]) number of emergency calls on each site was 8 (6-11 [2-14]) and the number of recipients for each call was 6 (4-9 [2-54]). In total, 103/132 calls (78.0%) included an anaesthetist (including a consultant in 29 (28.2%)) and 31 (23.5%) included an ODP.

Figure 1. Types of emergency calls used in 17 London Trusts (n = 132). Black shading = number including an anaesthetist.

The terminology used was variable, even between sites in a single Trust, though it was usually easily understandable e.g. ‘cardiac arrest’ vs ‘crash call’. However, we did identify one example of a significant overlap between two Trusts: in one Trust, ‘code purple’ meant MOH; in another, it meant inspector visiting the hospital.

Conclusion: The type and number of obstetric emergency calls in use in London Trusts varies considerably and this could lead to confusion, especially amongst trainees who change hospital frequently.

References

P168 What women want - patient’s attitudes towards enhanced recovery and factors affecting compliance
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Introduction: Enhanced Recovery in Obstetric Surgery (EROS) is becoming increasingly popular for patients undergoing elective caesarean section. Its aim is to speed up recovery after surgery and improve patient outcomes and satisfaction1. In a recent Obstetric Anaesthetists Association survey only 3.7% of maternity units routinely discharge their patients on postoperative day 12, despite the obstetric population’s characteristics being favourable towards enhanced recovery. There has been very little work published exploring women’s attitudes towards such a programme. Prior to the implementation of EROS in our Trust, we conducted a survey of patient’s views to identify any factors that may influence subsequent satisfaction and compliance rates.

Methods: We conducted a two-part survey of all patients having an elective caesarean section during September and October 2014. The first section was completed during routine anaesthetic follow-up (postoperative day one or two). The second was completed via telephone following discharge.

Results: A total of 26 fully completed questionnaires were achieved from 34 patients. The mean length of stay (LOS) was 2.2 days and 23% of women, all of whom were multiparous, were discharged on postoperative day one. Multiparous women were discharged sooner with a mean LOS of 1.7 compared to 2.6 days in the primiparous group. Overall, 92% felt ready to go home at the time of discharge. Zero primiparous women would have liked to have been discharged on post-operative day one if EROS existed, compared to 50% of the multiparous women. The most common reasons given for not wanting to be discharged on day 1 included lack of confidence or perceived support in caring for the baby (56%) and being in pain or concerned that they would develop pain at home (38%). Other reasons included having other children to look after at home and lack of breastfeeding support. Subsequent follow up identified that 73% of women had adequate pain control on day one, with 81% stating that their pain was well controlled on simple analgesia after discharge. 92% felt as though they received adequate support following discharge home.

Discussion: From a small sample, we have had some interesting feedback about women’s views, such as multiparous women being more motivated to go home earlier. This may be due to multiparous women being more confident in managing newborn children or reflect a desire to return home to see their other children. Analgesia was also a potential source of concern. Identifying reasons behind a patient’s motivation is important for optimising compliance and we have developed written information for women to help address the issues identified in this survey. We have subsequently started EROS within our Trust and we will shortly repeat our survey. We hope to prove that we have addressed the needs of the patient and that in practice patients are happy to be discharged on day 1 with appropriate support in place.

References
P169 What women want: a survey of maternal choice of pain relief in labour
M Salman, A Medniuk, S McDonald
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Introduction: Childbirth is a unique experience and a highly anticipated event. Many expectant mothers choose to devise a birth plan that reflects their wishes for labour and delivery, including their desired method of pain relief. This empowers them to actively participate in planning their care and allows them to articulate their preferences to health care providers. The choice of analgesia in labour is highly individual and may be influenced by factors such as personal beliefs or previous experience. We conducted a survey of maternal choice of pain relief in labour in our maternity unit.

Methods: Mothers were provided with postpartum questionnaires that asked about the sources they relied upon for information on pain relief in labour and on their attitudes towards epidural analgesia.

Results: Fifty responses were received. Of respondents, 78% were primiparous while 22% were multiparous. The most common source of information on pain relief in labour was the midwife in 82%, followed by antenatal classes in 56% and internet resources in 42%. The anaesthetist was the source of information in 24% and the OAA ‘Pain relief in labour’ leaflet in only 6%. The majority of respondents received this information during pregnancy (96%), while a smaller number (24%) received additional information during labour. Seventy two percent of women had completed a birth plan. Of this group, 40% had planned on receiving an epidural. A third of these women, however, did not receive one as labour was either less painful than they had anticipated or it had progressed too quickly. Twenty eight percent of all respondents wanted to avoid epidural analgesia. In this group, 42% received an epidural; the reason being labour more painful than they had anticipated. When asked about the reasons that discouraged them from requesting an epidural, 61% of women said they were worried about potential complications associated with its use, while 10% were not recommended it by family or friends. Of the women who had received an epidural in this labour, 75% would request one again for future deliveries while 12% would not do so.

Discussion: Labour pain is a dynamic and multifaceted phenomenon. Epidural analgesia remains a highly effective method for alleviation of pain in labour. It may not, however, be preferred by some women who desire a natural birth or who have concerns over its risks. Prenatal education and raising awareness of the multitude of available options for pain relief allows women to make informed choices. This may help them achieve realistic expectations and reduce negative experiences that can contribute to postnatal depression or impact future pregnancies.

References
to determine whether labour epidural analgesia (LA) might present difficulties should anaesthesia or regional analgesia be required in the theatre (Spinal for CS and epidural/CSE procedures resulted in an ADP).

In our unit, 41% of patients have a BMI > 50 and their choice of analgesia is highly individual and may be influenced by their BMI. Women with a BMI > 50 were more likely to opt for epidural analgesia (46%) compared to those with a BMI < 30 (24%). Seventy percent of women with a BMI > 50 received epidural analgesia as part of their routine care. Seventy-six percent of women with a BMI > 50 admitted to having been offered epidural analgesia for their labour, compared to 24% of those with a BMI < 30. Seventy percent of respondents received this information during labour. Seventy-six percent of respondents with a BMI > 50 had made a decision about their mode of delivery for their labour, compared to 36% of those with a BMI < 30.

The choice of analgesia in labour is highly individual and may be influenced by the patient's BMI. The potential for additional delay with epidural analgesia should be discussed with women and those at risk of extra delay should be given adequate time for decision making.

**References**


2. S Ghahreman, MJP Drake. | Level 9 Department of Anaesthesia, National Women's Health, Auckland City Hospital, Auckland, New Zealand |

**Introduction**

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**Results**

The median (IQR [range]) number of emergency calls on each busy day was 263 (587 [20 to 815]). The number of calls to Obstetric Anaesthetics varied with the number of obstetric beds in the district and whether the obstetric patients were admitted to the trust's main hospital or a peripheral hospital. Obstetric beds have an associated risk of an emergency call. The most frequent indication for referral to the clinic was for investigations, followed by antenatal and postnatal care.

**Discussion**

Appropriate obstetric care has significant implications in the anaesthetic management. We have devised to ensure that midwives on labour ward were given detailed information about LA and patient safety. We would be more confident looking after patients using regional analgesia (PCA). Therefore, a quick and practical method was devised to ensure that midwives on labour ward were given detailed information about LA and patient safety.

**Conclusion**

The choice of analgesia in labour is highly individual and may be influenced by the patient's BMI. The potential for additional delay with epidural analgesia should be discussed with women and those at risk of extra delay should be given adequate time for decision making.