Birmingham Women's NHS
NHS Foundation Trust

The Fetal Medicine Centre Birmingham and the West Midlands Region

Annual Report
April 2012 - March 2013

Editor **Prof. M.D. Kilby; Clinical Lead in Fetal Medicine**

1. Introduction

The Fetal Medicine Centre at the Birmingham Women's Foundation Trust offers specialist care for the 'unborn baby', to pregnant women from South Birmingham, the wider West Midlands 'Region' and a supra-regional service to many areas of the United Kingdom (UK).

The successful delivery of this service to patients both in South Birmingham and from other Primary Care Trusts, within the West Midlands and indeed nationally, is a credit to the hard work of our multidisciplinary team and its interaction with affiliated teams in specialties such as neonatal paediatrics and the paediatric subspecialties of surgery, cardiology and genetics (provided by our own Foundation Trust and our sister Foundation Trust, at the Birmingham Children's Hospital).

In addition, we continue to work closely with the West Midlands Newborn Network and the Regional Specialist Services Agency to deliver a 'seamless' service. In September 2006, the Birmingham Women's Hospital was designated the Perinatal Centre for West Midlands, commissioned by the Regional Specialist services team.

This comprises the perinatal centre / neonatal intensive care service but also includes other specialist services such as those provided within the fields of fetal medicine, perinatal pathology & genetics. We work closely with our neonatal and other specialist paediatric colleagues. The Fetal Medicine centre is thus commissioned by West Midlands Regional Specialist Commissioning group. This year we have worked to specific CQUINs approved by the West Midlands Regional Commissioning Service and we will work towards full implementation of these by the end of 2013. Simultaneously, the National CRG for Fetal Medicine (MDK is the vice-chairman) is working towards the recognition and implementation by NHS England by 2014.

We provide training opportunities in Royal College of Obstetricians & Gynaecologist's (RCOG) recognized training schemes for subspecialty training and ATSM places. As well as our two subspecialty trainees from the West Midlands (UK), we have international fellows / trainees from China and Kuwait.

As well as the clinical component to the Fetal Medicine Centre, there is also an academic component with the designated Professor of Fetal Medicine leading basic science and translational research in this specialty. There are a number of NIHR portfolio studies focusing on Fetal Medicine within our institution.

2. Midwifery Report *Veronica Donovan*

The fetal medicine midwifery/ sonographer team continue to lead and support:

- Amniocentesis clinic and clinical teaching
- Sonographer led fetal echo cardiology screening service
- 1st trimester fetal cardiology screening service
- NT scanning in multiple pregnancies

Marguerite Usher-Somers (Specialist Fetal Medicine Ultrasonographer) had a poster on fetal echo cardiology accepted for exhibit at the 44th annual BMUS conference held in Telford.
The midwife sonographers and specialist ultrasonographer have participated once again in the department's fetal cardiology course. They were involved in the organisation, presentation and hands on training. This was the second such course and once again the evaluation by the attending delegates was very positive. It is our intention to make this at least an annual event; the next course will be in February 2014.

The midwives continue to support the fetal medicine medical staff on detailed scan lists offering support to women with a suspected or diagnosed fetal abnormality, those undergoing diagnostic procedures or treatment and couples who experience pregnancy loss.

3. Patient and Public Involvement

The department produces patient information leaflets for specific conditions to complement the specific information given to patients in a formal letter at consultation. These leaflets have been produced in collaboration with the West Midlands Neonatal Networks and will be cascaded for use throughout this geographical area. Patient representation has been utilized in the development of patient information leaflets.

4. Summary of Clinical Governance

4.1 Audit

This report is the cornerstone of our audits providing metrics on:

1. Miscarriage rates for amniocentesis (<1.5% for miscarriage at 14 days and <24 weeks).
2. Miscarriage rates for CVS. (<2.5% for miscarriage at 14 days and <24 weeks).
3. Outcomes of pregnancies treated by in-utero transfusion & monochorionic twins complicated by TTTS and treated by fetoscopic laser ablation.

These outcomes are measured again international and national (RCOG) standards.
In line with national guidance (http://www.rcog.org.uk/files/rcog-corp/GT8Amniocentesis0111.pdf; authors Alfirevic, Walkinshaw & Kilby), the pregnancy loss rates for amniocentesis and chorionic villous sampling are less than 1% and 2% respectively. The 'threshold' in the national document for concern is 5%. In addition, we have been instrumental in defining outcomes for pregnancy loss associated with such procedures (Tonks A, Wyldes M, Larkin SA, Kilby MD. Arch Dis Child Fetal Neonatal Ed. 2009; 94:Fa4) and linking them to national datasets published by the NHS Fetal Anomaly
Screening Program (http://fetalanomaly.screening.nhs.uk/leafletsforparents.).

