P90 An audit cycle on written information for labour epidurals: are we offering it? WITHDRAWN:
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ABSTRACT WITHDRAWN

P91 A seven-year review of obstetric patients delivering at a tertiary cardiac centre
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Introduction: Cardiac disease is the single most common cause of death in pregnancy. We reviewed the demographic information, management and outcomes of all parturients who delivered at a tertiary cardiac centre over a seven year period.

Methods: After approval from the hospital audit committee, we retrospectively reviewed case notes of parturients who delivered between August 2008 and July 2015.

Results: 24 patients met the criteria. The average age was 32 years (range 21-40 years). 10 women were primiparous. Average gestational age at delivery was 33 weeks (range 28-37 weeks). 9 patients had new cardiac diagnosis made in pregnancy. With respect to cardiac diagnosis, 12 patients had congenital cardiac disease, 4 had pulmonary hypertension, 2 had eisenmengers, 9 had valvular heart disease and 8 with cardiomyopathy. Average length of stay (LOS) pre delivery was 8 days (range 0-53 days) and 10 patients had invasive monitoring at some point during this time. The reasons for delivery were as follows: maternal cardiac deterioration (13), maternal obstetric deterioration (4), foetal complications (4), optimal timing (3). All patients had caesarean sections, category 1 (2), category 2 (4), category 3 (15), category 4 (3). In terms of the anaesthetic technique used, 10 patients had combined spinal epidural, 14 had general anaesthetic (2 with volatile, 11 with total intravenous anaesthesia, TIVA, 1 was not documented). Intraoperatively, all patients were monitored with arterial lines, 18 with central lines. Average LOS in ICU post operatively was 2 days (range 1-11 days), average LOS post ICU was 5.5 days (1-37 days). 3 patients required inotropes, 4 were ventilated post operatively, 3 required an intraaortic balloon pump and 1 patient required extracorporeal membrane oxygenation and renal replacement therapy. 21 patients made a full recovery, 2 required cardiac transplantation prior to hospital discharge and 1 patient died.

Discussion: Our hospital is a regional heart and lung centre carrying out all adult heart and lung surgery for the region. There are no facilities to manage women attempting a vaginal deliver. So all women who are deemed high risk enough to warrant delivery at this centre will have a caesarean section. The use of TIVA over volatile anaesthetics for GA sections probably reflects the routine practice of the anaesthetists in this hospital. 3 patients had poor outcomes and required advanced cardiovascular support post-partum. All these patients had a new diagnosis of cardiomyopathy made during pregnancy. The recording of data is important in the setting up of appropriate clinical services and provides a measure of the resources required in the care of these patients. It is hoped that the data from this study will be used to aid discussion about future patient management and site of delivery.

References
P91 Antenatal raised BMI clinic: patient feedback on a multidisciplinary approach to tackling obesity in pregnancy.
N Pritchard, M Mirza*, F Austin*, H Gibson*

Introduction: Obesity in pregnancy, Body Mass Index (BMI) >30 Kg/m², is associated with high antenatal morbidity, dysfunctional labour and operative delivery, longer in-patient stays and higher costs. A key time for behaviour change around diet and exercise is in pregnancy. Since April 2013 we have run trust-wide multidisciplinary team (MDT) Raised BMI Clinics. These group sessions, run by a midwife, maternity specialist Dietician, Consultant Obstetrician and Anaesthetist, discuss clinical risks associated with obesity and provide healthy eating and physical advice. Referral is made at booking for women with BMI >35Kg/m². Departmental data shows mean voluntary attendance of 40%, or 10-15 women per monthly session.

Methods: Evaluation forms at each session ask attendees to score their experience of the quality and utility of this intervention, and advise on potential improvements. Content, presentation and teaching, communication, ability to ask questions and discuss answers, time management, how useful they felt clinic was and an overall assessment are given. Excellent, Good, Average, Poor or Very Poor. Forms for 2015 were analysed in two groups: the “Weight Management in Pregnancy” MDT session and dietician “Healthy Eating in Pregnancy”, with thematic analysis of freehand comments.

Results: 77 attendees from 12 clinics reported mainly the highest two scores for every element. (see example graph 1 for MDT antenatal outcomes) The commonest reason to mark down was time management. Comments were generally positive, appreciative, reported a lack of other similar input, and people liked being in a group. Graph 1: Patient feedback on experience of MDT Antenatal team session.

Discussion: Given the high mortality and morbidity associated with obesity in pregnancy, our unit has introduced an intervention that the increasing number of high BMI expectant mothers enjoy, find helpful and informative. Aiming to prevent excessive weight gain in pregnancy, ongoing large scale audit will evaluate the effect of the intervention on clinical outcomes for the mothers and their babies.

Reference

P92 Change in obstetric anaesthesia practice after NAP 5: Irish perspective
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Introduction: National audit project 5 is related to accidental awareness under general anaesthesia (AAGA) in the UK and Ireland. There were 14 cases of AAGA during obstetric general anaesthesia reported to NAP 5. Obstetric cases account for 0.8% of general anaesthetics in NAP 5 activity survey but accounted for 10% of reports of AAGA to NAP 5, making it most markedly over-represented of all surgical specialties. The NAP 5 report made 5 key recommendations to prevent saga in obstetric anaesthesia.

Methods: A national online survey was sent to 19 obstetrical units in Republic of Ireland, directed at consultant anaesthetist who administer daytime obstetric anaesthesia on a regular basis. This was followed by phone call to get maximum response. There were 18 questions in the questionnaire.

Results: 37 (approx. 62%) responded to the survey. There was no change in choice and dose of anaesthetic agent before and after NAP 5. There was no influence on the MAC of anaesthetic agent and 47.2% anaesthetist would increase MAC soon after induction. Over 80% welcomed use of nitrous for general anaesthesia. Most anaesthetist did not use depth of anaesthesia monitoring. 45% of departments have implemented strategies to prevent drug errors and the rate of consent for awareness has doubled from what it was before NAP 5.

Conclusion: Despite NAP 5 recommendations for GA, the practice in all 19 obstetric hospital is variable. Local policies to prevent awareness and drug errors based on NAP 5 recommendations in hospital shall be useful.

Reference
**P93** Failed intubation at caesarean section - what does the mother want us to do?

R Ford, A J Eldridge

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Introduction: Failed intubation at caesarean section (CS) under general anaesthesia (GA) regularly occur throughout the UK. In the majority of these cases, anaesthetists proceed with the operation using an alternative airway strategy. The Obstetric Anaesthetist Association and the Difficult Airway Society have recently produced guidelines helping us to manage these situations. However, as there is no method of discussing options with mothers at the time of the failed intubation, these decisions are necessarily paternalistic. This survey asked recently pregnant women how they would have wished to have been managed in the event of a failed intubation at a category 1 CS in the context of severe foetal distress.

Methods: Following discussion with members of the research ethics committee, it was decided that formal ethics review was not required. We surveyed women 1-3 days postnatally to minimise any potential anxiety that might be caused by presenting this scenario antenatally. The scenario of failed intubation during a category 1 CS was explained verbally and with written information. Every aspect of the maternal condition was presumed to be low risk, and CAT 1 section was assumed to have correctly identified an immediate threat to foetal life. The risk of proceeding with a GA using a second generation supraglottic device was given as approximately 1 in 20,000 for death following aspiration, as calculated from published data. The risk for poor foetal outcome was suggested to be 1:50, caused by a delay of at least 20 minutes for the process of waking a mother and performing a regional anaesthetic. Women were asked whether they would have wanted to proceed with the surgery or to be woken up. They were also asked whether they would have wanted this decision recorded in their notes antenatally. Their parity was noted, and additional comments were welcomed. If the partner was present, their decision was noted if it had been different to the mother's.

Results: 97 surveys were returned (64% response rate). 93% would have wished for surgery to have continued. 71% would have wanted this decision to have been recorded in their notes antenatally. 91% of first time mothers would have chosen to continue with GA compared to 94% of mothers who already have children. No partners reported that their decision would have been different.

Discussion: As outlined by the OAA DAS guideline, there are multiple factors that influence the decision to wake or continue with surgery in the event of a failed intubation at CS. The level of risk to the mother varies, and the risk used in this survey was calculated as an optimistic outcome. In the CEMD there has been no report of deaths due to aspiration associated with continuing surgery in the event of a failed intubation since 1985 (although deaths from aspiration have occurred at intubation and extubation). Worldwide there have been two deaths recorded in the literature, and both of these occurred before 1995. If the woman is low risk, most women would want surgery to proceed. Whilst many women wanted their decision to be included in their notes antenatally, the difficulty of predicting the individual maternal and foetal risk might in reality limit the value.

**References**

1 KinSELLA SM, Winton AL, Muchambi MC et al. Failed tracheal
P95 Massive obstetric haemorrhage simulation
NA Stewart, H Murdoch, J Cornes
Anaesthetics, Gloucestershire Royal Hospital, Gloucester, UK

Introduction: The 2014 MBRRACE ‘saving lives, improving mothers’ care’ report shows maternal haemorrhage to be the leading cause of maternal mortality worldwide. Obstetric in-situ simulation has previously been successfully used to detect latent errors and improve training.

Methods: We designed a point of care simulation using a high fidelity obstetric mannequin on delivery suite at our trust. We evaluated the management of a major obstetric haemorrhage scenario and the application of the major haemorrhage protocol. The assessing midwife was asked to admit a 35+2/40 multip with vaginal bleeding from an anterior placenta praevia. As the scenario developed midwives, obstetricians, anaesthetists, theatre, transfusion and portering staff became involved. The patient was taken to theatre for a caesarean section and management of a massive haemorrhage. Latent errors were identified by facilitators. Non technical skills were assessed using the anaesthetic non technical skills method. A debrief concluded the simulation and feedback was collated.

Results: The latent errors that were identified included the method for accessing emergency O negative blood, how the blood request forms were labelled and the time delays that occurred between blood arriving in theatre and being given to the patient. No one was trained to use the cell savage machine and transfusion noted difficulties when trying to contact the theatre team. Non-technical skills that facilitators identified as requiring improvement were team leadership, communication skills and role allocation. Distracting factors (particularly noise) was thought to be detrimental to the management of the case. Facilitators found candidates delegated tasks well, escalated care appropriately and asked for help with assertiveness when required. They had sound knowledge of the trust guidelines and a good recognition of the severity of the case. Using a likert scale of 1-5 (low to high), the average scores from the 10 participants were: 4.4 for realism, 4.9 for relevance to their practice and 4.3 for the debrief. They scored 4.0 for confidence in knowledge of topic before training, and 4.6 for confidence after training.

Discussion: In situ obstetric simulation has successfully identified latent errors that occur during the management of a massive obstetric haemorrhage at our trust. It has also identified ways to improve the system. The simulation has provided a practical method for teaching non-technical skills, and importantly, it has improved the knowledge and confidence of participants. In the future we will run more large scale simulation and smaller part task simulation exercises. We will evaluate how these exercises reduce the number of latent errors. We will use video material to aid with the debrief.

References

P96 Maternal collapse during caesarean section secondary to undiagnosed mitral regurgitation
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Introduction: Cardiac disease is the leading cause of mortality in pregnancy. Valvular disease is rare in the general population but if present, may become symptomatic during pregnancy. We present a case of undiagnosed mitral regurgitation (MR) with life threatening decompensation during delivery.

Case Report: A 35 year old woman presented at 41 weeks gestation for induction of labour. She described recent onset orthopnoea but was otherwise fit and well. Hypertension had been identified 10 days prior and labetolol commenced. Three years previously she had an uncomplicated pregnancy with a 4th degree tear. She had declined a caesarean section for perineal protection, but after failed induction she agreed. Spinal anaesthesia was established with 2.4mls of 0.5% hyperbaric bupivacaine + 300mcg diamorphine. A good motor block was noted but she started to complain of severe shortness of breath followed by rapid unresponsiveness, cyanosis and florid pink oral secretions.

Caesarean section was commenced with simultaneous airway intubation. High airway pressures (45cmH2O), widespread pulmonary coarse crackles and pink frothy endotracheal secretions were noted. Following lung suctioning and further paralytic agents, airway pressures improved. Severe cardiovascular instability was managed with 100mcg adrenaline boluses. Adrenaline and furosemide infusions were commenced.

An echocardiogram showed moderate to severe concentric MR, reversal of pulmonary systolic flow and normal biventricular function. A CTPA showed severe pulmonary oedema but no evidence of a pulmonary embolism. Thromboelastography and clotting were normal, making an amniotic fluid embolism less likely. An ECG showed sinus tachycardia with no evidence of ischaemia. The patient made a good recovery and was discharged five day later.

Discussion: Orthopnoea can be present physiologically in pregnancy, however as this case illustrates, not all symptomology in late pregnancy is physiological.

Cardiac disease is largest single cause of maternal death. MR is uncommon, affecting 2% of the adult population. Typically, valvular disease is diagnosed early as it become symptomatic during pregnancy. In MR, the reduced systemic vascular resistance of pregnancy improves forward flow, and thus can remain undiagnosed and untreated. If diagnosed medical optimisation and gentle regional anaesthesia can help minimise haemodynamic instability.

References
2. MBRRACE-UK Confidential Enquiry into Maternal Death 2015 www.npeu.ox.ac.uk/mbrrace-uk/reports.
P97 Non-pharmacological management of major obstetric haemorrhage (MOH)

K Livingstone, E McGrady
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Introduction: Obstetric haemorrhage accounts for 10% of all direct maternal deaths. Recognition of the patient with haemorrhagic shock, along with basic resuscitative measures and appropriate fluid administration play vital roles in reducing morbidity and mortality in these patients. Current guidelines advocate cross matching 4 units of packed red cells (PRC) and limiting colloid/crystalloid transfusion to 3.5L in an MOH. We audited resuscitative care and fluid management of these patients in our unit.

Methods: We work in a tertiary obstetric unit (6000 deliveries/annum). We undertook a 2 year retrospective data analysis of MOH cases ≥ 2.5L from a labour ward database. Collected data included delivery mode, cause of MOH, basic resuscitative measures and IV fluid/blood transfusion.

Results: Data from 72 cases was analysed. Mean age was 31.33 years. Mean BMI was 29.18kg/m². 40 cases were LSCS (11 of which elective). 19 were SVD. 13 were instrumental deliveries. The primary cause of MOH was uterine atony in 42 (58.3%), retained placenta in 10 (13.9%), placental pathology in 8 (11.1%), placental abruption in 5 (6.9%). The other 7 cases (9.8%) were from surgical causes/genital tract trauma.

<table>
<thead>
<tr>
<th>Resuscitative measure</th>
<th>Number of cases (total 72)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I4G IV access x2</td>
<td>67 (93.1%)</td>
</tr>
<tr>
<td>Oxygen therapy</td>
<td>47 (65.3%)</td>
</tr>
<tr>
<td>Major haemorrhage alert call</td>
<td>37 (51.4%)</td>
</tr>
<tr>
<td>Crossmatch ≥ 4 units PRC</td>
<td>48 (66.7%)</td>
</tr>
<tr>
<td>Crossmatch 2 units PRC</td>
<td>22 (30.6%)</td>
</tr>
<tr>
<td>No blood crossmatch done</td>
<td>2 (2.8%)</td>
</tr>
<tr>
<td>Colloid/crystalloid transfusion ≤ 3.5L</td>
<td>64 (88.9%)</td>
</tr>
<tr>
<td>Acute blood transfusion</td>
<td>47 (65.3%)</td>
</tr>
<tr>
<td>O-negative blood transfused</td>
<td>5/47 (10.6%)</td>
</tr>
<tr>
<td>Cell salvage used</td>
<td>6 (8.4%), 3 in elective cases</td>
</tr>
</tbody>
</table>

Discussion: Our results show that the majority of cases were managed with basic resuscitative measures in keeping with guidelines. Delays in PRC administration have been cited as a contributing factor in mortality from MOH. The aim of a major haemorrhage alert is to minimise such delays. Local guidelines recommend instigating an alert when blood loss exceeds 1.5L. It is concerning that an alert was therefore only initiated in 50% of these cases (where blood loss was at least 2.5L). Overall numbers of patients receiving cell salvaged blood was small. This situation is under local review.

References
2. Scottish Confidential Audit of Severe Maternal morbidity: reducing avoidable harm 10th annual report www.healthcareimprovementscotland.org

P98 Preventing accidental dural puncture - the stop before you pop project

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Introduction: Accidental dural puncture (ADP) during obstetric epidural insertion is a well known complication with a quoted incidence of 1 in 100 but this does vary between 0.19 - 3.6%.

The adverse effects are well known. In 2014 a dramatic increase in ADP rate of 2.5% led us to review the practice at our institution. Reduction in training time may be contributory to complications of epidural analgesia. This is compounded by rotation through modules, training at other sites, variable supervision and periods of time where obstetric anaesthesia may not be practiced.

Methods: We reviewed our data retrospectively using the variables proposed in the paper by Hollister N et al.

Overall 75% of the ADPs were trainee related. 44% were by our ST3 trainees. 29% of the ADPs occurred within the first month of change over with an increase to 44% within the first six weeks of change over. 68% occurred out of hours. 35% of our ADPs had an epidural space less than 5 cm depth from the skin. Whilst 50% had a depth of epidural space at 5.5-8 cm. Of the ADP cases 60% had a BMI of 20 – 25 and all had a BMI> 35.

We proposed to improve our one to one training and introduce our "stop before you pop project" to reduce the problem and risk of post dural puncture headache (PDPH).

Position.

Is the position optimal - can it be improved?

Consider a low dose spinal for analgesia and hence aid position. Note the depth on the spinal needle to the subarachnoid space.

Depth.

Only 35% of mothers have an epidural space greater than cm in our unit.

Risk of ADP correlates with the depth of epidural space. For every 1 cm beyond 4 cm there is a 19% increased chance of ADP.

A green needle is 38 mm long - beware the risk of inadvertent ADP when infiltrating local anaesthetic.

Anne.

Proceed with caution. Stop and reflect at 5 cm.

Two thirds of our ADPs occur below 5 cm.

Help.

44% of our ADPs occur within 6 weeks of change over.

Do you need supervised practice?

Would additional personnel to aid positioning be of help?

Results: This method of training was introduced to our trainees in November 2014. Following this, for the remainder of the year we only had one ADP. In 2015 we have had none. In addition, in 2015 the level of direct supervision trebled.

Discussion: The improvement in ADP rate from November 2014 is probably due to improvement in skill. However, the project and improvement in training and education may well have contributed to the lack of ADP in 2015. We look forward to subsequent data for the forthcoming years!

References
**P99 The pharmacological management of uterine atony in major obstetric haemorrhage (MOH)**

K Livingstone, E McGrady

*Princess Royal Maternity Unit, Royal Infirmary, Glasgow, UK*

**Introduction:** The incidence of post partum haemorrhage is increasing. Seven deaths (of 17 from MOH) were due to atony in the recent MBRRACE-UK report. Uterotonic drugs form a substantial part of the management of atony, of which anaesthetists play an active role in administering. Since 2009, guidelines have been in place emphasising the importance of uterotonic administration in the correct order. Our department employs similar guidelines and we audited adherence to these.

**Methods:** Our labour ward is in a tertiary obstetric unit (6000 deliveries/annum). We undertook a 2 year retrospective analysis of a labour ward database on MOH >2.5 litres. Selecting from patients whose primary cause of MOH was uterine atony, we collected data including: mode of delivery, uterotonic drugs/order given, total blood loss and further surgical intervention.

**Results:** From a total of 42 patients, 4 were para ≥3. Mean BMI was 29.43 kg/m². 5 cases were multiple pregnancies. 20 were LCSC (3 of which were elective), 10 were instrumental deliveries and 12 were SVDs.

<table>
<thead>
<tr>
<th>Drug/order of administration</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntocinon 5IU bolus</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ergometrine</td>
<td>2</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5mg IV</td>
<td>(4.8%)</td>
<td>(69%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syntocinon IV infusion</td>
<td>40</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carprofrost</td>
<td>6</td>
<td>14</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(14.3%)</td>
<td>(33.3%)</td>
<td>(25.6%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misoprostol/</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gemprofost</td>
<td>(25.6%)</td>
<td>(11.9%)</td>
<td>(4.8%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Further</td>
<td>7</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ergometrine bolus</td>
<td>(16.7%)</td>
<td>(2.4%)</td>
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</tbody>
</table>

Ergometrine was not given in 11 cases where the patient went on to receive prostaglandin therapy. One of these patients had cited hypertension as a reason for omitting ergometrine. The mean blood loss when the first 3 drugs were given in the correct order was 3000ml, compared with 3748ml for the incorrect order. There was no correlation between further surgical intervention requirement and drug order of administration.

**Discussion:** 10 patients were given drugs in the incorrect order as ergometrine was omitted. Drugs being given in the correct order was associated with a lower average blood loss. The appropriate use of uterotonics is imperative to reduce maternal morbidity and mortality, as well as reduce side effects from unnecessary drug administration. Results will be used to improve training for the labour ward team.

**References**


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**P100 Whatsapp™ - An e-forum for debate and case based discussion assessment**

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**Introduction**

A Whatsapp™ e-debate forum was established six months ago to extend learning and discussion beyond the physical classroom. A monthly clinical scenario is posed, with the lead for the thread facilitating discussion by continuing to set questions and prompts over a two week period. This was initially run by a consultant, and delegated to a trainee who completed a Case Based Discussion (CBD) in their advanced Obstetric Anaesthesia module.

**Methods**

After six months of Whatsapp™ debates on varying topics, feedback was sought from consultants and trainees via an online survey.

**Results**

39 people joined the group, 24 members responded to the survey. The e-debate format has been well received by both trainees and consultants. All respondents wanted the forum to continue.

41.6% (10) observed the conversation but did not post. Half of the respondents felt they would have liked to have contributed more: these were generally more junior trainees. Reasons for not contributing included similar comment already posted (64%), feeling too junior (33%) and afraid of looking ignorant (33%).

**Discussion**

The format of an instant messaging forum allows immediate contribution to a discussion with real time debate and has been welcomed by consultants and trainees in our department. As the trainee and supervisor, we have found the Whatsapp™ platform a useful tool for performing a CBD as it demonstrates understanding of the clinical issues of a complex case and evidence of further reading, as well as the challenges faced by the online educator.
P101 An on-going audit of anaesthetist’s response times for intrapartum analgesia in a large maternity unit

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Introduction: Timely provision of epidural analgesia is an essential part of obstetric anaesthetic services, which contributes to patient satisfaction and overall birth experience. National standards recommend that after requesting epidural analgesia, ≥80% of women should be attended by an anaesthetist within 30 minutes of the request and ≥90% of women should be attended within 60 minutes. It is recommended to regularly audit this standard. We have been auditing these standards in our unit annually since 2013 in an on-going audit loop.

Methods: The audit was registered with the Obstetric Audit department. 50 patients who had epidurals in our sample were attended by the anaesthetist within the first 30 minutes. An additional 14% of women were attended in the second 30 minutes. A comparison of the anaesthetist attendance times in the three audits is shown in the table.

Table: Anaesthetist attendance times in the three audits

<table>
<thead>
<tr>
<th>Year</th>
<th>&lt;30 minutes</th>
<th>30 - 60 minutes</th>
<th>Total &lt;60 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013 (n=60)</td>
<td>65%</td>
<td>11%</td>
<td>76%</td>
</tr>
<tr>
<td>2014 (n=25)</td>
<td>80%</td>
<td>16%</td>
<td>96%</td>
</tr>
<tr>
<td>2015 (n=50)</td>
<td>76%</td>
<td>14%</td>
<td>90%</td>
</tr>
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</table>

67% of causes of delay were anaesthetic related mainly because the anaesthetist is attending another patient. 25% of causes of delay were non-anaesthetic related. 30% of epidurals sited in our samples were sited during the working hours and 70% were sited out of hours.

Discussion: We perform approximately 1050 epidurals for analgesia on our unit per annum. This is the third annual audit of practice, with a larger sample size compared to last year. The first audit (2013) showed deficiencies in the compliance with audit standards but this improved in the subsequent audits following the introduction of an Obstetric Anaesthesia Escalation Standard Operating Procedure (SOP). The existing escalation SOP has been updated and re-publicised to reinforce the audit standards following the slight drop in performance in this audit. The epidural request times match the ratio between normal working hours and out of hours in a standard week in our unit, and suggest that the demand on our obstetric epidural service is uniform throughout the day and night. To improve accuracy in future audits, we will include women who delivered before the anaesthetist attended.

References

P102 Crossing borders with an innovative epidural information film: our experience

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Introduction: Women without English as a first language have poorer maternity outcomes, and improving their care is consistently a top ten recommendation of national enquiries into maternal deaths. It can be challenging to discuss choices for labour analgesia with non-English speaking women although multi-lingual information leaflets provided by the Obstetric Anaesthetists’ Association (OAA) can help. However, literacy rates in some patients’ homelands are low and are typically worse for women. The United Nations Educational, Scientific and Cultural Organization (UNESCO) reports adult (>15 y) female literacy at 60% in India, 45% in Pakistan, and routinely <40% in sub-Saharan Africa. In these circumstances, spoken word information is required, but interpreters may not be immediately available, are costly, and mothers may find them intrusive. Conversely, information films create an instant visual and auditory stimulus, are reproducible and are easy to set up.

Method: Using charity funding, we developed an epidural information film to enable mothers to participate more fully in decisions about their care. We recruited healthcare volunteers as actors and translators, and used a similar script to that used by the OAA2 to create a library of commentaries in relevant languages, as suggested by UNESCO data on literacy rates and common languages in our region. Our Maternity Liaison Group fed back on its accessibility, comprehensibility and communicative effectiveness of the material.

Results: The film explains and demonstrates epidural analgesia for labour. Phase 1 of the project created commentaries in languages prevalent in our catchment area and which have poor literacy rates including Somali, Urdu and Tamil. By uploading the film onto a portable tablet it is easily transported and viewed around the Delivery Suite, as well as on maternity wards and in antenatal clinics. Our Trust Youtube video streaming site also hosts the film which enhances the virtual community viewing potential.

Conclusion: This project has demonstrated proof of concept and has the potential to be a national venture. Our regional maternity clinical network is using the concept to develop similar film resources to improve information around clinical priorities like reducing still birth. During its development, we learned many things about securing funding, working with stakeholders in communications and patient groups, engaging local staff to provide translations and not least the value of innovation in creating reliable, time-sensitive information to mothers who might otherwise have missed the opportunity to learn more. Evaluation based on You Tube traffic and local feed back from mothers is in progress.

References
P103 Evaluation of patient knowledge of analgesia for labour and the availability of written information

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Introduction: The Changing Childbirth report emphasises women’s right to make informed decisions regarding all aspects of care during pregnancy and childbirth. Changes in the law, such as the Montgomery rule, call for improvement in the provision of evidence-based information at an appropriate time to facilitate decision making. These recommendations are echoed in OAA/AAGBI guidelines on obstetric services. We evaluated the knowledge of labour analgesia options and complications in women presenting for delivery and the proportion receiving antenatal written information.

Methods: The evaluation took place over a 3 week period. Any patient presenting in a condition necessitating delivery was interviewed. Patients in established labour were excluded. Information was collected on previous labour analgesia, awareness of options and complications, information source, if they would have liked written information and if so, at what stage. Data was also collected on the availability of written information.

Results: In total 25 patients were interviewed.

| Aware of all analgesia options | 12% |
| Aware of risks of epidural analgesia | 48% |
| Antenatal verbal info from healthcare worker | 28% |
| Antenatal written info given | 20% |
| Antenatal written info wanted | 92% |

In patients with previous epidural analgesia awareness of complications was <50% for all except failure rate. All patients receiving written information found it useful. Those wanting to receive written information 15/25 (60%) would have preferred it midway through pregnancy. Epidural information cards were available only labour ward and no written information was available on other analgesic options.

Discussion: The majority of parturients were unaware of any complications associated with epidural insertion and any knowledge was limited raising concerns regarding the quality of epidural consent. Information retention from previous pregnancies cannot be assumed as illustrated by the poor knowledge of epidural complications in woman having had epidural analgesia. Only 20% of women received written information and 72% sought information from non-medical sources. Patient knowledge could be greatly improved by the distribution of both the OAA leaflet ‘Pain Relief in Labour’ and also the comparison leaflet on pain relief to all women. To allow time to review the information and ask questions this information should be distributed at the penultimate antenatal clinic appointment. This information could be reinforced by intrapartum availability of the comparison leaflet and an epidural information card in antenatal areas.

References
4. Stewart A Sodhi V Harper W et al. Assessment of effect upon

P104 Labour analgesia: An audit of epidural response times

ZA Fazel, G Maffezini
Anaesthetics, Milton Keynes University Hospital, Milton Keynes, UK

Introduction: Analgesia in labour is an important part of the service offered by anaesthetists. However in smaller district general hospitals such as ours, dedicated obstetric cover is unavailable. Out of hours there is shared cover between obstetrics and emergency theatres. There was a perception from the midwifery point of view that anaesthetists were unavailable for long periods of time, prompting the audit to enable a service improvement. The royal college of anaesthetists (RCoA) standard for best practice states as follows: > 80% of epidurals are performed within 30 minutes and > 90% of epidurals are performed within 60 minutes.

Methods: All epidurals performed over a 3 month period were identified and data was collected retrospectively. Patient details were obtained from the obstetric logbooks and further information from electronic document management (EDM) searches. Data was collected under the following headings: time anaesthetist contacted, time anaesthetist arrived, reason for delay and the grade of anaesthetist. Recommendations were made and a re-audit was undertaken a year later using similar methods.

Results: Between 106 and 109 epidurals were carried out in the two audit periods. The results are shown in the table below.

<p>| Table: Epidural response times (%) for both audits as compared to the RCoA standards |
|---------------------------------|----------------|----------------|</p>
<table>
<thead>
<tr>
<th>RCoA Standard (%)</th>
<th>Initial audit (%)</th>
<th>Re-audit (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 30 minutes</td>
<td>80</td>
<td>66</td>
</tr>
<tr>
<td>&lt; 60 minutes</td>
<td>90</td>
<td>88</td>
</tr>
<tr>
<td>&gt; 60 minutes</td>
<td>12</td>
<td>5</td>
</tr>
</tbody>
</table>

The majority of epidurals were done by SAS doctors, a small proportion by consultants and less than 5% by specialty trainees.

Discussion: Following the initial audit, it was apparent that compared to the RCoA standards our department was underperforming. The majority of activity was out of hours and most of the delays accrued were in that time. The reason for delays were because the anaesthetist was either busy in theatre or performing another epidural. Recommendations were made with regards to enlisting support from the intensive care anaesthetist. A business case for the provision of 24/7 dedicated obstetric cover was also put into place. The initial audit was presented at the anaesthetic departmental audit meeting where the recommendations were communicated. Over the year between the initial audit and re-audit, the anaesthetic department introduced a second consultant tier, providing more out of hours support. As a result the re-audit showed a significant improvement in response times, demonstrating adherence to the standards set by the RCoA. These improved results were presented at a shared multi-disciplinary audit meeting involving the anaesthetic, obstetric and midwifery teams. A re-audit is planned later this year when the recommendation for 24/7 obstetric cover will be in place.

Reference
P105 Maternal pyrexia and neonatal outcomes following epidural analgesia.

SC Monks, A Hassan, K Bhatia

Anaesthesia, St Mary's Hospital, Manchester, UK

Introduction: Despite the expectation of reduction in temperature after epidurals, in more recent years an association between labour epidural and pyrexia has been described1. Theories include altered thermoregulation, inflammation and other associated factors (longer complicated labours, more frequent examinations)2.

Method: We performed a retrospective review of 54 parturients to investigate the incidence of pyrexia in our tertiary delivery suite in women with labour epidurals, noting observations, risk factors for infection, and neonatal condition at delivery.

Results: 11 had a documented temperature above 37.5°C (21%). In 18 cases (33%) there was some documented difficulty in epidural insertion, however this accounted for 54.5% of the pyrexial subgroup. Mean time of delivery after insertion of epidural was 8 hours in the whole group; 7 hours for the non-pyrexial subgroup and 10 hours for the pyrexial patients. Further results are summarised below:

<table>
<thead>
<tr>
<th>Data set</th>
<th>All women, n (%)</th>
<th>Non-pyrexial, n (%)</th>
<th>Pyrexial, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primiparous</td>
<td>38 (70%)</td>
<td>28 (65%)</td>
<td>10 (90%)</td>
</tr>
<tr>
<td>Prolonged rupture of membranes</td>
<td>14 (26%)</td>
<td>12 (27%)</td>
<td>2 (18%)</td>
</tr>
<tr>
<td>Normal vaginal delivery</td>
<td>18 (33%)</td>
<td>14 (33%)</td>
<td>4 (36%)</td>
</tr>
<tr>
<td>Instrumental delivery</td>
<td>28 (52%)</td>
<td>22 (51%)</td>
<td>6 (55%)</td>
</tr>
<tr>
<td>Caesarean section</td>
<td>8 (15%)</td>
<td>7 (16%)</td>
<td>1 (9%)</td>
</tr>
</tbody>
</table>

Cord gases and Apgar scores were very similar between groups, with 3 admissions to Neonatal Intensive Care Unit, all from the non-pyrexial group.

Discussion: Rates of maternal pyrexia with labour epidural in our hospital (21%) appear consistent with previous studies.1,3 Prolonged rupture of membranes was not associated with pyrexia, possibly as a result of prophylactic antibiotics. Studies have shown maternal temperature in labour increases on a linear scale with or without epidural2, suggesting temperature can increase further in longer labours, in keeping with our findings of longer times between epidural and delivery in pyrexial women. We found little difference in neonatal course, in contrast with studies showing a correlation between maternal temperature and poor neonatal outcome.4 Maternal fever associated with a labour epidural as an independent risk factor for neonatal outcome is possibly an area that requires more research, in addition to investigation of the reasons behind the maternal pyrexia in these patients.

References

P106 Relation between labour pain relief methods, postpartum depression, satisfaction with labour and labour analgesia for primiparous parturients. WITHDRAWN

R Kucinskaite, V Baluliene*, L Grauslyte*, A Zavackiene *, A Macas *, K Rimaitis*

Anaesthesiology, Lithuanian University of Health Sciences, Kaunas, Lithuania, *Anaesthesiology, 2Lithuanian University of Health Sciences Hospital Kaunas Clinics, Kaunas, Lithuania
P107 Response times for provision of labour epidural analgesia: a re-audit

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Introduction: The OAA/AAGBI guidelines for obstetric anaesthetic services recommend that where a 24-hour epidural service is offered, the time from anaesthetist being informed to attending the woman should not normally exceed 30 minutes, and must be within 1 hour except in exceptional circumstances. Timely attendance after request for labour analgesia improves patient experience.

Our maternity services are provided across 2 sites, each with a 24 hour anaesthetic service. A prospective audit of labour epidural analgesia in 2012 collected data over a 10 week period at 1 site, identifying 50 cases. In only 50% of these cases was an anaesthetist present within 30 minutes of the request for an epidural. Educational sessions aimed at increasing awareness of the OAA/AAGBI guidelines were arranged in view of these results.

Method: This prospective re-audit collected data over a 3 week period across both maternity sites. Data recorded included grade of anaesthetist, time of epidural request, time anaesthetist informed of request, time of anaesthetic presence and time of the first test dose. Any reason for delays that were recorded were also noted. The standard used was that >80% of women should be attended by an anaesthetist <30 minutes, and >90% should be attended <60 minutes of requesting labour regional analgesia.

Results: Data from 44 cases (22 each site) was recorded.

Time elapsed between epidural request and anaesthetist present: 0 -30 minutes in 70.5% of cases; 30-60 minutes in 18.2% of cases (present within 60 minutes: 88.6%), and not documented in 4.5% of cases.

In 27% of cases where there was a delay of >30 minutes until anaesthetic presence, there had been a delay of >30 minutes in informing the anaesthetist of the request. 50% of cases where there was a delay of >30 minutes occurred out-of-hours.

Reasons for delays: The commonest stated reason was that the anaesthetist was busy elsewhere (41.7%). In 25% no reason was documented. In 25% an obstetric review was awaited, and one delay was attributed to waiting for a bed to become available on labour suite.

Discussion: The above data shows that we are not compliant with OAA/AAGBI recommendations; however despite not meeting the standard, there has been an improvement from the previous audit. As highlighted in the previous audit, documentation is still incomplete.

Recommendations: Informative posters and educational sessions aiming to increase awareness of the OAA/AAGBI guidelines, availability of alternative anaesthetic cover and importance of good documentation, as laid out in Good Medical Practice.

References
1. OAA/AAGBI Guidelines for obstetric anaesthetic services. Revised Edition 2005
3. Good Medical Practice, GMC, March 2013

P108 Test dose for obstetric epidural analgesia - Are we teaching it correctly?

J Pettitt, A Waite
Anaesthetics, Royal Preston Hospital, Preston, UK

Introduction: Test doses of local anaesthetic have traditionally been used after sitting epidurals to confirm epidural placement rather than intrathecal or intravascular position. There is debate whether test doses are now required given the widespread use of low dose local anaesthetic mixtures now available. We evaluated which doses of local anaesthetics were used to both test and establish (in an initial dose) epidurals over one year to see whether there was an established practice.

Methods: Data was analysed retrospectively for one year to determine the concentration, volume and type of local anaesthetic used as a test dose when sitting epidurals in the maternity unit at Royal Preston Hospital.

Results: We found that anaesthetists used 22 different combinations of test doses for epidurals. 93% used the low dose mix from the bags but some in very small volumes which would not have adequately revealed an intrathecal placement. No anaesthetists used local anaesthetic with adrenaline. All used a test dose but 30 did not use an initial dose to establish the epidural. Doses for the epidural test dose ranged from 3.75mg to 60mg.

Discussion: It is clear that despite having a departmental guide for epidurals, including advice for test doses and initial doses, anaesthetists have a wide variation in practice, with some giving inadequate doses as tests. Often trainees do only a few supervised epidurals and may not be aware of the reason for giving a test dose or what to use. ‘Traditional’ test doses tend to use stronger solutions of local anaesthetics but this survey shows that we are moving towards using low dose epidural mixes for the test dose. Bupivacaine 10mg is sufficient to demonstrate intrathecal placement and perhaps guidance is needed to make this clear so anaesthetists can use an appropriate volume of their preferred concentration of local anaesthetic.

References
P109 Audit of efficacy of postoperative acute pain management for elective LSCS under spinal anaesthesia

DK Meessala, H Kathuria
Anaesthetics, New Cross Hospital, Wolverhampton, UK

Introduction: Acute pain management is necessary for patients to have a good postoperative experience and important for reducing hospital stay. We have done an audit to assess adequate pain relief in patients who underwent elective caesarean section (LSCS) after making changes to postoperative analgesia prescription in our hospital. Our regular analgesia prescription was Co-tdyramol (10mg of Dihydrocodeine and 500mg of paracetamol) two tablets four times daily and Ibuprofen 400mg tablet three times daily. Oral morphine 10-15mg thrice given for rescue analgesia.

Aim: Our aim was to check the compliance with regular analgesia prescription, incidence of patients with moderate to severe pain, incidence of analgesia failure, sleep disturbance due to pain, causes of these failures and patient satisfaction.

Methods: A prospective audit done using questionnaire in January and February 2015. We used a numerical rating scale to measure pain scores at 4-6 hrs, 10-14 hrs and more than 24 hrs after LSCS, at rest and movement.

Results: 25(74%) out of 36 patients were compliant with regular analgesia. 10 patients (27%) were in moderate to severe pain at rest at 4-6 hrs which increased to 19(52%) at 10-14 hrs. This decreased to 17(47%) patients after 24 hrs. 19 patients (52%) were in moderate to severe pain at movement at 4-6 hrs which increased to 25(69%) at 10-14 hrs. This decreased to 21(61%) patients after 24 hrs. Six patients had a delay in pain relief for more than 30 minutes and 11% of patients had sleep disturbed due to pain.

Reasons for non compliance of regular analgesia No. of Patients (n=36)

<table>
<thead>
<tr>
<th>Reason</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not given</td>
<td>7</td>
</tr>
<tr>
<td>Given after 4 hrs</td>
<td>1</td>
</tr>
<tr>
<td>Communication problem</td>
<td>1</td>
</tr>
<tr>
<td>Tramadol prescribed</td>
<td>1</td>
</tr>
<tr>
<td>Paracetamol allergy</td>
<td>1</td>
</tr>
<tr>
<td>Codeine allergy</td>
<td>2</td>
</tr>
<tr>
<td>Patient refused</td>
<td>1</td>
</tr>
</tbody>
</table>

Conclusions: Our study indicates that there is inadequate pain relief at rest and movement in significant numbers of patients. However, 97% of patients are satisfied with our pain relief measures. We are non compliant with regular analgesia mainly due to analgesics not being given at the prescribed time. The recommendations are to change the postoperative analgesia regime, to educate the midwives to administer regular analgesia and reaudit after 6 months.

Reference

P110 Audit of patient satisfaction with self administration of medicines and length of stay in maternity

Smita Gohil, Tejal Kothari
Anaesthetic, South Warwickshire NHS Foundation Trust, Warwick, UK

Introduction: Women attending our maternity unit at South Warwickshire Foundation Trust were observed as not being given an opportunity to self medicate, despite a long standing system being in place for over 10 years. NICE guidance supports the principle of early discharge following uncomplicated caesarean section 1. Effective analgesia following caesarean section is not only important for patient comfort and satisfaction but also to facilitate early ambulation and enhanced recovery 2. We hoped to identify areas where changes can be made to facilitate an enhanced recovery in all women.

Method: Patient questionnaires were performed face to face on day 1 or 2 following delivery over two 2 months and included data from medication charts. We included all mothers, regardless of mode of delivery, following an anesthetic intervention. We aimed to establish percentage compliance with self medication protocols, mothers satisfaction with provision of analgesics, opinions on adequacy and timeliness of analgesics, any concerns with self administration and finally length of stay.

Results: We collected data from 72 patients who underwent an anaesthetic intervention for delivery on the labour ward, of which, 26.38% had an elective LSCS. 29.16% had an Emergency LSCS and 13.88% underwent NVD and forceps respectively. Of all the patients evaluated, only 3% were offered self administration of medicines. 61.22% were keen on self medication had it been offered. Women’s concerns regarding self medication were greater than we expected. The most common patient concerns encountered were: safety with breastfeeding, fear of forgetfulness as there were too many distractions, over dosage and simply wanting midwives to take control over their pain control measures. 87% patients were satisfied with the timeliness of analgesics being provided.

<table>
<thead>
<tr>
<th>Parameters (% of patients)</th>
<th>El LSCS</th>
<th>Em LSCS</th>
<th>NVD Forceps delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain score 4 or above (good or excellent)</td>
<td>85</td>
<td>68.75</td>
<td>88.88 85.14</td>
</tr>
<tr>
<td>Time to 1st analgesic within 6 hours after delivery</td>
<td>43.75</td>
<td>55.55</td>
<td>71.42 37.5</td>
</tr>
<tr>
<td>Length of hospital stay (Discharge on day 1)</td>
<td>11.76</td>
<td>0</td>
<td>42.88 11.11</td>
</tr>
</tbody>
</table>

Discussion: Percentage of women given the opportunity for self administration, despite prescriptions for self administration, was very poor. We explored midwives views on this and found there was a lack of senior support and staff education on the process and also with regards perceived patient safety. The audit has also highlighted that patient education is pivotal for the process to succeed. Pain scores were 4 and above in 81.5% of women, this positive skew is a common finding in patient satisfaction surveys. Recommendations: 1) Working group created to establish barriers to self administration and how to re introduce practice of self administration. 2) Maternity self administration drug chart designed to include patient suitability and patient consent section, pre printed self medication prescription and quantities to be issued. 3) Formalise procedure for when to
P111 Evaluation of urinary catheter removal and mobilisation following elective caesarean section: breaking barriers to enhanced recovery
A Azhar, N Ungureanu, K Cullis
Selwyn Crawford Department of Anaesthetics, Birmingham Women's Hospital, Birmingham, UK

Introduction: Enhanced recovery (ER) pathways utilise multifaceted approaches in the perioperative period to reduce duration of hospital stay and improve patient experience. Prompt bladder care and early mobilisation in the postoperative period are seen as essential components in the delivery of enhanced recovery after elective caesarean section. The local departmental guidelines as well as guidance from NICE recommend that the urinary catheter should be removed when the woman is mobile and no sooner than 12 hours after neuroaxial anaesthesia. However ER protocols in obstetrics recommend catheter removal and mobilisation as early as 6 hours post neuroaxial anaesthesia. The aim of this study was to evaluate the time interval to mobilisation and urinary catheter removal post elective caesarean section and identify barriers to ER.

Methods: Data was collected prospectively over a 3 week period. All elective caesarean sections were included. Data were collected by notes review and analysed in Microsoft Excel. A total of 38 caesarean sections were identified (36 spinals and 2 epidurals). All patients received neuroaxial diamorphine.

Results: Average time to catheter removal was 20:01 hours post section. Average time to mobilisation was 22:47 hours post section. Average number of nights spent in hospital was 2.5. Only 1 patient was mobilised prior to the removal of catheter. Catheter removal was performed in the first morning after surgery between 6 am to 12 noon in 25 out of 38 patients.

<table>
<thead>
<tr>
<th>Time interval to catheter removal from caesarean</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 to 18 hours</td>
<td>14</td>
</tr>
<tr>
<td>18 to 24 hours</td>
<td>20</td>
</tr>
<tr>
<td>24 to 48 hours</td>
<td>3</td>
</tr>
<tr>
<td>Over 48 hours</td>
<td>1</td>
</tr>
</tbody>
</table>

Discussion: 22 patients spent 2 nights in hospital whilst only 1 patient was discharged on the first post-operative day. This falls well below what has been achieved in departments with established ER protocols in terms of discharge on the first post-operative day. The current local bladder care policy advises against removal of catheter after 10 pm to avoid sleep disturbance. Therefore nearly 70% of patients had their catheter removed in the first morning after surgery with average time to removal of catheter post section much higher than seen in common ER protocols. The presence of urinary catheter also seems to be a hindrance to mobilisation with most patients encouraged to mobilise only after the catheter has been removed. Undoubtedly early mobilisation and prompt catheter removal will have an effect on early discharge and enhanced patient experience. Further training for postnatal ward staff are presently being planned within the local department with the set target of patient mobilisation at 6 hours and catheter removal within 8 hours post caesarean.

References

P112 Fasting times, ketonuria and length of hospital stay before and after the introduction of an enhanced recovery programme for elective caesarean sections
R Vlies, F Bowden, E Christie, P Edmondson, R Mygerimath, H Makim, H McNamara, C Grassmann
Department of Anaesthesia, Liverpool Women’s Hospital, Liverpool, UK

Introduction: Enhanced recovery programmes (ERP) have been successfully used for more than a decade across a range of surgical specialities, and more recently for women undergoing elective caesarean section (CS). Our hospital performs 1000 elective caesarean sections each year, and following an initial service evaluation, a multidisciplinary enhanced recovery pathway was introduced and the service evaluation repeated. Fasting times and prevention of ketosis were identified as being particular areas for improvement.

Method: Following approval from the trust audit department, evaluation was undertaken before and after introduction of the ERP. Compliance with the ERP pathway was also audited. A wide range of preoperative, intraoperative and postoperative data were collected. 50 patients were included before and 51 after introduction of the ERP. Interventions within the ERP included the provision of carbohydrate drinks and a patient checklist advising when to take food and fluid and postoperative aims such as oral intake in recovery.

Results: Following introduction of the ERP pre-operative fasting times reduced from 13.6 to 12.7 hours for solid food and from 7.7 to 4.9 hours for clear fluids. 96% of patients in the ERP group received a carbohydrate drink preoperatively. The degree of ketonuria was significantly reduced, using the ERP. (p<0.01, chi-square test - Figure 1)

Postoperatively 70% of patients had oral fluids and 39% solid food in recovery or within an hour of returning to the ward. Discard on day 1 postoperatively increased from 7% to 47%.

Discussion: We have demonstrated that the introduction of an ERP has enabled many women to achieve discharge on day 1 post elective CS, in keeping with NICE guidelines. We were able to significantly improve our long fasting times and presence of urinary ketones using an ERP. It is important that postoperative as well as preoperative fasting times should be reduced as a catabolic state will be maintained until oral intake is resumed. This can be a logistical challenge in obstetrics although we feel increasing the carbohydrate preload with an alternative or additional drink, and providing a dedicated post recovery area may allow further improvement.

References
P113 Increasing use of enhanced recovery for obstetric surgery in the UK- a survey and national statistics

W Low, I Wrench
Anesthesia, Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK

Introduction: In 2013 our survey found that 10.3% of units in the UK had an enhanced recovery in obstetric surgery (EROS) protocol and 3.7% of units routinely discharged their patients home the day following elective caesarean section. We sought to establish how national practice has changed since then by means of a survey of 36 research active units and by reference to NHS statistics.

Methods: We conducted an electronic survey of 36 units who were actively recruiting into two national multicentre trials related to obstetric anaesthesia. We also accessed “National Maternity Statistics–England” to establish whether there was any evidence of a trend to earlier discharge from hospital following elective caesarean section.

Results: A response rate of 83% was achieved with 50% of units having an EROS protocol and 13% of the units routinely discharging their patients one day post elective caesarean section. A higher proportion of units that practised EROS routinely discharged patients the next day compared to units that did not practise EROS (15% vs 8%).

Figure 1: Percentage of women discharged the day after elective caesarean section vs the financial year from 2010 to 2015- information collated from National Maternity Statistics–England

Discussion: There was an increase in the number of units utilising the EROS protocol and an increase in percentage of patients routinely discharged the next day. This corresponds to an increase in next-day discharges nationally from 2010-15 according to the “National Maternity Statistics–England”. There is potential for further improvement in the rate of next-day discharges following elective caesarean section if more units have an EROS protocol.

References

P114 Pre-loaded to improve experience, satisfaction and starvation for patients undergoing caesarean section

MH Davies, AJ Downs
Department of Anaesthetics, Russells Hall Hospital, Dudley, UK

Introduction: Appropriate preoperative fasting reduces the risk of aspiration. This risk must be offset against the adverse effects of prolonged starvation, which are distressing to patients leading to headache, thirst, nausea and increased anxiety levels. National guidance requires that clear fluids should not be withheld for more than two hours prior to anaesthesia, and highlight the preoperative administration of carbohydrate beverages (CBs) as a proven method of attenuating preoperative thirst, anxiety and postoperative nausea and vomiting. CBs reduce postoperative insulin resistance, thereby improving the efficacy of postoperative nutritional support. As such, CBs are an important aspect of an enhanced recovery programme. Our aims were to assess the impact of introducing CBs on maternal satisfaction, patient experience and starvation times.

Method: An initial audit was conducted to assess starvation times, levels of thirst, and awareness of starvation guidance for all patients undergoing elective caesarean section (ECS) over a 6 week period (2014). Results were disseminated to the department. Repeat audit: Pre-load CBs were issued to non-diabetic ECS patients in the pre-operative assessment clinic, with instructions to take one at 22:00 the evening prior, and one at 06:00 on the morning of surgery. Patients identified as likely to require further fluids on day of surgery were offered a further CB.

Results: Initial audit: 44 patients included. On arrival in theatre, 61% of patients were thirsty. This figure rose to 100% if fasted for >3h. Re-audit: 55 patients issued with Pre-load drinks, 44 (80%) patients were followed-up in theatre.

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBM range</td>
<td>2h 0m – 11h 5m</td>
<td>1h 50m – 7h 15m</td>
</tr>
<tr>
<td>NBM median</td>
<td>3h 55m</td>
<td>2h 35m</td>
</tr>
<tr>
<td>Thirsty in theatre</td>
<td>61%</td>
<td>36%</td>
</tr>
<tr>
<td>Aware of NBM guidance</td>
<td>50%</td>
<td>91%</td>
</tr>
<tr>
<td>Improved experience</td>
<td>N/A</td>
<td>77%</td>
</tr>
</tbody>
</table>

Administration of Pre-load drinks resulted in 35% reduction in median starvation time, and an 82% improvement in patient understanding of starvation guidance. 77% of patients expressed a preference for drinking CBs over plain water, and 77% of patients thought that CB administration had improved their overall experience.

Discussion: Our re-audit reveals a clear improvement in patient experience and satisfaction through the self-administration of CBs – which were well tolerated by all. The introduction of CBs has led to increased awareness levels within our patient population, resulting in a clear reduction in patient discomfort. It has ultimately encouraged “active participation” from patients with respect to their preparation for theatre.

References
1. Powell-Tuck, J. British consensus guidelines on IV fluid therapy for adult surgical patients. 2011
3. Vallabhaneni NMK, Brennan C. Audit on Fasting of Fluids prior to Elective LSCS. 2014
P115 Prevention of peri-operative hypothermia in elective caesarean section

S Denning, J Lewis, R Lawton
Department of Anaesthesia, Nottingham University Hospitals NHS Trust, Nottingham, UK

Introduction: Prevention of peri-operative hypothermia is a key component of enhanced recovery after surgery. Patients undergoing elective caesarean section have multiple risk factors for peri-operative hypothermia. The scope of current national guidance does not cover inadvertent peri-operative hypothermia in caesarean section. It does, however, provide potential standards for service evaluation. We aim to assess current practice and review the need for further intra-operative warming strategies.

Methods: Data for 23 patients who had undergone elective caesarean section was retrospectively collected over 3 weeks using a simple pro-forma. Data collected included temperature recorded pre- and post-operatively, time in to and out of theatre and warming methods used intra-operatively.

Results: Overall, 22 patients (96%) had a recorded temperature pre-operatively. All of these were above 36.0°C, however, only 18% had were recorded within 60 minutes of entering theatre (Range 2 - 510 minutes). IV fluid warming was not used. Only 2 cases (9%) used intra-operative warming methods. 22 patients (96%) had a recorded temperature post-operatively, 4 were <36.0°C (18%).

Conclusion: Unfortunately more than 4 in 5 patients did not have their temperature assessed within one hour of surgery. This will be targeted for rapid improvement through staff education. Nearly 1 in 5 patients were hypothermic post-operatively. As a component of enhanced recovery this may impact early discharge. Further work should include service evaluation at the other obstetric unit within the same organisation, who routinely warm fluid intra-operatively to aim for a unified protocol. In addition, we only looked at elective patients; emergency patients may have a different risk of peri-operative hypothermia and should also be considered. When repeated we will also collect maternal satisfaction data regarding warming.

References

P116 Re-audit of category 4 LSCS. Enhanced recovery: simply introducing the idea enhances the process

L K Kessack, S Choudhury, G Bostock, J W Broadway Anaesthetics, Ipswich Hospital NHS Trust, Ipswich, UK

Introduction: The aims of an enhanced recovery programme are to reduce the stress response to surgery, optimise management, enable early mobilisation postoperatively and co-ordinate a perioperative care pathway designed and managed by a multidisciplinary team. We are planning to introduce an enhanced recovery programme in March 2016.

Methods: This prospective audit of all women undergoing category 4 lower segment caesarean section (LSCS) under spinal anaesthesia was conducted from December 2015 until January 2016 (25 cases). Prior to this we had introduced multidisciplinary team meetings regarding the programme and discussed key changes in perioperative management. Our clinical practice was compared with a previous audit from 2014 (43 cases). NICE guidelines and programmes from other hospitals are evidence that skin to skin following caesarean section can improve postoperative recovery, morbidity and mortality in these patients. Current guidelines also now discussed as part of our WHO team briefing and is considered for every woman operatively. All of these were above 36.0°C

Results: 36% of patients are going home on day 1 post LSCS (vs. 16% in 2014). The indication for LSCS for 72% of patients was a previous LSCS. 72% of patients had no co-morbidities or complications. 1 patient had muscular dystrophy, 1 patient had a grade IV placenta praevia, 1 was a twin pregnancy and 2 patients had type 2 diabetes. The mean BMI was 32, the mean preoperative haemoglobin was 112 g/L and the mean perioperative blood loss was 379ml. Cord clamping was delayed in 71% of cases and skin to skin took place in theatre for 40% of patients and in recovery for an additional 36% of patients. Regular analgesia and antiemetics were prescribed for 100% of patients. All recorded analgesia scores were 0 or 1 at 12 hours and 24 hours post op. 44% of patients received oramorph. The mean fasting time was 14.65 hours and the mean time from the spinal anaesthetic to when the patient mobilised was 11.3 hours.

Discussion: The enhanced recovery programme has not been formally introduced. However the multi-disciplinary team meetings discussing the key changes needed to implement the programme have already resulted in a change in practice and therefore more women were discharged home on day 1.

References
2. Caesarean section. NICE guideline CG132 November 2011.

Figure 1: Maternal expectation vs. actual day of discharge

Discussion: The enhanced recovery programme has not been formally introduced. However the multi-disciplinary team meetings discussing the key changes needed to implement the programme have already resulted in a change in practice and therefore more women were discharged home on day 1.
P117 An audit of decision to delivery times in emergency caesarean sections

H Wang, V Betharia, A Bewlay
Anaesthetics department, Royal Preston Hospital, UK

Introduction: Category 1 emergency caesarean section, defined as "immediate threat to the life of the mother or foetus" by the Royal College of Obstetricians and Gynaecologists requires a swift yet safe delivery and represents a challenging case for any obstetric theatre team. Compliance with the arbitrary 30 minutes decision to delivery interval (DDI) time can be difficult to achieve. Our aims were to assess DDI times for category 1 caesarean sections within our medium sized maternity unit and identify modifiable factors that are causing delays.

Methods: We retrospectively identified all cases of non-elective caesarean sections within 6 months on our obstetric anaesthesia database, retrieved notes to record timings of decision for caesarean section, arrival to theatre, anaesthetic start, knife to skin and delivery. We also recorded method of anaesthesia. Neonatal Intensive Care unit (NICU) admissions in those with gestational age over 36 weeks and compliance with the world health organisation (WHO) surgical checklist.

Results: We found 63 cases of category 1 caesarean sections, 31 (49%) under regional anaesthesia and 32 (51%) under general anaesthesia. 14 cases (22%) had a DDI time >30 minutes. There were 7 (11%) NICU admissions overall. In those with DDI time >30 min the NICU admission rate was 20% vs 7% in those with DDI time ≤30 minutes. Spinal anaesthesia seemed to be more time consuming compared to epidural top ups and general anaesthesia.

A 22% failure rate in regional anaesthesia did not seem to contribute to increased DDI times, in this group only one case (14%) had a DDI time > 30 minutes. Majority (76%) of cases were performed outside of routine working hours and that prolonged transit times were a frequent problem in those with a DDI >30 minutes especially in cases performed outside of routine working hours, WHO checklist compliance was associated with a higher transit time.

Discussion: Prolonged transit times, and cases performed outside of routine hours are associated with a prolonged DDI time and NICU admission. Completion of the WHO surgical checklist added to the delay in transferring the patient to theatre. Our main recommendations are to encourage timely multidisciplinary review of labour ward patients and to work on improving communication and teamwork to allow a seamless transfer of the patient to theatre. To enable this we have introduced twice daily multidisciplinary ward rounds and multidisciplinary simulation exercises.

Reference

P118 Caesarean section anaesthesia: technique and failure rate

J English, H McNamara
Anaesthesia, Liverpool Women’s Hospital, Liverpool, UK

Introduction: Regional anaesthesia (RA) is recommended for caesarean section, being safer than general anaesthesia (GA) with less maternal and neonatal morbidity. GA may be necessary if neuro-axial blockade is contraindicated or delivery is required urgently. Conversion from RA to GA is undesirable as it exposes patients to risks associated with both methods. Airway complications may also be more likely in this scenario. Conversion may be due to anaesthetic (inadequate or failed block), surgical (prolonged or complicated procedure) or patient (sensation or communication) factors. Our maternity unit had recently been the subject of a television documentary during which conversion to GA was featured. We had noted some patient anxiety following this and decided to audit our practice. We audited against the Royal College of Anaesthetists (RCoA) standards relating to anaesthetic technique used for caesarean section, as well as rate of conversion from RA to GA.

Methods: Approval was granted by the trust audit committee. A one year period (1st October 2014 to 30th September 2015) was analysed retrospectively. Each anaesthetic is recorded on the trust computer system. A summary report for the year was obtained, as well as cases where conversion from RA to GA had occurred. Case notes were reviewed for each conversion to determine possible associated factors including dose given, block level, time of day, grade of anaesthetist, additional analgesia and timing relevant to surgery.

Results: 2,431 caesarean sections were carried out. 97% of electives and 82% of emergencies were carried out under RA compared to the RCoA suggested guidelines of >95% and >85% respectively. The rates of conversion from RA to GA were 0.4% and 3.2% for elective and emergency caesareans respectively, compared to proposed standards of <1% and <5%. 67% of conversions occurred out of hours, and 77% were performed by trainee anaesthetists. An epidural or intrathecal dose lower than the recommended trust guidelines was used in 24% of cases. The reasons for conversion were varied, but the most common was discomfort. 57% were converted prior to incision.

Discussion: The overall rate of GA for caesarean section was slightly higher than proposed standards, but the rate of conversion from RA to GA was very low. This suggests that decision making regarding choice of anaesthesia was appropriate. The relatively high overall rate of GA is likely to be due to the management of complex obstetric cases within a busy tertiary maternity unit. We have increased the accessibility of departmental guidance for trainees since this audit and we have been able to reassure our patients regarding the risk of conversion from regional to general anaesthesia, despite what they may have seen on television.

References
P119 Category 1 delivery times, mode of anaesthesia and associated APGAR scores. WITHDRAWN
G Wong, H Gooneratne
Anaesthetic Department, Colchester Hospital, Colchester, UK

P120 General anaesthesia for caesarean section: a survey of regional practice
E Plunkett, J Mackie, J Marriott
*Anaesthetic Department, Worcestershire Acute Hospitals
NHS Trust, Worcester, UK, Birmingham School of Anaesthesia, Birmingham, UK

Introduction: According to the results of the 5th National Audit Project (NAP5), obstetrics carries by far the highest risk of Accidental Awareness under General Anaesthesia (AAGA) and is associated with many of the risk factors for awareness: rapid sequence induction (RSI), use of thiopentone, neuromuscular blockade and increased incidence of a difficult airway. Recommendations in the NAP5 report have led to questioning the standard obstetric RSI. We sought to investigate our local practice of obstetric general anaesthesia and whether a recent change of practice has been considered.

Methods: An online survey based around the recommendations of NAP5 was designed via iterations with the authors. It included questions on choice of anaesthetic drugs, airway management and the impact of the results of NAP 5 on local practice of obstetric general anaesthesia. The survey was distributed via contacts for the Midlands Obstetric Anaesthesia Network (MOAN), and the number of people to which the link was sent was requested in order to calculate denominator data.

Results: There were 81 respondents to the survey. The majority (65%) were consultants, two thirds of whom had regular daytime obstetric sessions. The choice of anaesthetic agent can be seen in the table below.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Emergency caesarean section (n=81)</th>
<th>Elective caesarean section (n=62)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiopeptone</td>
<td>95% (77)</td>
<td>94% (58)</td>
</tr>
<tr>
<td>Propofol</td>
<td>11% (9)</td>
<td>15% (9)</td>
</tr>
</tbody>
</table>

All respondents used suxamethonium, with 4 in each group also using rocuronium for intubation. 64% reported that there is a peripheral nerve stimulator available in their obstetric theatre, 16% did not know. 51% do not usually counsel patients about the risk of awareness, with only 12% reporting that they always do this. 12% reported that they have changed their practice because of the results of NAP5, with a further 54% considering changing. The three most likely areas for change were counselling about the risk of awareness (48%), having a second syringe of induction agent (37%) and communicating an airway plan (32%). The most commonly perceived barrier for change was deviating from historically normal practice (53%).

Discussion: In our region, the majority of anaesthetists have not yet changed their practice since the publication of NAP5, although more than half are considering changing. Thiopentone remains the most widely used induction agent with few changing to propofol. Counselling regarding awareness is still not routine, although many are considering doing this. It will be interesting to see how the practice of general anaesthesia in obstetrics changes over the coming months as historical practices are challenged.

Reference
P121 Maternal and foetal outcomes following propofol anaesthesia for emergency caesarean section

TH Pratt, RA Isaacs
Shackleton Department of Anaesthesia, University Hospital Southampton, Southampton, UK

Introduction: Thiopental remains the most commonly used drug for induction of anaesthesia for emergency caesarean section in the UK; however recent research demonstrating an excessive incidence of accidental awareness under anaesthesia associated with the use of thiopental has led some commentators to suggest propofol should become the anaesthetic agent of choice. Whilst research in the elective setting has shown propofol to be a safe drug in the obstetric population, its use during emergency caesarean section has not been studied previously. In particular, in vitro research suggesting propofol may increase blood loss has not been assessed.

Methods: After obtaining ethical approval we retrospectively reviewed the medical records of all women who underwent emergency caesarean section under general anaesthesia at University Hospital Southampton between January and May of 2012, during which time there was a national shortage of thiopental. Data on demographics and maternal and foetal outcomes were extracted. The primary outcome measure was estimated intraoperative blood loss.

Results: 56 women were eligible for inclusion in our study, 45 (80%) of whom received thiopental and 11 (20%) of whom received propofol for induction of general anaesthesia. The two groups were well matched by demographics and operative details. The mean (SD) doses of induction agent for the thiopental and propofol groups were 6.7 (1.4) mg/kg and 3.0 (0.8) mg/kg, respectively. We found no difference in intraoperative blood loss between the two groups, with a median [IQR] for the thiopental group of 650 [500-1000] mL and for the propofol group of 560 [250-700] mL (P=0.119). There were no differences in the rates of difficult intubation, awareness under anaesthesia or requirement for vasopressors between the two groups. Foetal outcomes (see table) also showed no difference between the two groups.

Results are expressed as median [IQR], mean (SD) or n (%).

<table>
<thead>
<tr>
<th></th>
<th>Thiopental (n=46)</th>
<th>Propofol (n=12)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apgar score at 1 minute</td>
<td>6 [4-9]</td>
<td>6 [4-7]</td>
<td>0.225</td>
</tr>
<tr>
<td>Apgar score at 5 minutes</td>
<td>9 [7-9]</td>
<td>9 [7-9]</td>
<td>0.680</td>
</tr>
<tr>
<td>Umbilical artery pH</td>
<td>7.23 (0.13)</td>
<td>7.22 (0.10)</td>
<td>0.823</td>
</tr>
<tr>
<td>Umbilical vein pH</td>
<td>7.16 (0.61)</td>
<td>7.26 (0.11)</td>
<td>0.626</td>
</tr>
<tr>
<td>Admission to NICU</td>
<td>17 (37%)</td>
<td>7 (58%)</td>
<td>0.181</td>
</tr>
</tbody>
</table>

Conclusion: In this retrospective study we found no evidence that the use of propofol for induction of general anaesthesia worsened maternal or foetal outcomes during emergency caesarean section.

References

P122 Multidisciplinary algorithm for category 1 caesarean sections; a collaborative service improvement

H Murray, K Johnston, S McGuirk
Royal Jubilee Maternity Hospital, Belfast, UK

Introduction: Review of serious adverse incidents within our institution highlighted a requirement to improve our approach to Category 1 sections, with pertinent areas identified including documentation, clarity in communication especially regarding degree of urgency, and availability of staff.

Methods: A retrospective chart review of Category 1 caesarean sections over the preceding two months were undertaken, and analysed independently of patient details, regarding timing, documentation, decision to delivery intervals, and consensus of urgency and indication between team members. In addition, informal but structured interviews and focus group discussions were carried out with each MDT group to identify common and pertinent issues surrounding the current process of taking a Category 1 caesarean section case to theatre.

Results: All cases had an appropriate indication for Category 1 caesarean section, with just over half these cases (58%) having the decision clearly documented. In 64% of cases both the anaesthetic and obstetric theatre records were in agreement regarding degree of urgency, and a decision-to-delivery interval of under 30 minutes was achieved in 82% of cases. One of the most significant issues identified by staff was the availability of anaesthetic nurse assistance out of hours, who could often be off site.

Conclusion: By their nature, Category 1 caesarean sections are often associated with poorer neonatal outcomes [1], with a lack of evidence to advocate one approach or technique over another. Furthermore the decision-to-delivery interval of less than 30 minutes is an auditable standard rather than a marker by which to judge MDT performance [2][3] therefore the issues specific to our individual institution were considered and challenged in a collaborative approach.

The communication process was immediately addressed to ensure a more efficient and unambiguous method of requesting anaesthetic assistance out of hours. To do this our anaesthetic assistant was added to the team emergency pager, and this pager also used to declare every category 1 section. An algorithm was subsequently developed, combining this service improvement, which streamlined the overall approach to the process, with clearly defined roles, 3-4 tasks per team member, and clarification of unnecessary duties which could be omitted in this life threatening emergency. After a period of staff training, the algorithm was initiated in December and has been well received. Achieving this level of agreement between all specialty members marks a significant step in our unit’s process of responding to, and learning from, previous events, to improve all levels of care. We look forward to auditing its adherence and outcome on previous targets in due course.

References
http://guidance.nice.org.uk/cg132
P123 Ranitidine in obstetrics: auditing a successful patient safety initiative

D Ferris, K Maclellan
Saint Mary’s Hospital, Central Manchester Foundation Trust, Manchester, UK

Introduction: Aspiration of acidic gastric contents is a potentially fatal event. Obstetric patients are at higher risk of aspiration due to a lower barrier pressure and delayed gastric emptying. NICE guidance advises the use of H2 antagonists, to increase gastric pH, in labouring women who receive opioids or who are at risk of needing a general anaesthetic. A local audit (2013) showed poor compliance with prescribing and administering ranitidine. In response, antacid prophylaxis during labour guidelines were written, a pre-printed ranitidine prescription sticker was introduced and an education drive was launched. This audit was completed to review the effectiveness of the changes that were implemented.

Methods: Prescription charts were reviewed on delivery suite and on the postnatal ward. Opiate administration was recorded as were any risk factors (obstetric, medical or anaesthetic) that would increase the likelihood of needing a general anaesthetic. Ranitidine (150mg oral) administered 6-hourly during labour for those women with risks was the gold standard. Data collected included presence of a correct ranitidine prescription and appropriate administration of doses.

Results: In total 41 women were included. The use of opioids or another risk factor increasing the need for general anaesthesia was present in 100% of women, with 46% of women having more than one indication for requiring ranitidine. 10% had a medical risk factor, 41% had an obstetric risk and 83% had an anaesthetic risk factor or the use of opioids. 93% had ranitidine prescribed (n=38) in line with NICE guidance. In 73% (n=30) ranitidine had been correctly administered.

<table>
<thead>
<tr>
<th>Year</th>
<th>Ranitidine Prescribed</th>
<th>Correct Prescription</th>
<th>Correct administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>11% (4/33)</td>
<td>Not recorded</td>
<td>100% (4/4)</td>
</tr>
<tr>
<td>2016</td>
<td>93% (38/41)</td>
<td>80% (33/41)</td>
<td>73% (30/41)</td>
</tr>
</tbody>
</table>

Discussion: The introduction of a clear guideline detailing who to and how often ranitidine should be prescribed; pre-printed ranitidine prescription stickers (now carried by obstetric anaesthetists on the four hourly ward round); and a sustained educational drive for doctors and midwives via our communication board have yielded good results. Appropriate ranitidine prescribing and administration have increased dramatically. With safer prescribing in line with NICE guidance we have been able to decrease the risk of acid aspiration in our obstetric population.

Reference
P125 A review of current skin-to-skin practice following elective caesarean section

J Overend, C Taylor, J Longbottom
Department of Anaesthesia, Royal Preston Hospital, Lancashire Teaching Hospitals NHS Foundation Trust, UK

Introduction: Early skin-to-skin (STS) contact for mother and baby following elective caesarean section has been shown to have many positive effects. Evaluation of our service in 2014 resulted in a campaign to raise awareness of STS, including educational posters and the introduction of alternative theatre layouts aiming to improve the experience for mothers in our theatre environment. In 2015 we re-evaluated our service and also conducted a multidisciplinary team (MDT) survey to establish if sustained improvement had been achieved.

Method: A standardised questionnaire was used to collect data during elective caesarean sections over a 6 week period. The data collected included occurrence of STS, timings for first visual and physical contact for both mother and partner and any events delaying contact. An electronic survey was also disseminated to members of the MDT exploring awareness and ideas regarding STS.

Results: Observations were recorded for 18 elective caesarean sections. The number of mothers experiencing STS contact had increased by 47% from 5/20 cases in 2014, to 13/18 in 2015. There was also a reduction in the time to first visual and physical contact. (See chart)

Data presented are mean [range] and number (percentage)

In both 2014 and 2015, several tasks took place prior to initiation of STS contact. Most commonly these included weighing of the baby, examination and labelling. Nausea and shivering were reported in two cases as complications delaying STS in 2015, but the majority of delayed STS was due to routine midwife tasks in both reviews. The MDT survey reflected several positive changes in 2015 compared to 2014. Preoperative discussion of plans for visual and physical contact had increased by 27% and 37% respectively, and 78% of long-term staff stated they had noticed increased occurrence of STS contact in both theatre and recovery.

Discussion: This review demonstrates a significant improvement in the standard of care provided in our theatres during elective caesarean section. Simple interventions such as a raising awareness, MDT work and adjusting theatre layout have effectively shortened the time to first visual and physical contact and improved overall prevalence of STS contact. Further work to emphasise the importance of STS contact above well established routines of weighing, swaddling and examining the baby prior to physical contact may further improve the mothers’ experience.

Reference

P126 An audit of analgesic delivery following caesarean section: four years of data and change

A Hartopp, S Sanusi, S Armstrong, H Dodwell, H Williams, S Milewczyn
Anaesthetics, Royal Surrey County Hospital, Guildford, UK

Introduction: Poorly controlled pain following caesarean section prolongs hospital stay, decreases satisfaction and increases the likelihood of chronic pain. Post-operatively patients should receive per rectum diclofenac, with regular paracetamol, ibuprofen and dihydrocodeine prescribed. To assess the effectiveness of strategies to control acute pain, the Royal College of Anaesthetists suggests >95% of women should be satisfied with their post-operative analgesia. We evaluated post-operative analgesic delivery.

Methods: Drug and anaesthetic charts were reviewed across four audit cycles. The last two cycles included detailed drug chart analysis, patient satisfaction and midwife questionnaires.

Results:

<table>
<thead>
<tr>
<th>Audit Cycle</th>
<th>Was PR diclofenac given post op N= (%)</th>
<th>Was any regular analgesia prescribed for post op N= (%)</th>
<th>Did patients receive all prescribed regular analgesia N= (%)</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>72/121 (60%)</td>
<td>102/121 (84%)</td>
<td>22/102 (22%)</td>
<td>Drug charts with regular analgesia pre-printed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ibuprofen QDS to match paracetamol dosing times</td>
</tr>
<tr>
<td>2nd</td>
<td>77/92 (84%)</td>
<td>110/110 (100%)</td>
<td>15/110 (14%)</td>
<td>One midwife dispenses per bay, rather than one midwife for entire ward</td>
</tr>
<tr>
<td>3rd</td>
<td>22/25 (88%)</td>
<td>25/26 (96%)</td>
<td>0/25 (0%)</td>
<td>Self-administration by patients</td>
</tr>
<tr>
<td>4th</td>
<td>19/22 (86%)</td>
<td>25/25 (100%)</td>
<td>0/25 (0%)</td>
<td></td>
</tr>
</tbody>
</table>

Data collection period: *36 hours post operatively, *entire admission

In the 52 drug charts audited in cycles 3 and 4, there were **383 doses of regular analgesia missed**, with no omission code stated. 78% (n=32) of patients were satisfied/very satisfied with their post-operative pain control. Multiple obstacles to drug administration were cited by the midwives including interrupted drug rounds, staffing, prolonged handover and not willing to wake sleeping patients.

Conclusion: The introduction of pre-printed drug charts has had a positive impact on the prescription of regular post-operative analgesia. PR diclofenac administration rates have improved. However there are a concerning number of prescribed doses of analgesia being missed. This represents a deficiency in care and a clinical governance issue, which is reflected by the failure to achieve patient satisfaction targets.

References
P128 Availability of appropriate staff and equipment in recovery area at the end of obstetric theatre cases

S W Sooriarachchi, H Kaye
Anaesthetics, Princess Royal University Hospital, Kings College Hospitals NHS Trust, Orpington, UK

Introduction: In the busy Obstetric Unit at PRUH site of King’s College NHS trust, we audited the availability of appropriate staff and equipment in Recovery area of the Labour ward at the end of theatre procedures as it is a vital component for patient safety. We used the AAGBI guidelines (2) and recommendations (1) as the gold standard and looked for the availability of the following key elements - trained midwife, monitoring equipment, drip stand and an infusion pump to administer Synioticon.

Methods: Data was collected prospectively over a period of three weeks using a questionnaire. In this period audited, there were 149 theatre cases (both elective and emergency procedures) and we managed to obtain data for 129, giving a capture of 86.5%.

Results: In 87% of the cases, a trained midwife was immediately available to take over care on arrival in recovery. Only 69% of the cases had a monitor available for monitoring their Vital signs in Recovery. In 60% of the cases an Intravenous drip stand was available. Only in 37% of the cases an infusion pump was available for ongoing Synioticon infusion.

Discussion: The audit demonstrated unacceptable lack of equipment and monitoring for the safe care of our obstetric women. The results were presented at the Obstetric and Anaesthetic Risk and Governance meetings and the need for significant improvements highlighted. This prompted new equipment to be purchased, formulated a check list to ensure availability of equipment and personnel before moving a patient from operating theatres to recovery area, raised awareness among labour ward staff and in the event of failure to comply with the recommendations a Red Alert Incident Report was done. Allowing adequate time for new equipment to arrive, we re-audited same and demonstrated significant improvements as follows:

<table>
<thead>
<tr>
<th></th>
<th>Audit</th>
<th>Re-audit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of Cases</td>
<td>149</td>
<td>126</td>
</tr>
<tr>
<td>Data Capture</td>
<td>86.5%</td>
<td>93%</td>
</tr>
<tr>
<td>Midwife Availability</td>
<td>87%</td>
<td>96%</td>
</tr>
<tr>
<td>Infusion Pump</td>
<td>37%</td>
<td>93%</td>
</tr>
<tr>
<td>Drip Stand</td>
<td>60%</td>
<td>98%</td>
</tr>
<tr>
<td>Monitor</td>
<td>69%</td>
<td>100%</td>
</tr>
</tbody>
</table>

References
P129 Effect of pre-spinal non-invasive blood pressure management in caesarean section on incidence and magnitude of hypotension
T Orr, J Wrench
Jessop Wing, Sheffield Teaching Hospitals, Sheffield, UK

Introduction: The incidence of maternal hypotension during spinal anaesthesia for caesarean section is up to 71%. A consensus definition of hypotension in this context is lacking but is commonly accepted as a fall in systolic blood pressure (sBP) below 80% of baseline or an absolute value below 100mmHg. Maternal hypotension has been associated with lower foetal pH at delivery and increases the incidence of maternal nausea, vomiting and dizziness. We looked at variation in practice in the measurement of maternal non-invasive blood pressure at the beginning of caesarean section under spinal anaesthesia at a tertiary obstetric centre.

Methods: We analysed sBP recorded during a blinded, ethically approved research project where sBP was measured conventionally by the anaesthetist according to their normal practice and separately by a researcher using a Finometer. Phenylephrine was given as repeated boluses as deemed appropriate by the anaesthetist. Where sBP was not measured before performing spinal anaesthesia, the pre-spinal value was extrapolated from the Finometer.

Results: We analysed data from 14 anaesthetics for elective caesarean section. A non-invasive sBP reading was taken before spinal anaesthesia in 6 (43%) and no baseline was taken in 8 (57%). There was an even spread of consultant or specialty trainee anaesthetists.

Where a non-invasive blood pressure was taken prior to performing spinal anaesthesia, the mean lowest sBP throughout the operation was 99mmHg (range 80-108mmHg) and the mean fall in sBP before delivery was 19mmHg (13 range +10-40%). Three out of six cases in this group (50%) met the definition of hypotension. In cases where a non-invasive sBP measurement was not taken before performing the spinals the mean lowest sBP was 87mmHg (70-98mmHg) with a mean fall before delivery of 40mmHg (29%, range 0-50mmHg). All 0 the patients in this group (100%) met the definition of hypotension.

Conclusions: Although the sample is small, in more than half the cases a baseline blood pressure was not determined prior to performing spinal anaesthesia despite all of the cases being elective. In this sample, those who did not determine the baseline blood pressure had greater haemodynamic instability with a greater incidence and severity of hypotension.

References

P130 Facilitating skin to skin contact in Obstetric Theatre
KMR Arrow, P Higgins, S Manning, G Campbell
Department of Anaesthetics, Ninewells Hospital, Dundee, UK

Introduction Early skin to skin contact after birth is associated with reduced infant crying, improved mother-infant interaction and breast feeding rates. Based upon the UNICEF Baby Friendly Initiative our institution has developed a bundle of care called the ‘Snuggle Bundle’ which includes early skin to skin contact. This has been very successful in normal deliveries however there has been little uptake in operative deliveries which constitute 44% of deliveries in our consultant led unit. This project aims to adapt the bundle of care to facilitate skin to skin contact in theatre.

Methods A baseline audit was performed to ascertain what proportion of women undergoing elective caesarean section were offered early skin to skin contact. We then organised multidisciplinary focus groups to explore the perceived barriers to offering skin to skin and to aid the development of a theatre specific ‘Snuggle Bundle’. We used manikins to trial a number of different ergonomic solutions to identify comfortable and safe positions for mother and baby to have skin contact, without compromising the sterile field. We also embarked upon an education programme to try and improve staff engagement and raise awareness of the potential benefits.

Results The baseline audit showed no woman were being offered skin to skin prior to surgery and no skin to skin on the operating table. During our focus groups we explored the perceived difficulties and found that staff felt that due to the positioning of the woman on the table skin to skin could not be safely offered without compromising patient monitoring or sterile field. We then developed a bundle of care to try and facilitate skin to skin. This was split into 4 sections including: 1. Preconditions which assessed both maternal and neonatal suitability prior to caesarean section and after delivery. 2. Preparation which included adding an extension to the table, considering a larger bar to support the screen, removing a sleeve from the gown and placing ECG monitoring on the rear of the shoulder. “Monitoring” arrangements were made with the midwife to remain in theatre and monitor the infant. 3. Communication - skin to skin contact was discussed with the woman prior to surgery, added to the team brief discussion and confirmed again after delivery. We have seen an increase in intraoperative skin to skin contact as a result of this bundle of care but formal audit results are still awaited.

Discussion Our Theatre Snuggle Bundle acts as an aid to prepare the theatre environment and team for immediate skin to skin contact. It should ensure that skin to skin is a topic at the team safety briefing and is considered for every woman coming to obstetric theatre in NHS Tayside. Many women will be unable to achieve early, complete skin to skin contact but our bundle is not an “all or nothing” tool and reminds staff that skin to skin can be achieved by putting baby and mother cheek to cheek or offering the birthing partner skin contact. On audit of the bundle, we hope to have improved the patient experience and identify and address reasons for no early skin contact.

Reference
P131 Patient satisfaction post caesarean section
A Gilbert, R Leslie, C Battle, M Eveleigh, W Headdon, A Jonas, N Kelleie, R Williams, N Wharton
Obstetric Anaesthesia, St Michaels Hospital, Bristol, UK

Introduction: Patient satisfaction is one of the ultimate outcomes of quality of care, and is increasingly being used to access this quality 1. The Royal College of Anaesthetists Compendium of Audit Recipes 2 recommends >95% satisfaction with analgesia at day 1 post lower segment caesarean section (LSCS) 100% should receive intrathecal opioids and NSAIDS where applicable. These standards were met in our 2013 audit. Due to the reduction in cardiovascular risk we now prescribe ibuprofen not diclofenac, and avoid codeine following reports of neonatal deaths in breastfeeding women taking it 3.

Method: Data was collected prospectively from all LSCS in December 2015. The number of LSCS was 92; day 1 data was collected on 82 patients (89%) and day 2 data on 48 patients (52%). Many patients were discharged home early on day 2 or transferred to their DGH, preventing follow up. A standardised data collection proforma included questions about pain, side effects and satisfaction, and the anasthetic record and drug chart were reviewed. We closed the audit loop.

Results:

<table>
<thead>
<tr>
<th>Satisfaction with pain relief</th>
<th>Day 1</th>
<th>Day 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissatisfied</td>
<td>14%</td>
<td>10%</td>
</tr>
<tr>
<td>Satisfied</td>
<td>63%</td>
<td>70%</td>
</tr>
<tr>
<td>More than satisfied</td>
<td>23%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Patient satisfaction on day 1 has fallen to 86% which is below the recommended level, and worse than previously. 94% of spinalis received intrathecal opioids, the remaining ‘rapid sequence’ category 1 LSCS precluded use of intrathecal opiate. Regular ibuprofen (600mg TDS) was prescribed for 85%; in 15% it was omitted for pre-eclampsia or post-partum haemorrhage. Mean oramorph dose was 29mg, although 34% of patients received none; mean dose was 36mg in 2013, with 27% receiving none. 83% of dissatisfied patients received oramorph, with one patient unaware of PRN oramorph. Antipruritics were prescribed for 96%, and pruritis was reduced (37% vs. 51% in 2013). However, only 20% received an antipruritic (7% in 2013).

Discussion: Patient satisfaction is highly complex and difficult to measure. Of dissatisfied patients, 33% had severe pain and 50% moderate. Ibuprofen was prescribed appropriately, and codeine for 1 patient who was not breastfeeding, compared to 23% of patients in 2013. Oramorph and naloxone prescription stickers were introduced at the previous audit and are contributing to high prescription rates (98% and 96%). Oramorph usage has reduced despite less codeine usage and more dissatisfaction. We need multidisciplinary education to ensure all realise oramorph is safe in breastfeeding. We will consider increasing the ibuprofen dose to 600mg QDS, along with a dihydrocodeine prescription which is without neonatal side effects in breastfeeding mothers.

References
2. The Royal College of Anaesthetists; ‘Raising the standard: a compendium of audit recipes’ 3rd edition 2012

P132 Skin to skin practice during elective caesarean section in a tertiary hospital
Louise Swan, Kavitha Manoharan, Claire Williams
Anaesthetics, South Tees Hospitals NHS Foundation Trust, Middlesbrough, UK

Introduction: The advantages of early skin to skin contact following vaginal birth include better neonatal temperature maintenance, increased incidence and duration of breast feeding, improved bonding and maternal satisfaction. There are evidence that skin to skin following caesarean section can be implemented with similar benefits 2,3 and NICE guidance states that it should be facilitated whenever possible following caesarean section. In our trust however, it is not offered to all so we decided to perform an evaluation of our practice.

Methods: We prospectively collected data including patient demographics, time of birth, time skin to skin was achieved and reasons for any delay or failure in achieving skin to skin. We also asked when and from whom any antenatal information was given and whether it was discussed as part of WHO team briefing.

Results: Data was collected from 37 women, the majority were Caucasian (84%), multiparous (86%) women. 36 out of 37 (97%) had skin to skin contact with the baby, of which 25 (70%) women had skin to skin in theatre. 16 (44%) women had immediate skin to skin, 9 (25%) within 10 minutes and 11 (31%) women 30 minutes after birth. The table below shows the reasons for not achieving immediate skin to skin contact.

<table>
<thead>
<tr>
<th>Reasons for not having immediate skin to skin</th>
<th>Number (total = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby needing resuscitation</td>
<td>8 (40%)</td>
</tr>
<tr>
<td>Mother wanting baby to be dried first</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>Mother unable to hold</td>
<td>3 (15%)</td>
</tr>
<tr>
<td>Declined by mother</td>
<td>2 (10%)</td>
</tr>
<tr>
<td>Mother worried of drooping</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Delayed cord clamping</td>
<td>1 (5%)</td>
</tr>
</tbody>
</table>

31 (84%) mothers had been given information about skin to skin contact during caesarean section. 16 (52%) of these were given this on the day of surgery, most often by the midwives. The process was discussed in WHO team briefing in only 18 (48%) of the cases.

Discussion: The data collection period created an increased awareness of the possibility and benefits of skin to skin in theatre among the midwives and theatre team. The standard operating procedure for elective caesarean section now includes offering skin to skin and a protocol has been developed for delivering this. There was some initial reluctance from the midwife body to embrace immediate skin to skin due to safety concerns but these were reduced by training. So as not to impact on the midwives’ breastfeeding audit, skin to skin was renamed ‘first cuddle’. Skin to skin is also now discussed as part of our WHO team briefing and midwives discuss it at the pre-assessment clinic.

References
3. NICE guideline Caesarean section CG132 Nov 2011
P133 A case report of changes in morphology of the pulse oximeter waveform following spinal anaesthesia for caesarean section

W Low, R Chebbout, M Reeves*, J Healey*, I Wrench Anaesthetics, Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK. *Medical Physics, Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK

Introduction: Pulse oximeter wave represents digital blood flow. A previous study demonstrated the movement of the dichrotic notch away from the primary waveform during hypotension. A larger ethics-approved observational study is currently being conducted to measure changes in the pulse oximeter waveform morphology during spinal anaesthesia for elective caesarean section. We report changes in the waveform during hypotension in a case study.

Case study: Ethics approval for the study and informed consent were gained. Non-invasive blood pressure was taken every 1 minute from when the spinal anaesthetic was administered. A data logger designed by medical physics at our hospital was used to download unfiltered waveform data from the Masimo Radical Seven® pulse oximeter. This waveform was then reproduced in Microsoft Excel according to the unfiltered data. Upon analysis of a subject’s waveform, we observed the movement of the dichrotic notch away from the primary waveform during hypotension (figure 1).

Figure 1: Changes in the position of the dichrotic notch during onset spinal anaesthesia. a) Blood pressure 120/56 b) Blood pressure 86/51.

Discussion: Preliminary results of this case suggest that analysis of the pulse oximetry waveform may assist in predicting hypotension prior to non-invasive blood pressure measurement following spinal anaesthesia for elective caesarean section. This may allow better prevention of maternal hypotension during caesarean section. Further analysis is being conducted in all 20 patients to objectively measure the distance of the dichrotic notch from the primary waveform.

References
2. Wrench I, Hammon L, Handa S, Mahajan R. Changes in the morphology of the pulse oximeter waveform during the onset of spinal anaesthesia for caesarean section. Poster session presented at: Obstetric Anaesthesia 2015 May 21-22; Torquay, UK

P134 ‘By failing to prepare, you are preparing to fail’: the perfect spinal tray setup

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Introduction: Preventable mistakes as a result of human error continue to occur in anaesthetic practice. Spinal anaesthesia is a very commonly performed anaesthetic procedure with the potential for disastrous consequences. We believe that optimal spinal tray setup can reduce the cognitive workload of the anaesthetist, reduce the likelihood of error, and improve the overall safety and success of the procedure by facilitating delivery of the right dose, of the right drug, in the right place. Based on our experience we have devised a tray setup we believe to be as safe and efficient as possible.

Methods: From a separate study assessing novel spinal needle connectors, we obtained three images of differing spinal tray setups, taken from the point of view of the performing anaesthetist, immediately prior to commencement of the procedure. All anaesthetists were consultant grade and used tray setup as per their usual clinical practice. One setup was close to our preferred method. We took these images and asked a combination of anaesthetists, operating department practitioners, midwives and laypeople which tray setups they thought were most and least likely to result in a mistake.

Results: We interviewed 50 people. 92% of respondents thought our preferred setup was least likely to result in a mistake. The setup most likely to result in a mistake was split 80% and 20% between the two other images.

Discussion: The transition from Luer to non-Luer neuraxial devices is underway across the UK, a process which has, and will continue to, incur significant costs. By deciding upon, and implementing through training, a standardised optimal tray setup it is likely that there will be further improvements to patient safety, at no additional cost. We believe our setup is both the safest and most efficient, and should be taught as standard.

References
P135 Could point of care testing improve haematological management in major obstetric haemorrhage?
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NHS Foundation Trust, Sheffield, UK

Introduction: In major obstetric haemorrhage (MOH) laboratory testing is often not timely enough to guide blood transfusion. Point of care testing is available for haemoglobin (Hb) in our unit using a blood gas analyser. Availability of POC thromboelastography is recommended by OAA/AAGBI guidelines and there is an increasing body of evidence supporting its use.1 The cost of all blood products is increasing, especially in the case of CJD free clotting products which are required for patients born before 01/01/1996 (imported cryoprecipitatate is £2120 an adult dose). We evaluated perioperative management of MOH assessing the numbers involved to inform a business case for POC thromboelastography.

Methods: Following project registration, obstetric cases over 18 months, Jan 2013 to Jun 2014, were identified. Notes were reviewed for cases with an estimated blood loss (EBL) of 2 or more litres. In each case we assessed the information available to guide transfusion. Examining the cases in retrospect we made a conservative estimate of how many cases would not have been transfused if coagulation results from bloods sent prior to transfusion were available at the time of transfusion.

Results: During the 18 month period 5250 obstetric cases were carried out, of these 3437 (66%) had EBL recorded.

![Graph](image)

**Fig 1:** Number of cases with 2 or more litres of blood loss.

Cell salvage was used in 14 out of a potential 33 cases. Red cell transfusions were given to 53 patients, guided by POC testing in 14 and given on clinical grounds in 39. Fresh frozen plasma was given to 22 patients (decision on clinical grounds in 20), cryoprecipitate to 14 (decision on clinical grounds in 12) and platelets to 20 (decision on clinical grounds in 14). We estimate that 50% of clotting products would not have been given if coagulation results had been available at the time of transfusion.

Discussion: A business case for provision of POC thromboelastography has been produced. We estimate the cost saving from reduction in transfusion of clotting products would at least equal the annual costs of providing thromboelastography (before taking into account the costs of CJD free clotting products). A multidisciplinary MOH checklist has been produced based on recommendations from the service evaluation. This advises that where possible red cell transfusion is guided by POC Hb measurement.

Reference
1. OAA/AAGBI Guidelines for obstetric anaesthetic services 2013.

www.aagbi.org/sites/default/files/obstetric анаesthetic services_2013

P136 Epidural analgesia following elective caesarean section under combined spinal epidural: a service evaluation
H Collett, CJ Mullington, JK Bray
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Introduction: Optimal pain relief following caesarean section is important and individualising analgesic requirements can be challenging. On our NHS labour ward, it is routine practice to remove the epidural catheter immediately post-operatively following elective caesarean section under combined spinal epidural (CSE) and for women to receive oral analgesia. On our private wing however the epidural catheter is routinely left in situ for up to 48 hours and patients are offered low dose epidural top-ups in addition. We hypothesise that epidurals provide superior post-operative analgesia, but this is not known and any benefit should be balanced against the low but potential risk of infection. The aim of our service evaluation was to quantify postoperative epidural usage and to establish if this provides superior pain relief and satisfaction compared to those who receive standard oral analgesia alone.

