## PFM.53 IS INTENSIVE ANTENATAL FETAL SURVEILLANCE OF USE IN REDUCING PERINATAL MORTALITY IN OBSTETRIC CHOLESTASIS?

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**Objective:** To investigate the benefits of a standardised intensive antenatal fetal surveillance protocol for obstetric cholestatsis (OC).
**Study Design:** All consecutive cases of OC presenting at any of three obstetric hospitals from July 2006 to July 2007 were included. Diagnostic criteria included: pruritis without other dermatological abnormalities, together with elevated hepatic transaminases or elevated fasting serum bile acid levels. After confirmed diagnosis of OC the standardised fetal surveillance protocol included antenatal visits two to three times weekly for non-stress test, biophysical profile and umbilical arterial Doppler studies.
**Results:** A total of 68 cases of OC were diagnosed, 47% of whom were admitted after OC diagnosis. Medical management included ursodeoxycholic acid and antihistamine therapy. Patients were induced at 37 weeks, or earlier if fetal surveillance was abnormal, whereas 3% were induced immediately after diagnosis because of advanced gestational age. Mean gestational age at delivery was 36.5/7 weeks. Meconium-stained amniotic fluid was noted in 1% of cases. There were no stillbirths or other abnormalities of neonatal outcome.
**Conclusions:** Although sudden unexplained stillbirth has been reported with OC, the use of an intensive antenatal fetal surveillance protocol was associated with no adverse obstetric or paediatric outcome events in this study. Whereas a randomised trial of fetal surveillance is required to address its role in preventing stillbirth, this may not be practical due to logistical and ethical concerns. In the interim, intensive fetal surveillance as suggested here by this study is associated with good outcome.

## PFM.54 MANAGEMENT OF WOMEN WITH POSITIVE GUILLAIN–BARRÉ SYNDROME STATUS IN CURRENT PREGNANCY

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**Background:** Guillain–Barré syndrome (GBS) is a leading cause of early-onset neonatal infection resulting in significant morbidity and mortality.
**Objective:** We aimed at establishing whether the RCOG guidelines on the prevention of early-onset neonatal GBS disease were followed in the management of these women.
**Methods:** Retrospective case notes review of women with positive GBS status.
**Results:** Out of 59 detected cases, 45 notes were available for analysis. 35 women had known positive GBS status antenatally, 10 were diagnosed postnatally. Out of 35, nine did not warrant treatment as they either had an elective Caesarean section (seven) or a late miscarriage (two). The remaining 26 went into labour. 16 (62%) received intrapartum antibiotic prophylaxis (IAP) according to guidelines. 10 (38%) received no treatment. 10 patients did not warrant IAP as GBS status was not known predelivery. However, five (50%) of these patients with another risk factor received treatment.
**Conclusions:** Although the compliance level with the RCOG guidelines was high, it is concerning that one in three eligible women who were at risk was not offered IAP. This study has identified areas in which there is room for further improvement. To improve compliance, our management strategy should include raising awareness of the importance of IAP, educating patients to report the onset of labour early and improved communication between paediatricians, obstetricians and midwives. Ultimately, if our goal is to minimise the incidence of early-onset GBS neonatal disease, then our management strategy should include a national screening programme.

## PFM.55 ABDOMINAL CIRCUMFERENCE MEASUREMENTS ON THE THIRD CENTILE AT ANOMALY SCAN

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**Objective:** To determine the outcome in fetuses whose abdominal circumference measurements were on/below the third centile, at anomaly scan.
**Methods:** A retrospective analysis of the database, at Ealing Hospital NHS Trust London, of all the abdominal circumference measurements, at anomaly scans, within a period of 24 months. Fetuses with measurements on or below the third centile were identified, using the LS Chitty abdominal circumference (AC) measurement (derived) chart. The case notes were reviewed to exclude fetuses considered to be at increased risk of aneuploidy based on maternal serum screening. The number of fetuses who had subsequent ultrasound assessments from 24 to 35 weeks of gestation was noted. The proportion of fetuses whose AC measurements persisted on or below the third centile was determined. Adverse outcome was induction of labour for fetal growth restriction.
**Results:** Sixty-one fetuses were identified at anomaly scan. Thirty-eight fetuses had ultrasound assessment between 24 and 29 weeks of gestation; 12/38 (32%) had AC that persisted on or below the third centile. Only 3/12 (25%) of these fetuses had absent or reversed umbilical artery end-diastolic flow, which resulted in adverse outcome. Twenty-five fetuses had ultrasound assessment between 30 and 35 weeks of gestation; 9/25 (36%) had AC that persisted on or below the third centile. None (0/25) of these fetuses had absent or reversed umbilical artery end-diastolic flow. No adverse outcome was observed.
**Conclusions:** Our data suggest that AC on the third centile with normal umbilical artery Doppler studies may not indicate fetal growth restriction.

# BMFMS: Labour and Delivery

## PLD.01 COST COMPARISON OF CAESAREAN SECTION FOR ABNORMAL PLACENTATION WITH AND WITHOUT USE OF INTERVENTIONAL RADIOLOGY

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Postpartum haemorrhage remains a significant cause of maternal morbidity and mortality. Fourteen deaths are attributed directly to haemorrhage in the most recent CEMACH report. At least two major surveys have shown that approximately two-thirds of all cases of severe maternal morbidity, so called ''near misses'', are related to severe haemorrhage. Of women requiring hysterectomy, 38% had a morbidly adherent placenta: placenta accreta, percreta or increta.

Interventional radiology can be used as a prophylactic measure to reduce blood loss when there is a known or suspected case of placenta accreta or placenta praevia associated with a previous Caesarean section scar.

Balloons are placed in the internal iliac or uterine arteries before delivery. The balloons can be inflated to occlude the vessels when required. Embolisation can be performed via the balloon catheters if bleeding continues despite inflation.

It has been reported that while blood loss during routine Caesarean section averages 1000 ml, haemorrhage during Caesarean hysterectomy for associated placental abnormalities may require up to 70 units of replacement blood products.

We have looked at the cost incurred by our trust when we do elective section along with interventional radiology (£2601) and compared this with similar cases in which elective section was associated with major postpartum haemorrhage (£4510). This is based on 12 cases in which we used interventional radiology and cost analysis included inpatient stay, total cost of procedure, blood products and uterotonics.

We recommend that interventional radiology is effective in achieving haemostasis during Caesarean section performed for placental abnormalities and is also cost effective.

## PLD.02 CAN A NEW OXYTOCIN ANALOGUE REDUCE THE NEED FOR ADDITIONAL OXYTOCICS AFTER CAESAREAN SECTION? THE RESULTS OF A DOUBLE-BLIND RANDOMISED TRIAL

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**Introduction:** NICE currently recommends 5 IU syntocinon to prevent postpartum haemorrhage (PPH) after Caesarean section. However, additional oxytocics may be required. Carbetocin is an oxytocin analogue, with a longer half life, which may reduce the requirement for additional treatment.
**Methods:** We conducted a double-blind randomised study of carbetocin versus syntocinon (1 : 1 ratio). The anaesthetist administered either the licensed dose (100 μg) of carbetocin intravenously after the delivery of the fetus or 5 IU syntocinon, from blinded ampoules. The surgeon was permitted to ask for additional oxytocics when required clinically. Elective and emergency Caesarean sections were included. We excluded women with multiple gestation, placenta praevia, placental abruption, gestation less than 37 weeks or undergoing general anaesthesia.
**Results:** 377 women were randomly assigned in the study. Both study groups had similar demographic and antenatal data. More women in the syntocinon arm needed additional oxytocic interventions (45.5% versus 33.5%, $p = 0.02$). A large proportion of women received a 4-h infusion of syntocinon (30.2% versus 22.3%, $p = 0.1$). There were no differences in the estimated blood loss, side-effect profile, intra and postoperative blood pressure and pulse readings or between pre and postoperative haemoglobin.
**Conclusions:** More than 40% of women required additional oxytocics following 5 IU syntocinon, but this was significantly reduced in the carbetocin arm. There was also a trend towards significance for a reduction in the use of a 4-h syntocinon infusion post-Caesarean section after carbetocin. This decrease in pharmacological intervention may reduce delay in transferring women to the postnatal wards postoperatively.

## PLD.03 CONTRACTILE PROPERTIES OF MYOMETRIUM IN TWIN PREGNANCIES

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Twin pregnancies present greater risks to both the mother and fetuses. The major clinical risk is that of preterm labour, with 40–70% of multiple pregnancies ending with preterm delivery (before 37 weeks).

Increased uterine stretch may play a role in this. There have, however, been no studies of the contractile properties of myometrium from multiple pregnancies and so we have investigated this and compared them with singleton pregnancies.

Following informed consent and ethical approval, myometrial biopsies were obtained at Caesarean section, from women having either singleton ($n = 11$) or twin ($n = 7$) pregnancies. Strips of myometrium were dissected, attached to a force transducer and mounted in a bath perfused with physiological solution. The force of contraction (relative to high-K depolarisation), duration and frequency of contractions were measured in both groups, as well as their response to 10 nmol oxytocin.

Myometrium from twin pregnancies contracted more frequently than singletons ($p = 0.02$), and there was a non-significant decrease in duration ($p = 0.06$), although when gestation was accounted for there was a significant decrease in duration ($p = 0.05$). Contractions from myometria of twin pregnancies were non-significantly more augmented by oxytocin ($p = 0.07$).

This first insight into the differences in myometria, showing increased contraction frequency in twin pregnancies, provides the basis for further work, such as oxytocin receptor and potassium channel expression, which may provide us with targets for tocolytics in pre-term multiple pregnancy.
**Funding:** This work has been supported by the Wolfson Foundation and the Jean Shanks Foundation.

## PLD.04 THE ROLE OF CERVICAL ELECTRICAL IMPEDANCE SPECTROSCOPY IN THE PREDICTION OF THE COURSE AND OUTCOME OF INDUCED LABOUR

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**Background:** We sought to compare the predictive value of cervical electrical impedance spectroscopy with clinical assessment by the Bishop Score (BS) for the course and outcome of induced labour.
**Methods:** 205 women undergoing indicated induction of labour were assessed by BS and cervical resistivity was measured using four probes of 3, 6, 9 and 12 mm diameter, before prostaglandin or amniotomy. The association of measured parameters with labour characteristics and outcomes (time to onset of labour, duration of labour, requirement for augmentation of labour and mode of delivery) were tested by correlation statistics, multilinear regression and receiver operator characteristic curve analysis.
**Results:** Compared with cervical resistivity the BS score better predicted time to onset of labour >12 h but neither correlated with the duration of labour nor predicted delivery by Caesarean section (CS). Conversely pre-induction cervical resistivity, measured with the 12 mm probe, between 19 and 156 kHz, better predicted labour duration and delivery by CS, being significantly increased in women who delivered by CS versus those who delivered vaginally and in labours >24 h. Prediction of CS was best at 78 kHz, with an optimal cut-off cervical resistivity of 2.24 Ω.m (area under the curve (AUC) 0.66, sensitivity 71.0%, specificity 56.5%). Prediction of labour duration was best at 39 kHz, with an optimal cut-off of 2.25 Ω.m (AUC 0.623, sensitivity 72.7%, specificity 55.4%).
**Conclusions:** Cervical electrical impedance spectroscopy predicts the duration and mode of delivery following induced labour better than the BS. Probe design may enhance the potential clinical utility of this technique.

## PLD.05 RANDOMISED CONTROLLED TRIAL TO COMPARE THE EFFECTIVENESS OF PROSTAGLANDIN GEL VERSUS TABLETS IN LABOUR INDUCTION AT TERM

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**Objective:** To compare the effectiveness of prostaglandin gel versus tablets in term labour induction.
**Design:** Prospective randomised controlled trial.
**Setting:** Patients attending for induction of labour at term.
**Participants:** 172 women aged 15–47 years (38–42 weeks of pregnancy).
**Interventions:** Women were randomly allocated to either prostin gel or tablets.
**Main Outcome Measures:** Time interval between induction to delivery. Other outcome measures: mode and indication of delivery, frequency of epidural usage, oxytocin used, epidural as analgesia, meconium staining in labour, uterine hyperstimulation, need for fetal blood sampling and admission to neonatal unit.
**Results:** 165 patients were randomly assigned, 83 to the gel arm and 82 to the tablet arm. Induction to delivery interval was

significantly shorter in the gel group, 1400 versus 1868 minutes ($p = 0.04$).
**Conclusions:** Prostin gel is more effective and has cost-benefit compared with tablets.

## PLD.06 A RANDOMISED TRIAL OF EPIDURAL VERSUS SPINAL ANAESTHESIA FOR CAESAREAN SECTION IN THE POTENTIALLY COMPROMISED FETUS

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**Background:** Spinal anaesthesia provides rapid and effective anaesthesia for elective Caesarean section. In healthy fetuses, spinal anaesthesia is associated with a statistically significant, but clinically irrelevant, reduction in umbilical arterial pH compared with epidural anaesthesia. We hypothesised that in the potentially compromised fetus, spinal anaesthesia would result in a clinically significant reduction in umbilical artery pH (defined as a fall of 0.05).
**Methods:** 60 women with severe pre-eclampsia, a small-for-gestational-age fetus or both were randomly assigned to spinal (SA: 12.5 mg bupivacaine 0.5% + 300 μg diamorphine) or epidural (EA: 50 mg bupivacaine 0.5% + 50 μg fentanyl) anaesthesia stratified by umbilical artery Doppler. An intravenous infusion of phenylephrine was used to prevent hypotension in all women. Haemodynamic measurements included maternal cardiac output (measured by Doppler and cross-sectional echocardiography) and umbilical artery pulsatility index.
**Results:** Three women were randomly assigned but not studied. Mean gestational age at randomisation was 33 weeks and mean (SD) umbilical artery pulsatility index was 1.86 (1.37). Baseline mean (SD) umbilical artery pH and base excess was similar in the two groups (SA 7.26 (0.07), −3.80 (2.94) versus EA 7.25 (0.11), −4.36 (4.39), respectively). Despite greater falls in systolic blood pressure (SA (23 (27) versus EA 14 (17) mm Hg, $p = 0.004$) and diastolic blood pressure (SA 14 (17) versus EA 5 (14) mm Hg, $p = 0.02$), there were no differences in cardiac output and umbilical artery Doppler after anaesthesia.
**Conclusions:** Spinal anaesthesia, with optimum hypotension prophylaxis, does not adversely affect acid base status in the potentially compromised fetus.

## PLD.07 CHILDBIRTH IN A STAND-ALONE MIDWIFE-LED UNIT: TRANSFERS AND OUTCOMES

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**Background:** The midwife-led maternity unit at the Royal Bournemouth Hospital (BMU) was opened in February 1992, the first in the United Kingdom. Patients requiring consultant care during labour have to be transferred to the consultant-led unit at Poole Hospital (PCU), 9 miles away. Despite the existence of midwife units in the United Kingdom for over 15 years, there remains a lack of good quality evidence on the safety of these units.
**Objectives:** To establish the incidence of intra and postpartum patient transfers between BMU and Poole Hospital and the reasons for transfer. To assess the time taken for interhospital transfers and potential problems. To determine the incidence of any maternal or neonatal adverse events.
**Design:** A retrospective, descriptive study of all patients transferred in labour or after delivery from BMU to PCU between 1 January 2007 and 30 June 2007.
**Main Results:** 238 women were admitted to BMU in labour. Of these, 31% (74) were transferred, of which 67% (60) were primigravidas. The mean time for transfer between the two units was 56 minutes. There were seven (9%) adverse neonatal events and 25 (20%) adverse maternal events, with an 8.4% emergency Caesarian section rate.
**Conclusions:** Midwife units are promoted as a way of offering choice to low-risk patients. However, patients should be made aware of their risk of transfer as well as possible adverse outcomes. This will only be possible if all units undergo continuous audit and participate in a national reporting system, which includes serious adverse maternal and neonatal events.

## PLD.08 FETAL DISTRESS: A MYOMETRIAL PERSPECTIVE

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Fetal distress (FD) occurs when the fetus is deprived of oxygen. During labour, the uterus contracts in order to expel the fetus. This contraction compresses the vasculature supplying the placenta with oxygenated blood and the supply of oxygenated blood to the uterus and fetus is reduced. The resultant decrease in blood supply gives rise to an accumulation of acidic carbon dioxide and lactate. This acidification inhibits uterine contraction, helps to relax the uterus and therefore protects the fetus. If this inhibitory feedback system is altered, then it may give rise to problems in labour and increase the risk of FD. We investigated whether patients with FD had altered uterine contractility and if they respond differently to uterine acidification.

Uterine biopsies were obtained with patients' consent during Caesarean delivery. Contractility of uterine strips was measured at physiological and acidic pH (pH 7.5 and pH 7.3, respectively). Expression of lactate dehydrogenase was measured in biopsies by Western blot, and lactate dehydrogenase isoenzyme activity was assayed using the Helena Biosciences SAS-1plus electrophoresis system.

Contractility of uterine strips was significantly increased ($p = 0.0002$) in FD ($6.726 \pm 0.903$ mN, $n = 18$) when compared with control labouring strips ($2.878 \pm 0.289$ mN, $n = 19$). Upon acidification, the FD strips were significantly ($p = 0.02$) more inhibited by acidification to pH 7.3 compared with labouring control strips ($1.524 \pm 0.918$ mN, $n = 5$ and $0.346 \pm 0.257$ mN, $n = 5$, respectively).

This study shows that FD is strongly associated with high uterine contractility. Also, uterine biopsies from patients with FD respond differently to changes in pH, suggesting an altered metabolic process.

## PLD.09 UK SURVEY OF ANTIBIOTIC TREATMENT OF WOMEN WITH SPONTANEOUS PRETERM LABOUR OR PRETERM RUPTURE OF THE MEMBRANES

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**Objective:** To determine practice regarding antibiotic treatment of women with spontaneous preterm labour (SPL) or preterm rupture of the membranes (PROM) before publication of ORACLE Children Study (expected spring 2008).
**Design:** Questionnaire survey of practice in 2007.
**Setting:** All obstetric units.
**Population:** Clinical directors of obstetric units.
**Methods:** Questionnaire regarding practice of antibiotic treatment for women with either SPL or PROM. Reminders are sent after one month.
**Main Outcome Measures:** Number of obstetric units offering treatment based on Cochrane systematic reviews.
**Results:** Response rate of 76% (163/214). SPL 78.5% (128/163) reported they did not treat these women and the majority stated that the evidence of benefit was not conclusive 71% (72/101). 21.4% (35/163) stated they did treat these women, with erythromycin (16/35), penicillin (15/35), or ampicillin (2/35). Reasons given included Guillain-Barré syndrome prophylaxis (10/29) and evidence

of benefit (9/29). PROM 97.5% (159/163) prescribe antibiotics for these women, with 97% (154/159) using erythromycin. The majority stated there was evidence of benefit 82% (93/113).

**Conclusions:** Evidence from the Cochrane reviews suggests that antibiotic treatment is of no benefit with SPL.[1] Whereas the majority (78.5%) of obstetric units stated they do not offer antibiotics, over 20% stated they did treat these women. Evidence suggests that antibiotic treatment (erythromycin) is of benefit with PROM;[2] the majority of UK women received this treatment.


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## PLD.10 THE LONGITUDINAL STUDY OF THE OUTCOMES OF OPERATIVE BIRTHS FOR MALPOSITION IN THE SECOND STAGE

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**Introduction:** Malposition of the fetal head is a major cause of operative birth during the second stage of labour. Liverpool Women's Hospital has available expertise in all approaches for this indication—Kjelland's forceps (KF), rotational ventouse (VEN) or manual rotation (MR) and careful case selection is emphasised.

**Methodology:** A retrospective case note audit has been performed for deliveries between 2002 and 2008 at Liverpool Women's Hospital. Deliveries were grouped by initially intended method for rotation delivery. Successful rotational delivery was defined as completion of vaginal delivery using a single instrument for VEN/KF or by successful rotation followed by the use of a single traction instrument for MR.

**Results:** 605 deliveries have been examined. Demographic features of groups were similar. The technique initially chosen to achieve birth was KF in 239, VEN in 117, MR in 48 and primary Caesarean section in 201. KF (85.4%) was significantly more likely to be successful than MR (64.6%) and VEN (45.3%). MR was associated with the highest percentage of neonatal morbidity (admission to neonatal intensive care unit, pH <7.0, 5-minute Apgar score <6) and maternal morbidity (major postpartum haemorrhage or trauma) (14.6% and 14.6%, respectively). The results show that only a small number of rotational deliveries that failed proceeded to Caesarean section (54/404 13.4%).

**Conclusions:** Careful choice of the appropriate technique for each woman achieves high success rates for vaginal birth for delay in the second stage secondary to malposition without exposure to high morbidity for either woman or baby.

## PLD.11 OXYTOCIN-INDUCED MYOMETRIAL CONTRACTIONS IN THE PRESENCE OF NIFEDIPINE, TOWARDS UNDERSTANDING THE MECHANISM

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**Background:** Oxytocin-induced release of calcium ions ($Ca^{2+}$) from sarcoplasmic reticulum (SR) and sensitisation of contractile proteins to $Ca^{2+}$ have been suggested to mediate the oxytocin-induced potentiation of myometrial contractions.

**Objective:** We investigated the effects of oxytocin in the presence of nifedipine, a known inhibitor of the L-type calcium channel.

**Methods:** Samples of myometrium were obtained from women undergoing term Caesarean section with the approval of the local ethics committee. A standard organ bath system (AD Instruments, UK) was employed to analyze contractile activity. Stable spontaneous contractions were recorded for 40 minutes before addition of nifedipine.

**Results:** In agreement with our previous findings, application of oxytocin to spontaneously active strips produced a two-component effect: a transient tetanus-like contraction, followed by prolonged augmentation of phasic contractions. Nifedipine (1 μmol) rapidly abolishes spontaneous contractions; the subsequent addition of 100 nmol oxytocin produced an initial, transient rise in force followed by high frequency oscillations in >50% of strips. Calcium-free solutions confirm these oscillations are due to $Ca^{2+}$ entry. No inhibition of oscillations was seen by either disabling the SR store with thapsigargin, T-type calcium-channel blockade by mibefradil (1 μmol) or 2-aminoethyldiphenylborate 50 μmol inhibition of the $IP_3$ receptor and store-operated calcium channel. Partial inhibition was seen with the store-operated calcium channel inhibitor SKF-96365 (50 μmol). The gap-junction inhibitor carbenoxolone (200 μmol) showed rapid abolition of oscillations.

**Conclusions:** Based on these results, we believe that gap junctions between myometrial cells are important in the maintenance of these oscillations. Further work needs to be completed for clarification of the mechanism.

## PLD.12 HIGH DEPENDENCY CARE PROVISION IN THE MATERNITY UNITS OF THE UNITED KINGDOM

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No national data exist as to what high dependency (HD) facilities exist in maternity units in the United Kingdom. However, the latest confidential enquiry suggested that HD facilities within labour wards are absorbing the rise in the number of women with major haemorrhage. Successive enquiries have recommended that critically ill patients should be cared for in a HD unit with adequate staff and facilities. Our aim was to assess HD provision and staffing in UK maternity units.

We carried out a self-report survey of 235 maternity units in the United Kingdom between September and December 2007.

159 questionnaires were returned (67.6% response rate). The mean number of deliveries per year is 3451 (240–8000). 56% of units have designated HD beds. Median provision is one bed per unit. In units with no specific maternity HD facilities, care is provided either in a room on the delivery suite (44%), in a separate HD unit used by surgical patients (34%) or in the obstetric theatre recovery area (22%).

Patients in obstetric HD beds are nursed, almost exclusively, by midwives (95%), but less than a third of these have any formal HD training. Joint medical care, by obstetricians and anaesthetists, is provided in 71.6% of units.

The main issues identified by responding units were: (1) the need for HD facilities in the delivery suite; (2) formal training for those providing frontline care; (3) improved midwifery staffing levels.

This survey clearly demonstrates major, and potentially life-threatening, deficiencies in the organisation and provision of HD care in UK maternity units.

## PLD.13 INTRAPARTUM STILLBIRTHS: 10-YEAR ANALYSIS BY RECODE

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**Background:** The number of stillbirths during labour and delivery has remained fairly constant over recent years and many remain unexplained. In his annual report published in 2007, the Chief Medical Officer called for renewed efforts to identify the factors associated with intrapartum-related deaths.

**Methods:** A 10-year database (1997–2006) of stillbirths in the West Midlands was investigated, using the ReCoDe classification[1] to determine the relevant conditions at death.

**Results:** There was a total of 3802 stillbirths over the 10-year period, including 386 intrapartum deaths (10.2%). 41.2% of deaths occurred after term (37+ weeks). According to ReCoDe, the main categories of intrapartum deaths were fetal growth restriction (<10th customised percentile) 33.2%; intrapartum asphyxia 26.4%; placental abruption 24.6% and cord accident 8.0%.
**Conclusions:** The results suggest that many intrapartum deaths are potentially avoidable with better awareness and care. Antepartum recognition of fetal growth restriction is important as an alert of potentially diminished intrapartum fetal reserve.

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## PLD.14 ASSESSING THE HUMAN CERVIX BY IMPEDANCE SPECTROSCOPY: WHAT HISTOLOGICAL TISSUE CHANGES ACCOUNT FOR THE CLINICAL HUMAN OBSERVATIONS

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**Background:** Electrical impedance spectroscopy (EIS) has demonstrated differences in resistivity between the pregnant and non-pregnant cervix. However, the tissue morphological characteristics that inform the resistivity spectra obtained are unclear. We hypothesised that several epithelial and stromal components that change during pregnancy would influence cervical resistivity to different degrees. We therefore sought to determine what cervical tissue elements correlated with cervical resistivity over 30 electrical frequencies.
**Methods:** Cervical biopsies of fresh hysterectomy specimens from non-pregnant women were assessed for epithelial layer thickness, epithelial cell sizes, connective tissue (collagen), fibroblast and blood vessel content. Additional samples were treated with collagenase in Hanks balanced salt solution (vehicle) or vehicle alone for 2 h. Cervical resistivity was measured using a 5 mm probe in all fresh samples before light microscopy and compared with histological findings.
**Results:** Compared with untreated tissue, collagenase treatment reduced cervical resistivity at low frequencies. Epithelial thickness and cell widths showed medium correlation with cervical resistivity at lower frequencies (coefficient 0.56, $p<0.001$ at 8 kHz and 0.414, $p<0.05$ at 6.3 kHz, respectively). Blood vessel proportions and collagen content affected impedance (correlation coefficient 0.48, $p<0.05$ at 4 kHz and 0.60, $p<0.05$ at 812 kHz, respectively). Fibroblast content had no significant correlation with impedance.
**Conclusions:** The key tissue determinants of cervical resistivity values are connective tissue content, epithelial thickness and cell width and blood vessel content. Information regarding these characteristics following cervical remodelling prelabour may enable probe design enhancements that optimise the assessment of cervical resistivity as a clinical tool for prelabour cervical assessment.

## PLD.15 "SAFE" TRAINING TO SAVE MOTHERS' LIVES AND BABIES FROM INJURY

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Investigators for the Confidential Enquiries into Maternal and Child Health have repeatedly identified substandard care, with inadequate communication and poor teamwork as major contributors, in a significant proportion of maternal, fetal and neonatal deaths in the United Kingdom. This has been reflected in the Clinical Negligence Scheme for Trusts standards and the "Safer Childbirth—Minimum Standards for the Organisation and Delivery of Care in Labour" paper, which recommend specific training in obstetric emergencies and group dynamics for all those who are involved in the management of women in labour or their babies.

We designed the multicentre Simulation and Fire-Drill Evaluation (SaFE) study to evaluate the effectiveness of multiprofessional obstetric emergencies training. The results demonstrate that training improves knowledge, communication, team behaviour scores and other markers of care during the management of simulated obstetric emergencies, such as shoulder dystocia or eclampsia, even without additional teamwork training. This translated into safe practice; in our unit and others where mandatory training was introduced, neonatal outcomes significantly improved. Following the training intervention, the risk of babies delivered with low Apgar scores, hypoxic ischaemic encephalopathy or brachial plexus injury was reduced by at least 50%.

Not all courses have been able to demonstrate an improved outcome after obstetric emergency training. We suggest that effective training programmes should include: (1) institution level incentives to train; (2) relevant and situated training; (3) team working principles integrated into the course; (4) realistic training tools; (5) multiprofessional involvement and 100% staff participation; (6) peer monitoring and (7) continuous monitoring of outcomes.

## PLD.16 WITHDRAWN

## PLD.17 EPIDURAL ANALGESIA: THE ASSOCIATION WITH MATERNAL AND FETAL URATE

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**Introduction:** Epidural analgesia in labour is associated with a rise in maternal and fetal temperature.[1] Unpublished work in our department indicated a concomitant rise in umbilical cord urate levels. It was hypothesised that this might represent a fetal antioxidant response to the oxidative stress of labour. One aim of our follow-up study was to investigate the relationship between maternal and fetal urate levels, duration of epidural and temperature.
**Methods:** After regional ethics committee approval and written consent, 30 women in labour with epidural analgesia were randomly assigned to one of two cooling groups or a control group. Hourly oral temperatures were recorded and maternal venous blood samples taken at epidural insertion and delivery, plus an umbilical venous sample for the measurement of urate levels. Regression analysis was performed using SPSS with $p<0.05$ indicating statistical significance.
**Results:** There was significant correlation between the duration of epidural and maternal urate ($R^2 = 0.131$, $p = 0.049$) but no independent correlation with the rise in maternal temperature. The cord urate was closely correlated with the maternal urate levels (Pearson correlation 0.953).
**Discussion:** Our findings confirm that maternal and fetal urate levels increase in parallel with the duration of epidural anaesthesia but that this rise is not associated with the rise in maternal temperature. The very close correlation between maternal and cord urates suggests that the rise in the fetus is likely to be an infusion effect from the mother.

1. **Fusi L,** Steer PJ, Maresh MJ, *et al*. Maternal pyrexia associated with the use of epidural analgesia in labour. *Lancet* 1989;**1**:1250–2.

## PLD.18 RISK OF LATE INTRAUTERINE FETAL DEATH IN UNCOMPLICATED MONOCHORIONIC TWINS: A RETROSPECTIVE COHORT STUDY

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**Background:** Monochorionic twins have an increased risk of morbidity and mortality. Recent reports suggest that even in

uncomplicated monochorionic diamniotic (MCDA) twins there is an increased risk of late intrauterine fetal death (IUD) predominantly after 32 weeks, leading to a recommendation in some units for elective delivery at 34 weeks.

**Aim:** We aimed to determine the risk of unexpected IUD in uncomplicated MCDA pregnancies beyond 24 weeks in our unit.

**Methods:** Data were collected on all MCDA twin pregnancies presenting to the Leeds General Infirmary from January 2005 to January 2008. MCDA twins were scanned every 2 weeks from diagnosis. ''Complicated'' MCDA gestations (twin-to-twin transfusion syndrome (TTTS), intrauterine growth restriction (IUGR), structural anomalies and delivery <24 weeks) were excluded.

**Results:** 281 twin pregnancies were delivered in the time period; 63 were MCDA twins with seven TTTS, six IUGR, three structural anomalies, three <24 weeks. 44 were ''uncomplicated'' MCDA twins. There were no intrauterine fetal deaths.

**Discussion:** Some studies quote unexplained fetal death rates of up to 4.6% in ''uncomplicated'' MCDA pregnancies leading to a policy of delivery at 34 weeks.[1] Our study does not support this. Delivery at 34 weeks carries increased neonatal and maternal morbidity. In view of our findings ''uncomplicated'' MCDA twins are not delivered until 37–38 weeks in our unit.

1. **Barigye O**, *et al*. High risk of unexpected late fetal death in monochorionic twins despite intensive ultrasound surveillance: a cohort study. *Pics Med* 2005;**2**:0521–6; e172.

## PLD.19 PERINEAL TRAUMA IN OPERATIVE VAGINAL DELIVERY WITHOUT EPISIOTOMY

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**Introduction:** Operative vaginal delivery (OVD) increases the risk of perineal trauma. Traditionally, episiotomy is performed at the time of OVD in an effort to reduce the severity of perineal trauma. Omitting to perform an episiotomy is becoming more commonplace but the consequences of this are not well described.

**Aims:** To determine the frequency of ''no episiotomy'' among women undergoing OVD. To describe the perineal trauma associated with ''no episiotomy''.

**Study Design:** Clinical data from the Princess Royal Maternity Unit, Glasgow, were collected retrospectively for the 326 women undergoing OVD between 1 February 2007 and 30 July 2007. Variables included: type of OVD, use of episiotomy, degree of perineal trauma and requirement for suturing.

**Results:** Delivery was by non-rotational forceps (58%), non-rotational ventouse (33%), rotational forceps (7%) and rotational ventouse (2%). Episiotomy was not performed in 13%. Group with no episiotomy: intact perineum (24%); first degree tear (19%); second degree tear (50%); third/fourth degree tear (7%); proportion requiring suturing (67%). Group with episiotomy: first degree tear (4%); second degree tear (87%); third/fourth degree tear (9%); proportion requiring suturing (99%).

**Conclusions:** 24% of women having OVD without episiotomy have an intact perineum and there is no increase in the incidence of severe perineal trauma. There is a reduction in the incidence of suturing when an episiotomy is not performed. This non-randomised comparison supports the selective use of episiotomy at OVD.

## PLD.20 DIGIT PREFERENCE AND THRESHOLD AVOIDANCE: A COMMON CAUSE OF ERROR IN ESTIMATED BLOOD LOSS ASSESSMENT?

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**Objective:** Postpartum haemorrhage (PPH) complicates 5–12% of all deliveries and is increasing. Current local policy is to document estimated blood loss (EBL). Digit preference and threshold avoidance are acknowledged confounders in other areas, but have not been assessed or described with EBL. This dataset afforded the opportunity to examine practice at a large inner-city London teaching hospital.

**Abstract PLD.20**

| EBL (ml) | 497 ml | 498 ml | 499 ml | 500 ml | 501 ml | 502 ml | 503 ml |
|---|---|---|---|---|---|---|---|
| n | 1 | 5 (0.02%) | 244 (0.77%) | 2966 (9.33%) | 0 | 0 | 0 |

EBL, estimated blood loss.

**Methods:** Data were obtained for all deliveries between 2000 and 2005 (n = 31 776).

**Results:** 76% of women had EBL ⩽499 ml, 20% >500–999 ml, 2% ⩾1000–1499 ml and 1.6% ⩾1500 ml. Digit preference was demonstrated with most EBL ending in 0, 00 and 50. Threshold avoidance was apparent, particularly in blood loss up to 1 litre. Both these factors were most apparent at 500 ml, the worldwide definition of PPH. EBL around 500 ml are shown in the table. The overall PPH rate was 24%. If 499 ml and 450–498 ml represent threshold avoidance, it could have been as high as 25 or 30%. Defining PPH as ⩾ or >500 ml would make a difference of 24% or 14%.

**Conclusions:** The reporting of digit preference and threshold avoidance in this context is original, inclining towards underestimation. Threshold preference (choosing 500 ml) is novel and unexplained. Digit bias could adversely influence management. It cannot help patients or data collection for managerial, audit or research purposes. Future work should focus on accurate estimation, direct measurement, psychological responses to emergencies, maternity culture and training.

## PLD.21 OPERATIVE DELIVERY IN SECOND STAGE IN THEATRE: A COMPARISON IN OUTCOME WITH AND WITHOUT CONSULTANT VAGINAL ASSESSMENT PREOPERATIVELY

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**Background:** Second stage Caesarean section is associated with high maternal and neonatal morbidity. This risk is further increased by failed multiple use of trial of instrumental delivery. Vaginal examination findings help in decision making on whether to proceed to Caesarean section or try an instrumental vaginal delivery and also which instrument is more likely to achieve a vaginal delivery.

**Aim:** To compare outcomes after registrar and consultant vaginal examination preoperatively with registrar vaginal examination only and consultant informed over the phone (out of hours).

**Methods:** After the registrar assessed the patient and made the decision to take to theatre, the consultant reassessed patient and findings and further management plans were compared. If out of hours then the consultant was informed by phone before proceeding with operative delivery.

**Results:** Data for 82 women over a 5-month period were analyzed. 22 women had both registrar and consultant assessment preoperatively. There were differences in vaginal examination findings in 11 (50%) cases; this led to a change in management plans in four women (18.2%). In the registrar-only group 52 (86.7%) of the 60 had trial with 38 (73%) successes. In the consultant vaginal examination group 17 (72%) had trial with 12 (71%) successes. Maternal and fetal morbidity were 18% and 0.9%, respectively (with consultant vaginal examination), 17% and 1%, respectively (without consultant vaginal examination).

**Conclusions:** There was a difference in vaginal examination findings in 50% of the cases and this necessitated a change in planned mode of delivery in 18% of the women. There was no difference in success rate of trial of instrumental deliveries, maternal and fetal morbidity.

## PLD.22 PROSPECTIVE STUDY OF INTRAPARTUM FETAL BLOOD SAMPLING

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Intrapartum fetal blood sampling (FBS) is an important adjunct to electronic fetal monitoring in assessing the potentially hypoxic fetus. Our aims were to assess the time taken from decision to result for FBS and any factors influencing this.

**Methods:** From 1 June to 31 July 2007, 125 samples were taken from 42 women. The operator, the time of decision, the time of result, maternal BMI and cervical dilatation were recorded.

**Results:** Only 61/125 samples (49%) yielded results. The average decision-to-FBS result interval was 20 minutes (range 6–65). In 82% of cases, decisions were made with a single result. If delivery was indicated, the FBS decision-to-delivery interval was 49 minutes (range 43–58). Machine malfunctions accounted for 58% of the failures to obtain results. Maternal BMI >30 significantly increased the risk of failure to obtain a result (overall relative risk 4, 95% CI 1.8 to 9) and the time taken to achieve a result (15 versus 28 minutes, $p<0.001$). Cervical dilatation <5 cm yielded a success rate of 57% and >5 cm yielded 70%. Grade of operator did not significantly affect the success rate.

**Conclusions:** The decision-to-result interval should be considered when undertaking FBS or planning a repeat test, especially with high BMI. Maternal BMI >30 increases the time to obtain a sample and the failure rate. FBS at cervical dilatation <5 cm is achievable and should be considered if indicated. Practical education with simulators to improve collection techniques and alternative blood collection systems may reduce procedure time and failure rates.

## PLD.23 CAESAREAN SECTION RATES AMONG FEE AND NON-FEE-PAYING NULLIPARAS ARE SIMILAR WHEN THE MANAGEMENT OF LABOUR IS MIDWIFERY LED

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**Objective:** Comparison of the Caesarean rates in fee and non-fee-paying single cephalic term nulliparous patients.

**Methods:** Data were collated prospectively for 2005–7 and analyzed for groups 1 and 2 of Robsons' classification.[1]

**Results:** The overall Caesarean section rate was 15.4% (1460/9472). The onset of labour was spontaneous in 67.5% (6390/9472), induced in 30% (2850/9472) and there were 232/9472 pre-labour Caesarean sections (2.5%). The overall Caesarean section rate in spontaneous labour was 6.6% (425/6390) and was similar for non-fee 6.4% (342/5301) and fee-paying 7.6% (83/1089) patients ($p = 0.2$) and in induced labour 28.3% (2213/4982) and 27.3% (196/718), respectively. The Caesarean section rates for pre-labour Caesarean sections were higher in private patients (2.1% versus 3.8%) The Caesarean section rate among non-fee patients was 14.6% (1109/7593) and was significantly less compared with fee-paying patients 18.7% (351/1879) ($p<0.001$); this difference is explained by a significantly lower induction rate among public patients (26.8%; 1301/7593 versus 38%; 718/1879, $p<0.001$) resulting in fewer Caesarean deliveries. The overall Caesarean section rate for spontaneous and induced labour combined was significantly higher in the fee-paying cohort (15.4%; 279/1807 versus 12.8%; 949/7430, $p<0.001$).

**Conclusions:** Midwifery-led management of spontaneous and induced labour results in similar Caesarean delivery rates for fee and non-fee-paying patients. The higher Caesarean rate among fee-paying patients reflects decisions (selection for induction of labour) made before the onset of labour.

1. **Robson MS.** Classification of Caesarean sections. *Fetal Maternal Med Rev* 2001;**12**:23–39.

## PLD.24 TRIAL OF LABOUR IN PATIENTS WITH ONE PREVIOUS CAESAREAN SECTION: DOES MATERNAL AGE AFFECT THE OUTCOME?

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**Objective:** To evaluate the effect of maternal age on the rate of vaginal delivery in patients undergoing trial of labour after one previous lower segment Caesarean delivery.

**Design:** The study included all women with a live singleton pregnancy over 37 weeks' gestation undergoing a trial of labour after one previous Caesarean delivery between January 2002 and December 2006. Patients were divided into four groups depending on the maternal age (<30, 30–34, 35–39 and >40 years). Women with no previous vaginal delivery and at least one previous vaginal delivery were analyzed seperately. The rate of vaginal delivery and the rate of uterine rupture were analyzed using binominal logistic regression. SPSS 14 was used.

**Results:** There were 6387 patients who met the study criteria (see tables 1 and 2).

**Conclusions:** Increased maternal age had an impact on delivery outcomes. Previous vaginal delivery increases the vaginal birth after Caesarean rate. Women over 40 years were more likely to have repeat Caesarean delivery.

**Abstract PLD.24 Table 1** Total number of patients in each subgroup

| Age (years) | Para 1 | Para >1 (previous vaginal delivery) |
|---|---|---|
| <30 | 703 | 797 |
| 30–34 | 1133 | 1213* |
| 35–39 | 990* | 1080* |
| >40 | 214 | 257* |

*Represents uterine ruptures.

**Abstract PLD.24 Table 2** Vaginal birth after Caesarean rate in each subgroup

| Age (years) | Para 1 | Para >1 |
|---|---|---|
| <30 | 58.8% (n = 414) | 68.9% (n = 549) |
| 30–34 | 46.4% (n = 526) | 64.3% (n = 780) |
| 35–39 | 43.9% (n = 435) | 60.3% (n = 651) |
| >40 | 40.6% (n = 87) | 61.5% (n = 158) |

## PLD.25 NEONATAL OUTCOMES OF THE SECOND TWIN BASED ON MODE OF DELIVERY

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**Background:** The decision about mode of delivery for twin pregnancy is challenging, especially in the light of the fact that one or both twins frequently have malpresentation. In the absence of limited evidence, clinical opinion is frequently divided on choosing the mode of delivery.

**Methods:** A retrospective review of 132 twin deliveries was conducted for 2005–6. Data were extracted on type of delivery, patient age, body mass index, parity, type of twin, gestational age, presentation (cephalic/non-cephalic) and neonatal outcomes for the second twin (admission to neonatal unit, arterial pH and Apgar scores). Multivariate regression analysis was performed for each neonatal outcome adjusting for the variables mentioned. Analyses were conducted separately for the type of delivery planned (intention-to-treat) and actually conducted (per-protocol).

**Results:** Vaginal delivery was planned in 102 cases and Caesarean section in 30 cases. Admission to the neonatal unit for the second twin was not significantly different comparing Caesarean section and vaginal delivery on both intention-to-treat (adjusted odds ratio (OR) 0.21; 95% CI 0.01 to 4.74) and per-protocol analyses (adjusted OR 1.63; 95% CI 0.15 to 18.40). There was no significant difference in arterial pH between the two groups in either analysis. The Apgar score at 1 minute was significantly higher in the Caesarean section group on both intention-to-treat (2.28 points; 95% CI 0.73 to 3.82) and per-protocol analyses (1.32 points; 95% CI 0.05 to 2.60), but there were no significant differences in the Apgar score at 5 minutes.
**Conclusions:** The neonatal outcomes for the second twin are similar regardless of the mode of delivery.

## PLD.26 THE PATERNAL PERSPECTIVE OF CHILDBIRTH

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**Background:** As the role of the father has extended from breadwinner to a full domesticated involvement, it is unsurprising that their presence at childbirth is now an accepted part of western culture. The father, often present from booking appointment to cutting of the cord, is often overlooked. This is reflected by the scarcity of research into their perceptions of birth.
**Objective:** To assess paternal attendance at antenatal classes and examine whether they influenced fathers' satisfaction with labour.
**Methods:** A Likert-style health service evaluation questionnaire, developed from literature, was completed by 45 new fathers who had attended normal births.
**Results:** 45 fathers (27 first-time (FT), 18 existing (E), age 22–26 years) completed the questionnaire. 55% (25) had attended antenatal classes (67% FT, 39% E). Mean paternal satisfaction score was 78% (SD 9.44 range 56–100%). There was no statistically significant difference in the satisfaction of those who had attended antenatal classes (FT 78% and E 83%) with those who had not (FT 74% and E 79%). The majority strongly agreed that it was their decision to attend (FT 70%, E 88%) and had felt prepared for birth but still felt scared by it. Most had no concerns about their future sex life and were pleased to have attended.
**Conclusions:** High levels of paternal satisfaction were found to be independent of antenatal class attendance. Further studies are necessary to assess the benefits and cost effectiveness of antenatal classes and investigate the paternal perspective of childbirth.

## PLD.27 PREDICTIVE MODEL FOR SHOULDER DYSTOCIA

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The majority of studies suggesting that shoulder dystocia (SD) is associated with prolonged second stage are retrospective. We aimed to assess 5 years of prospective births to determine which intrapartum factors are important in predisposing to SD.
**Methods:** Computerised medical records of all patients who delivered in Liverpool Women's Hospital (a tertiary care university teaching hospital) for a 5-year period were obtained from MEDITECH. Inclusion criteria were singleton, cephalic, 37+ weeks with vaginal birth. Univariate and then a stepwise logistic regression analysis were done using SPSS.
**Results:** Out of 23 762 births that fulfilled the criteria 426 had SD (see table).
**Conclusions:** Of all factors studied, birthweight and length of second stage were most significant. A predictive model has been devised. Receiver operator characteristic curves have been devised for the model and will be presented.

**Abstract PLD.27**

| | Significance | Exp (B) |
|---|---|---|
| Length of second stage (a) | 0.000 | 1.990 |
| Birthweight (b) | 0.000 | 9.031 |
| Epidural (c) | 0.494 | 1.084 |
| Onset of labour (d) | 0.084 | 1.200 |
| Constant | 0.000 | 0.008 |

## PLD.28 OUTCOME FOLLOWING A THIRD DOSE OF VAGINAL PROSTAGLANDIN TABLETS (3 MG $PGE_2$) FOR INDUCTION OF LABOUR

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**Introduction:** The NICE guideline for induction of labour (IOL) recommends the use of vaginal prostaglandin ($PGE_2$) tablets. The recommended regimen is 3 mg $PGE_2$ 6–8-hourly with a maximum dose of 6 mg. If the cervix remains unfavourable, our practice has been to consider a further 3 mg $PGE_2$.
**Methods:** A retrospective review of all women receiving a third 3 mg $PGE_2$ tablet for IOL between January 2005 and December 2006 was undertaken.
**Results:** Of the 1149 women who were induced with vaginal $PGE_2$ tablets over the study period, 100 received three $PGE_2$ tablets. The mean gestational age at IOL was 40–41 weeks and the commonest indication "post-dates" (48%). Cervical assessment before a third dose of $PGE_2$ was performed by a middle-grade or above in 97% of cases but the Bishop score was only documented in 40%. The mode of delivery is documented in the table. The overall Caesarean section rate was 49% in this group of women—54% for primigravid women and 24% for parous women. This compares with a section rate of 27% for all women undergoing IOL with prostaglandins during the study period (35% for primigravid and 16% for parous).
**Conclusions:** The delivery outcomes for those women receiving a third 3 mg dose of $PGE_2$ show that just over 50% of these women achieve a vaginal delivery. The actual figures could allow more accurate counselling in the decision-making process during IOL.

**Abstract PLD.28**

| | Primigravid (n = 83) | Parous (n = 17) |
|---|---|---|
| Caesarean section | 45 | 4 |
| Spontaneous vaginal delivery | 21 | 13 |
| Assisted vaginal delivery | 17 | 0 |

## PLD.29 OUTCOME OF EXTERNAL CEPHALIC VERSION AT A DISTRICT GENERAL HOSPITAL: OUR 1-YEAR EXPERIENCE

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**Background:** Vaginal breech delivery is associated with increased perinatal morbidity and mortality.[1] The RCOG recommends that all women with an uncomplicated breech at term should be offered external cephalic version (ECV).[2] ECV significantly reduces the Caesarean section rate. It is a cost effective, although underused, procedure with variable success. There appears to be a resurgence in the past two decades, with a national success rate of approximately 50%.
**Aim:** To assess the outcome of ECV at our unit in order to identify educational/training needs.

**Materials and Methods:** A prospective questionnaire-based study over a 1-year period from September 2004 to September 2005 at Wexham Park Hospital, Slough. During this period 40 eligible women with breech presentation at term had ECV attempted. Women with contraindications for ECV were excluded. Relevant data were obtained at the time of the procedure. Data regarding mode of delivery after successful ECV were obtained from the maternity database.
**Results:** The audit showed an ECV success rate of 62.5% (25/40) in our hospital. None of the women had procedure-related complications. More than 95% (24/25) of women with successful ECV delivered vaginally. There was a positive correlation of success rate with higher parity. Success rate was almost equal between 37 and 40 weeks' gestation.
**Conclusions:** The outcome of ECV at Wexham Park Hospital is encouraging. As recommended by RCOG we suggest that all women with uncomplicated breech at term should be offered ECV. Specialty trainees should actively participate to acquire counselling and procedural skills.

1. **Term Breech Trial Collaborative Group**. *Lancet* 2000;**356**:1375–83.
2. **RCOG guideline no 20a**. External cephalic version and reducing the incidence of breech presentation.

## PLD.30 LIVING WITH STAN: EARLY EXPERIENCE OF INTRAPARTUM FETAL SURVEILLANCE USING FETAL ECG ST SEGMENT ANALYSIS

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**Aims:** Our aims were to assess the frequency of ST events and obstetric outcomes after the introduction of fetal ECG ST analysis (STAN) to Ninewells Hospital, Dundee, in October 2007.
**Methods:** Data were collected prospectively from all women who had STAN between 1 October 2007 and 31 December 2007. Following an ST event, the cardiotocograph (CTG) was reviewed and classified as normal, intermediary or abnormal. Action was required if the STAN guideline criteria were met.
**Results:** 142/721 (20%) women who received continuous intrapartum electronic fetal monitoring had STAN. There were 400 ST events (median 3, range 1–32) and 338/400 (84%) were associated with a normal CTG. 80/142 (56%) women had at least one ST event. 68/80 (85%) with an ST event required no immediate action. 4/80 (5%) required immediate delivery. 24/142 (17%) had fetal blood sampling, 34/142 (24%) required operative vaginal delivery and 43/142 (30%) required emergency Caesarean section. 24/142 (17%) had operative delivery for suspected fetal distress. 2/142 (1.4%) were delivered for an ST event with a normal CTG. 3/142 (2.1%) had severe neonatal metabolic acidosis. All three cases were not managed according to STAN guidelines.
**Conclusions:** ST events are common but most require no action. The rate of obstetric intervention was higher than anticipated but the majority of operative deliveries were for reasons other than suspected fetal distress. We were initially concerned that an ST event with a normal CTG might lead to inappropriate delivery, but this occurred infrequently. We are now concerned that the high incidence of "false positive" ST events might lead to complacency and failure to act when a significant ST event occurs.

## PLD.31 ASSESSING THE IMPACT OF TRAINING DRILLS IN THE MANAGEMENT OF MASSIVE POSTPARTUM HAEMORRHAGE

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Massive postpartum haemorrhage (PPH) is defined as blood loss of >1500 ml 24 h after delivery and is an important cause of maternal morbidity and mortality. The aim of this study was to determine the effectiveness of training drills in the management of PPH.

**Abstract PLD.31**

| | 2002/3 | 2005/6 |
|---|---|---|
| PPH (500–1500 ml) | 512 (8.7%) | 862 (10.9%) |
| PPH (>1500 ml) | 13 (0.22%) | 33 (0.42%) |
| IV Ergometrine | 40% | 50% |
| Syntocinon infusion | 90% | 97% |
| Carboprost | 70% | 37% |
| Misoprostol | 0% | 27% |
| B-Lynch suture | 20% | 3% |
| Internal iliac ligation | 10% | 0% |
| Hysterectomy | 20% | 0% |
| Laparotomy | 30% | 7% |

IV, intravenous; PPH, postpartum haemorrhage.

**Methodology:** A cohort study comparing adherence to our unit PPH guideline was conducted in two time-frames: a retrospective study in 1 April 2002–31 March 2003 and then a prospective study in 1 April 2005–31 March 2006 following the implementation of PPH training drills.
**Results:** The total number of deliveries was 5842 in 2002/3 and 7895 in 2005/6. Similar predisposing risk factors and causes of PPH were present in both periods, the commonest cause being uterine atony. A marked improvement in the usage of first-line medical treatments and a significant reduction in the need for surgical interventions was observed in the second period (see table).
**Conclusions:** Regular training drills improved adherence to guidelines, reduced maternal morbidity and are effective tools for clinical practice and risk management.

## PLD.32 ANAESTHETIC CONSIDERATIONS FOR THE MORBIDLY OBESE WOMAN: ANTEPARTUM, INTRAPARTUM AND POSTPARTUM RECOMMENDATIONS

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The CEMACH report recommends that all morbidly obese women should be referred antenatally for anaesthetic assessment; trainees should be directly supervised when dealing with these patients and all morbidly obese parturients should receive prophylactic low molecular weight heparin post-delivery. Our audit considered whether this was current practice in out unit.

4% (125) of mothers who delivered in Newcastle upon Tyne over a 6-month period with a BMI >35 were retrospectively reviewed. The number requiring anaesthetic intervention, technical difficulties encountered, grade of anaesthetist, labour outcome and prophylactic low molecular weight heparin dose were studied.

We found that 35 primiparous women (54%) and 24 multiparous women (34%) required anaesthetic intervention (25 epidurals, 15 spinals, two combined spinal epidurals, one general anaesthetic). 66% of emergency Caesarean sections were done using spinal anaesthesia. Early data indicate that 50% of regional blocks were reported as being technically difficult. According to current hospital protocol, only women undergoing Caesarean section receive heparin (>100 kg, 50 IU/kg tinzaparin). Only 30% received the correct dose.

Referral is worthwhile because 54% of primiparous obese women need some form of anaesthetic intervention. Our data confirm that regional blockade is technically difficult in obese patients. Early epidural siting may avoid the need for technically difficult urgent spinal anaesthesia. A tinzaparin dosage chart could be provided in theatre rather than relying on the anaesthetist to calculate the dose.

## PLD.33 PREGNANCY IN WOMEN WITH SCOLIOSIS AND PREVIOUS SPINAL SURGERY: A CHALLENGE FOR OBSTETRICIANS AND ANAESTHETISTS

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**Introduction:** Pregnant women with scoliosis and previous spinal surgery present challenges to the obstetrician and anaesthetist, particularly with regard to counselling for appropriate analgesia for labour and delivery.
**Methodology:** Observational, retrospective study of women with scoliosis or previous spinal surgery reviewed in the maternal medicine and obstetric anaesthesia clinics in a large teaching hospital. Outcomes of these pregnancies including type of analgesia for labour and delivery and the mode of delivery were reviewed.
**Results:** Over the 3-year period, 49 patients with scoliosis and 13 patients with previous spinal surgery attended the clinics. In the cohort with scoliosis, vaginal delivery was achieved in 34 (69%), whereas 15 (31%) had Caesarean sections. Successful regional anaesthesia was achieved in 12 (35%) of the women delivering vaginally and 93% (14) of women requiring Caesarean sections. In the 13 women with previous spinal surgery, six (43%) had Caesarean sections, a third of which were emergencies. All patients requiring Caesarean sections and one (8%) of those delivering vaginally had successful regional blocks. Overall, only three women had a general anaesthetic for elective sections. These included patients with Klippel–Feil syndrome, previous spinal meningioma and spina bifida.
**Conclusions:** With appropriate antepartum counselling and planning in a multidisciplinary setting the majority of patients with scoliosis or previous spinal surgery can have successful regional anaesthesia for delivery.

## PLD.34 FACILITATING PLACENTAL TRANSFUSION: A SURVEY OF CARE DURING THE THIRD STAGE OF LABOUR IN A UK HOSPITAL

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**Background:** Early cord clamping is widely practised as part of active management of the third stage of labour. Delaying cord clamping, by just a few minutes, may allow continued transfusion from the placenta to the newborn infant. Other factors that may influence this placental transfusion include the position of the baby at delivery and timing and choice of uterotonic. Whether early clamping has advantages over late clamping remains unclear.[1]
**Methodology:** Delivery suite midwives at the Bradford Royal Infirmary were invited to complete a questionnaire about their third-stage practice. Practice was observed for 100 normal deliveries.
**Results:** See table.
**Discussion:** Current views and practice of delivery suite midwives in Bradford are to clamp the cord early. Although there is some variation in practice during the third stage, for most deliveries it seems likely that placental transfusion is restricted. Practice in our hospital appears typical within the United Kingdom.[2]

This study was conducted as part of the preparation for a multicentre trial comparing early with late cord clamping.

1. **NICE**. Intrapartum care: care of healthy women and their babies during childbirth. National Collaborating Centre for Women's and Children's Health. London: RCOG Press, 2007.
2. **Winter C,** *et al*. Variations in policies for management of the third stage of labour and the immediate management of postpartum haemorrhage in Europe. *Br J Obstet Gynaecol* 2007;**114**:845–54.

**Abstract PLD.34**

| | | |
|---|---|---|
| Survey of 63 midwives | 83% (52) responded | |
| | 90% (47) gave oxytocin with anterior shoulder | |
| | 92% (48) clamped the cord within one minute | |
| Observation of 100 deliveries | | |
| Timing of cord clamping | 32% within 10 s | 53% between 10 and 30 s<br>4% after 60 s |
| Position of baby at cord clamping | 78% on bed | 22% on mother's abdomen |
| Timing of tocolytic | 58% with anterior shoulder | 20% after birth of baby |

## PLD.35 A WEB-BASED INFORMATION PACKAGE FOR PARENTS EXPECTING A MULTIPLE PREGNANCY

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**Introduction:** 280 multiple pregnancies were managed at the Leeds General Infirmary between January 2005 and January 2008.[1] Prospective parents face a much medicalised pregnancy with intensive monitoring. It is well documented that these parents require additional support both from the medical and midwifery team. We have devised a web-based information package for parents expecting a multiple pregnancy. The package details all aspects of pregnancy care including diagnosis, screening, antenatal monitoring and delivery options. It was felt that a web-based guide for multiple gestations would provide an accessible medium for parents to answer their questions and provide some practical advice and support.
**Aim:** To produce a web-based package to guide prospective parents through their multiple pregnancy at Leeds General Infirmary.
**Methods:** Initial responses to the idea were considered alongside RCOG recommendations[2] and United Leeds Teaching Hospitals guidelines[3] for the management of multiple gestations. The software "Articulate presenter 5 pro" was chosen to produce a package allowing ease of use and the option to include narration to provide an alternative means of learning. A pilot study of the package is currently being evaluated by parents and health professionals.
**Results:** A questionnaire has been constructed to evaluate the usefulness of the package among parents and health professionals.
**Conclusions:** The web-based information package is easily accessible to most parents and provides them with immediately available information. We believe that this will provide an alternative method of advice and information in a group of parents who can feel isolated and unsupported in pregnancy.

1. Analysed from raw data for multiple pregnancies managed at the Leeds General Infirmary, between January 2005 and January 2008.
2. http://www.rcog.org.uk/index.asp?PageID = 2237.
3. **Multiple pregnancy—delivery suite guidelines**. United Leeds Teaching Hospitals NHS Trust.

## PLD.36 CHANGES IN MYOMETRIAL "PERFUSION" DURING NORMAL LABOUR AS VISUALISED BY 3-DIMENSIONAL POWER DOPPLER ANGIOGRAPHY

[1]NW Jones, [1]HA Mousa, [2]NJ Raine-Fenning, [1]GJ Bugg. *[1]Queen's Medical Centre, Nottingham, UK; [2]University of Nottingham, Nottingham, UK*

**Objective:** Myometrial contraction is one of the most important aspects of effective labour. For cells within the myometrium to work efficiently they need to be well oxygenated by an adequate blood supply. This is the first study to use three-dimensional (3D) power Doppler angiography to attempt to describe myometrial perfusion in terms of "fractional moving blood volume" (FMBV) during a relaxation–contraction–relaxation cycle of active labour.
**Methods:** 3D transabdominal ultrasound in the power Doppler angiography mode was performed in the first stage of spontaneous labour in 20 term, nulliparous women. 3D datasets were acquired during a single cycle of uterine relaxation, contraction and

subsequent relaxation for each subject. The resultant datasets were independently analyzed, using VOCAL within four-dimensional view by two investigators on two occasions each.

**Results:** Myometrial FMBV, the percentage change in indices compared with the initial uterine relaxation (taken as the local maximum of 100%), fell significantly during the uterine contraction and returned during the subsequent relaxation of the cycle. During contraction the vascularisation index fell to 44%, flow index to 86% and vascularisation–flow index to 41%. The intraclass correlation coefficients in blood flow measurements of 0.910–0.999 between the two investigators were indicative of good interobserver reliability.

**Conclusions:** This study confirms that FMBV within the myometrium falls during uterine contraction and returns during relaxation and demonstrates that this reduction can be quantified using 3D power Doppler angiography.

## PLD.37 DELAYED UMBILICAL CORD CLAMPING, A PRACTICAL OPTION IN JAMAICA?

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**Introduction:** Despite 30 years of public health measures, iron deficiency anaemia (IDA) in Jamaica's children has remained at a prevalence of 40%.[1–4] Delayed umbilical cord clamping (DCC) has been shown to reduce the risk of anaemia in infancy.[5–8] Evidence-based guidelines on delayed cord clamping for low-resource settings were recently published.[9 10] The aim of this study was to assess whether DCC was a practical option for reducing IDA in Jamaican infants.

**Methods:** The study was conducted at the University Hospital of West Indies (UHWI), Kingston, Jamaica. A cross-sectional observational study described cord clamping practices. A questionnaire survey assessed the knowledge and training of medical staff on umbilical cord clamping and requested their opinions on the current BMJ guidelines.

**Results:** This is the first study describing cord clamping practices and attitudes in the developing world. The mean time of clamping the umbilical cord at UHWI was 21.9 s (range 4–96). Midwives clamped significantly later than other professional groups (33 s versus medical students at 11.5 s, $p = 0.04$). 82% of staff were taught to clamp the cord early, with 70% receiving no training on cord clamping since qualifying. Half the staff were aware that DCC reduced anaemia in infancy, yet only 41.7% supported the implementation of the BMJ guidelines in Jamaica.

**Conclusions:** Early cord clamping is normal practice at UHWI, arising from a lack of awareness of the evidence-based benefits. These knowledge gaps can be used to direct training and promote a standard DCC policy at UHWI.

1. **Ashcroft MT.** Nutrition in Jamaica 1969–70. *Trans Roy Soc Med Hyg* 1969;**66**:653.
2. **Grantham-McGregor SM.** Haematological levels in Jamaican infants. *Arch Dis Child* 1974;**49**:525–9.
3. **Simmons WK.** A survey of the anemia status of preschool age children and pregnant and lactating women in Jamaica. *Am J Clin Nutr* 1982;**35**:319–26.
4. **Renaud D.** Micronutrient deficiencies in the Caribbean. *CAJANUS* 2002:35.
5. **Mercer J.** Current best evidence: a review of the literature on umbilical cord clamping. *J Midwifery Women's Health* 2001;**6**:402–1.
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7. **van Rheenen P,** Gruschke S, Brabin B. Delayed umbilical cord clamping for reducing anemia in low birth weight infants: implications for developing countries. *Ann Trop Paediatr* 2006;**26**:157–67.
8. **Hutton EK,** Hassan ES. Late vs early clamping of the umbilical cord in full term neonates: systematic review and meta-analysis of controlled trials. *JAMA* 2007;**297**:1241–52.
9. **van Rheenen P,** Brabin BJ. A practical approach to timing of cord clamping in resource poor settings. *BMJ* 2006;**333**:954–8.
10. **WHO**. Recommendations for the prevention of postpartum haemorrhage. WHO/MPS/07.06. Geneva: World Health Organization, 2007.

## PLD.38 ONE HUNDRED AND SEVENTY-THREE CONSECUTIVE TWIN DELIVERIES: A 2-YEAR REVIEW

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**Background:** Vaginal twin births are associated with a fourfold increase in perinatal mortality and depressed Apgar scores usually due to intrapartum asphyxia of twin 2.[1] Caesarean section for twin 2 occurred in 3.5% of deliveries in the United Kingdom.[2]

**Materials and Methods:** A retrospective audit looking at the birth records of all twin deliveries in our unit between January 2006 and December 2007 (2 years) totalling 175. Two sets were excluded, as they were less than 24 weeks' gestation. In the same period there were 10 611 total deliveries, giving a twin birth rate of 1.6%.

**Results:** We had a 36% (62/173) elective Caesarean section and 36% (63/173) emergency Caesarean section rate. 17.5% (30/173) spontaneous vaginal deliveries and 10.5% (18/173) instrumental deliveries. Among the successful vaginal deliveries, 30/48 (64%) were multiparous. In vertex/breech twins, multiparous women were 2.5 times more likely to have a successful vaginal delivery. Twin 2 was 2.4 times more likely to have a cord pH <7.20 if vaginal delivery was successful and there were eight times more emergency Caesarean sections for twin 2 at nighttime. 9/173 (5.2%) of our deliveries required an emergency Caesarean section for twin 2, with 8/9 having a non-vertex presentation of twin 2 and 7/9 having a cord pH <7.20 at delivery.

**Conclusions:** The mode of delivery in twins remains controversial and counselling should include a frank discussion of the uncertainties and the small absolute risk of adverse events at term.[3]

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2. **RCOG**. The National Sentinel Caesarean Section Audit Report. London: RCOG Press, 2001.
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## PLD.39 FETAL FIBRONECTIN BEDSIDE TESTING: COSTLY KIT OR COST-SAVING INTERVENTION?

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Prematurity is a major contributor to perinatal morbidity and mortality. Fetal fibronectin (fFN) is found in cervicovaginal secretions. Its detection between 24 and 34 weeks is associated with preterm delivery. Before the introduction of fFN testing, the management of women presenting with threatened preterm labour (tPTL) included admission, steroids, tocolysis (atosiban) and possible in-utero transfer.

Following the introduction of a new tPTL protocol that incorporated fFN testing, an audit was designed to investigate compliance with the protocol and whether fFN testing could reduce admission rates, steroid and atosiban use and in-utero transfers.

30 symptomatic women were tested for fFN. Nine women tested fFN positive. These women received steroids. Two received atosiban and none required in-utero transfer. The median length of inpatient stay was 3 days. The median gestation at delivery was 33 weeks. 44% of women delivered within 14 days of a positive test.

21 women tested fFN negative. One woman received steroids for another indication. No women received atosiban or required an in-utero transfer. The mean length of inpatient stay was less than one day. The mean gestation at delivery was 39 weeks.

Before the introduction of fFN testing the cost of atosiban per month was £1886. After introduction of fFN testing the cost of atosiban and fFN kits per month was £1021.

After introducing fFN testing there were savings of £865 per month due to a reduction in the use of atosiban. Further cost savings are associated with reduced inpatient episodes. Moreover, unnecessary anxiety for women and their families was avoided.

## PLD.40 OBSTETRIC AND NEONATAL OUTCOMES OF TWIN PREGNANCIES IN A GLASGOW HOSPITAL

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**Introduction:** Evidence suggests an increased risk of fetal mortality in vaginally delivered second twins from intrapartum anoxia, proposing delivery of twin gestations by planned Caesarean section (CS). We investigated the neonatal outcome of labouring twin pregnancies.
**Methods:** A retrospective analysis of twin deliveries (January 2005–January 2007). Neonatal outcome was evaluated by Apgar score, special care baby unit (SCBU)/neonatal intensive care unit (NICU) admission and mortality.
**Results:** Of 79 cases, 52 twin pregnancies (65.8%) had twin 1 vertex presentation at delivery; 11 had elective Caesarean section (21.2%) and 41 were allowed to labour (78.8%). Of the labourers, 25 were induced (61%), six had emergency (E) Caesarean section (14.6%), 33 had a vaginal delivery (80.5%) and two had vaginal delivery of twin 1 and emergency Caesarean section for twin 2 (4.9%). Median labouring inter-twin delivery interval was 12 minutes (range 6–20 minutes). 31.7% of deliveries occurred from 09:00 to 17:00 hours; a consultant was present in five cases (38.5%). Of first twins, there were no Apgars <5. Of second twins, one had Apgars of 5 at 1 and 8 at 5 minutes (E Caesarean section delivery) and one had Apgars of 3 at 1 and 5 at 5 minutes (mid-cavity forceps delivery E Caesarean section). Six twin pairs were admitted to the SCBU (14.6%; median gestation 35 weeks, 34–37 weeks). Three pairs of twins were admitted to the NICU (7.3%; 37 weeks, 24.0–38 weeks). One twin pair, delivered at 24 weeks' gestation, died in the NICU.
**Conclusions:** In our unit, the delivery and neonatal complication rate is low despite a high percentage of labouring twin pregnancies. We cannot justify delivering all twin pregnancies by elective Caesarean section.

## PLD.41 CASE REPORT: PSOAS ABSCESS AND SACROILIAC JOINT INFECTION POST-CAESAREAN SECTION

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**Introduction:** This is the second reported case of a psoas abscess related to a Caesarean section. There are now many reports of psoas abscesses or sacroiliac joint infections in pregnancy and the postpartum period and there is only one other report of a psoas abscess post-Caesarean section.
**Case Report:** A 31-year-old primigravida woman attended with an *Escherichia coli* urinary tract infection, she was 12 days post-emergency Caesarean section at full dilatation after a failed ventouse extraction. Three days later she presented with severe abdominal, sacroiliac joint and left leg pain. On examination she was tachycardic, pyrexial with left loin tenderness. There was no neurological deficit identified. Computed tomography imaging revealed a psoas abscess and subsequent magnetic resonance imaging showed a sacroiliac joint infection with a small left-sided gluteal abscess. The surgeons elected to drain the psoas abscess by an open approach.
**Discussion:** Psoas abscess can be primary following haematogenous spread of pathogens, or secondary to direct spread from abdominal, retroperitoneal or lumbar spine infections. A sacroiliac joint infection is also commonly caused by haematogenous spread, but may also occur secondary to local infection or chronic joint disease. The vague symptoms and poorly localised signs can lead to a delay in diagnosis so extra consideration is needed in these complex cases. The cause of this psoas abscess is most likely to be secondary to the urinary tract infection; no intra-abdominal collection or dilation of the upper urinary tract was identified so haematogenous spread was the most likely cause.

## PLD.42 DECISION TO INCISION: HOW LONG DID IT TAKE TO DELIVER THE BABY?

EA Simm, A Stock. *Department of Obstetrics and Gynaecology, Milton Keynes General Hospital, Milton Keynes, UK*

**Objective:** To assess potential errors, secondary to inaccurate clocks and watches, in documentation of decision to delivery time interval (DDTI) for emergency Caesarean sections.
**Methods:** Times displayed on clocks in the labour ward were compared with a digital watch set to Greenwich mean time (GMT). Absolute time differences were then calculated using the clock in the main obstetric theatre and secondary obstetric theatre as reference points. Differences were expressed in seconds, with a positive value indicating that a clock was fast relative to the time displayed in theatre. The watches/fob watches of the midwives and doctors present on the labour ward at the time were similarly assessed. The study was conducted one month after the clocks had been altered from British summer time to GMT.
**Results:** For main theatre average time errors (in seconds) were: labour ward clocks 207 (range 72–266), midwives watches 167 (89–221) and doctors' watches 179 (−12–508). For the secondary theatre the corresponding results were labour ward 47 (−112–82), midwives 38 (−36–95) and doctors 118 (−196–324). In the worst case scenarios the most inaccurate timepieces could therefore add 196 s to the documented DDTI or reduce it by 508 s.
**Conclusions:** Inaccurate watches and clocks could introduce significant errors in determining the DDTI. In the context of the recommended 30-minute interval, this degree of inaccuracy is unacceptable. Protocols are required to ensure the accurate setting of all timepieces used in calculating the DDTI.

## PLD.43 POSTNATAL RE-ADMISSIONS: THE INCIDENCE, CAUSES AND LENGTH OF STAY IN A LARGE ANTENATAL POPULATION

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**Objective:** To ascertain the incidence, causes and length of stay for maternal re-admissions in the puerperium.
**Methods:** A retrospective and prospective study of re-admissions over a 6-month period in a tertiary referral hospital. A retrospective chart review was performed over 3 months as a pilot study and then continued for three consecutive months prospectively. The study group included all women who delivered a singleton infant >37 weeks' gestation and who subsequently required re-admission for at least one night during the puerperium.
**Results:** There were 4270 deliveries. We identified 69 re-admissions with two patients re-admitted twice. The main reason for re-admission was mastitis 15, then secondary postpartum haemorrhage 12, followed by endometritis eight and wound infections or haematoma 10 and hypertension four. The mean length of stay was 3.4 days (range 2–6). Of those re-admitted 44 patients were discharged routinely and 14 were planned early discharges. There was no difference between primiparous (n = 44) and multiparous (n = 23) patients. 22 of 67 patients were delivered by emergency Caesarean section and 33/67 vaginally $p<0.01$. Mean BMI was 26 and six patients had BMI >30; four had wound infections. The commonest intervention was intravenous antibiotics. The majority of re-admissions were public patients 43/67 (64%) with a minority 24/67 (35%) fee-paying. The expected proportions were 52.2% and 47.7%, respectively.
**Conclusions:** The rate of re-admission after Caesarean delivery is 26/1000 (22/807), after instrumental 18/1000 and spontaneous vaginal delivery 11/1000. Sepsis was the commonest cause of re-admission. Admission rates appear higher among public rather than private patients. The reasons for this deserve further study.

## PLD.44 CHORIOAMNIONITIS OR VILLITIS: WHICH POSES THE GREATEST RISK TO MATERNAL AND FETAL WELLBEING?

SM Cooley, J Donnelly, T Walsh, U Durnea, A O'Malley, J Gillan, MP Geary. *Rotunda Hospital, Dublin, Ireland*

**Objective:** The fetus is at risk from ascending infection and the haematogenous spread of pathogens from its mother. The definitive diagnosis of chorioamnionitis is histological and requires the presence of neutrophils in the amniotic and chorionic tissues. Parenchymal infection or villitis is the histological presence of maternal mononuclear cell infiltrate around or within the villous structure. We aimed to determine the incidence of ascending infection, chorioamnionitis and villitis in the low-risk population and to determine which posed the greatest risk to maternal and fetal wellbeing.
**Methods:** Caucasian women with a singleton pregnancy, booking at less than 20 weeks' gestation were recruited. They were aged between 18 and 40 years and had no chronic medical conditions. Fetal growth, uterine and umbilical Dopplers and placental architecture were reviewed ultrasonographically at 24 and 36 weeks' gestation. Maternal and neonatal outcome was recorded at delivery. Systematic placental histology was performed and the presence of ascending infection, chorioamnionitis and villitis was recorded.
**Results:** 1011 primips were recruited. Ascending infection was present in 26.5%, chorioamnionitis in 2% and villitis in 3.5%. Chorioamnionitis was associated with significantly higher rates of postpartum haemorrhage. Villitis was associated with a fivefold increase in the incidence of placental infarction at the 24-week scan and significantly higher rates of antepartum haemorrhage, suspected intrapartum fetal acidosis and lower fetal birthweights at delivery.
**Conclusions:** We conclude that villitis appears to pose the greatest risk to the wellbeing of the fetus and chorioamnionitis the greatest risk to maternal health.

## PLD.45 THE INTRODUCTION OF STAN INTRAPARTUM MONITORING: THE LESSONS LEARNT AND THE PITFALLS TO AVOID

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**Aim:** The introduction of ST analysis (STAN) intrapartum monitoring onto a busy high-risk labour ward.
**Study Design:** A prospective study of the first 125 labouring women to be monitored with STAN.
**Background:** Study days were provided to all midwives and doctors before and during the study period. Only high-risk labouring women who required continuous monitoring were chosen to be part of the study. Clear guidelines were in place for its use.
**Methods:** Every case was studied in detail with regards to outcome of labour and the condition of the baby.
**Results:** 53% of women were delivered by Caesarean section. All the women who were delivered by Caesarean section for failure to progress had syntocinon augmentation. 17% were delivered by instrumental delivery. 6% of babies were admitted to the special care baby unit. Two babies were born with arterial pH of <7.05. In one of the cases guidelines were not adhered to and there was a delay in delivery.
**Conclusions:** STAN cannot be a replacement for sound clinical judgement and strict adherence to guidelines for its use is a must. The training of staff, especially newcomers to the unit, can be challenging but is possible and extremely important.

## PLD.46 TRENDS AND MODE OF DELIVERY IN PRETERM TWINS

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**Introduction:** Currently, there is no consensus on the optimal mode of delivery for preterm twins, presenting a dilemma with regard to counselling women in this situation. We reviewed the outcomes for the trends and mode of delivery in our unit over a 5-year period.
**Methodology:** Observational retrospective cohort study in a tertiary referral centre. Preterm twin birth defined as birth ⩾24 weeks' gestation and up to 36 completed weeks. Main outcome variables included mode of delivery, presentation of the first twin in labour, and admission to neonatal unit at birth.
**Results:** During the 5-year period 672 twin pairs were delivered, of which 323 (48%) had preterm births. A gradual rise in the number of preterm twins has been noted since 2003. Before 33 weeks 29% of the twins delivered, whereas 71% delivered after 33 weeks. Overall, 196 (61%) twin pairs were delivered by Caesarean section, of which 59 (30%) were elective and 137 (70%) were emergency Caesarean sections. Vaginal delivery was achieved in 39% of preterm twins. The first twin was non-vertex in 34% of elective and 40% of emergency Caesarean sections. Neonatal unit admission occurred in 90% of twins delivered before 33 weeks and in 35% delivered after 33 weeks.
**Conclusions:** The preterm twin birth rate was 50%, with a rising trend over the years. Two thirds required Caesarean section for the first twin; however, non-vertex presentation for the first twin was not a primary indication for the majority of the Caesarean sections. Appropriate antenatal counselling and awareness about complications with preterm twin births are essential.

## PLD.47 MANAGEMENT OF INCIDENTAL FINDING OF OVARIAN CYST FOR THE FIRST TIME AT CAESAREAN SECTION: A SURVEY

B Bell, N Vaithilingam. *St Mary's Hospital, Portsmouth, UK*

An ovarian pathology detected for the first time at Caesarean section has been reported in the region of 0.5%, and a cancer occurrence rate of 0.93%, or 0.0179 per 1000 deliveries.
**Aim:** The aim of this study was to evaluate the management of incidental finding of ovarian mass for the first time at Caesarean section.
**Methods:** The postal questionnaire was sent to the consultants and trainee obstetricians enquiring about the management of incidental findings of ovarian cyst for the first time at Caesarean section.
**Results:** 100 questionnaires were sent out and 55 completed questionnaires returned. 52% were by consultants and 48% by trainees. We found the management of simple cyst at the time of Caesarean section included ovarian cystectomy (35%), conservative management with follow-up (51%) and ovarian cyst aspiration 14%. The management difference between the trainees and consultants was not significant ($p = 0.389$). There were no differences observed in the management under regional or general anaesthesia. The management of complex cysts included ovarian cystectomy 15%, oophorectomy 11%, conservative management 65% and ovarian biopsy 16.2%. Here again the management variation between the trainees and consultants was not significant ($p = 0.562$). There were no differences noted in the management under regional or general anaesthesia. Tumour markers were requested by 98% of trainees and 68% of consultants as part of their management and the differences were statistically significant ($p = 0.04$). However, 98% of trainees and 88% of consultants will seek oncology advice and the difference is not significant ($p = 0.186$)
**Conclusions:** An agreed management of ovarian cysts at Caesarean section and guidelines are strongly recommended.

## PLD.48 NEONATAL OUTCOME AFTER BIRTH IN WATER: AUDIT OF 50 CASES AT THE ROYAL BLACKBURN HOSPITAL

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Birth in water has been an option in our hospital since 1994 and has become more widely used.

Following the introduction of the water birth information leaflet given to all pregnant women and mandatory midwifery training on water birth, the percentage of women using the pool for birth has increased dramatically. The pool was used for labour and birth by 1.7% women in 2006 and by 4.5% in 2007.

One reason that is often cited for not promoting water birth is worry about neonatal complications and possible increased risk of admission to the neonatal intensive care unit (NICU). However, there is no evidence of either a higher perinatal mortality rate or increased admission to the NICU.[1 2]

We have audited 50 consecutive births in water between September and December 2007. Out of these only four babies had an Apgar score of <9 at 1 minute and only one had an Apgar score of <9 at 5 minutes. This baby consequently needed admission to the NICU.

Water birth is offered to low-risk women in our unit. Maternity services in East Lancashire are currently being reconfigured and include midwife-led birth centres. This audit shows that the incidence of neonatal morbidity is low in these cases and pool births should be included in these plans.

1. **Gilbert and Tookey**. 1999.
2. **Geissbuehler** *et al*. 2004.

## PLD.49 CASE PRESENTATION—SUBINVOLUTION OF UTEROPLACENTAL ARTERIES: A RARE CAUSE OF LIFE-THREATENING SECONDARY POSTPARTUM HAEMORRHAGE IN A YOUNG WOMAN

M Doohan, C Rhodes, S Patni. *Good Hope Hospital, West Midlands, UK*

**Objective:** Subinvolution of uteroplacental arteries is one of the very rare and relatively unknown causes of secondary postpartum haemorrhage. To illustrate the occurrence of this idiopathic condition and to highlight the clinical features and histological findings of this rare but potentially life-threatening obstetric complication.

**Methodology:** Analysis of information obtained from a MEDLINE search combined with a case report of a woman presenting with life-threatening secondary postpartum haemorrhage 3 weeks after normal vaginal delivery. Search words used were secondary postpartum haemorrhage, subinvolution, uteroplacental arteries.

**Results:** A 25-year-old multigravida attended the labour ward 3 weeks after normal vaginal delivery in a collapsed state. She had an emergency hysterectomy to save her life. Secondary postpartum bleeding is a less frequently addressed obstetric complication; however, it is estimated to complicate approximately 1% of all pregnancies. Although possibly underrecognised by obstetricians and pathologists, subinvolution of the placental site is an important contributor to secondary postpartum bleeding. We also emphasise the difficulties in diagnosis that can lead to a delay in operative management and consequently significant maternal morbidity and mortality.

**Conclusions:** Subinvolution of the placental site is an important diagnosis, as this process implies an idiopathic cause, rather than an iatrogenic cause, of postpartum uterine bleeding. Obstetricians should be aware of this condition as prompt and early operative management can be life saving. The aetiology of subinvolution is poorly characterised, but this process may be a manifestation of an abnormal interaction between fetal-derived trophoblasts and maternal tissue.

## PLD.50 EVALUATION OF OUTCOMES FOR INDUCTION OF LABOUR IN PRIMIGRAVID WOMEN USING PROPESS (CONTROLLED RELEASE DINOPROSTONE)

V Puli, A Nicoll, P Lynch. *Ninewells Hospital, Dundee, UK*

**Aim:** To evaluate the safety and efficacy of propess administered for the induction of cervical ripening in primigravid women. The outcome measures were the time taken to achieve cervical ripening, the incidence of uterine hyperstimulation and the mode of delivery.

**Study Design:** Prospective study of all primigravid women (n = 115) who had induction of labour using propess between 15 May 2007 and 15 September 2007. The indications for induction of labour included post-term pregnancy, maternal, fetal and social indications. All women had singleton pregnancies, intact membranes and a viable fetus. Propess boxes were numbered and data collection forms were attached. The time of propess insertion was recorded along with the time when amniotomy was possible and also whether uterine hyperstimulation occurred. The mode of delivery was retrieved from the hospital information system.

**Results:** 95 forms were completed. The median gestation for induction of labour was 41 weeks (range 35–42) and median Bishop score at the time of propess insertion was 3 (range 0–6). 50/95 (53%) women were favourable for amniotomy by 12 h and 79/95 (83%) by 24 h. 14/95 (15%) had uterine hyperstimulation. Propess was removed in all women who had uterine hyperstimulation, but only 4/95 (4%) required tocolysis. Delivery outcomes were available for all 115 women. 78/115 (68%) had a vaginal delivery. 37/115 (32%) required delivery by Caesarean section.

**Conclusions:** Propess is effective in achieving cervical ripening in primigravid women, with a high rate of vaginal delivery. However, a higher rate of uterine hyperstimulation was observed compared with other studies.

## PLD.51 AUDIT OF THE BLOOD GLUCOSE CONTROL FOR DIABETIC PATIENTS IN LABOUR AT THE NORFOLK AND NORWICH UNIVERSITY HOSPITAL

T Hamouda, K Stanley, R Temple, N Dozio. *Norfolk and Norwich University Hospital, Norwich, Norfolk, UK*

**Introduction:** Recent CEMACH findings indicated that 86% of diabetic patients had intravenous insulin and dextrose and only 50% had optimal glycaemic control during labour and delivery. Tight control during labour avoids neonatal hypoglycaemia, maternal ketoacidosis or hypoglycaemia during labour.

**Aim:** To monitor compliance with the hospital guideline: intravenous insulin regime for the management of labour in pre-existing diabetic patients. Standards (should be 100%): (1) regime should be started at onset of labour or artificial rupture of the membranes; (2) blood glucose levels should be checked hourly; (3) blood glucose should be within target 3.5–8 mmol/l; (4) insulin dosages should be altered as per the regime.

**Subjects:** 16 pregestational IDDM patients who laboured during 2006 and who had intravenous insulin.

**Results:** There were 145 blood glucose measurements. Almost half of the readings were checked hourly and the rest 1–2 hourly. The regime was followed in 100% of cases. Inspite of following the regime there were 25 readings above 8 mmol/l (22 in one patient) and four readings less than 3.5 mmol/l. Medical input was sought in only three patients.

**Conclusions:** Our protocol works well for most patients, but a standard regime will not suit all patients. Obstetric trainees and midwives were slow to intervene in those patients with inadequate control. Documentation could be improved

**Proposals:** (1) Review of regime by diabetologists; (2) increase awareness of the importance of tight glycaemic control during labour; (3) obstetric trainees to be more confident in manipulating the regime.

## PLD.52 INTRAVAGINAL PROSTAGLANDIN E2 FOR INDUCTION OF LABOUR AT TERM: COMPARISON OF A MULTIDOSE GEL AND SINGLE, CONTROLLED-RELEASE PESSARY

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**Aim:** Our aim was to determine whether a sustained release preparation of prostaglandin E2 (propess) is more effective in inducing labour at term when compared with the short-acting prostin gel.
**Materials and Methods:** This prospective cohort study included induction of labour at term for various indications. Propess was used in the study group whereas the comparison group comprised women induced with prostin gel matched for age, parity, gestation and indication for induction. The outcomes studied included induction of labour failure rate, time to onset of labour, Caesarean section rate, uterine hyperstimulation and number of preparations used.
**Results:** A total of 120 women were recruited: 57 in the study and 63 in the comparison group. The induction failure rate was similar between the two groups (5.3% versus 4.7% in the propess and prostin group, respectively). Caesarean section rate was similar in both groups (14% versus 10%). Labour onset took on average 32 h for propess and 25 h for prostin. The hyperstimulation rate without fetal heart rate changes was 12% versus 4.6% in the study and control group, respectively. On average the number of preparations used was 1.9 for propess and 2.3 for prostin. Preliminary analysis of 120 out of 200 women revealed that both prostaglandin preparations had similar efficacy.
**Conclusions:** Although a substantial proportion of women who received propess experienced hyperstimulation there were no associated fetal heart rate changes. Propess reduces the number of preparations needed and increases women's satisfaction. However, it failed to demonstrate any other advantages over prostin gel, which appears to be more cost-effective.

## PLD.53 SURVEY ON MATERNITY WARDS REGARDING PRIVACY AND CONFIDENTIALITY

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**Objective:** To assess the patient impression of the confidentiality and privacy maintained on maternity wards.
**Design and Setting:** Prospective study over a period of 2 weeks in the month of October 2007 using a structured questionnaire on the maternity wards at St Mary's Hospital, Manchester, a tertiary referral centre.
**Results:** Sixty patients returned the completed questionnaire. Questions regarding confidentiality included: overhearing of conversation of personal information about patients and their families; were other people (relative or friend) given information about their condition? Results showed a positive response that more than 75% were happy with the degree of confidentiality maintained on wards. Questions regarding privacy included: permission before entering the room; were the patients offered separate room for examination or discussion? Results revealed permission was asked in 65% of patients before entry but only 15% of patients were offered a separate room for examination or discussion.
**Conclusions:** The importance of understanding consumer perceptions of services is widely acknowledged and becoming more relevant in healthcare. Our study focused on womens' responses to their recent experience on maternity wards regarding privacy and confidentiality. Regular survey is required on the wards to improve and maintain high standards of clinical care.

## PLD.54 CAESAREAN RATES AMONG FEE AND NON-FEE-PAYING MULTIPARAS ARE SIMILAR IN SPONTANEOUS LABOUR: WHILE INDUCTIONS ARE HIGHER IN THE PRIVATE SECTOR, THE PROPORTION DELIVERED BY SECTION IS LOWER

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**Objective:** To compare Caesarean rates in Robson groups 3 and 4 among fee-paying and non-fee-paying multiparas in a unit that practices midwifery-led active management of labour.
**Methods:** We prospectively collated data from all deliveries from 1 January 2005 to 31 December 2007 in our hospital. 24 019 women were delivered, of whom 9969 were multiparous without a previous Caesarean section (CS).
**Results:** Among 9969 multiparas (excluding previous CS), the CS rate was 3.8% (380/9969). Labour was spontaneous in 74.4% (7422/9969), induced in 23.9% (2383/9969) and there were 128 (1.6%) prelabour Caesareans. The CS rate in spontaneous labour was similar for public 1.3% (80/6011) and private 1.2% (15/1411), but among induced labours was significantly higher among public patients (7.2%; 101/1388 versus 2.0%; 20/995, $p<0.001$). The private induction rate was more than double the public rate (40%; 995/2442 versus 18% (1388/7527), $p<0.001$). 18.6% (2283/12 252) of multiparous patients had previous CS and 56.5% (1290/2283) had repeat CS. The proportion of patients with a previous scar was significantly greater among private compared with public patients (22.5%; 711/3153 versus 17.3%; 1572/9099, $p<0001$) as was the CS rate among this cohort of private patients (64.6%; 459/711 versus 52.8%; 831/1572, $p<0.001$). The overall CS rate in multiparas was lower in public patients (1140/9099, 12.5% versus 530/3153, 16.8%, $p<0.001$).
**Conclusions:** A higher induction rate among private patients (excluding previous CS) had a minimal effect on the CS rates in labour (midwifery led). The higher CS rate among private patients is attributed to the proportion of women with a previous scar and a higher CS rate in this cohort reflects a decision made before labour.

## PLD.55 EVALUATION OF HYOSCINE-N-BUTYL BROMIDE (BUSCOPAN) IN ACCELERATION OF LABOUR

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**Aims/Objectives:** To compare hyoscine N-butyl bromide (buscopan) administered through intravenous and rectal routes with respect to: efficacy in acceleration of the first stage of labour; drug delivery interval; difference in safety profile of drug depending on route of administration; labour complications/neonatal outcome in the two groups.
**Material and Methods:** Prospective study among primigravidae admitted to a university hospital in India during the years 2001–3 in active labour after uncomplicated singleton pregnancies and consisted of two series of 60 patients each. One series was administered the intravenous form of buscopan compared with rectal administration in series 2. The envelope technique was employed for randomisation of treatment options.
**Results/Conclusions:** The parasympatholytic drug buscopan in suppository and intravenous forms brings about significant shortening of the active phase/first stage of labour in primigravidae. The suppository form of the drug is more efficacious than the intravenous form in cutting short the duration of the first stage of labour. The suppository form achieved significantly higher rates of cervical dilatation when compared with the intravenous form of the drug. Accelaration of labour with buscopan is not associated with a high incidence of operative delivery. Minor side effects such as dryness of mouth, nausea and vomiting were observed with both forms of the drug, but are not of clinical significance No significant maternal/neonatal morbidity is associated wih buscopan irrespective of the route of drug delivery.

## PLD.56 TIME IS OF THE ESSENCE

EA Simm, A Stock. *Department of Obstetrics and Gynaecology, Milton Keynes General Hospital, Milton Keynes, UK*

**Objective:** To assess whether obstetric units have protocols for: determining which clocks or watches should be used to document the time of events on labour wards and in theatres; ensuring the accuracy of these watches and clocks.
**Methods:** Senior midwives or matrons from each of the labour wards in Milton Keynes, Oxford, Kettering, Luton, Northampton, Bedford and Aylesbury were contacted to discuss whether they had protocols that address these issues.
**Results:** None of the maternity units questioned had a written policy for determining which watches or clocks should be used, or how the accuracy of these clocks could be determined. Five of the units used radio-controlled clocks in the rooms on the labour ward, but only one unit (Kettering) used radio-controlled clocks in theatre. It was current practice in all centres that midwives would take times from labour ward clocks although no written policies regarding this existed.
**Comment:** We have shown in our own unit that inaccurate clocks and watches have the potential to produce significant errors when determining the decision to delivery time interval for emergency Caesarean sections. The use of radio-controlled clocks should minimise these errors but in some buildings, due to physical constraints, these devices do not work. If this is the case, protocols should be implemented to ensure the accuracy of clocks and watches used to record the timing of events in obstetric emergencies.

## PLD.57 A SURVEY OF OBSTETRIC CRITICAL CARE ADMISSIONS IN A TERTIARY CENTRE

RA Samangaya, NMG Sadhu. *St Mary's Hospital, Manchester, UK*

**Objectives:** To determine the number of women admitted to critical care (intensive care and high dependency unit) and to identify underlying reasons for admission.
**Methods:** A retrospective review of all obstetric patients (>20 weeks' gestation) admitted to critical care in a 3-year period (2005–7) in a tertiary centre in the United Kingdom.
**Results:** There were 11 admissions to critical care (0.23% of all deliveries) in 2005 compared with 19 (0.38%) in 2006 and 26 (0.52%) in 2007. The proportion of women requiring intensive care was 63.6% in 2005, 47.4% in 2006 and 88.5% in 2007. Eight women were antenatal (13.8%) and 50 (86.2%) were postnatal. The most common cause for admission was major postpartum haemorrhage (31%), of which 77.8% had been delivered by Caesarean section. The proportion of admissions due to postpartum haemorrhage has risen from 18.1% in 2005 and 26.3% in 2006 to 42.3% in 2007. Other common reasons for admission were postnatal observation due to major cardiac conditions (19%), respiratory failure (12%), sepsis (5%) and fits (5%). There were two stillbirths and one maternal death in the 3-year period.
**Discussion:** There has been a rise in admissions to critical care in obstetric patients. In addition, the proportion requiring intensive care rather than high dependency care has increased. This may be due to increased recognition of the need for specialist observation or other factors such as the rising Caesarean section rate.

## PLD.58 INDUCTION OF LABOUR USING PROSTAGLANDIN IN PRIMIPAROUS WOMEN IN A TERTIARY REFERRAL CENTRE

V Gleeson, M O'Connell. *Coombe Women's and Infant's University Hospital, Dublin, Ireland*

**Aim:** To assess the use of prostaglandin in induction of labour in primiparous women in a tertiary referral centre.
**Methods:** A retrospective analysis of all primiparous women who underwent induction of labour using prostaglandin in the Coombe Women's and Infant's Hospital in Dublin in 2006. A database was formed looking at gestational age, indication for induction, dose of prostaglandin used and mode of delivery. The dose of prostaglandin used correlated with mode of delivery.
**Results:** 450 primiparous women underwent induction of labour with prostaglandin. The dose of prostaglandin used ranged from 1 mg to 7 mg. Overall, 70% of the cohort studied achieved a vaginal delivery. Using doses of prostaglandin of 4 mg and 5 mg 50% of women achieved a vaginal delivery. The commonest indications for Caesarean section were abnormal cardiotocograph/fetal blood sampling (50.6%), failure to advance in the first stage (28.3%) and failed induction (10%).
**Conclusions:** Successful vaginal delivery rates in primiparous women decreased with increasing doses of prostaglandin required for induction of labour. If more than 5 mg prostaglandin was required to induce labour then consideration should be given to elective Caesarean section.

## PLD.59 PERINEAL TRAUMA ASSOCIATED WITH BIRTH IN WATER: AN AUDIT OF 50 CASES AT ROYAL BLACKBURN HOSPITAL

K Trafford, J Davies, EA Martindale, SR Hill. *East Lancashire Hospitals NHS Trust, Blackburn, UK*

The use of water for labour and birth has been offered in our unit since 1994. Following the development and use of a water birth information leaflet, which is given to all pregnant women and mandatory midwifery training on water birth, the percentage of women using the pool for birth has increased dramatically. The pool was used for labour and birth by 1.7% women in 2006 and by 4.5% in 2007.

A recent audit revealed a high incidence of third-degree tears and perineal trauma. It was suggested that this may be due to the increasing incidence of water births.

An audit was therefore undertaken of 50 consecutive water births between September and December 2007. The number of third-degree tears in this cohort was zero compared with 21 in the unit overall for the same period.

The presentation will also include details of other perineal trauma in these women.

Water birth is offered to low-risk women in our unit. Maternity services in East Lancashire are currently being reconfigured and include midwife-led birth centres. This audit shows that the incidence of third-degree tear (and subsequent transfer into the hospital unit) is low in these cases and pool births should be included in these plans.

## PLD.60 A 3-YEAR STUDY OF PERIPARTUM HYSTERECTOMY IN A MULTI-ETHNIC UK MATERNAL POPULATION

S Chakravarti, N Shah, GV Sunanda. *Heart of England NHS Foundation Trust, Birmingham, UK*

**Aim:** To evaluate the indications, risk factors and outcome of women undergoing peripartum hysterectomy in a multi-ethnic, inner-city population.
**Methods:** A retrospective study of all women who underwent a peripartum hysterectomy at Heart of England NHS Trust, Birmingham, between 1 January 2005 and 31 December 2007.
**Outcomes:** Primary and secondary indications resulting in hysterectomy, antenatal identifiable risk factors and maternal mortality were assessed. Severe morbidity, as defined by a composite from multiple possible maternal complications, was scored for each case.
**Results:** 19 women underwent peripartum hysterectomy in the 3-year period, resulting in an overall incidence of nine per 10 000 deliveries. There were no maternal deaths. The commonest primary

indication was uncontrollable haemorrhage secondary to uterine atony (79%). Secondary associations with previous Caesarean section (36.8%), placenta praevia/accreta (42.1%) and uterine rupture (15.7%) were found. 47% of women were European, 37% Asian and 16% African. Multiparity and maternal age over 35 years were risk factors. Composite severe morbidity score was significant (more than two separate morbidities) in 10/19 women, 52.6%.
**Conclusions:** Peripartum hysterectomy is performed in the face of life-threatening obstetric haemorrhage. We present a large series from an inner-city, multi-ethnic UK population and show a rising trend. We devised a composite severe morbidity scoring system to correlate with early and late patient outcomes. This can also be used in women with life-threatening obstetric haemorrhage or near-miss events.

## PLD.61 PREVALENCE AND OUTCOME OF PERINEAL TEARS REPAIRED IN OBSTETRIC THEATRES

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**Objectives:** To compare the incidence of third and fourth-degree perineal tears in midwifery versus consultant-led delivery units, the relationship to the absence/presence of episiotomy, and delivery–repair interval.
**Methods:** Retrospective study of 53 patients delivered in a community midwifery unit (CMU) and central delivery suite (CDS) who sustained severe tears that were repaired in theatre. Forty-one patients had third and fourth-degree perineal tears. The CDS theatre register and individual case notes were used to obtain the details.
**Results:** Incidence of third and fourth-degree tears was 2.2% in CDS and 2.5% in CMU, which was higher than RCOG standard but comparable with other national and international studies. 70% of patients had documentation of systematic examination. The majority (72%) were repaired more than 1 h after delivery. Follow-up rate in perineal clinic was 83%. Episiotomy decreased the incidence and severity of perineal tears (see table).
**Conclusions:** There was no statistically significant difference in the rate of third and fourth-degree tears between CDS and CMU. Documentation of examination findings should be improved. The delivery–repair interval should be reduced. The importance of follow-up assessment needs to be emphasised. The role and technique of episiotomy needs further studies.

**Abstract PLD.61**

| Degree of perineal tear | With episiotomy (N = 12) % | Without episiotomy (N = 41) % |
|---|---|---|
| 1st | 0 | 4.8 |
| 2nd | 0 | 24 |
| 3a | 50 | 31.7 |
| 3b | 33.3 | 26.8 |
| 3c | 16.7 | 0 |
| 4 | 0 | 9.7 |

## PLD.62 UNEXPECTED COMPLICATION OF BICORNUATE UTERUS

S Basude, A Gale. *Lancashire Teaching Hospitals NHS Trust, Preston, UK*

**Background:** The incidence of mullerian anomalies in the reproductive age group is 0.1–0.5%. Bicornuate uterus is associated with late miscarriage, preterm labour and malpresentation. There is no report of bicornuate uterus causing difficulty at Caesarean section.
**Case report:** A 27-year-old woman was booked for Caesarean section in view of previous Caesarean section and a very unfavourable cervix at 41 + 1 weeks' gestation. A mass of soft tissue was attached to and stretched across the middle of the lower uterine segment. To it was attached a normal-appearing fallopian tube and ovary. A normal tube and ovary were identified at the left side but not on the right. This posed difficulty for decision regarding the site for uterine incision. After thorough assessment of the anatomy (position of uterine artery, space available for incision), a transverse incision on the left lateral aspect of the lower segment was made. The uterus was exteriorised to suture, as the left angle was not easily accessible. There were no complications and she recovered very well.
**Discussion:** Depending on how the uterus expands during pregnancy, the position of the non-gravid cornua may vary. It is possible that in the previous pregnancy the cornua was more lateral or posterior, hence the bicornuate anatomy of the uterus was not recognised. A transverse incision was possible due to adequate assessment, which is associated with fewer short and long-term complications.
**Conclusions:** The key message is to highlight the importance of assessing and understanding anatomy, a logical approach and tailoring the surgical technique can improve care and avoid complications.

## PLD.63 AUDIT OF PATIENTS ADMITTED TO THE HIGH DEPENDENCY UNIT FOLLOWING POSTPARTUM HAEMORRHAGE

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**Objectives:** To determine the total number of patients admitted to the high dependency unit (HDU) with postpartum haemorrhage (PPH) as a percentage of our total deliveries; the commonest cause of PPH in our unit and to make appropriate recommendations.
**Background:** In the first quarter of 2007 there was a general impression of increased admission to the HDU following PPH. Prudence dictated that it was audited.
**Methods:** It was a retrospective audit from October 2006 to March 2007. A list of all patients and the reasons for their admission to the HDU were obtained. Sixty-three sets of notes were reviewed. Data were collected into a proforma and Excel database for analysis.
**Results:** The total number of deliveries in that period was 1871, of which 284 had a PPH of >500 ml. Sixty-three (3.36%) of these were admitted to the HDU. 37% had a PPH of more than 1500 ml including 16% with a massive PPH (≥2000 ml). Approximately one-third of the admissions followed spontaneous vertex delivery. The majority of the PPH occurred at Caesarean section. However, the commonest cause of massive PPH followed retained placenta. Four patients (6.34%) had a Rusch balloon inserted. 55% of the time there was no documentation of consultant involvement.
**Conclusions:** Consultants need to be informed sooner rather than later in the presence of PPH and act quickly in the presence of retained placenta. Medical management is adequate the majority of the time.
**Recommendation:** To consider syntocinon infusion for all our patients delivered by Caesarean section. Review the obstetric haemorrhage guideline to reflect these conclusions.

## PLD.64 ACCURACY OF GRADING OF CAESAREAN SECTION

TA Salman, EA Martindale. *Royal Blackburn Hospital, Blackburn, UK*

The Caesarean section (CS) rate in England and Wales is 21.5%. Almost 11% of women in labour will have emergency CS. The common indications for primary CS are fetal distress in 28% and

failure to progress in 25%. Nearly 48% of maternal deaths were after CS. The mortality rate after CS is 208 per 1 000 000 deliveries compared with 48 per 1 000 000 after vaginal delivery.

Grading of CS is very important as it facilitates communication of the degree of urgency between different parts of the team taking care of labouring women (obstetrician, anaesthetist and midwives). It is also a requirement of the Clinical Negligence Scheme for Trusts.

In our audit we looked at the grading of emergency CS (63 cases) in 1 month in a busy general hospital.

When the notes were reviewed there was disagreement about the grading in almost 15% of cases, including grade 1 CS graded as grade 3. It was noted that the surgeons deciding and performing the operation graded only 39% of the cases and the rest were graded by other members of staff, eg, midwives or scrub nurses. Most cases of discrepancy occurred when the surgeon failed to document the grade of CS at the time of decision.

### PLD.65 CONSENT FOR CAESAREAN SECTION

L Shanmugasundaram. *Dorset County Hospital Foundation Trust, Dorchester, UK*

**Audit of Standards:** RCOG consent advice nos 6 and 7 (obtaining valid consent and Caesarean section).
**Methods:** Retrospective case notes review of 95 written consents in 2007.
**Setting:** Dorset County Hospital Foundation Trust with 2159 deliveries in 2007 and 24% Caesarean section rate.
**Background:** Adaptation of the national consent form has been in practice in this trust for consents and women are consented in the antenatal clinic when decision is taken for elective Caesarean. Information pack including Caesarean and pain relief are provided antenatally. However, 57% of the Caesareans in 2007 were emergencies, ie, unplanned.
**Findings:** Client details were fully entered in 65%, with duplicate copy having no client details in 24%, the rest were only partly complete. The procedure was not entered in 7%. Complications outlined in >90% were bleeding, infection; >80% for organ damage, thromboembolism; 3% for future pregnancy implications. Two cases with placenta praevia did not have documentation of hysterectomy risk. Client's copy of the consent form was given to the client in 24%. Documentation of information leaflets provided in 3%.
**Conclusions:** Improved documentation was required. Despite RCOG guidelines, NICE guidelines and our hospital guidelines, there is a need to improve consent content. Some of the shortcomings can be due to pressure of time during clinic appointments and in emergency Caesareans.
**Recommendations:** Pre-printed Caesarean consent with local adaptation from NICE Caesarean guideline and RCOG guideline to be implemented. Theatre checklist amended to include client copy to be given to client by surgeon after revalidating.

### PLD.66 VAGINAL BIRTH AFTER CAESAREAN SECTION: OUR EXPERIENCE AT A DISTRICT GENERAL HOSPITAL IN EAST LONDON

V Thakur, O Olawu, R Wuntakal, B Dawaltly, D Visvanathan, G Benchetrit. *Whipps Cross University Hospital, London, UK*

**Introduction:** In a busy district hospital that caters for a high-risk and multi-ethnic population Caesarean section rates are rising and this has led to an increased proportion of the obstetric population with previous Caesarean section.
**Aim:** To review care of women undergoing planned vaginal birth after Caesarean section (VBAC) and compare it with the RCOG green top guidelines on birth after previous Caesarean section.
**Methods:** A retrospective audit from January 2007 to December 2007. We identified women undergoing planned VBAC from the labour ward database. The case notes were reviewed for documented discussion of risks and benefits of VBAC and elective Caesarean section, grade of doctor involved in counselling, care of these women in labour and delivery outcome.
**Results:** During the study period 99 women underwent planned VBAC. Among these women 35% were Caucasian, 28% were Afro-Caribbean and 32% were Asian. In 85% women who had spontaneous onset of labour, 48% achieved vaginal delivery and only 25% of women achieved vaginal delivery after induction of labour. There was very poor documented discussion of risk and benefits during the antenatal period and the majority of women were counselled by middle-grade doctors and consultants. There were five special care baby unit admissions.
**Conclusions:** We recommended that there should be a special VBAC clinic in the unit to manage these women as per the set standards.

### PLD.67 ESCAPE FROM DEATH, A CLOSE ENCOUNTER: A CASE REPORT

K Kamakshi, M Moloney. *Good Hope Hospital, Birmingham, UK*

A 31-year-old gravida 2 para 0 had an uneventful antenatal period till 37 weeks. She was induced because of pre-ecclampsia. She had an emergency Caesarean section under general anaesthetic as a result of a pathological cardiotocograph. The baby was delivered in good condition. While the abdomen was being closed, the anaesthetist called for the cardiac arrest team. Her central pulses were not felt. She had asystole followed by ventricular fibrillation.

She reverted to normal rhythm after 20 minutes of cardiopulmonary resuscitation, three DC shocks and eight doses of adrenaline. She was then stabilised and transferred to the intensive care unit and very soon she went into disseminated intravascular coagulation. Her clotting was corrected and she went into renal failure, which was corrected. A week later she had tracheostomy and after another week was on continuous positive-airways pressure. After 3 weeks, she was moved to the postnatal ward and went home a week later without any sequelae.

The possible diagnosis with such a cascade of events is most likely to be amniotic fluid embolism. Acute hypotension or cardiac arrest, acute hypoxia, coagulopathy, absence of any other explanations and events occuring during labour, Caesarean or within 30 minutes postpartum are strongly suggestive of amniotic fluid embolism. Most of the investigations are non-specific. It is associated with very high mortality and morbidity. This is a rare case with an extremely good outcome after an acute catastrophic event. High clinical suspicion, early and timely resuscitation with excellent teamwork definitely contributed to giving the best outcome.

## BMFMS: Maternal Medicine

### PMM.01 DIFFERENCES IN PLACENTAL GLUTATHIONE PEROXIDASE ACTIVITIES AND MRNA EXPRESSION BETWEEN NORMAL AND PRE-ECLAMPTIC PREGNANCIES

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**Background:** Pre-eclampsia is associated with impaired placentation, oxidative stress and systemic endothelial damage. Glutathione peroxidases (GPx1, 3 and 4) are selenoproteins and play critical roles in regulating antioxidant status; they reduce damaging hydrogen peroxide products, preventing the propagation of reactive oxygen species thereby protecting the endothelial lining of placental spiral arteries. We know of no systematic study of placental GPx in pre-eclampsia.