In addition this year there are a number of audits within the national requirements for CNST Level III (relating to liaison with neonatal care providers) and also our set CQUINS (see below):

The aim of the 2013-14 CQUIN is to implement as per the national dashboard for quality indicators for fetal medicine that all suspected serious fetal anomalies are seen in 3 working days.

a) In quarter we defined what constitutes a serious fetal anomaly (see below)
Quarter 1
Definition of a serious anomaly
A serious fetal anomaly is one that is life threatening to the fetus where intervention with direct or indirect fetal therapy may prevent fetal death or damage. The following list of anomalies is consistent with this definition;

- Monochorionic twins with Twin to twin transfusion syndrome
- Single twin demise in a monochorionic twin set
- Hydrops fetalis
- Fetus with a high suspicion of fetal anaemia
- Fetal cardiac arrhythmias
- Severe intrauterine growth restriction <32 weeks

All other fetal anomalies to be seen in 7 working days

b) Quarter 2

The requirement for was to audit referrals made to the Fetal Medicine Centre for a period of 3 months against the quality indicators that require compliance with the above time scales of 90% or better.

For the purposes of the audit we excluded routine screening echos, routine amniocentesis/CVS and detailed screening scans for a previous fetal anomaly.
Time scale 1st April 2013 to 30th June 2013
137 women were referred during this period after the exclusion of the routine referrals as defined above.

There were 11 cases that fulfilled the definition of a 'serious anomaly'.
9 cases were seen within 3 working days.
2 cases were seen in 4 working days.

The cases were SVT and Heart block, the delay was due to a lack of fetal echocardiology lists, both women were seen on the first available list.

126 remaining cases, of those;

120 were seen within 7 working days

6 cases were seen > 7 days

All of these cases were referred for a fetal cardiology opinion

4 of the 6 cases were delayed because the fetal cardiology lists were cancelled due to Cardiologists annual leave or other commitments. In all 4 cases the women were seen on the first available list. (3 waited 8 days and 1 waited 9 days)

5th case was an out of region transfer of care and was therefore seen appropriately

The 6th case was that of a diagnosis already made in the private sector where the woman had emphasised that she was committed to the pregnancy and would not terminate under any circumstances including the presence of a fetal chromosome anomaly (she had declined prenatal diagnosis). Therefore she accepted an appointment 12 days following her referral date.

Result of Audit

The figures from the audit of 3 months referral data show that the Fetal Medicine Centre was 95% compliant (overall) within the definitions described in quarter one.

Discussion
During the period of the audit the department was served by 2 Consultant Fetal Cardiologists from Birmingham Children's Hospital who provides 3 fetal cardiology lists per week. Consultants have other commitment s at BCH, during periods of leave it was necessary to cancel at least one if not all lists and consequently there was a delay from referral date to the appointment date.
In July a third Consultant Fetal Cardiologist was appointed, it is our hope that the need to cancel all lists during a working week will be negated or significantly reduced. Consequently our compliance with the quality indicators (with regard to serious cases requiring fetal echocardiology) should improve.

Conclusion
The result of the audit has determined a high level (95%) of compliance against the quality indicators for fetal medicine as defined by the dashboard (National Fetal Medicine Commissioning Group).
It is our intention to implement the 3 and 7 day rules respectively as defined in the requirements for Quarter 3 of the Fetal Medicine CQUIN. We will continue to audit our compliance during this period and will present the findings in a report to the commissioners at the end of Quarter 4.

4.2 Training

We provide training opportunities in Royal College of Obstetricians & Gynaecologist's (RCOG) recognized training schemes for subspecialty training and ATSM places. As well as our two subspecialty trainees from the West Midlands (UK), we have international fellows / trainees from Ireland, China and most recently Argentina.

Subspecialty Trainees (2011/2012)

- Dr Noel Shek – RCOG Subspecialty trainee sponsored by University of (Hong Kong). Returned December 2012.
- Dr Katie Morris – RCOG Subspecialty trainee & NIHR lecturer.

- Dr Caroline Fox – RCOG Subspecialty trainee (to start January 2013).

In addition we have Dr Amal Ayed (from Kuwait) visiting us as a two year clinical research fellow.

4.3 Incident reporting / Serious Untoward Incidents

The Fetal Medicine Centre follows the Trust policy on the reporting of incidents and Serious Untoward Incidents (SUIs) through the Directorate and Trust risk management structure,

There has been no SUI's reported by The Fetal medicine Centre in 2012-2013.

5. Human Resources

The service is provided on a sessional basis by a team of NHS consultant's and University staff, and is supported by a dedicated midwifery and administrative team and works closely with the Birmingham Women's Hospital obstetric staff. The team works within the Maternity Services Directorate, and is supported by the Regional Specialized Services Agency.

6. Business Summary

In 2012-2013 Fetal Medicine continued to be regionally commissioned through a block contract by West Midlands Specialist Commissioning Group and the annual report has been submitted to this group in September 2013.

6.1 Service Developments 2011-2012

Service developments throughout the year have included:

- Fetal Medicine working as a reference centre for Siemens Ultrasound through the planning of collaborative educational courses, training and trialing of new technology.
- