concurrently with Doppler studies. Changes were analyzed using repeated measures ANOVA.
Results: 25 infants, median (range) birthweight 710 g (490–1320), gestational age 25.7 weeks (23.7–29.1) and age 7 days (3–26) were studied. SMA average velocity significantly increased ($p<0.05$) and pulsatility index decreased ($p<0.05$) by 45 minutes after treatment. A significant rise in mean blood pressure was seen by 45 minutes ($p<0.05$) and in diastolic blood pressure by 60 minutes ($p<0.05$). There was a non-significant trend ($p = 0.07$) towards and increase in end-diastolic velocity.
Conclusions: SMA average velocity significantly increases and pulsatility index falls following treatment with intravenous ibuprofen and in contrast to our hypothesis there was no evidence of an initial reduction in SMA flow. SMA BFV improves within an hour of intravenous ibuprofen treatment in VLBW babies with a significant patent ductus arteriosus. The changes seen in blood pressure and BFV measurements are in keeping with acute ductal constriction and a reduction in ductal steal.

PD.21 GUT BLOOD FLOW VELOCITY RESPONSES TO ENTERAL FEEDS IN BABIES WITH CONGENITAL HEART DISEASE

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Background: In term babies gut blood flow increases with postnatal age and enteral feeds. Abnormalities in gut blood flow increase the risk of necrotising enterocolitis (NEC). In term babies NEC is associated with underlying cardiac lesions.
Aims: To describe gut blood flow velocity (BFV) responses to a 5 ml/kg bolus enteral feed in babies with congenital heart disease (CHD) and in controls.
Methods: Doppler BFV measurements from the coeliac artery and superior mesenteric artery (SMA) were performed before and at 15-minute intervals after a bolus feed. Average velocity was calculated from the Doppler waveform.
Results: We recruited 15 babies with CHD and 12 controls. There were no differences in birthweight, gestational age or the proportion receiving maternal milk between the groups. Age at study was lower ($p<0.01$) in controls. Coeliac artery average velocity increased from baseline in controls ($p<0.05$) but not in CHD. SMA average velocity increased in both groups. The magnitude of rise in SMA average velocity differed between groups, with controls having higher SMA average velocity by 15 minutes post-feed persisting to 60 minutes, $p<0.01$. The subgroup of babies with hypoplastic left heart syndrome ($n = 8$) showed no increase in their SMA average velocity and a drop in coeliac artery average velocity ($p<0.05$) after the bolus feed.
Conclusions: Gut BFV response to a bolus enteral feed is significantly blunted in stable postoperative babies with CHD. In babies with hypoplastic left heart syndrome there was no increase in SMA average velocity and coeliac artery BFV was lower post-feed, indicating a risk of gut ischaemia in these babies with the introduction of enteral feeds.

PD.22 BOWEL APPEARANCE AS A PREDICTOR OF OUTCOME IN GASTROSCHISIS: A 7-YEAR REVIEW

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Introduction: During ante and postnatal counselling it is difficult to predict outcome for neonates with gastroschisis. A retrospective review of all liveborn neonates with gastroschisis over a 7-year period (2000–6) was undertaken to assess whether ante and postnatal bowel appearance could be prognostic indicators.
Methods: Discharge and theatre databases were used to identify patients. Maternal and neonatal case notes were used to collect demographic data, antenatal ultrasound findings, postnatal bowel appearance, feeding details and duration of hospitalisation.
Results: 60 neonates were identified with 55 case notes available for analysis. Median gestation was 36 weeks (24–39), birthweight 2408 g (470–3220). Five patients died before discharge. 58 were diagnosed antenatally of which 38 had bowel appearance recorded. Of these 22 had abnormal bowel appearance. Postnatally, seven of these had abnormal bowel (matted, peel, thickened, ischaemic), six had atresias, six were normal and in three no comment was made. 16 were normal antenatally, of these seven were abnormal and one atretic. Sensitivity for abnormal bowel 81%, specificity 43%. Median duration of parenteral nutrition was 171 days (20–411) for neonates with atresia, 28 (9–553) with abnormal bowel and 19 (11–84) with normal bowel and time to full enteral feeding was 135 days (21–413), 34 (15–470) and 20 (11–87), respectively. Median time to discharge was 62 days (10–314), 47 (22–865), 45 (22–222).
Conclusions: Antenatal ultrasound correlates poorly with postnatal bowel appearance. The postnatal bowel findings are highly predictive of duration of parenteral nutrition, time to establish full enteral feeding and duration of hospital stay.

PD.23 WITHDRAWN

BMFMS: Fetal Medicine

PFM.01 LONG-TERM EXPRESSION OF HUMAN FACTOR IX AFTER ULTRASOUND-GUIDED DELIVERY OF AAV8 HFIX TO FETAL SHEEP IN UTERO

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Introduction: Haemophilia B is a life-threatening coagulopathy caused by human factor IX (hFIX) deficiency. In 15% of patients hFIX antibodies prevent adequate hFIX replacement therapy. Adult gene therapy trials with adeno-associated virus (AAV) show only short-term hFIX expression. We hypothesised that fetal delivery of AAV would give long-term hFIX expression, without stimulating an immune response to the transgenic hFIX protein.
Methods: We injected AAV8 hFIX vector ($1–9 \times 10^{12}$ p/kg) into the peritoneal cavity of fetal sheep under ultrasound guidance in early ($n = 3$) or late ($n = 4$) gestation. Fetal and lamb blood was tested for hFIX expression, antibody responses and liver damage up to a year after birth. Lambs received subcuticular injection of hFIX protein with Freund's complete adjuvant at 6 months ($n = 2$) or 1 year ($n = 2$) after birth to test for immune tolerance.
Results: High-level hFIX was detected 3–21 days after early (8.7%) and late (44% and 28%) gestation injection, but hFIX levels dropped rapidly as fetal liver and lamb weights increased. Low level hFIX (0.7%) was detectable 1 year after birth in early and 4 months after birth in late gestation injected lambs. There was no evidence of liver pathology or functional antibodies to the hFIX protein. After injection of hFIX protein, lambs mounted an antibody response.
Conclusions: Long-term hFIX expression is possible after AAV fetal gene therapy in a large animal, but immune tolerance was not demonstrated.

PFM.02 A STEREOLOGICAL STUDY OF CHRONIC UTEROPLACENTAL INSUFFICIENCY ASSOCIATED WITH NORMAL BIRTHWEIGHT: A DISTINCT ENTITY

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Objectives: Chronic uteroplacental insufficiency (CUPI) causes accelerated villous maturation. Of 800 low-risk pregnancies, 79

placentas had accelerated villous maturation; pre-eclampsia (PET) and thrombophilia were excluded in these cases. Of these, 53 were associated with normal infant birthweights (NBW) (CUPI–NBW) and 17 with intrauterine growth restriction (IUGR) (CUPI–IUGR).
Methods: 10 placentas were examined from each of the following groups: NBW, CUPI–NBW, CUPI–IUGR and PET–IUGR. The placental disc volume was estimated followed by uniform random sampling of 10 full-thickness biopsies. Five fields were examined from coded haematoxylin and eosin stained sections. Stereology comprised star volume and surface area measurements of terminal villi and capillaries. Two-dimensional counts of syncytial knots were also performed.
Results: The CUPI–NBW had significantly reduced capillary star volume and surface area, but had a normal villous surface area compared with NBW. This contrasted with CUPI–IUGR in which all the parameters, including surface area, were reduced similar to PET–IUGR. The PET–IUGR capillary star volume was, however, partly reduced compared with NBW although capillary surface area was significantly reduced (possibly related to maternal antihypertensive therapy). Clinically, 72% of CUPI–NBW required surgical/instrumental delivery compared with 53% in CUPI–IUGR and 48% in NBW.
Conclusions: The normal total villous surface area in CUPI–NBW compared with NBW and reduced terminal villous vascular volume similar to PET–IUGR provides an understanding of previously unexplained intrapartum hypoxia.

PFM.03 GASTROSCHISIS OUTCOMES: THE SOUTHAMPTON EXPERIENCE

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Objectives: The optimal method of monitoring in third trimester for babies with gastroschisis is unclear. This study describes the condition at birth of babies with gastroschisis in relation to the short-term variation (STV) immediately before birth. Customised birthweight centiles were also calculated.
Methods: All fetuses with prenatally diagnosed gastroschisis at the Wessex Fetal Medicine Unit from January 1996 to December 2007 were included. Data were collected by retrospective review. Variability, including computerised STV when available, on the last cardiotocography before delivery was reviewed. Immediate neonatal condition, using cord gases, was evaluated.
Results: 133 babies were antenatally diagnosed with gastroschisis. Median (range) gestational age at delivery and birthweight were 36 weeks (31–38) and 2365 g (1200–4500), respectively. Caesarean section rate (excluding terminations and intrauterine deaths) was 41% (51/124) with 86% (44/51) being emergency for fetal concerns. 55% (28/51) were performed for reduced variability and/or reduced STV alone. Cord gases were available in 93% and both arterial and venous pH were above 7.20. Using population-based estimates, 28%, 18% and 10% were below the 10th, 5th and 3rd centiles. Customisation was possible in 51% (68/133). Using customised growth estimates 50%, 34% and 29% were below the same respective centiles. The intrauterine fetal death rate was 3% (4/133).
Conclusions: Using reduced STV to predict neonatal condition at birth is not supported by these data. Careful consideration should be given to the timing of birth when STV is reduced. A higher percentage of babies were small for gestational age using customised growth estimates.

PFM.04 ANTENATAL DETECTION OF CLEFT LIP WITH OR WITHOUT CLEFT PALATE: INCIDENCE OF ASSOCIATED ANOMALIES

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Objectives: To ascertain the incidence of congenital structural and/or chromosomal abnormalities with antenatally diagnosed cleft lip and/or palate and correlation to the anatomical type. The accuracy between prenatal scan and postnatal clinical diagnosis was also analyzed.
Methods: Retrospective review of cases referred to the cleft lip and palate (CLAP) team from 2000 to 2006.
Results: 528 cases were referred to the CLAP team (69 excluded as incomplete data). 252 had isolated cleft palate, none were diagnosed antenatally. These babies have a 25% risk of associated abnormalities/syndromes. 38.5% of isolated cleft lips were diagnosed antenatally with correlation to postnatal diagnosis in 59%. None of these fetuses had abnormal karyotype. Unilateral CLAP was diagnosed prenatally in 60%, with correct postnatal correlation diagnosis in 41%. If the unilateral CLAP was isolated there were no associated abnormal karyotypes. There were additional scan abnormalities in 5.8% (normal karyotype) and 5.8% had chromosomal abnormalities. Bilateral CLAP was diagnosed prenatally in 64.7%, with postnatal correlation in 77%. 8.8% had chromosomal abnormality, 23.5% had structural abnormality. 100% of midline CLAP were diagnosed antenatally, all had associated abnormalities.
Discussion: This is the largest single-centre study examining CLAP karyotype and structural abnormality associations. Studies have quoted 35% association of abnormalities with CLAP, this being irrespective of the type of CLAP.[1] It is vital to tailor the discussion according to the anatomical type, thus enabling targeted offering of chromosomal testing. This highlights the need for accurate scan diagnosis both of the type of CLAP and the presence/absence of other abnormalities.

1. **Chmait R,** Pretorius D, Moore T, *et al*. Prenatal detection of associated anomalies in fetuses diagnosed with cleft lip with or without cleft palate in utero. *Ultrasound Obstet Gynaecol* 2005;**27**:173–6.

PFM.05 CHRONIC UTEROPLACENTAL INSUFFICIENCY CAUSING DISCORDANT GROWTH—INTRAUTERINE GROWTH RESTRICTION IN ONE OF DICHORIAL TWINS: EVIDENCE OF A PRIMARY DISORDER OF THE NON-VILLOUS TROPHOBLAST

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Objectives: Placentas from 10 dichorial twin pairs (gestation 36–40 weeks) with discordant birthweights showed accelerated villous maturation in the smaller twin, suggesting chronic uteroplacental insuffiency, whereas the second placenta was normal. This setting suggests impaired maternal physiological vascular adaption in one twin, reflecting a primary trophoblast disorder in one twin only.
Methods: Stereology was used to compare 10 twin placentas with 10 gestation matched placentas from normal pregnancy and birthweights (NBW) and pre-eclamptic (PET) gestations with intrauterine growth restriction (IUGR). The volume of each placenta was measured, followed by uniform random sampling of 10 full-thickness biopsies. Five fields were examined from coded haematoxylin and eosin stained sections. The stereological examination comprised star volume and surface area of terminal villi and their capillaries. Two-dimensional counts of syncytial knots were also performed.
Results: Placental villi from the IUGR twins had significantly reduced total surface area and star volume compared with NBW and the normal sized co-twin, while having no significant difference from the PET–IUGR group. The villous capillary space also demonstrated a significant reduction in area and star volume in parallel with the villous measurements above. The two-dimensional syncytial knot count was significantly elevated in the IUGR twin and PET–IUGR, whereas the NBW twin was similar to that in the normal control.
Conclusions: As PET or thrombophilia of necessity should effect both twin placentas, this study strongly suggests that this pathogenesis is unique to one twin, indicating that a primary disorder of the non-villous trophoblast is involved in some cases of chronic uteroplacental insuffiency.

PFM.06 A PILOT STUDY OF THE FEASIBILITY OF A RANDOMISED TRIAL OF LOW GLYCAEMIC DIET VERSUS NORMAL DIET FROM EARLY PREGNANCY IN EUGLYCAEMIC WOMEN

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Objective: To study the feasibility of conducting a randomised controlled trial of low glycaemic diet versus normal diet from early pregnancy in euglycaemic women. Our aim is to study the influence of low glycaemic diet on infant birthweight and the recurrence of macrosomia. A power calculation suggests that at least 700 women would need to be recruited to show a statistically significant difference.
Study Design: A randomised controlled trial. All secundagravida were identified and invited to participate in the trial if first birthweight was >4000 g and the current gestational age was <14 weeks' gestation. Women with impaired glucose tolerance were excluded. Following computerised randomisation, a low glycaemic diet was instituted under dietetic supervision in the intervention group. The control group received no dietetic advice. Percentage participation was recorded. Maternal weight gain in pregnancy was measured as a marker of adherence to low glycaemic diet.
Results: Among 193 potential recruits for the study, 13 booked too late for inclusion and of the remaining 180 women, 163 (90.5%) accepted study participation. The mean BMI at booking visit (14 weeks' gestation) was similar in both groups (n = 76, 26.8 ± 5.8 versus n = 76, 27.7 ± 5.2) as was the initial maternal weight (74.7 ± 17.2 versus 76.2 ± 13.6). The mean maternal weight gain up to 28 weeks' gestation was significantly less in the dietary group (n = 31, 6.4 ± 2.5 kg versus 42, 8.2 ± 3 kg, $p<0.01$).
Conclusions: Preliminary results suggest that this randomised controlled trial is feasible with high patient participation rates. Our results also suggest that a low glycaemic diet effectively reduces weight gain in pregnancy.

PFM.07 FETOMATERNAL ALLOIMMUNE THROMBOCYTOPENIA IN THE UNITED KINGDOM: A PROSPECTIVE NATIONAL STUDY OF INCIDENCE, MANAGEMENT AND OUTCOMES USING OBSTETRIC, PAEDIATRIC AND LABORATORY REPORTING SYSTEMS

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Background: Fetomaternal alloimmune thrombocytopenia (FMAIT) is the commonest cause of severe neonatal thrombocytopenia in otherwise well term infants and can lead to serious bleeding, intracranial haemorrhage and death. There is current debate about antenatal screening for the condition. The aim of this study was to address the deficiency in basic epidemiological data on FMAIT to inform this debate.
Methods: Parallel national descriptive studies were conducted using the UK Obstetric Surveillance System (UKOSS) and the British Paediatric Surveillance Unit (BPSU) from October 2006. Data were cross-checked with the National Blood Service (NBS) laboratories.
Results: There were 76 cases of FMAIT identified through the three sources in an estimated 726 517 total births, representing an estimated incidence of 1.0 cases/10 000 total births (95% CI 0.8 to 1.3/10 000). 29% of cases were identified antenatally and 71% postnatally. The 22 antenatal cases (19 in women with previously affected pregnancies) were managed with steroids plus intravenous immunoglobulin (IVIg) plus intrauterine platelet transfusion (IUT) (41%), IVIg alone (36%), steroids plus IVIg (9%), IVIg plus IUT (9%) or IUT alone (5%). There were two intrauterine deaths, one infant death and seven infants had an intracranial haemorrhage. Seven of these 10 cases with serious clinical problems occurred in women without a history of FMAIT.
Discussion: The incidence of clinically detected FMAIT estimated from this national study is less than one third of that estimated from prospective screening studies. More than two thirds of cases with serious clinical problems were diagnosed postnatally, highlighting the importance of appropriate assessment of the case for antenatal screening.

PFM.08 INCIDENCE OF FETAL CONGENITAL MALFORMATIONS IN WOMEN WITH TYPE 1 AND TYPE 2 DIABETES IN PREGNANCY IN A LARGE MULTI-ETHNIC UK REGION

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Aims: To analyze the West Midlands cohort data collected from the UK CEMACH programme into pregnancy in women with type 1 and type 2 diabetes 2002–3 and to compare major congenital malformation rates (CMR), their nature and ethnicity of the mother in West Midlands with UK figures.
Methods: Data for pregnancies in West Midlands region between 1 March 2002 and 28 February 2003 and followed through to the infant outcome at 28 days were obtained. All data were re-examined by two investigators to maximise the validity. The CMR, pregnancy outcomes and prevalence of malformations within different ethnic populations in West Midlands were examined.
Results: There were 32 major congenital malformations. Seven of these resulted in spontaneous fetal losses before 24 weeks' gestation. There were three stillbirths, two neonatal deaths and 22 babies alive at 28 days. The CMR for the West Midlands is 82.1/1000 births compared with 41.8/1000 births nationally. A higher proportion of women were of Asian ethnicity, predominantly Pakistani (17.5% versus 10.5% nationally) and they were over-represented in the type 2 diabetic population. However, 78% of congenital anomalies occurred in the European population and the highest CMR was in European type 2 diabetic women, at 110/1000 births. The majority of anomalies (53%) were cardiac or central nervous system abnormalities.
Conclusions: The CMR in the West Midlands is twice that reported in the United Kingdom pregestational diabetic population and four times that of the non-diabetic population. Detailed antenatal fetal anomaly and cardiac scanning is advocated to screen for major malformations in this high-risk population.

PFM.09 IMPLEMENTATION OF AN NHS FIRST TRIMESTER SCREENING CLINIC

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Problem: To improve screening for trisomy 21 and reliability of routine maternal screening tests by introducing an NHS first trimester screening clinic.
Design: Implementation of a "one-stop" clinic, which included first trimester ultrasound assessment of nuchal translucency, measurement of serum free β human chorionic gonadotrophin and pregnancy-associated plasma protein A, along with maternal screening tests (full blood count, rubella, hepatitis B, syphilis, HIV and midstream urine culture).
Background and Setting: Fetal care unit in a university hospital with 3000 deliveries/year. Key measures for improvement: uptake of fetal and maternal screening; detection rate of trisomy 21; screen

positive rate and number of invasive procedures. Strategies for improvement: restructuring of antenatal clinics; publishing of clear algorithms for antenatal care; establishment of telephone clinic booking service; provision of detailed patient information and consent leaflets; ensuring high standard of first trimester ultrasound and high quality measurement of first trimester serum biochemistry; provision of counselling for high-risk patients.

Effects of Change: Improvement in completion of screening (60–90% of antenatal booking population) while maintaining a high detection rate of trisomy 21 (89%) along with a 23% reduction in the number of invasive procedures. Lessons learnt: the NHS live programme proved useful in implementing the first trimester screening clinic, particularly at the planning stage as this body provided a forum in which input from all stakeholders was encouraged. Piloting the clinic before full introduction helped identify minor problems but we still underestimated the amount of administration required to run the clinic. A reliable first trimester screening programme can be introduced that complements existing NHS maternity care.

PFM.10 IS FREE FETAL DNA PLASMA CONCENTRATION INCREASED IN TWIN PREGNANCIES: A REAL-TIME PCR QUANTITATIVE STUDY

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Introduction: The discovery of free fetal DNA (ffDNA) has revolutionised non-invasive prenatal diagnosis. Quantitative studies of ffDNA have demonstrated that ffDNA concentration increases with gestation and is also increased in pregnancies complicated by pre-eclampsia. It has been shown that the most likely source of ffDNA is the trophoblast. Therefore, ffDNA concentration should be increased in pregnancies with increased trophoblastic mass, such as multiple pregnancies. We performed a quantitative study to examine this hypothesis.

Methods: Women with normal singleton and multiple pregnancies were recruited in two Bristol hospitals. Blood samples were taken at different gestational ages and the extracted plasma was stored at −80°C before further processing. ffDNA quantification was undertaken with real-time quantitative PCR for the DYS14 gene of the Y chromosome. Chorionicity was determined with a combination of ultrasonography and histology. We examined the difference in ffDNA concentration between pregnancies with one and two male fetuses.

Results: 169 women were recruited in the study. There was higher ffDNA concentration in pregnancies with two male fetuses in comparison to pregnancies with one male fetus ($p<0.05$). The difference is more marked in the third trimester. There were similar ffDNA concentrations in singleton pregnancies and twin pregnancies with one male fetus. There was no significant difference between monochorionic ($n = 9$) and dichorionic ($n = 16$) pregnancies.

Conclusions: There is a higher plasma concentration of ffDNA in twin pregnancies. This finding adds further support to the trophoblastic origin of ffDNA. Future quantitative applications of ffDNA would have to use different reference ranges for multiple pregnancies.

PFM.11 MONITORING QUALITY IN A REGIONAL CHORIONIC VILLUS SAMPLING SERVICE

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The West Midlands Region covers 66 000 births per annum in 20 units, of which four offer chorionic villus sampling (CVS).

A group was convened of all CVS operators in the region to monitor activity and outcomes against national guidelines.

All CVS procedures undertaken in the region during 2005 and 2006 were reviewed. Data from the regional cytogenetics laboratory were linked to datasets from the four units performing CVS. Outcomes were established by linking with regional datasets (congenital anomaly register, perinatal deaths and clinical genetics) and via the network of local antenatal screening co-ordinators. Outcomes up to 28 days post delivery were obtained in all cases.

The indications for CVS were recorded and reviewed. Loss rates as defined by a recent systematic review[1] were generated for singleton pregnancies both as crude and corrected rates, which excludes cases with either structural and/or chromosomal anomalies.

740 CVS procedures were performed in the region (5.5 procedures per 1000 births). All procedures were performed transabdominally. 34% of cases had structural malformations on ultrasound or chromosomal defects.

The crude loss rates following procedures were 2.5% (1.2–3.8%) within 14 days of the procedure and 6.5% (4.5–8.6%) before 24 weeks. In the normally formed group, these were 0.9% (0–1.8%) and 2.8% (1.2–4.3%), respectively.

The number of procedures that failed to obtain an adequate sample was six (0.8%) and the laboratory success rate in obtaining karyotype results in adequate samples was 100%.

1. **Mujezinovic F,** Alfirevic Z. Procedure-related complications of amniocentesis and chorionic villous sampling: a systematic review. *Obstet Gynecol* 2007;**110**:687–94.

PFM.12 A STEREOLOGICAL STUDY OF PLACENTAS FROM MOTHERS WITH THROMBOPHILIA

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Objectives: Stereological assessment of placental villi in thrombophilia.

Methods: A prospective study of both acquired and inherited thrombophilia in 1012 low-risk prima gravid pregnancies provided four clinical cohorts for this study. 10 placentas were sampled from each of the following groups: pre-eclampsia (PET) with intrauterine growth restriction (IUGR); normal birthweight controls (NBW); acquired thrombophilia and inherited thrombophilia. The volume of each placental disc was measured followed by uniform random sampling of 10 full-thickness biopsies. Five fields were examined from coded haematoxylin and eosin stained sections. Stereological assessment comprised star volume and surface area measurements of terminal villi and of their capillaries. Two-dimensional enumeration of syncytial knots was also performed in each case.

Results: The results showed a statistically significant reduction of both star volume and surface area of terminal villi in acquired and inherited thrombophilia and PET–IUGR when compared with NBW. Although the surface area of capillaries was significantly reduced in acquired and inherited thrombophilia and PET–IUGR, capillary star volume was only significantly lower in acquired and inherited thrombophilia when compared with controls (the lack of difference in PET–IUGR is possibly related to antihypertensive therapy in these mothers). Syncytial knots were increased in each test group when compared with NBW.

Conclusions: These findings demonstrate that both acquired and inherited thrombophilia clearly affect the placenta in a way that is very similar to PET–IUGR.

PFM.13 WITHDRAWN

PFM.14 USE OF VIDEO AS A DECISION AID IN ANTENATAL SCREENING: A RANDOMISED CONTROLLED TRIAL

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Introduction: The National Screening Committee wants pregnant women to make informed choices about screening tests. We undertook a randomised controlled trial to assess whether an information video would improve women's knowledge regarding antenatal screening.
Methods: Following block randomisation, 647 women were sent an information video and standard literature at booking and 738 controls were sent standard literature. Following confirmation of an ongoing pregnancy, 473 women in the video group and 613 controls were sent a questionnaire regarding demographics and knowledge about screening.
Results: We received 202 replies from the video group and 238 from the controls, giving a response rate of 42.7% and 38.7%, respectively (NS). There was a significantly higher knowledge score in those who received the video compared with the controls, with a mean score of 11.24 in the study group compared with 10.33 in the controls ($p<0.05$). Age and ethnicity affected test score ($p<0.001$ and $p<0.05$, respectively), with older mothers and white women scoring higher. There is no difference in the demographics between the two study groups; however, when compared with the hospital demographics we observed a higher response rate among older ($p<0.05$) and white (χ^2 15.5, $p<0.001$) women.
Conclusions: The use of multimedia demonstrates a significant improvement in knowledge regarding screening over traditional literature. This study reveals differences in knowledge between both different ethnic groups and ages, which highlight further areas for study. It is time that maternity services embrace modern technology to enhance women's knowledge.

PFM.15 PROVISION OF LATE TERMINATION OF PREGNANCY AND FETICIDE: RESULTS FROM A SURVEY OF UK FETAL MEDICINE CONSULTANTS

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Background: Provision of late termination of pregnancy (TOP) for fetal anomaly is regulated by legal criteria (eg, ''serious/severe'' for TOP >24 weeks) and professional guidance (eg, feticide preceding TOP $>21^{+6}$ weeks). In practice, professionals' interpretations of regulations differ. There is little evidence on current practices to understand the variations in context.
Methods: An e-mail/postal questionnaire survey of fetal medicine consultants' experiences of providing late TOP. Questionnaires were sent to 82 consultants in 21 UK tertiary units. Questions related to current practice and personal impact of providing late TOP. Data were analyzed using descriptive statistics and qualitative methods.
Results: Provision of TOP remains stable, with a majority view that current personal (71%) and unit (61%) provision were unchanged over recent years; more participants felt that feticide provision had increased. Except for Edward's syndrome, there was a lack of consensus in eight other clinical scenarios about whether/when TOP should be offered (eg, for isolated ventriculomegaly (atrium 12 mm), 34% would not offer TOP, 57% would at 21 weeks and 4% would at 26 weeks, whereas for ''isolated'' Down's syndrome respective figures were 0%, 49% and 51%). Most participants had used clinical discretion to provide care that was close to, but not within, professional guidance for feticide. Suggestions for more rigid guidance were perceived negatively; only 20% of participants felt a ''list'' of serious/severe anomalies would be enabling and workable.
Conclusions: Clinical discretion is crucial to how late TOP and feticide are provided. Variations in practice may reflect differing but legitimate interpretations of the existing regulatory mechanisms.

PFM.16 FIRST TRIMESTER COMBINED SCREENING FOR DOWN'S SYNDROME IN 6209 UNSELECTED PREGNANCIES

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Objective: To audit the performance of combined first trimester screening (CFTS) for Down's syndrome in clinical practice.
Design: Prospective audit.
Setting: First trimester clinic in a university hospital.
Population: Pregnant women at 11–13 weeks' gestation.
Methods: The standard was: ''Pregnant women should be offered a Down's syndrome screening test with detection rate >75% and a false positive rate of <3% based on a cut-off of 1/250 at term.'' (NICE 2003, UKNSC, 2004). Data on CFTS for Down's syndrome (involving nuchal translucency (NT) measurement and maternal serum beta human chorionic gonadotrophin and pregnancy-associated plasma protein A) were collected over a 2-year period, following establishment of a ''one-stop screening clinic'' at the Royal Devon and Exeter Hospital. The main outcomes were detection and false positive rates for trisomy 21. Incidences of other fetal abnormalities during screening were also determined.
Results: Of 6998 antenatal women 6209 underwent CFTS after excluding 630 (9%) non-consenting women, 146 (2%) with early fetal demise, 67 (1.1%) with impossible NT measurement and 334 (4.8%) ⩾14 weeks' gestation. The latter two groups were offered the triple test and were excluded in analysis. Median age was 29.5 years and 22.2% were ⩾35 years. 132 (2.1%) women had multiple pregnancies. Age-standardised screen-positive rate (cut-off of 1 : 250 at term and 1 : 300 at the sampling) was 2.4%, with detection rate of 89.5% and false positive rate of 3.3%. The incidence of other aneuploidies and major structural abnormalities was 0.2% and 0.3%, respectively.
Conclusions: Universal first trimester screening for trisomy 21 with high detection and low false positive rates is achievable within the NHS setting.

PFM.17 WITHDRAWN

PFM.18 OUTCOME FOLLOWING PRENATAL DIAGNOSIS OF PULMONARY AND TRICUSPID ATRESIA

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Aim: To review the fetal outcome following prenatal diagnosis of pulmonary atresia (PA) and tricuspid atresia (TA).
Methods: We retrospectively reviewed the outcome of all cases of prenatally diagnosed PA and TA between 1 January 1997 and 31 December 2004.
Result: During this period, 25 cases of PA and 19 cases of TA were diagnosed prenatally. The majority of mothers were referred for specialist fetal echocardiography because of an abnormal mid-trimester anomaly scan (95%). The median gestational age at diagnosis was 21 weeks. None of the cases were associated with extracardiac anomaly. One case was associated with trisomy 21. Following prenatal counselling, 12 couples chose termination of pregnancy (five PA and seven TA). There were six stillbirths (four

PA and two TA). There were 23 live births (14 PA and nine TA). There were six neonatal deaths in the PA cohort. One-year surgical survival was 87.5% for PA and 88.8% for TA, with a median survival age of 67.5 months for PA and 67 months for TA. At the time of prenatal diagnosis, the overall survival for PA and TA was 41% and 80%, respectively (excluding terminations and those lost to follow-up).

Conclusions: In our series the overall outcome was significantly poorer for PA. However, the surgical survival for these babies was well over 85%. Prenatal diagnosis allows for counselling of couples and planning of delivery at a tertiary obstetric unit with adjoining facilities for stabilisation and transfer to a surgical centre.

PFM.19 COCHRANE SYSTEMATIC REVIEW OF ANTENATAL SCREENING FOR DOWN'S SYNDROME

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Background: Ultrasound, serum and urine markers, often in combination, are used as a screening test for Down's syndrome in pregnancy. Most of the currently quoted screening effectiveness data are derived from modelling and an international consensus on the most accurate screening method is still lacking.

Methods: We have reviewed all relevant literature using standard Cochrane methodology for systematic reviews of diagnostic test accuracy focusing on real patient data. Results were pooled using hierarchical summary receiver operator characteristic meta-analytical methods. The methods and reporting of the studies were assessed according to standard QUADAS criteria.

Results: A comprehensive literature search identified 13 079 papers of which 238 were deemed suitable for inclusion, according to prespecified criteria. Information and data from 46 single tests and 174 combinations were extracted. Many studies reported little detail of study methods and risk calculations and some omitted reporting results for the study participants, rather reporting theoretical performance of models derived from the data. Few studies reported the uncertainty of estimates of test performance. We identified 10 studies (n = 79 412) evaluating nuchal translucency alone and 22 of nuchal translucency in combination with first trimester serum screening (n = 222 171). The pooled analysis showed that the addition of serum screening significantly increased sensitivity from 72% (95% CI 62 to 79) to 86% (95% CI 83 to 88), with no increase in false positives.

Conclusions: The large heterogeneity of populations and methodology makes meaningful pooling of the diagnostic data accuracy challenging. The data for nuchal translucency-based screening show that adding serology significantly improves screening performance.

PFM.20 SYSTEMATIC REVIEW AND META-ANALYSIS OF MIDDLE CEREBRAL ARTERY DOPPLER TO PREDICT FETAL GROWTH RESTRICTION/COMPROMISE OF FETAL WELLBEING

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Background: Accurate antenatal prediction of fetuses at risk of growth restriction and compromise of fetal wellbeing would allow interventions to prevent the high associated perinatal mortality and morbidity.

Objective: To evaluate the accuracy of middle cerebral artery Doppler in the prediction of fetal growth restriction and compromise of fetal wellbeing.

Methods: Extensive electronic searches (inception to November 2007), reference lists, contact with experts. Without language restrictions, we selected all studies on middle cerebral artery Doppler that allowed construction of a 2 × 2 table. Multiple reviewers independently selected studies, extracted data on participants, Doppler indices and outcomes and assessed study validity. Meta-analysis of sensitivity and specificity was conducted and likelihood ratios were calculated.

Results: There were 27 articles that met the selection criteria, including a total of 2865 fetuses and 75 2 × 2 tables. Despite promising results in the individual studies the meta-analysis showed low predictive accuracy. The best overall result was middle cerebral artery Doppler, which predicted the need for admission to a neonatal intensive care unit with a positive likelihood ratio of 4.43 (2.64 to 7.40) and a negative likelihood ratio of 0.63 (0.53 to 0.74). Disappointingly, meta-analysis did not show good predictive accuracy for combined outcomes such as adverse perinatal outcome and perinatal mortality (Forest plots will be used to demonstrate main results and subgroup analysis).

Conclusions: Abnormal middle cerebral artery Doppler showed limited predictive accuracy for fetal growth restriction and compromise of fetal wellbeing. High quality primary research or individual patient data meta-analysis looking at this test alone and in combination with other tests is required.

PFM.21 PREDICTION OF ADVERSE PREGNANCY OUTCOMES IN WOMEN WITH LOW PREGNANCY-ASSOCIATED PLASMA PROTEIN A

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Low maternal serum pregnancy-associated plasma protein A (PAPP-A) at 11–13 weeks is associated with pre-eclampsia, intrauterine growth restriction (IUGR) and perinatal death. We prospectively recruited 73 women (45 delivered) with normal singleton pregnancies and PAPP-A ⩽0.3 multiples of median (MoM). Sixteen week maternal serum screen and 19–23 week placental ultrasound (morphology and uterine artery Doppler; UTAD) were related to pregnancy complications. 56% had no previous complex obstetric or medical history. 36% had a normal term delivery; 44% delivered <32 weeks, 58% were small for gestational age (<10th centile), 33% severe IUGR, resulting in 24% perinatal mortality. 45% had elevated α-fetoprotein (AFP; >2.0 MoM), 60% had one or more ultrasound abnormalities (small and/or thick shape in 40%, mean UTAD pulsatility index >1.45 in 31%). Elevated AFP increased the odds of IUGR (odds ratio 4.78; 95% CI 1.17 to 19.39); any T2 placental ultrasound scan/UTAD abnormality increased the odds of delivery <32 weeks (7.11; 1.87 to 26.67) and IUGR (18.31; 2.63 to 119.71). When placental thickness/length was >0.5, perinatal death (27.50; 3.40 to 204.54) was substantial. Elevated AFP plus any abnormal T2 ultrasound scan/UTAD test increased the odds of delivery <32 weeks (5.67; 1.28 to 24.41), IUGR (8.40; 1.87 to 37.87) and perinatal death (7.67; 1.57 to 37.16). The odds of delivery <32 weeks (0.20; 0.05 to 0.73) or IUGR (0.06; 0.008 to 0.38) were significantly lower when all tests were normal. Severe pre-eclampsia (including haemolysis–elevated liver enzymes–low platelet syndrome) occurred in four (9%) women and was predicted by previous complex medical history (16.0; 2.01 to 118.88) but not these placental function tests. Maternal serum screen and placental ultrasound reliably identifies a subset with low PAPP-A at risk of preterm delivery and perinatal death from placental complications of pregnancy.

PFM.22 WITHDRAWN

PFM.23 MAGNETIC RESONANCE IMAGING OF THE PLACENTA IN INTRAUTERINE GROWTH RESTRICTION

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Introduction: Magnetic resonance imaging (MRI) is an adjunct to ultrasonography, improving detection and characterisation of fetal brain abnormalities. It can assess placental maturity (Grannum grading) and placental morphology (eg, in placenta accreta). However, use has been limited in conditions such as intrauterine growth restriction (IUGR).
Materials and Methods: Fetal MRI was performed using T2-weighted sequences in a 1.5 T scanner in both structurally normal and IUGR fetuses. Placenta : amniotic fluid signal intensity ratios were calculated, placental maturity graded, and appearance scored ''none'', ''mild'', ''moderate'' or ''severe'' by the presence of dark nodules, light bands and abnormal heterogeneity.
Results: Thirty-two scans were performed on fetuses between 21 and 38 weeks' gestation: 19 on structurally normal fetuses and 13 on IUGR fetuses (gestational age 27.4 $\pm$ 4.6 versus 28.3 $\pm$ 2.9, $p>0.05$). Gestational age correlated with the presence of dark nodules and placental maturity. There was a significant difference in the placenta : amniotic fluid signal intensity ratios between IUGR and structurally normal fetuses (0.63 $\pm$ 0.09 versus 0.55 $\pm$ 0.11, $p<0.01$). The placentas of IUGR fetuses had a significantly higher score when scored by the presence of dark nodules (corrected for gestation, mean score 1.08 versus 0.58, $p<0.05$), light bands (mean score 1.62 versus 0.26, $p<0.001$) and abnormal heterogeneity (mean score 1.77 versus 0.32, $p<0.001$). There was no significant difference in placental maturity score (corrected for gestation) between both groups.
Conclusions: Placental MRI has a role to play in assessing the morphological changes in the placentas of IUGR pregnancies. This may have implications for the management of these patients.

PFM.24 IMPACT OF REGIONAL FETAL ECHOCARDIOGRAPHY TRAINING

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Introduction: In Northern Ireland, all women receive fetal cardiac screening during the anomaly scan. Referral to the regional fetal cardiology centre is recommended if the heart appears abnormal or other risk factors are present. We assessed the effect of regional training in fetal echocardiography.
Methods: Obstetric radiographers were invited to attend a one-year training programme. Questionnaires regarding cardiac screening practice and confidence were distributed. Records identified referral reasons and echo results for the year before (period 1) and year of training (period 2). All antenatal diagnoses of major congenital heart disease (CHD) were recorded.
Results: 90% (78/87) of radiographers attended. In period 1, 24% (17/72) of respondents reported confidence in cardiac scanning, compared with 85% (41/48) in period 2 ($p = 0.03$). The table demonstrates the change in views attempted after training. Referrals with suspected abnormality increased from 33 to 66. The percentage with CHD increased from 39% in period 1 to 45% in period 2; however, this was not significant ($p = 0.57$). 21 major diagnoses were made in period 1 and 34 in period 2. Suspected abnormality referrals now make a greater contribution to those with antenatally diagnosed CHD (13/21 to 30/34, $p = 0.02$).
Conclusions: Radiographers' confidence in cardiac screening and the extent of scan attempted has significantly improved since training commenced. The increase in diagnoses may be largely attributable to a decreased referral threshold.

Abstract PFM.24

View	Period 1 (%)	Period 2
4-Chamber	72/72 (100)	48/48 (100%)
LVOT	32/72 (44)	47/48 (98%), $p<0.05$
RVOT	16/72 (22)	48/48 (100%), $p<0.05$

LVOT, left ventricular outflow tract; RVOT, right ventricular outflow tract.

PFM.25 A NOVEL METHOD FOR BIAS-ADJUSTED META-ANALYSIS: ASSESSMENT OF THE EFFECT OF ROUTINE PROPHYLAXIS WITH ANTI-D ON THE RISK OF ISO-IMMUNISATION

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Background: Meta-analysis of data from multiple studies is an increasingly important tool in the development of clinical guidelines. However, current methods generally assess internal and external biases in candidate studies and simply exclude all studies below an arbitrary threshold.
Methods: This paper describes a novel method for bias adjusted meta-analysis. The approach is: (1) define the target question and identify all relevant studies; (2) construct an idealised protocol for each study that would be free of internal biases; (3) identify internal biases by comparing each idealised study with each actual study; (4) identify external biases by comparing each idealised study with the population in which the intervention is being considered; (5) using elicitation, obtain quantitative estimates of internal and external biases; (6) using a moment-based modelling method, estimate bias-adjusted pooled odds ratios (OR), confidence intervals and estimate of heterogeneity.
Results: This method was applied to all eight published comparative studies of routine antenatal prophylaxis with anti-D in rhesus-negative women. We assessed these in relation to routine anti-D (500 iu at 28 and 34 weeks) in the United Kingdom. The OR from a crude meta-analysis was 0.28 (95% CI 0.17 to 0.46) and this demonstrated some between-study heterogeneity ($I^2 = 9\%$). The bias-adjusted OR was 0.25 (95% CI 0.11 to 0.56) and there was no heterogeneity ($I^2 = 0\%$).
Conclusions: We describe a novel meta-analytic approach that allows the inclusion of all evidence from comparative studies by adjusting for internal and external biases. This method may have widespread application in evidence synthesis of both interventional and observational studies in perinatal medicine.

PFM.26 ULTRASOUND ESTIMATION OF FETAL BIRTHWEIGHT IN TWINS

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Introduction: It is well known that the differences between the birthweights of twins and singletons increase, with twins weighing progressively less than singletons as pregnancy advances. In current practice estimating fetal weights in twins is based on formulae derived from singleton pregnancies.
Aim: To assess and compare the accuracy of fetal weight estimation in twin pregnancies using five selected conventional formulae.
Methods: A retrospective study based on ultrasonographic measurements of 145 twin pregnancies scanned serially at University College Hospital, London, from 2001 to 2007. Fetuses with visceral abnormalities and those with no early dating scan recorded were excluded. All women delivered within 21 days from the last scan. Maternal notes were reviewed to rule out any antenatal complicating factors. Actual birthweight was compared with estimated fetal weight (EFW) of each of the five (Hadlock-BPD, HC.AC.FL,[1] HadlockAC,FL,[2] Warsof, Hansmans, Marsal) EFW.

Results: Of the total of 145 twin pregnancies there were 290 fetuses, with a median gestational age of 37 weeks (range 26–39). The mean birthweight was 2435 ± 600 g. Four of the five EFW formulae were significantly different from birthweight when compared using paired two-tailed t-tests (Hadlock[1] EFW, $p<0.001$; Hadlock[2] EFW, $p<0.001$; Warsof EFW, $p = 0.001$; Hansmans EFW, $p = 0.15$ and Marsal EFW, $p<0.001$). The mean percentage errors for each EFW were compared using the ANOVA test with a Bonferroni adjustment for multiple comparisons.
Conclusions: EFW predicted with Hansman seems to be the most accurate, although the mean percentage errors demonstrate it tends to overestimate slightly.

PFM.27 FETAL EXOMPHALOS DETECTED IN THE FIRST TRIMESTER: ASSOCIATED ANOMALIES AND LONG-TERM OUTCOMES

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Introduction: Fetal exomphalos is now commonly diagnosed early in pregnancy. The long-term outcome of these fetuses is unclear and counselling parents is difficult. We assessed the long-term outcome of exomphalos diagnosed in the first trimester.
Methods: A retrospective study of referrals to the Fetal Medicine Unit at University College London Hospital from 1992 to 2007 following diagnosis of exomphalos before 14 weeks of gestation. Maternal and neonatal casenotes were examined for karyotyping, sonograpy and neonatal outcome, up to a minimum of 3 years after surgery.
Results: Of 33 fetuses referred, the exomphalos had resolved in one case, which was excluded. Fetal karyotyping was offered in all cases (euploid n = 12, aneuploidy n = 12, declined n = 8). The exomphalos was isolated in seven cases, one of which was aneuploid. The remaining 25 fetuses had multiple anomalies identified in the first (n = 8) and second (n = 17) trimesters. In 10 cases the pregnancy continued. Two chromosomally normal fetuses with multiple anomalies died in utero. There were two neonatal deaths, one with trisomy 18 and the other with pulmonary hypoplasia. One chromosomally normal neonate died aged 2 years of complications associated with congenital cardiac disease. Four chromosomally normal fetuses with isolated exomphalos were liveborn and had uneventful development after postnatal surgery.
Conclusions: Euploid fetuses with isolated exomphalos diagnosed before 14 weeks of gestation had a good long-term outcome. These data will aid counselling of couples when exomphalos is diagnosed in the first trimester of pregnancy.

PFM.28 SUBTELOMERIC DELETIONS: A CASE REPORT

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Chromosomal rearrangements involving the telomeres are emerging as an important cause of human genetic diseases. Chromosome rearrangements involving the subtelomeric regions are more likely to have phenotypic consequences than those in any other parts of the genome.

We report the case of an 18-year-old woman who booked at 12 weeks of gestation in the index pregnancy having had a miscarriage at 5 weeks' gestation previously. Combined screening in the first trimester gave her a low risk for aneuploidy. The mid-trimester ultrasound revealed multiple congenital abnormalities including small cerebellum, enlarged cisterna magna, tetralogy of Fallot and talipes. Amniocentesis revealed a normal male karyotype. She opted to terminate the pregnancy.

Postmortem confirmed the multiple congenital anomalies seen on ultrasound. Fetal blood was sent for subtelomere analysis by fluorescence in-situ hybridisation, which showed an unbalanced translocation with monosomy for the telomeric region of the short arm of chromosome 5 and trisomy for the telomeric region of the short arm of chromosome 16.

She had a strong family history of fetal loss. Her mother had three miscarriages; her paternal grandmother had several miscarriages and also had a daughter who died at 9 days of age from multiple congenital anomalies.

This case highlights the need for subtelomeric analysis in patients with a strong family history of fetal loss or after babies with multiple congenital malformations as standard G-banded karyotyping misses these. The cost of these methods restricts their widespread use. However, for selected couples, this allows for options of prenatal diagnosis in future pregnancies.

PFM.29 THE INFLUENCE OF MATERNAL AGE ON OUTCOME OF PREGNANCIES COMPLICATED BY BLEEDING AT LESS THAN 12 WEEKS

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Objective: To assess the effect of maternal age on outcome of threatened miscarriage when ultrasound has confirmed fetal heart pulsation.
Design: Prospective cohort study.
Setting: Early pregnancy unit in a university hospital.
Population: 138 singleton pregnancies with bleeding before 12 weeks' gestation and sonographically confirmed fetal heart pulsation.
Methods: Patients recruited over a 6-month period were followed up until delivery or pregnancy loss. Multiple pregnancies, ectopic pregnancies, social terminations of pregnancy, assisted conceptions and temporary residents were excluded. Primary outcomes were pregnancy loss, fetal abnormalities, prematurity, low birthweight (LBW) and Caesarean delivery. The effect of age on outcomes was analyzed.
Results: Overall live-birth rate was 88.7%, with 6.5% miscarriages, 3.2% major abnormalities and 1.6% stillbirths. Incidences of prematurity and LBW were 11.7% and 5.4%, respectively. The Caesarean section rate was similar to our hospital's rate (21.6% versus 22%, respectively). Age ⩾35 years was significantly associated with reduced live-birth rate (73.9% versus 92.1%, $p = 0.02$) and increased miscarriage rate (17.4% versus 4%, $p = 0.04$). Women ⩾35 years had a higher Caesarean section rate (35.3% versus 19.4%, $p = 0.19$), fetal abnormalities (8.7% versus 2%, $p = 0.15$) and pregnancy loss (17.4%versus 6%, $p = 0.07$), but lower prematurity rates (5.9% versus 12.9%, $p = 0.68$) and no LBW compared with younger women.
Conclusions: This pilot study suggests that advancing maternal age exacerbates adverse outcomes of threatened miscarriage when ultrasound has confirmed fetal heart pulsation. We propose a larger prospective study to confirm the risk of adverse outcomes for each gestational week and the impact of age on prognosis in such pregnancies.

PFM.30 CAN LABOUR PROMOTE A FETAL INFLAMMATORY RESPONSE?

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Introduction: A fetal inflammatory response and elevated pro-inflammatory cytokines (eg, IL-6) are associated with fetal brain injury and the later development of cerebral palsy. A fetal inflammatory response has been detected in labour but has been attributed to the fetal role in the initiation of labour; labour has

been attributed a relatively minor and largely hypoxia-mediated role in fetal injury. Our aim was to determine if markers of a fetal inflammatory response differ according to the mode of delivery and onset of labour.

Methods: This prospective pilot cohort study compared whole cord IL-6 from three groups of neonates. Group 1 had an elective Caesarean section for a ''mechanical'' indication; group 2 delivered vaginally after spontaneous labour; group 3 delivered vaginally after labour induction. Women with a possible pre-existing inflammatory response (eg, pre-eclampsia, fever) were excluded. Fresh cord blood was collected in a standard manner and assayed for IL-6.

Results: There were 11 neonates in groups 1 and 2 and 10 in group 3. Neonates delivered after both spontaneous and induced labour had significantly elevated levels of IL-6 compared with those delivered by elective Caesarean section.

Conclusions: Fetal IL-6 levels are elevated in normal labour. This does not appear to be the result of the fetal initiation of labour. Further work is warranted to evaluate the role of labour in the fetal inflammatory response and its possible contribution to fetal injury.

PFM.31 PROVISION OF DOWN'S SYNDROME SCREENING PROGRAMMES IN CONSULTANT-LED UK MATERNITY UNITS IN 2008

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Introduction: A survey undertaken in 2001 to assess the availability of Down's syndrome screening to women in the United Kingdom identified large variations in the type of screening being offered. Only 15% of units providing nuchal-based screening and 27% offered either age-based or no screening at all. In July 2006, the National Screening Committee (NSC) published a policy that Down's screening programmes should have a detection rate of at least 75% with a false positive rate of 3% or less by April 2007. The only programmes to achieve such performance targets would be the combined or the integrated test. Now that the deadline has passed, we wondered if UK maternity units had been able to achieve the recommended standards.

Methods: Between November 2007 and January 2008, we conducted an anonymised telephone survey of moderately sized (deliveries >2500), consultant-led, UK maternity units. We collected data on the availability and type of NHS Down's screening in each unit, by talking directly to antenatal screening midwives or other knowledgeable staff. When the quality of the information given was questionable, clarification was sought from other staff.

Results: We have information from 93 units (>2500 deliveries/year). All units offer some form of screening. Only 35 units (33%) offer tests that match the performance standards of the NSC. Of these, 92% use the combined test and 8% use the integrated test.

Conclusions: Clearly, there is still a ''postcode'' lottery in the United Kingdom when it comes to accessing high quality, sensitive Down's screening.

PFM.32 CYSTIC FIBROSIS IN WALES (1998–2006)

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Cystic fibrosis is an autosomal recessive condition. The affected individual processes two copies of the affected gene (homozygote) cystic fibrosis transmembrane conductance regulator. Mutations in this gene affect electrolytes and water balance on cell surfaces. Heterozygotes are unaffected.

Many congenital anomaly registers do not record cystic fibrosis. It is not thought to be environmentally sensitive as the inheritance pattern is Mendelian.

We present Welsh data on 130 cases of cystic fibrosis (66 male, 63 female) reported in the past 9 years. The prevalence rate is 4.5 per 10 000 total births. Most cases were detected within the first year of life with 5% detected antenatally. There were five terminations and three neonatal deaths. The remaining 122 cases survive.

Echogenic bowel was detected in 14 cases (10.8%) but in only five cases was this followed up with an antenatal cystic fibrosis test.

Of the seven cases detected antenatally, five were first detected with echogenic bowel. The remaining two cases belong to the same mother, in which there was a family history of cystic fibrosis. Only two mothers chose to continue with the pregnancy after diagnosis.

Meconium ileus was reported in 23 cases (18% of the live born cases). In six of these cases, echogenic bowel had been noted antenatally.

A map of prevalence rates for Wales is presented.

PFM.33 ECHOGENIC YOLK SAC: MARKER FOR FETAL ANEUPLOIDY?

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Previous studies have suggested an association between an echogenic yolk sac and aneuploidy. Changes in yolk sac appearance have been described to be a consequence of poor embryonic development or embryonic death.

We decided to test the association between an echogenic yolk sac and aneuploidy in a UK population. We report the outcome in a series of women with an echogenic yolk sac on first trimester ultrasound either in an early pregnancy unit or first trimester screening clinic.

In only one case was an echogenic yolk sac not found to be associated with fetal aneuploidy. 50% of these women presented to the first trimester screening clinic for their routine dating scan. All of the fetuses had a nuchal translucency measurement of >3 mm and risks for aneuploidy varied from 1 : 2 to 1 : 225. Karyotyping by chorion villus sampling performed in all of these women confirmed aneuploidy. All of these women except one elected to have a termination of pregnancy. The one pregnancy, which was continued with a trisomy 21 fetus, resulted in a live birth.

The remaining 50% of women had presented to an early pregnancy unit for ultrasound. All of these ended in a miscarriage and aneuploidy was confirmed in all cases from karyotyping the products of conception.

This preliminary report suggests the need for a formal prospective study to confirm the association between an echogenic yolk sac and aneuploidy. The simplicity of its detection would suggest usefulness for its inclusion in routine first trimester assessment of risk for aneuploidy.

PFM.34 IS RECLASSIFICATION OF STILLBIRTHS BY THE RECODE (RELEVANT TO CONDITION OF DEATH) SYSTEM BETTER THAN THE CURRENT CLASSIFICATION SYSTEM?

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Background: By Wigglesworth classification, a high percentage of stillbirths remain unexplained (62% in one of the studies) despite postmortem examination. The development and testing of the new system was carried out by a team led by Professor Jason Gardosi and revealed a strong link between poor growth rates of babies and stillbirth.

Aim: To determine whether reclassifying stillbirths using the relevant to condition of death (ReCoDe) system instead of the Wigglesworth classification system improves the identification of the cause of stillbirths in our population.

Objectives: To determine the cause of stillbirths using the Wigglesworth classification and the ReCoDe classification. To determine whether using the ReCoDe classification reduces the number of unexplained stillbirths.
Methodology: Retrospective review of 55 case notes of women who had a stillbirth above 27 weeks of gestation between 2000 and 2005.
Results: Growth was <10th centile in 55%. Gestational age: 9% 26–28 weeks; 60% 29–36 weeks; 31% term. Birthweight: 4% <500 g; 18% 501–1000 g; 33% 1000–2000 g; 46% 2001–4500 g. Postmortem 29%. Wigglesworth classification: 58% unexplained antepartum fetal death. ReCoDe classification: intrauterine growth restriction 40%; 15% cause not ascertained.
Conclusions: The new ReCoDe classification system reduces the predominance of stillbirths currently categorised as unexplained. Fetal growth restriction is a common antecedent of stillbirth but its high prevalence is hidden by current classification systems. Early detection of intrauterine growth restriction and timely intervention can reduce the number of stillbirths.

PFM.35 ANTENATAL MANAGEMENT OF WOMEN WITH EXTREME LEVELS OF DOWN'S SYNDROME SCREENING MARKERS IN THE UNITED KINGDOM

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Introduction: Extreme levels of Down's syndrome (DS) screening markers (low pregnancy-associated plasma protein A (PAPP-A) and oestriol and high α-fetoprotein (AFP), second trimester β human chorionic gonadotrophin (βHCG) and inhibin) are associated with adverse pregnancy outcomes such as fetal growth restriction and pre-eclampsia. We investigated current antenatal management of these pregnancies in the United Kingdom.
Methods: An observational questionnaire study of UK antenatal screening coordinators.
Results: Of 44 questionnaires so far sent, 19 have been returned (43% response rate). All units questioned offered DS serum screening tests; over half (n = 10) offered more than one type of test. Most units (n = 15, 79%) offered the triple test; the combined, quadruple and integrated tests were offered in a further 10, three and one unit, respectively. Eleven units (58% of respondents) offered additional second and third trimester sonography for fetal growth velocity; four units also assessed uterine artery Doppler blood flow. The markers used were high AFP (n = 9), low PAPP-A (n = 3) and high second trimester βHCG (n = 3); there was no consensus on which multiples of median cut-offs to use. In those units not offering additional antenatal sonography (n = 9), this was because of insufficient evidence (n = 6) or lack of sufficient ultrasound resources (n = 4). All respondents thought national guidelines were needed; opinion was divided about which marker(s) to use.
Conclusions: Over half of UK antenatal screening coordinators surveyed are offering women with extreme DS screening markers extra antenatal sonography, but there is no consensus as to the best management of these pregnancies. National guidelines to inform practice would be useful.

PFM.36 FACIAL CLEFTS: OUTCOMES AND CLINICAL IMPLICATIONS

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Objective: To report on the prevalence, antenatal detection and outcomes of fetal facial clefts reported to the Cheshire and Merseyside Congenital Malformation Register (CONMAL).
Methods: Notifications of facial clefts to the CONMAL register over a 12-year period (1995–2006) were reviewed in terms of whether reported antenatally or postnatally, whether isolated or associated with other abnormalities, whether associated with aneuploidy and outcomes.
Results: 418 cases identified: 151 (36.1%) notified antenatally, 267 (63.9%) postnatally. The birth prevalence was 1.52 per 1000 births, 62% of which were isolated clefts. Over time there were similar numbers of postnatal notifications but an increasing proportion of antenatal notifications ($p<0.001$). One third of facial clefts were diagnosed antenatally. The diagnosis was correct in 72% of cases. Antenatal detection was better if the lip was involved (32% versus 2% if palate only). 16 cases were incorrectly diagnosed, 10 of which were normal infants, ie, false positives (positive predictive value 86%). Overall, 11 (2.6%) cases were associated with aneuploidy, eight of these were antenatal notifications (incidence of aneuploidy in antenatally diagnosed cases 4.3%; 95% CI 1.4 to 9.7%). There were 20 pregnancy terminations, 18 of which were for multiple abnormalities. If isolated the live birth rate was 94% versus 47% if associated with abnormalities.
Conclusions: Prevalence, detection rates and aneuploidy incidence in our region were similar to those reported in the literature. When a facial cleft is diagnosed antenatally invasive prenatal diagnosis should be offered. The data reflect the diagnostic, prognostic and ethical uncertainties when facial clefts are diagnosed antenatally.

PFM.37 A REVIEW OF PRENATALLY DETECTED FEMORAL ABNORMALITIES

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Antenatally detected femoral abnormalities are rare and form a heterogeneous group in terms of diagnosis and prognosis.
Objective: To evaluate the management and outcome of fetuses after prenatal detection of femoral abnormalities in a tertiary fetal medicine unit over a 5-year period, thus facilitating accurate diagnosis and appropriate counselling.
Methods: Patients were identified via a regional fetal anomaly database or clinician recall. Information was collected as follows: isolated abnormality or generalised skeletal abnormality, additional non-skeletal abnormalities detected, prognosis counselled, referral to clinical genetics, investigations performed, eventual outcome, final diagnosis.
Results: A definitive diagnosis was made in 66% (27/41) of patients. However, a correct diagnosis was only achieved in 20% (8/41) of cases before delivery. Prognosis was correctly predicted in 83% (34/41) of cases. Families found the degree of uncertainty difficult, with 67% (6/9) of patients in which the prognosis was ''uncertain'' electing to terminate the pregnancy. Eighty per cent (8/10) of those in which the condition was deemed ''lethal'' also elected to end the pregnancy.
Conclusions: It is difficult to achieve a correct diagnosis before delivery when a femoral abnormality is identified; however, detailed antenatal assessment may aid the differential diagnosis and help determine prognosis. This was more likely to be achieved if the patient was seen in association with a clinical geneticist. A multidisciplinary team approach involving fetal medicine, genetics, paediatric radiology and pathology is advocated. Fetal examination, medical photography, chromosomes and DNA storage, postnatal *x* ray and a postmortem facilitate postnatal diagnosis and counselling.

PFM.38 PREDICTING ADVERSE PERINATAL OUTCOMES IN A GENERAL OBSTETRIC POPULATION USING FETAL UMBILICAL ARTERY DOPPLER

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Aim: Our aim was to assess the performance of fetal umbilical artery Doppler (FUAD) in predicting adverse perinatal outcomes in a general obstetric population.
Methods: Data were collected prospectively from 1519 women who were referred for third trimester ultrasound scan at Ninewells Hospital, Dundee, between 1 January 2006 and 31 December 2006. FUAD was classified as abnormal if pulsatality index (PI) was >95th centile or if there was absent/reversed end-diastolic flow (EDF).
Results: 78/1519 (5.1%) had abnormal FUAD. 9/1519 (0.5%) had a stillbirth. 87/1519 (5.7%) delivered <34 weeks and 226/1519 (17.5%) had a birthweight of <2.5 kg. More women with abnormal FUAD had preterm delivery <34 weeks (odds ratio (OR) 2.3, 95% CI 1.1 to 4.7, p = 0.04) and birthweight <2.5 kg (OR 7.1, 95% CI 4.4 to 11.3, p<0.0001). There were also more stillbirths (OR 5.4, 95% CI 1.1 to 26.4, p = 0.07). Abnormal FUAD has only a marginal effect in predicting preterm delivery (positive likelihood ratio (LR) 2.1) and stillbirth (positive LR 4.4) and a moderate predictor of low birthweight (positive LR 6.0). However, the upper 5th centile for fetal umbilical artery PI is a moderate predictor of low birthweight (positive LR 5.1) and stillbirth (positive LR 5.0). Absent EDF was a good predictor of low birthweight (LR 68) but was not predictive of preterm delivery and stillbirth.
Conclusions: All pregnant women who are referred for a third trimester ultrasound scan at Ninewells Hospital, Dundee, currently have FUAD assessment, irrespective of fetal biometry and liquor volume. Using a cut-off of the upper 5th centile for PI appears to be a better predictor of perinatal outcome than the presence or absence of EDF alone.

PFM.39 PREDICTING ADVERSE PERINATAL OUTCOMES IN A GENERAL OBSTETRIC POPULATION USING MATERNAL UTERINE ARTERY DOPPLER

K Ragupathy, J Speedie, AE Nicoll. *Ninewells Hospital, Dundee, UK*

Aim: Our aim was to assess the performance of maternal uterine artery Doppler (MUAD) in predicting adverse perinatal outcomes in a general obstetric population.
Methods: Data were collected prospectively from 2520 women who attended for a fetal anomaly ultrasound scan at Ninewells Hospital, Dundee, between 1 January 2006 and 31 December 2006. MUAD was classified as abnormal if bilateral notching was present. Adverse perinatal outcome was defined as stillbirth, preterm delivery (<34 weeks) and low birthweight (<2.5 kg). Logistic regression analysis was used to determine the association between MUAD and adverse perinatal outcome.
Results: 71/2520 (2.8%) had abnormal MUAD. None of these women had a stillbirth. 6/71 (8%) delivered <34 weeks and 11/71 (15%) had a birthweight of <2.5 kg. 2449/2520 (97.2%) had no MUAD abnormalities. 14/2449 (0.6%) had a stillbirth. 78/2449 (3%) delivered <34 weeks and 168/2449 (7%) had a birthweight of <2.5 kg. Although MUAD was not a predictor of stillbirth, more women with abnormal MUAD at 20 weeks' gestation had preterm delivery <34 weeks (odds ratio (OR) 2.8, 95% CI 1.2 to 6.7, p = 0.04). More women with abnormal MUAD at 20 weeks' gestation had low birthweight (OR 2.5, 95% CI 1.3 to 4.8, p = 0.01). However, abnormal MUAD at 20 weeks' gestation has only a marginal effect in predicting preterm delivery (sensitivity 7.1%, specificity 97.3%, positive likelihood ratio 2.7). Abnormal MUAD at 20 weeks' gestation also has only a marginal effect in predicting low birthweight (sensitivity 6.1%, specificity 97.4%, positive likelihood ratio 2.4).
Conclusions: All pregnant women who attend Ninewells Hospital, Dundee, are currently offered MUAD screening. Our study shows that this strategy will have a modest effect in predicting adverse perinatal outcomes.

PFM.40 CHANGING POPULATION TRENDS IN STILLBIRTH OVER THE PAST 10 YEARS

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Objective: To evaluate changing trends in stillbirth in a large population cohort over a 10-year time period.
Study Design: A consecutive cohort of 211 163 women, delivered of infants weighing 500 g or more in the three designated obstetric centres serving a single urban area from January 1995 to December 2004, was analyzed for stillbirth. Two comparative cohorts were created, comprising stillbirth cases from 1995–9 and 2000–4.
Results: A total of 1159 stillbirths were recorded from a population of 211 163 total births (5.5/1000). Congenital anomalies were present in 140 (12.1%), and fetal weight <3rd centile was noted in 275 (23.7%). Multiple gestations accounted for 6.6% of the stillbirth cohort and pregestational or gestational diabetes was present in 2.7% of cases. Detailed pathological evaluation of all 1019 cases without congenital malformations suggested the following aetiologies for stillbirth in this cohort: fetal hypoxia 217 (21.3%), placental abruption 212 (20.8%), umbilical cord accident 108 (10.6%), pregestational or gestational hypertensive diseases 95 (9.3%), intrauterine infection 61 (6.0%), fetal hydrops 61 (6.0%), other various causes 157 (15.4%) and unexplained 108 (10.6%). There were no significant changes in demographics or aetiology of stillbirth during the 10-year study period.
Conclusions: Almost 40% of all stillbirths occur in the setting of fetal anomalies or abnormal fetal growth. Maternal hypertensive disease, multiple gestations and intrauterine infection are important potentially modifiable risk factors for stillbirth. Unpredictable causes, such as placental abruption and umbilical cord accident, remain significant contributors to perinatal mortality.

PFM.41 SONOGRAPHIC DIAGNOSIS OF KNIEST DYSPLASIA

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Background: Kniest syndrome is a severe autosomal dominant skeletal dysplasia caused by the defective formation of type II collagen subsequent to mutations in the *COL2A1* gene. It is phenotypically variable and manifestations include prenatal onset of short stature, a flat face, prominent eyes, a disproportionately large head, talipes and a short chest. To date there are very limited data on the prenatal sonographic presentation of this dysplasia.
Material and Methods: We present four cases of Kneist syndrome and describe the sonographic features and growth pattern of long bones.
Results: In three cases long bones were on or just below the 5th centile at 20 weeks, with growth beginning to fall away from the 5th from approximately 25 weeks. Other features seen were mild bowing of the femora (one), flared metaphyses (one), talipes (two), short chest (two), micrognathia (one). No abnormality was detected at 20 weeks in the 4th case.
Conclusions: Kniest syndrome is a non-lethal skeletal dysplasia with a variable prenatal presentation. In view of the variability and subtlety of features, a definitive diagnosis in a low-risk case is not possible prenatally. However, the finding of short or short and bowed femora with or without talipes or a short chest should raise suspicion of a skeletal dysplasia. After birth mutation analysis may

confirm the diagnosis. In time, advances in molecular genetic technology may allow for targeted genetic testing and a definitive antenatal diagnosis.

PFM.42 INCIDENCE AND OUTCOME OF FETAL GASTROSCHISIS REPORTED TO THE SOUTHWEST CONGENITAL ANOMALY REGISTER, 2002–6

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The Southwest Congenital Anomaly Register has prospectively collected data since 2002. It was used to identify all pregnancies affected with fetal gastroschisis over a 5-year period. 77 cases were identified.

The rate of gastroschisis per 10 000 births in 2004 rose to 5.8 but was constant in the other 4 years (~3.0). 39% of cases were in women under 20 years, 36% in women aged 20–24 years.

From 77 cases, 65 were live births. 53 cases were diagnosed under 21 weeks, nine between 21 and 25 weeks, eight after 25 weeks' gestation and nine cases postnatally. Of the non-live pregnancies, 50% of the six termination of pregnancies under 21 weeks had associated anomalies, one second trimester miscarriage had no associated anomalies and there were associated anomalies in all four spontaneous fetal losses and one stillbirth.

A similar total increase in 2004 was noted overall in the United Kingdom (ONS) and in particular regions; in the North (NORCAS database) and Wales (CARIS database).

Conclusions: Our data are consistent with the observation of an increased risk of gastroschisis in younger women. Gastroschisis is reliably diagnosed by antenatal ultrasound. 18.2% of cases had significant other fetal anomalies justifying detailed fetal ultrasound assessment. Of 71 ongoing pregnancies, 8.5% were non-live births. The increase in rate in 2004 noted in three regions, two of which are adjacent geographical regions, raises the possibility of environmental cause(s).

PFM.43 PREVALENCE AND OUTCOME OF FETUSES WITH A FIRST DIAGNOSIS OF SHORT FEMUR IN THE THIRD TRIMESTER

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Background: Short femora (<5th centile) detected after 24 weeks have a variety of aetiologies including aneuploidy, skeletal dysplasias, growth retardation and constitutional smallness. We report our experience of such cases and suggest a management pathway to facilitate accurate prediction of outcome and optimum management.

Aim: To determine outcome and prognostic indicators for fetuses with normal biometry at the routine anomaly scan who subsequently develop femoral lengths <5th percentile.

Methods: Our Fetal Medicine Unit database was searched to ascertain all fetuses scanned at 24 weeks or later with a femoral length <5th percentile, seen between 1 January 2001 and 31 December 2006. Fetuses with short femora <24 weeks, other visceral abnormalities, multiple pregnancies and those with no early dating scan recorded were excluded. Maternal and neonatal notes were reviewed to determine maternal serum screening, anomaly scan and Doppler results, pregnancy outcome, birthweight and neonatal complications.

Results: 105 cases were ascertained at a median age of 30 weeks (25–38). The table shows features at presentation and outcome.

Conclusions: Combining detailed anomaly scanning, growth patterns and Doppler evaluation allows accurate prediction of prognosis.

PFM.44 REVIEW OF TRIPLOID PREGNANCIES DURING THE PERIOD 2003–6 AT A TERTIARY REFERRAL CENTRE

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Aims and Objectives: To review all cases of triploid pregnancies diagnosed at a tertiary unit.

Background: Triploid pregnancies occur in 1–3% of recognised conceptuses and are associated with miscarriages and hydatidiform moles.

Materials and Methods: Databases from the cytogenetics laboratories were used to identify cases of triploidy for the period 2003–6. Astrai ultrasound reporting system and hospital case records were used to obtain relevant information.

Results: Triploid pregnancies account for 7% of all first trimester losses and 12% of all abnormal karyotypes. There were 13 triploidy cases. Diagnoses were made on cytogenetic studies from chorionic villus sampling (four, 30%); amniocentesis (one, 8%) and retained products of conception (eight, 62%). Karyotypes were nine (69%) 69,XXX; three (23%) 69,XXY; and one (8%) 69,XYY. There were three (23%) molar pregnancies. The median maternal age was 34 years (range 28–44). The median gestation at presentation was 15 weeks (range 8–17). Presentations follow recurrent miscarriage (two, 15%), early pregnancy (two, 15%), dating (two, 15%), and nuchal translucency (one, 8%) scans, second trimester serum screening (four, 30%) and hypertension (one, 8%). Ultrasound features included intrauterine growth restriction, oligohydramnios, ventriculomegaly, hydrocephalus, holoprosencephaly, cystic hygroma and exomphalos. Pregnancy outcomes were three (23%) first trimester miscarriages, three (23%) intrauterine deaths and seven (54%) terminations.

Conclusions: The commonest triploidy was 69,XXX. Almost all cases would have presented during the routine dating, first trimester ultrasound and second trimester biochemical screening or following recurrent miscarriage and are associated with fetal structural anomalies. Pregnancy outcome is invariably fatal.

Abstract PFM.43

FL <5th						Outcome				
Other features at first scan in FMU at ⩾24 weeks										
Uterine artery Doppler			AC		Skeletal features					
	N (not done)	Ab	<5th	⩾5th		Number	IUGR ± PET	Normal small	Skeletal dysplasia	Other
A	+			19	+	19	0	0	17/19	2/19
B		+	32	3	–	35	31/35	2/35	0	2/35
C	+ (4)		25		–	25	19/25	5/25	0	1/25
D	+ (5)			26	–	26	7/26	17/26	1	1/26

Ab, abnormal; AC, abdominal circumference; FL, femoral length; FMU, Fetal Medicine Unit; IUGR, intrauterine growth restriction; PET, pre-eclampsia.

PFM.45 TERM STILLBIRTH STUDY

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Objectives: To evaluate the risk factors associated with term stillbirths, to evaluate whether they are avoidable or not, to find the causes for term stillbirths and to classify according to the relevant to condition of death (ReCoDe) classification.
Materials and Methods: Patient information was retrieved from the stillbirths register and the perinatal mortality meeting register for 3 years between 2004 and 2006. The notes were reviewed and the data were analyzed. The total number of deliveries in a consultant-led unit and the community midwife unit was 15 965. The total number of stillbirths was 101; of these 33 were term stillbirths (32.6%). The stillbirths were classified by ReCoDe classification and were counter-checked by two authors.
Results: The majority of the patients belonged to the low-risk group (63%). Growth was appropriately plotted in only 15 patients and patient handheld notes were missing in 14 patients. 51% of stillbirths occurred after 40 weeks of gestation and 87% were antepartum stillbirths. 63% of the babies were male and 54% were fresh stillbirths. 84% of the stillbirths were unavoidable. When classified according to the ReCoDe classification, 39% belonged to the unclassified or unknown group, 24% were growth restricted and 15% were due to placental causes.
Conclusions: In our study the majority of the stillbirths occurred in the low-risk population and were unavoidable. We monitor high-risk pregnancies closely and intervene early, this might influence the outcome. Despite the advances in obstetrics it is unfortunate that we may continue to have unexplained stillbirths.

PFM.46 ADMINISTRATION OF ANTENATAL BETAMETHASONE BEFORE ELECTIVE CAESAREAN SECTION AND NEONATAL MORBIDITY IN PREGNANCY COMPLICATED BY DIABETES: EXPERIENCE IN A SINGLE UNIT

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Offspring of mothers with diabetes are at greater risk of respiratory distress and are usually delivered before 40 weeks. Following publication of the ASTECS study[1] our unit extended betamethasone administration to women with diabetes undergoing elective Caesarean section at term but before 39 weeks.

We have assessed neonatal outcomes in consecutive women with diabetes (six type 1, two type 2, 15 gestational) delivered by elective Caesarean section in the 37th and 38th week of pregnancy—both 18 months before (No-BETA; nine patients not given antenatal betamethasone) and 18 months after (BETA; 14 patients given antenatal betamethasone) the introduction of the above policy.

There was no difference in mean gestation at delivery (No-BETA 38.1 ± 0.3 weeks; BETA 38.0 ± 0.5 weeks; $p = 0.73$) or birthweight (No-BETA 3.86 ± 0.56 kg; BETA 4.06 ± 0.81 kg; $p = 0.50$). Admission to the neonatal intensive care unit was similar in the two groups (No-BETA one admission, 11%, BETA one admission, 7%; p = NS) and in both cases was due to a requirement for continuous positive airways pressure. Rates of neonatal hypoglycaemia (lowest glucose <2.6 mmol/l) were similar in the two groups (No-BETA five neonates, 56%, BETA four neonates 29%; p = NS).

Our numbers are too small to show any significant difference in neonatal morbidity with the administration of steroids before elective Caesarean section in women with diabetes. However, trends to both improvements in neonatal respiratory morbidity and hypoglycaemia are observed.

1. **Stutchfield P.** *BMJ* 2005;**331**:662.

PFM.47 AUDIT ON REQUEST FOR PLACENTAL HISTOLOGY EXAMINATION IN QUEEN'S MEDICAL CENTRE

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We aimed to assess how well our hospital guideline on ''placental request for histology examination'' was adhered to. This guideline was with reference to the fetal and perinatal pathology report of a joint working party published in 2001.

We collected 50 retrospective placental requests for histology examination from our local pathologist. They were received before 31 March 2006. We analyzed the reason(s) for placental examination.

We introduced a poster and demonstrated it at the labour suite from 1 April 2006. It had listed all indications for placental examination, with reference to our local guideline. The request form for placental examination was also amended in August 2006. 49 prospective requests were collected from 28 September 2006 for re-audit.

We failed to retrieve one retrospective request during our analysis period. Out of our 49 requests, 63% (31) met the criteria. 18.5% (9/49) did not. Insufficient or no clinical details were found in 18.5% (9/49) of the requests.

After the introduction of the poster demonstration and new request form, 65% (32/49) requests met the criteria and 11% (5/49) did not. Inadequate or no relevant clinical details were found in 24% (12/49) of the requests.

The obstetric staff should ensure that an adequate amount of relevant clinical details should be given when requesting placental examination. Allocating named staff who would be responsible for checking the requests might improve the situation. Pathologists may consider declining examination if relevant clinical details are absent or if it was not indicated. We recommend re-auditing this guideline in one year's time.

PFM.48 OUTCOME OF MONOCHORIONIC TWIN PREGNANCY IN A DISTRICT GENERAL HOSPITAL OVER 5 YEARS

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Aim: To evaluate the outcome of monochorionic twin pregnancies in our unit.
Methods: This study was carried out in a district general hospital over a 5-year period (January 2003–December 2007). Sixty women with a confirmed ultrasonographic diagnosis of monochorionic twin pregnancy in the first trimester have been included for analysis. The demographic details and pregnancy outcome were analyzed.
Results: The mean age was 27.8 years (17–42), parity (0–4). 56 were monochorionic diamniotic, four were monochorionic monoamniotic, of which one was a conjoined twin. Obstetric complications included preterm labour (21.6%), preterm premature rupture of the membranes (5%), pre-eclampsia (10%) and postpartum haemorrhage (10%). Fetal complications included twin-to-twin transfusion syndrome (TTTS; 15%), intrauterine growth restriction (IUGR; 28.3%), intrauterine death of both twins (3.3%) and co-twin death (3.3%). Fetal abnormalities included hydrocephalus (following co-twin death), cystic hygroma (45 X/46XY mosaic) and conjoined twin (thoracophagus with hydrops). 18 (30%) twins had vaginal delivery, 39 (65%) were delivered by Caesarean section, three (5%) had termination of pregnancy for fetal abnormalities. The mean gestational age at delivery was 33 weeks. Indications for section included IUGR, cardiotocography abnormalities, pre-eclampsia, TTTS, abruption and failure to progress in the first stage of labour. The median birthweight for twin one was 1866 g, ranging from 537 to 2920 g and that of twin two was 1938 g (range 500–3270 g).
Discussion: In this study monochorionic twins are associated with varying complications including TTTS, IUGR, fetal abnormalities

and preterm labour. Therefore these pregnancies are associated with high perinatal morbidity and mortality, which require close fetal surveillance.

PFM.49 MECKEL–GRUBER SYNDROME: EXPERIENCE OF A UK UNIT

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Background: Meckel–Gruber syndrome (MGS) is a lethal, rare, autosomal recessive condition characterised by the triad of occipital encephalocele, large polycystic kidneys and postaxial polydactyly. Improvements in ultrasonography have enabled prenatal diagnosis as early as 10 weeks' gestation. It is a condition with 100% mortality. Worldwide, the incidence of MGS is 1 per 140 000 live births, with a higher incidence (1 per 9000 live births) in Finland.
Aim: To review the experience of our perinatal unit with MGS.
Methods: A retrospective review of all cases diagnosed between 1997 and 2006 was performed in a large perinatal unit. The case notes, ultrasonographic images and placental histology were reviewed.
Results: A total of 10 cases were identified in six mothers. Five of them were Asian with consanguineous marriage and one was Caucasian with no consanguinity. In four mothers the other pregnancies were normal (three Asian and one Caucasian) Two had multiple MGS pregnancies. All foetuses were antenatally diagnosed between 12 and 16 weeks and the parents underwent counselling regarding termination of pregnancy. Of the 10 diagnosed on our unit, eight pregnancies were medically terminated, one had an intrauterine death and one had a breech presentation needing emergency Caesarean section. All the fetuses had renal hyperplasia and cysts, encephalocoeles and oligohydramnios.
Conclusions: MGS is a rare lethal condition and antenatal diagnosis and counselling play a very important role. Our unit has a high incidence of MGS in England. In mothers with a previous pregnancy with MGS vigilant surveillance is valuable.

PFM.50 LEVEL OF FEAR AND AWARENESS BEFORE AND AFTER PRENATAL DIAGNOSTIC CLINIC

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Objectives: To determine the level of fear and awareness before and after attending the Regional Prenatal Diagnostic Clinic, and to ensure that we are delivering a satisfactory service. This would also help to identify potential areas for improvement.
Methods: Forty-five pregnant women attending the regional clinic, irrespective of gestation, participated in a questionnaire study. The mothers and their partners were requested to complete the questionnaire before and after the procedure, before leaving the clinic.
Results: 96% of patients understood the reason why they attended the clinic. Their source of information was mainly verbal, being provided by their base unit or their GP. The majority had high anxiety levels before the consultation and the clinic attendance reduced the anxiety level considerably. Most of them found this consultation useful. Information regarding the processes likely to be encountered at the clinic was generally obtained from the Internet or the GP before consultation. Services provided were considered useful in reducing anxiety levels as indicated by scoring scales. The atmosphere during consultation was considered to be relaxed by the majority of the attending relatives.
Conclusions: Knowledge of the factors considered important to women and their concerns are essential for professionals working with prenatal counselling and management. Counselling should emphasise that attendance at the regional clinic can be seen as a stress-reducing procedure, rather than the opposite.

PFM.51 CONGENITAL LEUKAEMIA ASSOCIATED WITH DOWN'S SYNDROME: AN UNUSUAL CAUSE OF HYDROPS FETALIS

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We report a rare case of congenital leukaemia associated with Down's syndrome, presenting as hydrops fetalis.

A 36-year-old British primigravida booked in Thailand with an ICSI pregnancy. The early pregnancy was uneventful and all Down's syndrome screening was declined. A scan at 29 weeks demonstrated fluid in the fetal abdomen and an enlarged right ventricle.

She returned home to the northwest and following review in Blackburn she was referred to the tertiary centre in Liverpool. The findings were confirmed with no evidence of fetal anaemia, but echocardiography demonstrated right-sided dilatation and mild tricuspid regurgitation in a structurally normal heart. No firm diagnosis was made, but increased surveillance was advised.

Amniocentesis was performed at 33 weeks for karyotyping and parvovirus; PCR revealed trisomy 21 (B19 DNA negative).

By 34 weeks, polyhydramnios and marked skin oedema had developed, along with reversed a′ waves in the ductus venosus. A repeat middle cerebral artery doppler was not done at this time.

A pale, oedematous, male infant was delivered by Caesarian section at 35 weeks. Haemoglobin was 5 g/dl and blood film diagnosed acute myeloid leukaemia. Treatment was withdrawn and the baby died 5 h later.

The increased risk of leukaemia in Down's syndrome was first reported in the 1950s, but very few cases have presented in utero.

PFM.52 SYSTEMATIC REVIEW OF ACCURACY OF ANTENATAL ULTRASOUND TO PREDICT POSTNATAL RENAL FUNCTION IN CASES OF CONGENITAL LOWER URINARY TRACT OBSTRUCTION

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Background: Congenital lower urinary tract obstruction is a disease of high morbidity and mortality. Antenatal ultrasound parameters may be useful in the selection of those cases that may benefit from perinatal therapy.
Objective: To evaluate the clinical usefulness of antenatal ultrasound in the prediction of postnatal renal function in cases of fetal lower urinary tract obstruction.
Methods: A systematic review was performed. We conducted extensive electronic searches (database inception to 2007). The reference lists of articles obtained were searched for any further articles. Two reviewers independently selected the articles in which the accuracy of antenatal ultrasound was evaluated to predict postnatal renal function. There were no language restrictions. Data were extracted on study characteristics, quality and results to construct 2 × 2 tables. Likelihood ratios for positive and negative test results, sensitivity and specificity were generated for the different ultrasound parameters.
Results: There were four articles that met the selection criteria, including a total of 98 women and 11 2 × 2 tables. The ultrasound parameter that showed the greatest predictive accuracy for renal dysplasia at autopsy was oligohydramnios (sensitivity 0.87–1.00 and specificity 0.7–1.00). Other parameters showed varying accuracy. Meta-analysis and subgroup analysis could not be employed due to the limited number of papers and heterogeneity in the reference standards used.
Conclusions: Measurement of amniotic fluid volume at the time of diagnosis of lower urinary tract obstruction shows promising predictive accuracy for postnatal renal function.

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.