Methods: Pain (severity) and satisfaction scores were compared between 2 groups: A. oral analgesia only and B. epidural and oral analgesia, with a structured interview 48 hours postoperatively. Data are displayed as medians (interquartile range). Comparisons were made with Mann-Whitney U and Kruskal-Wallis (pairwise comparisons) tests.

Results: 53 women were recruited (Group A 22, Group B 31). Women in Group B requested more top ups on day 1 (D1: 3 (2.5), D2: 2 (1), p=0.02). Worst pain scores were not different between the groups on either day (D1: Group A 5 (2), Group B 5 (3.5) p=0.147; D2: Group A 6 (4), Group B 6 (2) p=0.007). Best pain scores were better in group B on both days (D1: 1 (2.75) p < 0.001; D2: 2 (4) p < 0.001). Overall satisfaction scores did not differ between the two groups (Group A: 2 (1), Group B 1 (1), p=0.343). 4 epidurals leaked (12%). No other complications were reported.

Conclusion: Epidural top-ups, although used infrequently were more effective at providing pain relief than standard oral medication alone. Satisfaction was equally good in the NHS and private sector which may reflect differences in expectations between patient populations. As epidurals were minimally used on the second postoperative day, we suggest limiting the epidural service to the first 24 hours to optimise the balance between potential risks and benefits.
P137 If you start cold you end up cold. An audit on evaluation of Hotdog patient warming devices
D Verma, K Maclellan
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Hospital NHS Trust, Manchester, UK

Introduction: Inadverent hypothermia, which is defined as temperature below 36°C, is common in the perioperative setting. Peri-operative hypothermia is associated with poor outcomes. The risk factors for the occurrence of hypothermia include regional anaesthesia, blood loss, cold fluid administration (All common to obstetric patients). NICE guidelines on Peri-operative hypothermia do not include parturient, but they are at risk group.1 Intraoperative forced air-warming during cesarean delivery under spinal anaesthesia does not prevent maternal hypothermia.2

Method: Our aim was to assess the effectiveness of our own design of “Hot seat” at St. Mary’s. It was a prospective audit sept-oct 2015 on elective caesarean section.

The data was collected on ambient theatre temperature, anesthetic type, estimated blood loss, temperature pre, intra and postoperative. Various different types of Hotdog warming products used either in combination or alone as required.

Result: In our audit 19% patients had pre-operative temp of <36, 21% patients had temperature of 36-36.50 and 60% of patients had temperature of >36.50. Most of the parturient used hot seat in waiting area, under patient mattress, upper body and lower body warmer in theatre and recovery full body warmer if needed. 98% patients used hot seat, 47% patients used under pt mattress and lower body warmer, 31% patients only under patient mattress, 22% used under patient mattress, upper and lower body mattress. In patients who were hypothermic i.e. <36 in pre op and used hot seat 20% had rise of temp to >36, 60% maintained the temp and 20% had 0.2 drop in temp in proc period. The use of Hot dog products and especially chair in waiting area has reduced the patients with temp <36%from 13% to 3% in comparison to previous audit and has risen the patients with temp>36% from 87% to 97% post operatively.

Discussion: Hotdog controllers are compact and virtually silent. It has the most flexible and safest underbody warming mattress available without air hose or water channels. St. Mary’s hospital design of hot seat on which patients wait preoperatively is effective as they are warm to start with and give mothers a warm welcome to theatre suite.

References

P138 Restructuring our obstetric airway trolleys in line with new OAA/DAS guidance
KC Horn, P Kamath, SA Kirby
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Introduction: The Obstetric Anaesthetists’ Association (OAA) and Difficult Airway Society (DAS) have recently published guidance for the management of difficult and failed tracheal intubation in obstetrics. The guidelines recommend that Airway Trolleys (ATs) are available, regularly checked, standardised and the anaesthetic team are familiar with their contents.1 Other guidance pertaining to ATs recommends that they are clutter-free, stocked in a logical sequence and provide a visual prompt as to how to progress through a difficult airway algorithm.2,3,4

Method: We audited the ATs in our two obstetric operating theatres to determine whether they met these recommendations.

Results: Main findings were: a) ATs missing essential airway equipment implying trolleys were not being checked/restocked, b) inconsistent layout and equipment in the two theatres, c) ATs cluttered with inappropriate equipment and d) ATs not laid out in a logical sequence.

Discussion: Our ATs were missing essential equipment, not standardised, cluttered and not laid out in a logical sequence. If an unexpected difficult or failed tracheal intubation occurred, it would be difficult for staff to find what they needed on the AT, which was a risk to patient safety.

We restructured our ATs based on the new OAA/DAS guidelines.1 The drawers of the AT now correspond to OAA/DAS Algorithms 1, 2 and 3. Each drawer is labelled with its contents (pictures and text) and the AT provides a visual prompt as to how to progress through the OAA/DAS obstetric failed intubation algorithms.2 We created a contents checklist and it is clearly displayed on the AT along with the OAA/DAS Master algorithm.1 A system has been introduced to ensure the ATs are regularly checked. Rollout of the ATs was accompanied by staff training.

Re-audit after 2 months revealed that the contents of each drawer perfectly reflected the contents checklist, suggesting that the ATs are regularly checked.

With only a very minimal cost implication, we believe our hospital is now a safer place for parturients to undergo general anaesthesia.

References
2. Chishiti, K. Setting up a Difficult Airway Trolley. http://www.das.uk.com/content/difficult_airway_trolley
P139 TEG (thromboelastography) analysis algorithm in bleeding parturients for management of haemostasis

D Verma, P Kochhar
Obstetric Anaesthesia, Central Manchester University Hospital NHS Trust, Manchester, UK

Introduction: Major Obstetric Haemorrhage (MOH) remains the leading cause of major morbidity in the obstetric population. Underlying haemostatic imbalances such as consumptive and dilutional coagulopathies may develop during post partum haemorrhage (PPH). Monitoring coagulation status in patients with PPH may be crucial for effective haemostatic management, goal-directed therapy, and improved outcomes. Emerging evidence suggests that viscoelastic monitoring (thromboelastographic or thromboelastometric) may be useful for rapid assessment and for guiding haemostatic therapy during PPH.

Methods: The algorithm for use of TEG in clinical practice was first introduced in October 2013 to guide management during acute bleeding. This algorithm is unique in a way that it analyses and treats the coagulopathy at the same time. The R-Time (reaction time), MA maximum amplitude and LY30 (clot lysis) are looked at in a systematic way and therapy is guided.

Results: Since the introduction of this algorithm we have data of 230 patients who had blood loss of more than 1500ml. Out of these patients a total of 128 patients were managed with the help of TEG.

Discussion: We believe that an algorithm based approach can lead to reduction in overall blood loss due to more prompt, targeted treatment of MOH. The TEG algorithm allows earlier recognition of normal coagulation and therefore a reduction of inappropriate transfusion despite heavy blood loss.

References

P140 To wash or not to wash? That is the question. An audit to investigate whether washing of surgical swabs increases the return from cell salvage.

SMC Kelly, F Hayat, M Dunham, P Yoxall
Department of Anaesthesia, Whiston Hospital, Liverpool, UK

Introduction: Intra-operative Cell Salvage (ICS) is becoming increasingly common in obstetric practise; AAGBI1 and NICE2 both recommend its use. It is both cost effective and reduces the demand on red cell donors. However one of the disadvantages is the cost in setting up the cell saver when blood isn’t returned. Conversion rates for ICS (ie when collection leads to returning of blood) has been as low as 23 %3.Blood loss in surgical swabs can account for 30 – 50 % of the total estimated loss. The washing of swabs in aortic surgery increased the amount of blood available by 67%.4 The aim of this audit was to investigate whether the washing of surgical swabs increased the amount of blood available from ICS and whether this had an impact on the conversion rate for caesarean sections.

Methods: This audit collected retrospective data from 2014 and prospective data from 2015. We reviewed how many times ICS was used, how often cell salvage blood was returned to the patient (conversion rate) and whether the washing of surgical swabs resulted in an increased amount of blood available for use via ICS. No washing of swabs occurred in 2014, and the data from this year was used for comparison. When washed, the swabs were soaked in a bowl of normal saline and then washed 2-3 times depending on the amount of blood that was present.

Results: In 2014, 966 caesarean sections were performed compared to 980 caesarean sections in 2015. With the introduction of washing of surgical swabs, nearly three times as much blood was returned to patients in 2015 compared to 2014 (93166ml vs 37846 ml), with a conversion rate of 81.1%. For cases in 2015 where the washing of surgical swabs was used compared to when it was not, as per consultant preference, the conversion rate for ICS in caesarean sections increased significantly (from 12.5% when swabs were not washed to an average of 80.7% when washed).

Discussion: This audit shows that the use of washing of surgical swabs increases the conversion rate for ICS in caesarean sections, as well as an increased in the volume of blood returned. We are performing a prospective study to look for the impact on transfusion rates and the impact upon the cost effectiveness of ICS in obstetric practise.

References
2. Intraoperative blood cell salvage in obstetrics NICE interventional procedure guidance [PG144] Published date: November 2005
P141 A prospective analysis of critical care provision in Maternity HDU.

R Hart, J Gardner, K Lake, R Fulton, K Litchfield
Princess Royal Maternity, Glasgow Royal Infirmary, Glasgow, UK

Introduction: Critically ill obstetric patients provide a unique challenge to the anaesthetist and obstetrician. Obstetric HDU allows the provision of patient-centred critical care within the labour ward and is now well established in many maternity units. It is important to audit our practice and ideally benchmark against nationally recognised standards. The utilisation of a registry database, like ICNARC CMP or SICSAG Wardwatcher, is a robust and validated way of doing this. In July 2015 the SICSAG Wardwatcher database was implemented in our unit, allowing prospective data entry.

Methods: The SICSAG Wardwatcher database was utilised to provide a summary report of all admissions to a dedicated labour ward based HDU since its introduction in July 2015.

Results: Since July 2015 we have captured data from 42 admissions. The median age was 30yrs [range 20-41]. Median length of stay was 0.8 days [range 0.1-4.8]. The most common diagnosis requiring HDU admission were pre-eclampsia, major obstetric haemorrhage and sepsis [26%, 31% and 21% respectively]. As predicted our unit demonstrates high patient turnover with a third of patients requiring a length of stay greater than 24 hours. Only 12% of patients required a stay of greater than 48 hours. Half of our patients required level 2 care at some point during their admission. The vast majority of our patients [94%] improved upon discharge. The use of invasive monitoring was commonplace with 31% of patients requiring invasive blood pressure monitoring and 12% having central venous access. We were able to gather unit specific data which included: magnesium infusion required [12%], baby with mother [71%], psychologic support required [6%] and admission following caesarean section [30%]. Quality indicator data including out of hours admissions [50%] and discharges [19%] was also collected.

Discussion: In the initial month following the launch there was poor compliance with data entry. We introduced a handover checklist for anaesthetists, which subsequently achieved 100% compliance with data collection. Prior to the launch of Wardwatcher, similar data was collected retrospectively; however this was labour intensive and often incomplete. Wardwatcher allows consistent standardised data collection, with robust assessment of level of care, diagnosis, length of stay, outcome, cost estimation and activity such as bed occupancy and out of hours admissions/discharges; which are quality indicators of care. The introduction of Wardwatcher and our measures to ensure consistent data collection with the introduction of a handover checklist has improved data acquisition in a labour ward based HDU. This will hopefully allow targeted resource planning, service development and staff education.

Reference

P142 Defining a reference range for vital signs in healthy term pregnant women undergoing caesarean section

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Introduction: Early warning systems (EWS), used to identify deteriorating patients, are based on measurement of vital signs (VS). When patients are pregnant, most EWSs still use non-pregnant reference ranges for VSs to determine trigger thresholds.1 Peripartum complications are important to recognise early. A common serious complication at this time is haemorrhage & it is essential that early warning signs of haemorrhage are recognised. From our clinical experience we had observed that many women with serious obstetric haemorrhage often had heart rates (HR) between 100-110 BPM & did not meet the trigger EWS threshold of 120 BPM. We thought that EWS triggers might need to be adjusted for pregnancy. There are no published reference ranges for all VSs in pregnancy. Therefore as the first step we aimed to define VS reference ranges for term pregnant women on the day of their caesarean birth, to determine the appropriateness of the current EWS triggers in term pregnancy.

Method: After institutional ethics approval we conducted a 1-year retrospective study in a tertiary referral obstetric hospital. The study sample was healthy term women (ASA 1) undergoing planned caesarean section. Measurement of VS was performed in all women by trained peri-operative nurses using standardised, automatic monitoring systems (Spot Vital Signs®, WelchAllyn, NY, USA) to measure non-invasive systolic (S) and diastolic (D) blood pressure (BP), HR, & oxygen saturation (SpO₂). Respiratory rate (RR) was measured manually by counting the RR in a minute. Temperature (Temp) was measured via a tympanic thermometer (Genius™ AccuSystem, Covi, MA, USA). Data were recorded in the pre-operative record & retrieved by investigator (LH).

Results: 258 women met inclusion criteria. Mean±SD age, term body mass index, & gestation was 30±10.1 years, 29±3.4 kg.m⁻², 39±1.2 weeks respectively. Vital sign data for the study group compared with current Modified Early Obstetric Warning Score (MEOWS) triggers are shown in the Table as well as a proposed healthy reference range based on study mean values ± 2SD.

<table>
<thead>
<tr>
<th>Vital sign</th>
<th>Study mean ± SD, Healthy Reference Range</th>
<th>MEOWS Trigger values</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBP (mmHg)</td>
<td>118 ± 11.2, 96-140</td>
<td>≤ 90 or ≥ 160</td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>75 ± 10.3, 54-96</td>
<td>&gt; 10</td>
</tr>
<tr>
<td>HR (BPM)</td>
<td>84 ± 10.2, 64-104</td>
<td>≤ 40 or ≥ 120</td>
</tr>
<tr>
<td>RR (BPM)</td>
<td>18 ± 1.5, 15-21</td>
<td>≤ 10 or ≥ 30</td>
</tr>
<tr>
<td>SpO₂ (%)</td>
<td>99 ± 1.0, 97-100</td>
<td>≤ 95</td>
</tr>
<tr>
<td>Temp (°C)</td>
<td>36.4 ± 0.43, 35.5-37.3</td>
<td>&lt; 35.0 or &gt; 38.0</td>
</tr>
</tbody>
</table>

Conclusion: This study has helped define a reference range for vital signs in healthy term pregnant women on the day of their caesarean birth. Study findings suggest that currently used criteria for EWSs triggers, based on non-pregnant values, are too extreme for timely detection of deteriorating pregnant patients especially for HR. We suggest HR triggers be modified to ≤ 50 and ≥ 110 BPM in term pregnant women.

Reference
P143 Five years of morbidly adherent placenta cases
R S Newton, M J Woolnough
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Introduction: Morbidly adherent placenta (MAP) is a potentially life threatening complication of pregnancy. As part of setting up a dedicated morbidly adherent placenta service and continual service improvement we carried out a service review to learn from our current practice.

Methods: Cases of MAP in our department over a five year period were identified and case notes were reviewed.

Results: Of the 20 cases identified 19 were diagnosed preoperatively using MRI scanning and one patient was diagnosed at caesarean section. Caesarean sections were planned for a mean gestation of 36 weeks and 3 patients required expedited surgery for antepartum haemorrhage.

Fig. 1: Estimated blood loss for the confirmed MAP cases. Mean blood loss for all cases was 4 litres, range 0.5-15, (fig.1). When the placenta was incised or separated the mean loss was 5 litres (range 2-7). Haemorrhage control was assisted by interventional radiologists who secured femoral artery access in 15 patients, placed prophylactic internal iliac balloons in 4 patients and perioperative internal iliac balloons in 3 patients (inflated in 5 cases). When interventional radiology was not available haemorrhage control was assisted by the use of iliac artery slings in 1 patient, manual aortic compression in 1 patient and a B Lynch suture in 1 patient. Peripartum hysterectomy was carried out in 16 patients. Ureretic stents were placed in 3 patients and bladder repair was required in 3 patients. One patient proceeded to postoperative radiological embolisation. Histological diagnosis confirmed percreta in 11 cases, increta in 4, acreta in 3 and non-adherence in one case. Mean postoperative inpatient stay was 9 days (range 4-21).

Significant complications included 7 patients with bladder injury and a femoral artery thrombus requiring thrombectomy.

Discussion: Service improvement over this period has included identifying a regular multidisciplinary team to look after these patients, introduction of a proforma for planning care, adoption of enhanced recovery principles, optimising cell salvage use and introducing the use of fibrinogen concentrate. Ongoing service review will focus on physiotherapy input and optimising pain relief.

P144 Obstetric outcomes in the super morbidly obese patients
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Introduction: Obesity during pregnancy continues to increase in the western world. This poses significant challenges for the obstetric anaesthetists, amongst many other things the rates of operative intervention are greater and according to the CMACE report obesity is a risk factor for maternal death.

Methods: Outcomes of patients with BMIs greater than 46 who delivered in our institution between 1/8/12 and 28/2/15 were obtained. The patients were separated into two groups - those with BMI of 50 and over and those with BMI 46–49. The main outcome measures were mode of delivery and mode of anaesthetic. Results from the BMI 50 and over group are detailed below.

Results: Twenty-eight patients delivered in the above time frame with BMI 50 or above. Of those 5 had an elective section, 7 an emergency section, 2 instrumental deliveries, 9 spontaneous vaginal deliveries and 3 stillbirths. Two were excluded, as they had no electronic notes available for review. Of the spontaneous vaginal deliveries 7 were multiracial (range para 1–4) and two were primips. Of the emergency sections 4 were classified as category 2 and 1 as category 3. There was also a category 1 instrumental delivery, where the decision was made to deliver in the room due to potential difficulties with transfer.

<table>
<thead>
<tr>
<th>Category 1 section: Anaesthetic</th>
<th>Decision time to delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidural top up</td>
<td>18</td>
</tr>
<tr>
<td>Spinal</td>
<td>36</td>
</tr>
<tr>
<td>Unsuccessful spinal then GA</td>
<td>52 (Baby to neonatal unit)</td>
</tr>
<tr>
<td>Spinal</td>
<td>37</td>
</tr>
<tr>
<td>Epidural top up in room for instrumental delivery</td>
<td>Timings unclear, a least 30 delivery</td>
</tr>
<tr>
<td></td>
<td>PPH 2300mls</td>
</tr>
</tbody>
</table>

Conclusion: For patients with BMI of 50 and above who attempted NVD 50% required medical intervention, 39% of those were emergency sections. Of the successful vaginal deliveries 78% were multipara. Of those having an emergency section 57% were category 1 and of those decision time to delivery was greater than 30 minutes in 75% of cases. Similar patterns were seen for the 61 patients with BMI 46–49, over half required medical intervention and around 40% of those emergency sections.

Discussion: Super morbidly obese obstetric patients need to be counselled fully on their risk of requiring medical intervention during delivery and that in certain cases it may not be possible to meet the 30 minute target. There may be a role for elective caesarean section in those patients with BMI greater than 50. We are using the above information to design a local guideline for the management of the obese obstetric patient and are setting up a task force to address areas that could be improved in their management.

References
P145 Service evaluation on the management of post partum haemorrhage in anaemia and low body weight parturients

Modhar Mahmoud, Anu Philips
Anaesthetics, Nottingham University Hospitals, Nottingham, UK

Introduction: Anaemia in pregnancy is defined as Hb < 10.5 g/dl in second and third trimester. Anaemia during pregnancy is associated with increased risk of PPH. Total blood volume increases by 40-50% during pregnancy as a result of an increased red blood cell and plasma volumes. Small women have less circulating blood volume compared to obese parturient. Therefore, women with body weight of less than 60 kg may be at risk of excessive blood loss in relation to their total blood volume. The aim of this service evaluation was to highlight that parturients of body weight < 60 kg and those who are anaemic during pregnancy (Hb<10.5) are at risk of excessive blood loss, increased transfusion requirement, and increased length of hospital stay if they develop PPH of more than 1500 ml.

Method: A retrospective analysis of data covering a 6 month period (March-August 2015). Data collected from all parturients who developed PPH ≥1500 ml which included body weight, pre-delivery haemoglobin, blood loss, amount of blood transfused, and length of hospital stay.

Results: Data from 91 patients were evaluated.

<table>
<thead>
<tr>
<th>Blood loss in ml</th>
<th>Patients&lt;60kg</th>
<th>Patients≥60kg</th>
<th>Patients with Hb&lt;10.5g/dl</th>
<th>Patients with Hb≥10.5g/dl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood loss in ml</td>
<td>2004 (1817-2393)</td>
<td>2312 (2008-2614)</td>
<td>2533 (1739-3368)</td>
<td>2171 (1960-2381)</td>
</tr>
<tr>
<td>Number of units of blood transfused</td>
<td>1.45 (0.8-2)</td>
<td>1.12 (0.7-1.54)</td>
<td>2.15 (0.8-3.4)</td>
<td>1 (0.7-1.3)</td>
</tr>
<tr>
<td>Days of hospital stay</td>
<td>3.7 (2-2.5)</td>
<td>3.19 (2.5-3.8)</td>
<td>5.53 (2.7-8.34)</td>
<td>3.46 (2.8-4)</td>
</tr>
<tr>
<td>Percentage of blood loss</td>
<td>41.6%</td>
<td>32%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data are mean, confidence interval (CI).

Discussion: The service evaluation demonstrated parturients with body weight < 60 kg are at higher risk of excessive blood loss in relation to their total blood volume if they develop PPH. This might indicate an element of underestimation of the amount of blood loss in low body weight mothers. The service evaluation also showed that antenatal anaemia is associated with increased risk of blood loss, transfusion requirements and length of hospital stay. Improving management of anaemia during pregnancy may help to reduce the risk of PPH. This data was presented at obstetric divisional meeting and is planned for midwifery update sessions. The data coincide with the MBRRACE -UK report which has strengthened the need to cater for the low body weight women and a table of blood loss has been introduced in labour ward rooms as an aide-memoir. Further studies to evaluate the use of a formula that takes in consideration body weight, amount of blood loss and pre-delivery haemoglobin concentration are warranted.

References
1. British committee for standards in haematology 2011

P146 The cardiac obstetric anaesthesia team (COAT) model – A multidisciplinary approach in the management of obstetric cardiac patients at a tertiary obstetric centre

K Bhatia, S Vause, A Roberts*, B Clarke†
Anaesthetics, St Mary’s Hospital, Manchester, UK,
*Obstetrics, St Mary’s Hospital, Manchester, UK,
†Cardiology, Central Manchester University Hospitals, Manchester, UK

Introduction: Over the last three decades, the rate of maternal death caused by cardiac disease in pregnancy has doubled. It remains the largest single cause of indirect maternal deaths in United Kingdom (UK). We share our experience on the impact of the cardiac obstetric anaesthesia team (COAT) in the management of obstetric cardiac patients over the last 10 months at our tertiary obstetric unit.

Methods: A team comprising of a consultant cardiologist, consultant obstetrician, lead midwife and a consultant anaesthetist along with a cardiac anaesthetist meet every month discussing high-risk cardiac cases, reviewing echocardiography findings and formulating obstetric, anaesthetic and cardiac care plans for each parturient.

Results: The details of the cardiac conditions presented at the MDT over last 10 months in 39 parturients are highlighted in the table given below:

<table>
<thead>
<tr>
<th>No</th>
<th>Cardiac conditions</th>
<th>No of patients</th>
<th>Specific cardiac features of some parturients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mitral valve disease</td>
<td>6</td>
<td>Mitral stenosis (Valve area - 0.8)</td>
</tr>
<tr>
<td>2</td>
<td>Aortic valve/root disease</td>
<td>11</td>
<td>Aortic stenosis (Valve area - 0.6)</td>
</tr>
<tr>
<td>3</td>
<td>IHDI Heart Transplant</td>
<td>6</td>
<td>Aortic root 4.9 cm</td>
</tr>
<tr>
<td>4</td>
<td>Arrhythmias</td>
<td>6</td>
<td>Coronary stents, CABG, Ejection fraction (EF) 20-25%</td>
</tr>
<tr>
<td>5</td>
<td>Adult congenital heart disease</td>
<td>5</td>
<td>Congenital heart block, VT, SVT</td>
</tr>
<tr>
<td>6</td>
<td>Cardiomyopathy, Idiopathic PHT</td>
<td>5</td>
<td>Fontan’s circulation, Truncus arteriosus, Shone’s syndrome</td>
</tr>
</tbody>
</table>

CABG: coronary artery bypass graft, VT-ventricular tachycardia, SVT -supraventricular tachycardia, PHT - pulmonary hypertension

Discussion: The COAT multi-disciplinary approach has enhanced the high-quality obstetric care, decreased variation and improved lines of communication in the obstetric, cardiac, midwifery and the anaesthesia teams. The model also serves as an excellent forum for education. Clinicians from all specialities learn from each other (shared learning) enhancing expertise of professionals to deal with rare conditions. Similar care models could be used for high-risk pregnant women from other sub-specialities to enhance safety, improve outcomes and decrease morbidity and mortality in obstetrics.

Reference
P147 The influence of patient body mass index (BMI) on the occurrence and severity of intrathecal diamorphine related pruritus

K Livingstone, R Clarke, E MacDonald*, E McGrady*
Anaesthetic department, QEUH, Glasgow, UK, *Princess Royal Maternity Unit, Royal Infirmary, Glasgow, UK

Introduction: Pruritus may occur following opiate administration by any route, with the reported incidence being 0-100% after neuraxial dosing. The proposed mechanism is poorly understood but is thought to involve a modulation of serotoninergic pathways. We undertook an evaluatory audit to ascertain if patient BMI placed an impact upon the incidence and severity of pruritus following intrathecal diamorphine.

Methods: From our 2 labour wards (6000 deliveries/annum each), we collected data retrospectively from anaesthetic charts of parturients who received 0.3mg intrathecal diamorphine. Patients were also given a corresponding questionnaire to complete, detailing the presentation, timing and severity of their itch, if applicable.

Results: Data was collected for 25 patients. 22 (88%) described an itch. 3 had no itch.

<table>
<thead>
<tr>
<th>Initch present</th>
<th>Itch present BMI&lt;24.9</th>
<th>Itch present BMI&lt;25</th>
<th>No itch present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall (n=22)</td>
<td>26.1</td>
<td>NA</td>
<td>27.3</td>
</tr>
<tr>
<td>BMI kg/m2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time lapse</td>
<td>6.5 hours</td>
<td>4.51 hours</td>
<td>7.09 hours</td>
</tr>
<tr>
<td>between spinal and itch onset</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of itch</td>
<td>22.55 hours</td>
<td>30 hours</td>
<td>17.66 hours</td>
</tr>
<tr>
<td>Peak severity of itch (0-10)</td>
<td>5.86</td>
<td>4.14</td>
<td>5.33</td>
</tr>
<tr>
<td>Sleep disturbance due to itch</td>
<td>4/22 (18.18%)</td>
<td>1/7 (14.3%)</td>
<td>3/15 (20%)</td>
</tr>
<tr>
<td>Ondansetron administered in theatre</td>
<td>7/22 (31.8%)</td>
<td>NA</td>
<td>1/3 (33.3%)</td>
</tr>
</tbody>
</table>

Discussion: The numbers are small so it is difficult to know if our results are comparative with the general population. Our results indicate that patients with a lower BMI may be more likely to develop pruritus at an earlier onset, longer duration but lesser severity than those with a higher BMI. A larger study would be required to establish the statistical significance of this. Our project also revealed little administration of prescribed itch relieving agents on postnatal wards. We intend to use the results to educate patients and ward staff about diamorphine related itch, to increase maternal satisfaction.

References


CL Halligan, G Keightly, S Bell
Anaesthetic Department, University Hospital Wales, Cardiff, UK

Introduction: One in every 140 pregnancies is affected by severe maternal morbidity, a number of which will need to be managed in an intensive care setting. Monitoring obstetric admissions to critical care provides vital information regarding an obstetric department. This includes the success of the obstetric high dependency area, feedback for quality improvement projects (such as the introduction of a sepsis pathway) and trends in pathologies within the maternal population.

Method: A retrospective evaluation (2010-2014), and now prospective review (2014 onwards) of obstetric patients admitted to the critical care unit (level 2 or level 3) was performed. This data was collected by interrogating the critical care admissions database to identify the pregnant, or recently pregnant patients. Notes review for each individual patient was then undertaken.

Results
Table 1 shows the total number of ICU admissions over the last 6 years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Deliveries</th>
<th>ICU Admissions</th>
<th>Sepsis</th>
<th>VTE</th>
<th>Cardi-resp</th>
<th>PET</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>6483</td>
<td>13</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>2011</td>
<td>6530</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2012</td>
<td>6208</td>
<td>7</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2013</td>
<td>6000</td>
<td>15</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>5972</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2015</td>
<td>5862</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Discussion: The EMBRACE report provides vital data regarding national maternal mortality. Our own local review of intensive care admissions has also provided our department with important information regarding local morbidity trends. We have introduced a sepsis care pathway and a number of changes to the management of post partum haemorrhage, both appearing to have led to a decrease in the number of level 3 admissions to critical care. It is extremely important to continue to closely monitor these trends. Rates of PET and VTE are static despite local policies but many of these women are admitted from the community rather than delivery suite.

It is our opinion that all units should monitor level 3 admissions as this data is extremely important. Perhaps a national database for morbidity information should be implemented so trends across the UK can be observed and factors that have led to decreased admissions can be shared nationally.

Reference
P149 An iOS app template for the distribution of standard operating procedures to anaesthetic staff

H Saumtally, F Walsh
Obstetrics Anaesthesia, Cork University Maternity Hospital, Cork, Ireland

Introduction: Considering the widespread adoption of smartphones among physicians, this presentation aims at describing a simple and adaptable framework to distribute local guidelines on iOS devices. The app was designed for the anaesthetics team in Cork University Maternity Hospital (CUMH). In addition to information and tables on the most common aspects of obstetric anaesthesia, it also incorporates links to reference articles. As such it serves as an education tool for trainees (a “survival guide”), helps for the dissemination of information at a local level, and encourages teamwork communication.

Methods: The app was created using Xcode, Sketch 3 and Microsoft Word for Mac OS X. The interface relies on the open-source library SWRevealViewController by John Lluch, freely available on GitHub. The colour scheme of the app itself is based on the CUMH logo. The design while simplistic and minimalist, allows the user to focus on the content only (see Figure). The simple nature of the code allows for a responsive user experience on any iOS device. The code will be made available on the GitHub platform and videos will be published on YouTube to explain how users to create their own app.

Results: The app was uploaded on the Apple AppStore on the 6th October 2015 as a free download 86 times. It was presented at the Irish Society of Obstetrics Anaesthesia on the 4th December 2015 and has generated positive feedback and interest from consultants in other hospitals.

Discussion: We propose that each hospital should have their own iTunes Developer account under which all the different apps would be listed. The icons within the same hospital should have a common theme to avoid confusion with the users when choosing the app. We hope that the simple nature of the code and the editing through Microsoft Word will make updates easy. As for adoption rate, hospitals will have to make sure that the hospitals advertise the apps as an essential tool for anaesthetists. If successful, this initiative may drive us to create a similar format for Android.

P150 Can't sim, won't sim - simulation in obstetrics: perceived barriers to participation by multidisciplinary teams

CSA Pritchett, H King, Z Nelson*, R Langford, A Cripps, G Meredith, S Harris†
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Introduction: Simulation has become a widely adopted method of teaching within the NHS. Despite the paucity of evidence linking simulation training to improved patient outcome, such studies do exist within delivery suite based training. This evidence gives compelling reason to install regular simulation on the delivery suite. A recent integrative review suggested key barriers and enablers to installing high-fidelity patient simulation manikins and raised issues predominantly around service delivery. However, there is little evidence investigating barriers to participation at an individual participant level. At the Royal Cornwall Hospital we have delivered in-situ simulation and simulation based multidisciplinary team (MDT) training days for delivery suite personnel for 6 years. Despite this tradition we have experienced difficulties in embedding in-situ simulation and perceived that this may be exacerbated by more than operational pressures alone. This service evaluation sought to assess the attitudes of all members of the MDT towards simulation.

Methods: Questionnaires sent to obstetric staff were designed to capture job role, experience, confidence in basic skills and obstetric emergencies. We also assessed anxiety related to simulation. The questionnaire was completed anonymously by participants.

Results: 53 completed questionnaires were collected. 35 midwives, 7 midwifery co-ordinators, 5 obstetric and 7 anaesthetic doctors. Less experienced midwives had attended the most simulation sessions (4 in 12 months). Midwives of all experience levels reported more anxiety than medical staff when taking part in simulation (6.7/10). Concerns cited were varied but most frequently observed included being asked to pretend to do someone else’s role an performing in front of others. Out of all professional roles, midwifery co-ordinators were the least anxious (2.3/10). Anaesthetists appeared to feel the most confident in dealing with simple (8.9/10) and complex (8.9/10) obstetric complications.

Discussion: We have identified some key barriers experienced by individual participants during in-situ simulation. We are now implementing additional training to increase confidence of midwives in clinical assessment.

References
5. Al-Ghareeb AZ, Cooper SJ. Barriers and enablers to the use of high-fidelity patient simulation manikins in nurse education: an integrative review. Nurse Education Today 2006;36:281-286
P151 Educating the multi-disciplinary team on the new obstetric difficult airway guidelines
J A Fasham, G Crossingham, E J Drake, C Hoyer
Department of Anaesthesia, Derfford Hospital, Plymouth, UK

Introduction: Failed intubation occurs in 2.3 per 1,000 for Caesarean Section with an associated mortality of 1 in 901. The recently published guidelines are the first that relate specifically to the management of the difficult airway in obstetrics2. The aim of this project was to assess current management of the difficult airway in obstetrics, and whether a teaching session could improve self-reported management according to the new guidelines.

Method: A questionnaire was devised to assess management of the difficult airway in obstetrics and awareness of the new guidelines. This was completed face-to-face across the multi-disciplinary team. A teaching session was then delivered to the staff incorporating lectures and in situ-simulation with debriefing. An email was sent to all maternity staff with a summary of the guidelines. This was to consolidate learning but also to improve coverage to those that could not attend the teaching session. Laminated copies of the algorithms were attached to all airway trolleys. The questionnaire was then redistributed to assess whether learning had occurred and whether practice would change as a result of the session. The research and development department deemed this project service evaluation and did not require ethics approval. It was registered and supported by the audit department.

Results: 11 people completed the pre-teaching questionnaire and 7 completed the questionnaire following the teaching. 12 people attended the teaching. The teaching session resulted in global improvements in the understanding of how to safely manage the obstetric patient with a difficult airway. Marked improvements were noted in the understanding of correct patient positioning for a general anaesthetic (54% correct before vs 86% after), the maximum number of intubation attempts (63% to 86%), the factors influencing the decision to proceed with surgery with a supra-glottic airway (31% to 53%), and the need to avoid fundal pressure at delivery (30% to 86%). The teaching session was highly regarded.

Discussion: This project indicated that awareness initial awareness of the guidelines was low. The teaching session improved this. The multi-disciplinary nature of the teaching session, which included in-situ simulation, was particularly positive. The teaching session also highlighted some areas for development within the theatres such as visible placement of anaesthetic contacts and placement of nasal cannulae in theatre. This is currently being addressed. As the questionnaires were administered face-to-face this provided a further opportunity for learning discussions and questions once the participant had had time to reflect on the session. This was however labour intensive. We aim to continue to review ways to improve knowledge of the guidelines.

References

P152 How comfortable are our midwives in delivering maternal enhanced critical care?
R Hart, K Lake, K Litchfield
Princess Royal Maternity, Glasgow Royal Infirmary, Glasgow, UK

Introduction: Our labour wards are increasingly exposed to patients with complex medical problems, co-morbidities and complications which necessitate a higher level of care. The Maternity HDU aims to strike a balance between critical care and obstetric needs, allowing the provision of critical care within the labour ward. Patients admitted to Maternity HDU are generally cared for by midwives. If midwives are expected to nurse more challenging patients then we must ensure that there is appropriate support and education in place. In order to address this we constructed a midwife questionnaire to quantify how comfortable our midwives caring for Maternity HDU patients and whether there is a requirement for further training.

Methods: A short survey was constructed and circulated to midwives working in the labour ward over a three-week period. Comfort scores of a variety of critical care elements were assessed using a 0-10 visual analogue scale (ranging from lowest to highest comfort).

Results: Our questionnaire was completed by 30 midwives. Half of these had a background accreditation in nursing. Median comfort scores were high with obstetric diagnoses, such as caring for patients with pre-eclampsia (8/10), PPH (9/10) and anti-hypertensive drugs (10/10). Invasive monitoring demonstrated the lower comfort scores of 5/10. All midwives agree that anaesthetists should be involved in the care of patients admitted with maternity HDU. The majority (93%) felt confident they could get help from medical staff easily and felt well supported by both obstetricians (87%) and anaesthetists (90%). There were 12 free text comments requesting more training.

Discussion: The provision of maternity enhanced care is currently under review and is a contentious issue. Given that direct entry midwives do not undertake nursing training it is vital that all midwives who provide care to critically ill patients have the necessary knowledge, skills and support required. The results of this survey are reassuring as our midwives do feel comfortable looking critically ill mothers, particularly those with obstetric diagnoses. Nevertheless there is an desire for further training, particularly on invasive monitoring. We will utilise this survey to construct an educational programme mapped to the Maternity Enhanced Care competency document provided by the Obstetric Anaesthetist Association [1]. This will ensure a safe number of midwives are able to deliver the specialist enhanced skills required for maternity enhanced care. It is clear that anaesthetic support is vital for the ongoing development of maternity HDU as all midwives feel anaesthetists should be involved in the provision of maternity critical care.

Reference
P153 Improving midwife knowledge and confidence through use of an epidural teaching workshop
SA Hannah, Ravi Agaram
Princess Royal Maternity Unit, Glasgow Royal Infirmary, Glasgow, UK

Introduction: Continuing professional development is key to improving clinical standards and paramount to patient safety. In our unit no formal anaesthetic lead midwifery education program existed, meaning teaching interactions were often fragmented and opportunistic. Feedback from midwifery staff suggested that there was a demand for anaesthetic lead teaching, particularly in reference to patient controlled epidural analgesic (PCEA) infusions, following the introduction of the BodyGuard 545 ColorVision Epidural Infusion Pump in September 2014. In this project, we aimed to provide targeted teaching to midwives to improve knowledge and confidence with regards to management of PCEA infusions on labour ward.

Methods: The teaching program was quality assured and approved by senior clinicians in midwifery and anaesthesia. Midwives were voluntarily recruited over a three week period to the teaching based on availability of staff on labour ward. 20 midwives were recruited in total and teaching was delivered in groups of three or four to allow optimum opportunity for interaction. They were initially given a short anonymous questionnaire assessing their knowledge of safety, complications and management relating to PCEA infusions. A 10 minute presentation was then given highlighting the key safety issues relating to PCEA infusions and allowing time for questions. Following the presentation, midwives were then asked to complete the questionnaire again before receiving the correct answers. Results were then analysed and statistical analyses performed.

Results: Twenty midwives were recruited to the teaching with no drop outs from the study. Midwives completed the initial questionnaire with a median score of 17 out of 25 [IQR 16-19], improving to 21 out of 25 [IQR 19-22] following teaching, representing a 23.5% improvement. Specifically, one important question relating to the location of intralipid on labour ward improved by 63.6% following teaching. Overall midwives rated a higher than expected confidence in managing PCEA prior to teaching with a median of 7/10. This improved by 14.3% to 8/10 following teaching.

Discussion: This study is an example of how a simple teaching programme can be designed to target specific educational needs within a department. Teaching does not have to be time consuming and many objectives can be achieved using this format. Testing before and after teaching gives an indication of its effectiveness as well as positive feedback to the students that learning has occurred. In the future, further work could look at retention of knowledge over a longer time frame.

Reference

P154 Information overload! Patient positioning for neuraxial anaesthesia
A Sturmy, O Chambers, H McNamara
Department of Anaesthesia, Liverpool Women’s NHS Foundation Trust, Liverpool, UK

Introduction: Patient positioning is an important factor in determining the success of neuraxial anaesthesia and can be challenging to explain to patients in the loud, busy environment of labour ward; particularly for patients who may be very anxious, in active labour or undergoing an emergency procedure. Poor positioning may lead to delay or failure of these techniques, increasing the risk of conversion to general anaesthesia. We evaluated the positioning techniques used by anaesthetists at our hospital for patients undergoing spinal anaesthesia for caesarean section.

Methods: We performed an initial survey of the anaesthetic department (consultants and trainees) asking how they position patients for neuraxial techniques, as well as how they thought this could be improved. We then observed the positioning of 20 patients undergoing neuraxial anaesthesia for caesarean section. We recorded each verbal instruction that was given, as well as the time taken to position the patients. We used a stopwatch to record only the time spent on positioning.

Results: 14 anaesthetists completed the survey. 50% said that it is difficult to get patients into the optimal position for neuraxial blockade. 100% said that having a visual aid depicting the ideal position would be beneficial. During direct observation of 20 spinal anaesthetics for caesarean section, a total of 172 verbal positioning instructions were given (154 pre- and 18 during the procedure). The maximum number of instructions given to any one patient was 26. The most commonly used phrases were ‘drop/relax shoulders’, ‘put your chin on your chest’ and ‘push your back against my finger’, although this varied greatly. 21 different phrases were used altogether. Mean time spent positioning pre-procedure was 47 seconds, with a mean of 15 seconds during the procedure for the 25% of cases that required repositioning after the start.

Discussion: Optimal positioning of patients for neuraxial anaesthesia can be challenging, especially in obstetrics due to pain or anxiety. The movement required in order to minimise or reverse the lumbar lordosis is quite specific and easily misunderstood by patients. This often requires a large number of different instructions before the correct position is achieved. We have shown that our ability to communicate this to our patients could be improved upon. With 100% consensus from our initial survey, we plan to introduce a diagram that we have developed to make the optimal position clearer to patients. We hope that this can reduce the number of verbal instructions given and time spent on positioning, with the aim of improving patient experience.
**P155 Initial assessment of obstetric anaesthesia: are 20 sessions enough?**

JA Gwinnutt, J Sadashiviah, A Arch

*Department of Anaesthesia, Wirral University Teaching Hospitals NHS Trust, Wirral, UK*

**Introduction:** A minimum of 20 directly supervised sessions on labour ward is recommended during basic level training.\(^1\,^2\) We reviewed the emergency obstetric workload our trainees experience to evaluate if this is adequate.

**Methods:** Emergency obstetric anaesthetic workload data was collected for the period Jan 2015 to Dec 2015. The number of anaesthetic interventions performed on weekdays between 08:00 and 17:00 has been analysed. We have worked out what experience a trainee can expect to gain during their placement, and how this would improve if the duration of placement was longer.

**Results:** Our unit has approximately 3500 deliveries per year. During the study period, 169 labour epidurals, 22 general anaesthetics, 205 spinals and 60 epidural top-ups were performed within the hours 08:00-17:00 on weekdays for emergency obstetric procedures.

**Table 1. Number of procedures predicted for each placement**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Mean per 08:00-17:00 shift</th>
<th>Mean per 20 sessions</th>
<th>Mean per 40 sessions</th>
<th>Mean per 60 sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour epidural</td>
<td>0.67</td>
<td>6.68</td>
<td>13.4</td>
<td>20.0</td>
</tr>
<tr>
<td>Obstetric GA</td>
<td>0.09</td>
<td>0.87</td>
<td>1.74</td>
<td>2.61</td>
</tr>
<tr>
<td>Spinal GA</td>
<td>0.81</td>
<td>8.10</td>
<td>16.2</td>
<td>24.3</td>
</tr>
<tr>
<td>Epidural top-up</td>
<td>0.24</td>
<td>2.37</td>
<td>4.74</td>
<td>7.11</td>
</tr>
</tbody>
</table>

**Discussion:** Achievement of competence varies between individuals, but it has been suggested that performance of 50 epidurals is needed to be deemed competent.\(^3\) It seems logical that it would require a similar, if not higher, number of caesarean sections to become competent at these. Our data suggests trainees do not gain adequate exposure to obstetric anaesthetics during 20 sessions on our maternity unit, with an average workload intensity. In addition, there is no opportunity to cover the labour ward without immediate supervision, as recommended by the 2010 joint OAA/RCOA training survey.\(^4\) We think this supports an increase to 60 sessions as a 3 month ‘block’ to improve technical and non-technical skill acquisition in obstetric anaesthesia. A regional or national review would reveal if our findings are repeated elsewhere and may prompt a review of the way training time is divided in basic level training.

**References**


**P156 What information did mothers get? A post emergency caesarean section survey**

AC Robertson, K Roberts, F Ejelani, U Misra

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**Introduction:** Our unit recently surveyed expectant mothers to find out what information they would like about a potential emergency caesarean section\(^1\) (ECS), revealing 54% of women would like to receive information. We followed-up this survey to identify what information women, who had undergone an ECS, had received preoperatively.

**Methods:** Within 48 hours of their ECS women were invited to answer a paper questionnaire. The questionnaire enquired about what information had been given and from whom this information came.

**Results:** There were 85 responses. Seventy-six women (91%) received information about the expected anaesthetic from the duty anaesthetist. The majority of women (74%) received verbal information alone. Seventy-nine women (93%) felt they received the right amount of information about the anaesthetic. Fifty-nine percent of women would have liked this information prior to going into labour. Twenty women (23.5%) were worried about feeling pain during their ECS, while 54 women (63.5%) expressed worries relating to potential problems with the operation and anaesthetic. Thirty-seven (43.5%) expressed praise for the care provided by the multidisciplinary team on delivery suite.

Only 15 (18%) women had accessed information in the antenatal period regarding an ECS on their own. Fifty-seven percent had received some information about the anaesthetic from their midwives prior to admission to the delivery suite.

**Discussion:** In our antenatal survey 54% of women surveyed wanted information before labour. We currently do not provide written information about an anaesthetic for an ECS. The OAA website does give access to cards giving this information and recommends they be given to mothers on the delivery suite who may be considered at high risk of having an ECS. A survey of post ECS women conducted by Fortescue\(^2\) found that 50% of women would have liked some information about the anaesthetic in the antenatal period.

The recent judgement in the Montgomery case\(^3\) highlights the importance of explaining risks about a procedure to a patient and behoves us to improve our clinical practice on the delivery suite. We aim to develop information cards on the anaesthetic for an ECS, with a view to having them available in each delivery room. We will then resurvey our mothers and midwives to see if they find them useful.

**Acknowledgements:** Ms K Ramsay, Clinical Governance Facilitator

**References**

1. Preparation for emergency caesarean section – What do mothers want? An antenatal questionnaire. Dr KC Roberts, Dr U Misra
3. Montgomery (Appellant) v Lanarkshire Health Board (Respondent) [2015] UKSC 11
P157 A literature review of high spinals in obstetric anaesthesia
RL Freedman, OH Clancy, PN Robinson, DN Lucas
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Introduction: High spinal block is a known complication of central neuraxial block (epidural or spinal). The terms 'high', 'total' or 'complete' are used interchangeably to describe a sensorimotor block above that which is required for surgery and which is associated with significant cardiovascular/respiratory compromise, sometimes culminating in cardiac arrest. The incidence of high spinal in obstetrics is not known but estimates suggest a very low incidence of 1 in 16 000 epidurals. This area is poorly studied. We aimed to perform a literature review to identify cases of high spinal and elucidate risk factors in obstetrics.

Methods: Medline and EMBASE literature searches were performed using the phrases 'total spinal' or 'high spinal' and 'anaesthesia', 'obstetrics' and 'pregnancy' or 'pregnancy complications'. This search covered papers published since 1946.

Results: Ninety-eight articles were initially identified. Forty-eight papers were subsequently excluded as they were found not to be relevant. Twelve were excluded as they were review type articles or correspondence. There were 11 prospective and retrospective studies looking at strategies to modify the height of central neuraxial block. This left 27 case reports/series for analysis. Of these, 12 described high spinal block in association with labour analgesia, 11 described it in association with surgical anaesthesia and 4 described it in association with both analgesia and anaesthesia. In terms of the neuraxial technique associated with the development of a high spinal, 17 papers described epidural analgesia, 7 spinal anaesthesia and 3 combined spinal epidural anaesthesia. Four patients suffered a total spinal associated with a first epidural dose after an earlier inadvertent dural puncture. Patient risk factors identified included obese women or women with polyhydramnios. Data regarding maternal and neonatal outcomes was not complete, but when reported was good.

Conclusions: This literature review confirms previously identified risk factors for the development of high spinal anaesthesia. It is noteworthy that most of these cases were reported before the widespread use of low dose solutions in epidural obstetric anaesthesia. Caution should be exercised when topping up epidurals with previous unusual spread, and when performing spinal anaesthesia or epidural top up following earlier accidental dural puncture or failed epidural analgesia. Unidentified spinal catheters represent a significant risk. Dose adjustment in high risk scenarios and an increased 'sitting time' may also mitigate risk. The paucity of data on this rare but serious complication of central neuraxial blockade justifies further prospective investigation.

Reference

P158 An audit of the assessment & follow-up management of headache in parturients
T Mahendrayogam, K So, W S V Lam, A Surendran
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Introduction: A parturient who develops post-dural puncture headache (PDPH) should be notified to her general practitioner (GP), routine follow-up and protocols developed to ensure that appropriate communication with the GP occurs in the event of complications following discharge. It was also recommended that all new-onset headaches mandate neurological examination including assessment for neck stiffness. This audit looked at previous inpatient cases of headache to assess compliance with MBRRACE recommendations.

Methods: Three year retrospective analysis of the casenotes (including documented history, examination, investigations and management) of parturients with headache.

Results: 32 cases identified. 13 cases reviewed due to casenotes availability: 12 PDPH & one non-PDPH. 9/13 and 6/13 cases (including the only non-PDPH) were not assessed respectively for neck stiffness nor examined neurologically despite 8/13 being severe and/or persistent. 6/13 cases resolved before discharge. Of the remaining seven, three cases were followed up by a community midwife/anaesthetist by telephone. GPs were not notified in any of the 13 cases.

Conclusion: Diagnosis and assessment of PDPH should include consideration of other potential causes of post-partum headache. The inadequate neurological assessments, documentation, follow-up post-discharge and GP notification suggest that improvement is required in all these areas. A checklist has been created below. The duty anaesthetist completes this form in the patient’s notes. The patient & GP’s phone numbers are added to the PDPH diary kept on Delivery suite and re-written daily until the GP is notified. The electronic audit system also provides daily alerts to this effect.

HEADACHE ASSESSMENT & MANAGEMENT FORM

1. Nature of headache
   a) Severe
   b) Moderate
   c) Mild

2. Localisation
   a) Head
   b) Neck
   c) Shoulder

3. Duration
   a) Acute
   b) Chronic

4. Associated symptoms
   a) Photophobia
   b) Phonophobia
   c) Fever
   d) Confusion
   e) Eye pain
   f) Focal deficit

5. Neurological examination
   a) Sensory examination
   b) Motor examination
   c) Cranial nerve examination
   d) Reflexes

6. Radiological investigation
   a) CT scan
   b) MRI

7. Diagnosis

8. Management

9. Follow up post-discharge
   a) By phone
   b) Written

10. Name and phone number of GP

References
P159 Back to the future? Intrathecal morphine & time to analgesia post caesarean section: a baseline evaluation
CSA Pritchett, H King, S Banks
Anaesthetics, Royal Cornwall Hospital, Truro, UK

Introduction: Achieving discharge at 24 hours post caesarean section (CS) as per NICE guidance relies on good analgesia to allow early mobilisation. Use of intrathecal (IT) morphine in the United Kingdom is a less popular choice than diamorphine but it may have advantages in providing longer duration of post-operative analgesia. At the Royal Cornwall Hospital, intrathecal morphine is used as our standard IT opiate of choice for CS, with varying doses of fentanyl added. We conducted an evaluation to establish current practice and assess efficacy of our central neuraxial blockade.

Methods: Data on category of CS and IT agents used in 106 CS was prospectively collected via questionnaire. Each patient electronic prescribing record was examined retrospectively and post-operative time recorded for each patient who required oramorph (OM).

Results: IT Morphine was used in all CS with varying doses of fentanyl. 53.8% of all women undergoing CS required post-operative OM at an average time of 6.2 hours.

Discussion: Variation of practice exists in IT fentanyl dosing which could lead to dosing errors. Standardising dosing with a single agent such as diamorphine may be preferable. Women undergoing elective CS were least likely to require OM post operatively. We were surprised at the relatively short time to analgesia seen with IT morphine compared with the literature. This may be due to earlier mobilisation post-operatively in modern practice compared to when these studies were conducted.

References

P160 Intrapartum prophylaxis of post-partum haemorrhage: an audit of anaesthetists’ practice in operative deliveries in theatre
CE Adams, G Peters
Anaesthetics, Wishaw General Hospital, Wishaw, UK

Introduction: Postpartum haemorrhage (PPH) is the most common cause of major obstetric haemorrhage. The leading cause of PPH is uterine atony. NICE advise routine administration of uterotonic. At our maternity unit an intrapartum ‘PPH prevention bundle’ was introduced to determine PPH risk score and appropriate first line uterotonic for all deliveries to try and reduce PPH. Patients deemed low risk based on their score should receive oxytocin and those deemed higher risk should receive Syntometrine. Usually the anaesthetist administers uterotonic in theatre and it was noted that some women were not receiving the appropriate initial uterotonic by score. We aimed to determine anaesthetists’ compliance with this bundle.

Method: Following approval by our local clinical audit department, prospective data collection was performed for 50 consecutive deliveries in theatre requiring anaesthetic intervention in September 2015. Data collected included mode of delivery, urgency of caesarean section, PPH risk score, presence of pregnancy-induced hypertension (PHI) or pre-eclampsia (PET) and uterotonic given. Documentation regarding deviation from the guideline was also examined.

Results: There were 47 caesarean and 3 forceps deliveries. Seven patients did not have a PPH prevention bundle in the casenotes and were excluded. One patient had no documented evidence of receiving a uterotonic. Forty-two patients were thus included for analysis. Thirty-one (73.8%) patients received the correct initial uterotonic by score. Six high risk women had PHI/PET and did not receive Syntometrine first line. A remaining 5 of 22 (22.7%) high risk women did not receive Syntometrine first line. The reason for this deviation from the guideline was not documented in any casenotes.

Discussion: Fourteen percent of women did not have a PPH risk score completed. There was a significant number of high risk women who did not receive the appropriate first line uterotonic. Reasons may have included lack of knowledge of the PPH bundle, poor communication between obstetric and anaesthetic staff, presence of PHI/PET, or reluctance to administer Syntometrine. In an attempt to improve compliance we have discussed these results with all anaesthetists to increase awareness of this bundle and encourage appropriate Syntometrine use, and will discuss with obstetricians and midwives to improve performance of risk scoring and communication of the score to the anaesthetist. We have also included a PPH score reminder in our new obstetric anaesthetic chart and plan to include PPH risk score in our obstetric surgical pause. Once these changes are in place we will re-audit compliance.

References
P161 Intrathecal opioids for caesarean section: an audit of post operative monitoring to improve patient safety

P Thomas, J Hackney, R Goyal
Anaesthetics Department, Princess Alexandra Hospital, Harlow, UK

Introduction: NICE guidelines state that women should be offered diamorphine for intra and postoperative analgesia because it reduces the need for supplemental analgesia following caesarean section (CS). Those receiving intrathecal diamorphine, should receive minimum hourly observations of respiratory rate, sedation and pain scores for at least 12 hours. Our aim was to determine what fraction of women undergoing CS were given intrathecal diamorphine, what post operative monitoring was recorded and whether category of CS influenced the care received.

Methods: Fifty women were identified over a three month period. The following data was gathered retrospectively: category of CS, opioid administered intrathecally, duration and frequency of post operative observations of respiratory rate, sedation and pain scores.

Results: All of the women studied received intrathecal opioids for CS. The majority (60%) were given diamorphine, with fentanyl to the remainder. The rate of diamorphine administration varied across CS categories (33%, 63%, 50%, 63% for categories 1 to 4 respectively). Few (10%) of women received hourly observations of all three audited parameters (respiratory rate, sedation and pain scores) for the entire 12 hours post CS. Forty four percent of patients did not achieve this target for 3 hours post operatively.

<table>
<thead>
<tr>
<th>Hourly observations</th>
<th>3 hours</th>
<th>6 hours</th>
<th>9 hours</th>
<th>12 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diamorphine</td>
<td>18</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Discussion: Although all women received intrathecal opioid for CS, which meets current RCOA guidelines, a large proportion did not receive diamorphine as recommended by NICE. A very low number of women received all of the recommended post operative observations. Respiratory rate and sedation monitoring guidelines were introduced as a patient safety measure in response to the risk of opioid induced respiratory depression. Pain scores are measured to guide post operative analgesia, helping to ensure new mothers’ experience a comfortable, satisfactory recovery period. The frequency of observations decreased once patients had left the theatre recovery area for the post natal ward, with low staff numbers cited as a reason. The increased time to prepare diamorphine versus fentanyl is a potential reason that its use is not universal across categories of CS. Following this audit and discussion with hospital management, additional midwives have been employed to aid post operative monitoring amongst their other duties. Staff education on the importance of adhering to monitoring standards is amongst other recommendations from this audit.

References
1. National Institute for Health and Clinical Excellence (NICE). Caesarean section, guideline CG132. 2011, 1.6

P162 Introduction of an epidural insertion bundle and quality improvement strategy to reduce accidental dural puncture and post dural puncture headache in parturients.

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Princess Royal Maternity Unit, Glasgow Royal Infirmary, Glasgow, UK

Introduction: Accidental dural puncture (ADP) and subsequent post-dural puncture headache (PDPH) is one of the more common and debilitating complications of epidural analgesia. An ADP target rate of <1% has been proposed by the Royal College of Anaesthetists [1]. Data from our unit demonstrated considerable monthly variation with frequent periods above this target. Several quality improvement strategies have since been implemented in our unit, including an epidural insertion bundle. We hypothesise that this will allow standardised insertion technique and ensure consistent practice in an attempt to improve ADP/PDPH rates.

Methods: An epidural insertion bundle was introduced. All bundle elements were recorded on our unit’s standard audit documentation. Education was delivered before introduction of the bundle and subsequently with each new intake of anaesthetic trainees to our rota. Regular monthly feedback was delivered to all anaesthetist. When ADP/PDPH did occur, a mandatory debrief with reflection was delivered by a consultant anaesthetist during the next trainee shift. Trainees at all levels were encouraged to ensure they had an appropriate level of direct supervision for epidural insertion to help refine practice, particularly following ADP.

Results: The quality improvement project and epidural bundle were commenced in April 2015. PDPH rates immediately dropped to our target level of <1% and remained consistent for the first five months of data collection. This data confirms a non-random pattern of improvement based on an α error of p<0.05 [2].

Discussion: Our data suggests that the epidural insertion bundle together with associated quality improvement strategies have acted to improve our ADP/PDPH rates since their introduction. It is not clear whether any of the specific elements of the process have in themselves made an impact or whether there is an unquantifiable effect observed as a result of greater emphasis and importance placed on avoiding this common complication amongst trainees. Ongoing data analysis will reveal further trends which may help to answer these questions.

References
P163 Major obstetric haemorrhage: an audit of antenatal anaemia and blood transfusion

A Klobas, I Browne, A Moynihan
Department of Anaesthesia, The National Maternity Hospital, Dublin, Ireland

Introduction: Anaemia increases the requirement for blood transfusion and is independently associated with adverse outcomes in patients undergoing cardiac and non-cardiac surgery. Anaemia in pregnancy is defined as a second or third trimester haemoglobin (Hb) less than 10.5 g/dL. Our proposed audit standard is that no obstetric patients should be anaemic prior to delivery. Our aim was to assess what fraction of patients who had a major obstetric haemorrhage were anaemic and to determine if anaemia had an impact on the incidence of blood transfusion.

Methods: All cases of major obstetric haemorrhage were identified over a twelve-month period. After hospital ethics committee approval the following information was collected retrospectively from case notes: estimated blood loss (EBL), last available Hb in the twelve weeks prior to delivery, immediate blood transfusion and delayed blood transfusion later on an inpatient ward.

Results: Data from 70 patients were evaluated. 14 (20%) were anaemic.

Table: Immediate transfusion incidence

<table>
<thead>
<tr>
<th>Starting Hb (g/dL)</th>
<th>≥ 10.5</th>
<th>&lt; 10.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBL 1.5-2L</td>
<td>6/24 (25%)</td>
<td>3/7 (43%)</td>
</tr>
<tr>
<td>EBL 2-2.5L</td>
<td>13/21 (62%)</td>
<td>5/5 (100%)</td>
</tr>
<tr>
<td>EBL 2.5L+</td>
<td>10/11 (91%)</td>
<td>2/2 (100%)</td>
</tr>
</tbody>
</table>

Data are number transfused/total in that group (%).

11 patients (16%) had a blood transfusion on the ward. The mean Hb for delayed transfusion was 7.2 g/dL (range 6.5-7.9 g/dL).

Conclusions: The proposed standard that no patient should be anaemic prior to delivery was not achieved in this group of patients. Antenatal anaemia increased the incidence of emergency blood transfusion at all sizes of major obstetric haemorrhage. Improvement in the diagnosis and treatment of antenatal anaemia at this institution are recommended from this audit.

References

P164 Starvation and ketonuria during labour

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Introduction: Historically, delivery units with high risk parturients allowed only sibs of water during established labour. In addition to being unpleasant to women, restriction of oral intake may result in ketosis. Mild ketonuria may be physiological during labour and not harmful. However, high levels of ketonuria have been directly related to prolonged labour and increased need for intervention. On our consultant-led delivery unit (CDU), women typically receive water only as the risk of requiring opiates analgesia or anaesthesia is high. We evaluated the relationship between fasting duration and the degree of ketonuria.

Methods: Data were collected in theatre from the CDU women undergoing operative obstetric interventions. Detailed questions were asked regarding their oral intake during labour. Urine was tested for ketones immediately postoperatively. The results of ketone tests were then compared to the patient’s time of fasting. Women with ketonuria were categorized into low (ketones – 1+), moderate (ketones – 2+ or 3+), and severe (ketones – 4+) ketonuria.

Results: Data were collected from 49 women; 26 had caesarean section, 16 instrumental delivery and 7 other indications. 29 women had nil/mild ketonuria, 12 had moderate ketonuria and 8 had severe ketonuria.

- 37 women drank only water and 12 drank sugar containing fluids.
- The 37 women who drank water only had a median fasting to food intake of 12 hours. 40% developed moderate or severe ketonuria. Of the women who drank sugar containing fluids, none developed severe ketonuria, 7 developed mild ketonuria and 5 developed moderate ketonuria.
- Women with severe ketonuria fasted for longer duration (median 18 hrs) than those with nil/mild (median 12 hrs) or moderate ketonuria (median 12 hrs).
- 100% of women with severe ketonuria suffered from sickness.
- 100% of women with severe ketonuria received water only in labour.
- We considered procedures for failure to progress or prolonged 2nd stage indicators for prolonged labour requiring intervention. 88% (7/8) of women in severe ketonuria group had prolonged labour compared to 50% (6/12) in moderate ketonuria group and 34% (10/29) in nil/mild ketonuria.

Discussion: Prolonged periods of fasting resulted in increased severity of ketonuria, which was associated with increased incidence of sickness and increased likelihood of operative intervention. However, it is not clear whether ketonuria was a cause or a consequence of these complications. We would support the use of isotonic drinks during labour. A randomised controlled trial is required to reveal the effect of ketonuria on labour and the best management strategy.

Reference
P165 “Progressive” subarachnoid block in an achondroplastic dwarf for caesarean section
CC Cruz, S Franco*, P Paredes*
*Anesthesia, Centro Hospitalar Lisboa Central, Lisboa, Portugal, *Anesthesia, Centro Hospitalar Lisboa Ocidental, Lisboa, Portugal

Introduction: Achondroplasia is the most common type of short-limb disproportionate dwarfism, with an incidence of 1 in 15000-40000 live births. In about 80% of the patients, achondroplasia is a disorder that results from a spontaneous mutation in fibroblast growth factor receptor gene (FGFR3) on chromosome 4. The remaining cases have an autosomal dominant inheritance.

Case report: A 33-year-old multiparous achondroplastic dwarf woman presented for elective caesarean section at 39 weeks gestation. She was 123 cm height and weighted 63 kg, classified as ASA II. Regarding to her past anesthetic history, she only had had a c-section performed with regional anaesthesia. It was decide to perform a "progressive" subarachnoid block. After the patient was monitored, 500 ml of ringer lactate solution plus 250 ml of HAES 6% were administrated and then the technique was performed in the sitting position. In aseptic conditions, an initial volume of 2 ml was prepared in a syringe, containing 1.9 ml of heavy bupivacaine 0.5% and 0.1 ml of morphine 0.1%. A 27-gauge pencil point spinal needle was then passed into subarachnoid space, free flow of cerebral spinal fluid was ensured and then the syringe was adapted. The mixture was slowly injected at the same time another doctor tested the block level spraying her skin with an alcoholic solution until sensory block to cold at T4 level was achieved. The total administered dose was 1.7 ml. She was positioned in dorsal decubitus, a transitory episode of hypotension was registered and a total of 45 mg of ephedrine was given, with a good response. The surgery had no complication and an healthy baby girl weighing 2105 g was born 9 minutes after the beginning of surgery, with Apgar scores of 9/19/19 at 1, 5 and 10 minutes, respectively.

Discussion: Dwarfs are high-risk population for both general and regional anaesthesia. Problems with airway due to craniofacial and airway associated abnormalities are common. Additionally, the presence of neurologic abnormalities such as atlantoaxial instability and foramen magnum stenosis contraindicate neck flexion. Sedation, as well as general anaesthesia, can be associated with upper airway obstruction, generally caused by facial malformations and sleep apnea. Pulmonary and cardiovascular dysfunction are common, and can be worsened with general anaesthesia. Osteoarticular abnormalities can be responsible for technically challenging neuraxial blockage, narrowing of epidural space and spinal stenosis, specially at thoracolumbar and lumbal regions, leading to unpredictable spread of local anesthetic.

References

P166 Anaesthesia for elective caesarean section in a patient with active Guillain-Barre syndrome
N Ungureanu, J Kerr
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Introduction: Guillain-Barré syndrome could affect pregnant patients. The decision to proceed with c. section depends on the gestational age, obstetric history, patient's symptoms and comorbidities. The choice of anaesthesia in patients with active Guillain-Barré is subject to controversy especially when patients have concomitant peripheral nerve involvement and respiratory compromise1-3.

Case report: A 28-year-old woman (G2P1) who had a previous normal vaginal delivery and was otherwise fit and well, presented to hospital at 26 weeks’ gestation with shortness of breath for which she was admitted to critical care for 3 days. She required non-invasive respiratory support for 24 hours and developed a mild degree of ascending motor weakness in her lower limbs. A diagnosis of Guillain-Barré was made (following delayed nerve conduction studies and a high level of proteins in the CSF) and she received 2 courses of intravenous IgG, the last of which was administered 3 weeks before her scheduled caesarean section.

She did not require any subsequent critical care, but her lower limbs motor power deteriorated and she became wheelchair bound. She attended the obstetric anaesthesia high-risk clinic 3 days prior to her elective surgery with no obvious respiratory distress at rest but with a weak cough.

Her neurological examination revealed paraesthesia in the distribution of CNV and CNVII, but no dysarthria, dysphagia, diplopia or blurred vision. She had subjective loss of sensation below the T6 dermatome, but objectively she an intact sensation to cold in all dermatomes and only bilateral L4-L5 sensory loss to pinprick could be elicited. The lower limbs motor power was 3-4/5 at the ankles and 4/5 at the knees and hips. She did not have signs of autonomic dysfunction.

The patient underwent an uneventful elective c. section at 35 weeks and 5 days under spinal anaesthesia with standard AAGBI monitoring and a phenylephrine infusion to maintain adequate levels of blood pressure intraoperatively. She was cared for in Delivery Suite HDU for the next 4 days. She returned to her pre-delivery neurological status within 6 hours of surgery.

Discussion: Guillain-Barré syndrome is extremely rare in pregnancy. There is no clear evidence that termination of pregnancy can improve the outcome or facilitate the recovery of the mother3. Uterine contractility is preserved and vaginal delivery is possible and has been reported. The anaesthetic management needs to be tailored to the patient’s clinical condition at presentation to theatre, with central neuraxial blocks and general anaesthesia as possibilities. There is also no evidence that regional techniques worsen neurological symptoms in patients with active Guillain-Barré.

References
P167 Delivery at any cost in complex cases? The peripartum management of a patient with severe von Willebrand disease type 3 with von Willebrand inhibitor

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Obstetric Anaesthesia, Central Manchester University Hospital NHS Trust, Manchester, UK

Introduction: Type 3 von Willebrand Disease (vWD) is the most severe and rare form of vWD characterized by near-total absence of von Willebrand factor(vWF) in the plasma.

Method: A 27 year old lady with type 3 vWD presented with a singleton pregnancy. She had a history of severe spontaneous bleeding into joints, muscles and gums. As a child she was treated with antihemophilic Factor/vWF Complex, Hemate-P. In her teens developed antibodies to vWF (1 of 7 in the UK). She was reviewed in the joint haematology/obstetric and anaesthetic clinic. The management plan involved having a spontaneous vaginal delivery to minimise the risk of caesarean section and blood loss.

Result: At 37/40, she presented with bleeding and disrupted coagulopathy. Recombinant activated factor VII NovoSeven® 270 mcg/kg was started every 2 hours, platelets (2 doses every 4 hours) and tranexamic acid every 6 hours. The clinical picture and coagulopathy improved and she was induced. A remifentanil PCA was started in established labour. She had a category 2 caesarean in the middle of the night for failure to progress. She was desaturating prior to the induction of general anaesthesia, intubation was difficult (grade 3 view, 3 attempts). She was very difficult to ventilate with high airway pressures. A TEG done prior to theatre showed a very unusual trace.

She was treated with platelet concentrate, cell salvage, tranexamic acid, oxytocin infusion, intrauterine Bakri balloon and intra-uterine misoprostol. Blood loss was 1800mls. She was transferred to ITU with high airway pressures, was ventilated for 3 days and suffered acute renal failure.

Discussion: This patient posed a unique challenges as there is not much in literature for type 3 vWD. We were very aggressive in our intrapartum management and this was reflected in the improvement of her clinical situation. However, prophylactic treatment appeared to give her an acute lung injury that was not anticipated and significantly complicated her general anaesthetic. Additionally the cost of blood and coagulation products for delivery came to over £400,000. In a challenging financial situation, the economic implications of such deliveries needs to be debated.

References

P168 Not plugging the hole: NSAIDs to blame?

P Mehrotra, J Lewis, D Levy
Department of Anaesthesia, Queens Medical Centre, NOTTINGHAM, UK

Introduction: Epidural blood patches (EBP) have been shown to have a variable success rate in the treatment of post-dural puncture headache (PDPH). We present the case of a woman who had a PDPH following labour epidural insertion. This case raises two important discussion points: the safety of repeated EBPs, and the effect of NSAID use on EBP success.

Case Report: A 29 year old woman requested epidural analgesia for labour. An accidental dural puncture occurred using a 16 g Tuohy needle, and an epidural catheter was threaded into the subarachnoid space.

Within 12 hours of dural puncture, the patient developed a postural headache with neck stiffness and muffled hearing. The anaesthetic team offered advice on maintenance of hydration and caffeine consumption for symptomatic relief. She was prescribed regular paracetamol (4g/day), diclofenac (150mg/day) and as requested oral morphine (10-20mg). Since the headache was unremitting at 48 hours, an EBP was performed. Upon mobilisation at 4 hours, there was complete resolution of her symptoms. However, 48 hours after the EBP, the headache and neck stiffness returned. A 2nd EBP was performed, producing a similar result. On account of the return of a debilitating headache, a MR brain was performed, which showed no abnormality. Physiological observations were unremarkable.

The woman declined a 3rd EBP on account that her symptoms were not as severe as before. Neurology outpatient follow-up at 3 months noted her symptoms have now resolved.

Discussion: There was reticence among the anaesthetic body in performing a 3rd EBP in view of causing serious permanent neurological damage with repeated EBP, such as the case of a 29 year old patient with chronic adhesive arachnoiditis following a 3rd EBP to treat PDPH. An extensive literature search revealed variable (33 to 90%) success rates of EBP, with a recurrence rate of 30% quoted. Evidence is lacking as to why recurrence occurs. A possible explanation for the transient relief offered by EBP is the use of NSAIDs as analgesics in PDPH. The mode of action of EBP is believed to be that blood creates a clot adherent to the dura mater, preventing further CSF leakage. NSAIDs are known to inhibit platelet aggregation, therefore potentially impairing clot formation. The effect of NSAIDs on platelet function have been highlighted in transfusion guidelines, which state that platelet donations must not be used if the the donor has taken NSAIDs in the preceding 48 hours. This could account for the relatively high recurrence rate (30%) of PDPH post EBP.

References
P169 Peripartum management of long QT syndrome: taking the initiative as the anaesthetist

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Introduction: Routine events and complications of pregnancy can trigger cardiac events in women with long QT syndrome (LQTS). We present a case of a woman with LQTS who had a vaginal delivery and the anaesthetist’s role in her management.

Case report: A 27 year old primigravida at 34 weeks uncomplicated gestation was referred to the anaesthetic clinic with known familial LQTS. Her baseline QTc was 490ms, mean heart rate 72bpm, and was asymptomatic on a maintenance dose of bisoprolol 5mg daily. She was asymptomatic with no previous syncope, arrhythmias nor cardiac arrest, and did not have a pacemaker or implantable cardioverter-defibrillator. Electrolyte levels were normal in the antenatal period.

Published medical literature was consulted, relevant triggers of torsades and further ventricular fibrillation were jointly identified and a joint cardiology, obstetric and anaesthetic care plan to avoid precipitating drugs and excess adrenergic stimulation, and strict continuation of bisoprolol throughout the perinatal period was made. Copies of relevant literature including potentially arrhythmogenic medications were placed in her notes. These included all inotropes and vasopressors, antimuscarinics, suxamethonium, sevoflurane and several anti-arrhythmics. Therefore on her admission to labour ward at 41+4 weeks gestation, she was seen immediately by the midwifery, obstetric and anaesthetic teams. Sufficient intravenous magnesium was immediately available in her room and the location of the closest defibrillator was confirmed with all members of the labour ward. A L3/4 epidural was placed to minimise adrenergic surges, prior to artificial rupture of membranes. 20ml of 0.1% bupivacaine and 2mcg/ml fentanyl loading dose was given in 5ml aliquots over 20 minutes by the anaesthetist after establishing 3 lead electrocardiogram, non-invasive blood pressure, pulse oximetry and cardiotocogram monitoring. No significant cardiovascular changes occurred as a result of the loading dose, QTc was 489ms. Patient controlled epidural analgesia was commenced thereafter, with a background rate of 8ml/hr providing adequate analgesia.

Vaginal delivery of a healthy baby, with episiotomy and vacuum extraction occurred with total blood loss of 650ml. One intramuscular dose of oxytocin 10 units and ergometrine 500 micrograms and an infusion of oxytocin 40 units over 4 hours were given post-delivery. Post-partum cardiac monitoring for 48 hours in the obstetric level 1 unit was uneventful.

Discussion: Anaesthetic input to prevent further pharmacological and physiological QTc prolongation contributed to her individualised MDT management and decreased the risk of avoidable adverse events. Ante-natal review allowed logistical preparedness, contributing to a safer and more pleasant experience for the mother.

References
2. Wooley RL, Romero KA. www.crediblemeds.org QT Drugs List. AZCERT, Inc. 1822 Innovation Park Dr., Oro Valley, AZ 85755.

P170 The use of noradrenaline for spinal-induced hypotension during caesarean section in a parturient with severe pulmonary regurgitation

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Introduction: The use of noradrenaline for spinal-induced hypotension is currently under investigation. We present a case of its use in a patient with severe pulmonary regurgitation undergoing caesarean section.

Case report: A primiparous woman presented for antenatal care having had an open pulmonary valvulotomy as a child for congenital pulmonary stenosis. Serial echocardiograms throughout pregnancy showed free regurgitation at the pulmonary valve with a severely dilated, but normally functioning, right ventricle. The left ventricle was normal. Prior to pregnancy she was relatively asymptomatic and required no treatment. Furosemide was started in the third trimester in response to increasing dyspnoea and peripheral oedema. The caesarean section took place at 37 weeks and 3 days, 5 days after admission with worsening cardiac failure. Symptoms responded well to an increase in diuretics. A combined spinal-epidural anaesthesia was used with invasive blood pressure monitoring. Attempts to site a peripheral long line were unsuccessful and the procedure continued without central venous monitoring. The CSE was sited with 2 ml hyperbaric bupivacaine and 300 micrograms diamorphine injected into the subarachnoid space. The spinal component had no clinical effect after 5 minutes and a sensory block was gained with epidural ropivacaine. A peripheral noradrenaline infusion with a concentration of 6 micrograms/ml was commenced at a rate of 30 ml/hr on sitting of the spinal, and titrated to maintain blood pressure. There were no episodes of bradycardia. Following delivery a syntocinon infusion was started at a rate of 5 units/hr. The arterial and venous cord gases were 7.306 and 7.36 respectively. 500 ml crystalloid was given during the procedure and diuretic therapy was re instituted post operatively. Post-operative recovery was uneventful and the patient is awaiting a pulmonary valve replacement.

Discussion: Severe pulmonary regurgitation has been shown to increase the risk of cardiac events during pregnancy. These cases are usually associated with right ventricular failure, often with scarring from correction of congenital abnormalities. Our patient had a severely dilated, although normally functioning right ventricle on echocardiogram. During the intraoperative period, noradrenaline was used as the vasopressor of choice. A high-normal heart rate was desirable to reduce the regurgitant fraction through the affected valve. A recent paper by Ngan Kee et al showed that noradrenaline was as effective as phenylephrine at maintaining blood pressure during spinal anaesthesia without the associated bradycardia. Patients in this study were low risk, with no cardiac disease. We were able to demonstrate its safe use in this high risk patient with no adverse effects to mother or baby.

References
2. Ngan Kee WD, Lee SW, Ng FF, Tan PE, Khaw KS. Randomized double-blind comparison of norepinephrine and phenylephrine for maintenance of blood pressure during spinal anaesthesia for caesarean delivery. Anesthesiology. 2015 Apr; 122(4): 736-45
P171 Valsalva maneuver mediated Hamman’s syndrome in the parturient: a case report. WITHDRAWN

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P172 Where’s the baby? Anaesthetic management of an advanced abdominal pregnancy (AAP)

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Introduction: AAP is rare with an occurrence of 1 in 10,000-50,000 deliveries1 Most AAPs are terminated due to increased maternal and fetal mortality. Delivery of a live baby following an AAP is rarely described.2 The main complication is massive haemorrhage during removal of the placenta at delivery. Several cases have described leaving the placenta in situ, to allow involution within the abdomen. We report successful delivery of a 27-week gestation AAP via laparotomy.

Case report: primigravida mother was diagnosed with a total extra-uterine viable pregnancy at her 20-week anomaly scan, after a reportedly normal booking scan at 12 weeks. An MRI scan confirmed the diagnosis. Termination of pregnancy was offered, but declined. The pregnancy progressed until 27 weeks gestation when the patient was admitted with abdominal pain. Repeat MRI described the fetus in an extra-uterine sac with the placenta around the anterior, posterior and lateral walls of the sac. The vascular supply could not be determined. Due to escalating abdominal pain the patient was prepared for an urgent caesarean section. The consultant interventional radiologist advised that because the vascular placental supply could not be identified, placement of pre-operative internal iliac balloons would be appropriate. A multidisciplinary team was assembled, including anaesthetists, obstetricians, midwives, neonatologists, a vascular surgeon and an interventional radiologist (with mobile radiology team). Pre-operative internal iliac balloons were placed under local anaesthetic in the interventional radiology suite. The patient was then transferred to a general theatre. General anaesthesia was induced via rapid sequence induction with invasive arterial blood pressure monitoring. Two consultant obstetricians performed the laparotomy and delivery. They identified a live fetus encased in an extra-uterine sac, presumed to be a rudimentary horn. The baby was delivered by incision of this compartment leaving the placenta within the sac. The sac was then ligated and excised. A large placental clot was noted. The mother lost approximately 2000mLs of blood and received cell salvaged blood. She remained haemodynamically stable throughout and required no additional blood products. The internal iliac balloons did not require inflation and were removed after delivery. The mother recovered and was discharged two days post-operatively. The baby was admitted to the neonatal unit and was discharged eight weeks later.

Discussion: AAP is associated with high mortality and morbidity. Fortunately in this case both mother and baby did well. Unlike in previously published cases, the placenta was fully resected, due to its unexpected and unusual relationship with the uterus. The main reported complication relates to bleeding from the placental bed and interventional radiological can be of assistance in these situations. In such rare complex cases the key to achieving an optimal outcome is gather a multidisciplinary team to cover all eventual outcomes.

References
P173 A Review of anaesthesia for instrumental delivery (RAID). WITHDRAWN

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P174 An adapted WHO checklist for category 1 delivery - as easy as ABC

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Introduction: Checklists within emergency obstetrics can minimise errors, improve situational awareness and decision making but have the potential to introduce delays within time critical deliveries. The National Patient Safety Agency (NPSA) and Royal College of Obstetricians and Gynaecologists (RCOG) adapted the WHO surgical safety checklist for maternity cases in 2010, aiming to enhance patient safety through improved anticipation of possible challenges and complications, better communication and team working.1 We intended to further adapt the maternity WHO surgical safety checklist to facilitate its use in category 1 emergency obstetric care.

Methods: After approval by the local audit committee, a quarterly audit of current adherence to the WHO checklist was carried out within the emergency obstetric theatre. Data was collected on compliance with briefing, sign in, time out, sign out and debriefing. This data was used to inform areas of focus for an adapted ABC style checklist in collaboration with obstetric, anaesthetic, midwifery and theatre staff using ‘Plan, Do, Study, Act’ (PDSA) cycles.2 A survey of obstetric staff on the barriers to use of the current checklist in category 1 deliveries and then their views on the new checklist was then performed.

Results: Compliance within obstetrics is good overall, with excellent ‘buy in’ from all members of the theatre team. However, completion of the various elements of the WHO checklist were inferior in emergency compared to elective theatre cases: sign in 85% vs 100%, time out 88% vs 100%, sign out 90% vs 98%. Obstetric staff felt that the adapted WHO checklist is simpler to use (100%), more time efficient (86%) and improves compliance in emergency cases (91%).

Discussion: The WHO surgical safety checklist has been shown to improve patient outcomes3 but there are challenges to its use in emergencies. The revised checklist adopts an ABC approach, which is familiar to clinicians in emergency situations. By combining briefing, sign in and time out steps it enables smooth preparation and prioritisation in a complex environment, and encourages exchange of key information within a supportive team with the additional prompt “Any safety concerns please shout out”. We plan to develop the role of this modified checklist to include other obstetric emergencies, and its regular use in all urgent maternity cases will ensure familiarity and compliance in the most time-critical, pressurised situations.

References
P175 Anaesthetic charts - does one size fit all?  
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Introduction: Adequate documentation is essential during every stage of obstetric anaesthesia including pre-operative assessment, consent for anaesthesia, recording of per-delivery timelines, handover and post-operative care plans. There is currently no standard obstetric anaesthetic record in the UK. The Royal College of Anaesthetists (RCoA), Association of Anaesthetists of Great Britain and Ireland (AAGBI) and Obstetric Anaesthetists' Association (OAA) have provided guidance on minimum data sets which the GMC uses for assessment purposes. Bespoke anaesthetic charts may improve compliance with national recommendations on documentation by providing obstetric specific prompts.

Methods: After local audit committee approval, a retrospective snap shot audit of generic anaesthetic charts was carried out over a 2 week period in 2014. Records were examined for risks informed during consent, airway assessment, past medical and anaesthetic history, significant illness and documentation of time line in theatre. Following introduction of a bespoke anaesthetic chart in our Maternity unit in 2015, the new anaesthetic chart was audited against the same criteria over a further 2 week period and the results were compared.

Results: n=48 (2014) and n=52 (2015). Data capture was approximately 60% for the relevant details in the initial audit and 75% with the new charts. There were several improvements in documentation of the 'times of interest' from the 2014 audit: time of entering theatre 37% to 73%, time of block insertion 69% to 83%, time of knife to skin 63% to 65%, time of delivery 69% to 71%. Improvements in consent for risks of regional anaesthesia (RA) were most improved. These included risk of failure 54% to 90%, high block 7% to 81%. The amount of charts documenting 'no explained risks' decreased from 27% to 0% when the new charts were implemented. Airway assessment and past anaesthetic history documentation was missing in 14% of the old style charts and in only 5% of the new maternity charts.

Conclusion: An anaesthetic chart is an important indicator of quality of care and an essential tool for risk management. It is a GMC Good Medical Practice requirement to enter all relevant details clearly and accurately. Recording every activity and intervention that a patient receives enhances peri-operative care and accurate record keeping is essential for resolution of any medico-legal allegations. Results of the initial audit indicated a need for a bespoke chart for obstetric anaesthesia practice to reflect the style of information required to enhance care. The redesign has provided an invaluable tool to enhance care and the reaudit has proved that the levels of documentation have improved considerably.

References
4. Patient Safety - Quality Improvement; Department of Community and Family Medicine: Duke University Medical Centre

P176 Epidural block documentation - What do we really need to know?  
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Introduction: Epidural analgesia is considered the gold standard for labour analgesia; but has the potential for serious, even life threatening complications. Once established, accurate monitoring is essential to ensure the utmost in patient safety. Poor documentation has serious medico-legal ramifications in the event of a critical incident and at best may result in substandard management of epidural analgesia in labour. Our aim was to institute a quality improvement project to improve documentation, with secondary outcome measures of better midwife education and earlier escalation to the anaesthetist.

Methods: A random selection of epidural charts were audited in March 2015, from which we established drivers for change. This process utilised expert opinions from the field of obstetric anaesthetics and current guidelines (1, 2). The focus of our first audit cycle was a redevelopment of the existing epidural chart which excluded epidural block dermatome height. Subsequent cycles led to refinement of this chart and the introduction of other interventions: the development of a simple epidural troubleshooting guide and surveys of midwife knowledge, which acted as a simple bedside teaching tool.

Results: Our initial audit demonstrated very poor documentation and implied a lack of understanding with respect to the complications of epidural analgesia. The introduction of a new simplified chart and concurrent educational interventions led to a dramatic improvement in documentation of the block (Figure 1), as well as in blood pressure post top-up (improved from 25% to 100% compliance), inclusion of patient details and enhanced accountability for both midwives and anaesthetists.

Conclusion: Our quality improvement project led to a demonstrable improvement in documentation. The new epidural charts underwent several rounds of re-evaluation and were well received - creating a sustainable improvement. It also improved midwife awareness of the potential pitfalls with epidurals and when to alert the anaesthetist; ultimately leading to an improvement in patient safety. Despite the limitations of our project - namely the small sample size, any unfilled epidural chart must be a driver for change. There is scope to continue this project with the introduction of formal midwife teaching.

References
P177 Handover of responsibility of patients in the obstetric post anaesthetic care unit (PACU)
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Introduction: Multidisciplinary teams must communicate effectively to ensure comprehensive handover of patient care. This is integral to patient safety. Following surgery, incomplete information transfer between anaesthetists and nursing staff in the post-anaesthetic care unit (PACU) may lead to significant patient harm. The Association of Anaesthetists’ state the anaesthetist must formally hand over patient care to a recovery room nurse or appropriately trained staff member. The Royal College of Anaesthetists’ (RCoA) state that all handovers should include: patient demographics, medical history, allergies, anaesthetic technique, prescription charts & a post-operative plan. Communication tools facilitate structured transfer of information between healthcare professionals. We audited the handover process of post-operative obstetric patients between anaesthetists & PACU staff at our Trust.

Methods: A survey of PACU nursing staff was initially conducted to gauge views on current quality of handovers, & establish areas for improvement. Subsequently we devised a checklist, guided by RCoA recommendations, to assess transfer of information between anaesthetists & recovery staff. The checklist was completed by PACU staff at information transfer during post-operative handovers & audited over a one month period.

Results: All recovery nurses surveyed wanted a structured handover. Areas for improvement were a request for a unified approach & ensuring patient monitoring was in place prior to commencement of verbal handover. Of note, during the audit, two patient safety incidents occurred due to syntocinon not being restarted in PACU at handover. This lead to a postpartum haemorrhage in both patients following elective caesarean. Twenty three handovers were audited. Information transferred in most cases included type of anaesthetic (91%), intraoperative analgesia (91%), operation type (87%) & estimated blood loss (78%). Information less frequently volunteered included medical background (65%), urototixics (65%), allergies (61%), drug prescriptions (57%) & ASA status (35%).

Discussion: Post-operative handovers in our obstetric PACU are mostly incomplete. Through formalising the process & by introducing a standardised checklist we hope to improve information transfer between anaesthetic & recovery nursing teams, & prevent further incidents occurring. Findings have been disseminated at departmental & Trust level. We are introducing a tailored checklist at each recovery bed space with a view to re-auditing to quantify quality improvement in coming months.

References
4. Institute for Healthcare Improvement. SBAR: Situation-Background-Assessment-Recommendation
P179 Improving theatre utilisation, flow and team-working through simple intervention

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Introduction: As the demand for NHS resources continues to increase, there is a constant pressure and obligation to seek out ways of improving efficiency and productivity. The increase in national elective caesarean section rates, from 9.4% of all deliveries in 2004 to 11% in 2014(1) is one example where such a predicament exists. In our organisation, elective caesarean sections are scheduled onto a dedicated training operating list, occurring on 3 fixed morning sessions across the working week, with an expected standard of 3 caesarean sections to be completed per list. The aims of this full audit cycle were; to assess the functioning of the elective caesarean section lists, improve productivity and theatre utilisation.

Methods: Prospective audit data collected over a 16 week period, from June - October 2014. Time of team brief, reasons for delays, anaesthetic start time for 1st, 2nd, 3rd case and number of midwifery staff allocated to the list all recorded. Presentation of findings given at combined obstetric-anaesthetic clinical governance meeting. Improvements agreed by the co-directorate included; a commitment to the allocation of 2 midwives per-list, a prompt team brief at 08:45, and provision of a dedicated operative surgeon with responsibility to the elective patients only. Impact of changes assessed by re-auditing list performance using identical data fields over an 18 week period, occurring between February-June 2015.

Results: Initial audit identified a changeable number a cases booked per list; 1 case (12.5%), 2 cases (25%), 3 cases (50%), 4 cases (12.5%) and erratic start times of team briefs (08:35-10:00). In 12/16 weeks, the reason for a late team brief included the non-attendance of the surgeon. There was a mean/median average of time from brief to anaesthetic start of 21.3/20 mins. 2 midwifery staff were appropriately allocated in only 50% of lists. 14% of lists were fully completed, with the second case completed in 36%. The mean number of cases completed per list was 1.57. Re-audit continued to identify changeable case load; 1 case (11%), 2 cases (28%), 3 cases (33%), 4 cases (22%) and 5 cases (6%). 14/18 team-briefs conducted at agreed time with surgeon attendance improved therein. Brief to anaesthetic start time interval remained unchanged. 2 midwives were appropriately allocated for 87.5% of lists. 37.5% of lists completed within session, 2nd case completed in 87.5%. The mean number of cases completed increased to 1.93.

Discussion: The nature of obstetric working is unpredictable, even within elective cases, however this is no excuse for inefficiency. Our audit revealing a 60% increase in list completion highlights how clear planning and communication can significantly improve theatre utilisation and patient flow. With all incomplete elective cases being diverted to the afternoon solo-emergency theatre, our simple interventions have resulted in a significant patient safety improvement.

Reference

P180 Modification of World Health Organisation surgical safety checklist for category 1 caesarean section

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Introduction: The World Health Organisation (WHO) Surgical Safety Checklist was introduced in 2008, following a study which demonstrated a decrease in morbidity from 11 to 7% and mortality from 1.5 to 0.8% with its use.1 The checklist was modified for Obstetrics in 2010 by the National Patient Safety Agency and the Royal College of Obstetricians and Gynaecologists.2 A survey in 2012 demonstrated implementation in 92% of obstetric units.3 The modified WHO checklist is used routinely in our department, but we noted that it was not always being used in emergency cases, presumably due to pressure of time. We wanted to audit our compliance with the WHO checklist in emergency cases and assess how we could improve this.

Method: Following approval from the trust audit committee, we looked at casenotes for 26 patients who had category 1 caesarean sections. We recorded whether a checklist form was present in the casenotes, and whether each section and question had been completed or not.

Results: In 2 cases urgency of caesarean section had been downgraded prior to commencement of the procedure. In 2 cases no checklist was in the case notes. 8 of the remaining 22 cases (36%) had no questions of the “sign in” section of the checklist completed. Introduction of staff only occurred in 82% of cases and identity of the patient was not even documented as confirmed in 2 of the 22 cases. All other questions in the “time out” section were completed in 21/22 (95%) of cases.

Discussion: Completing the WHO Surgical Safety Checklist in emergency cases can be challenging, due to pressure of time. Although it may not take long to complete the full checklist, perception by staff that it may cause delay may result in it not being completed. However, emergency cases are probably those where human error may be more likely to occur, and therefore it is even more important to use such a checklist. In an effort to make it easier for essential questions to be completed, we have re-designed our local checklist including a shorter, more concise area to be completed in category 1 caesarean sections. We plan to re-audit and hope that this intervention will improve compliance.

References
Postnatal visits allow patient feedback and help improve care. The Royal College of Anaesthetists' (RCOA) Guidelines recommend that postnatal care should include early postoperative visits by an anaesthetist to facilitate communication between the obstetric and anaesthetic teams.

Anaesthesia for elective caesarean section in a patient with chronic adhesive arachnoiditis was performed in the UK. The patient was a 29-year-old with a history of chronic adhesive arachnoiditis and a previous high spinal block. She was admitted for elective caesarean section and received intravenous morphine 75mg every 6 hours and pentazocine 30mg every 4 hours. She also received tranexamic acid 1g every 6 hours and was given additional fluids as required.

In the operating theatre, the patient was inserted into an L4 epidural space with a single injection of bupivacaine 0.25% and fentanyl 20mg. The block lasted for 1 hour and 30 minutes before a local anaesthetic topping up was required.

In the postoperative period, the patient complained of severe postural headache with neck stiffness and muffled hearing. The episode of headache lasted for the remainder of the day and was treated with oral analgesics. The patient was discharged home after 24 hours with no further complications.

In conclusion, this case highlights the importance of effective communication between the obstetric and anaesthetic teams to ensure optimal patient care. The use of chronic adhesive arachnoiditis and the need for additional analgesics are also important considerations for future cases. The patient's postoperative course was uncomplicated, and she was discharged home after 24 hours.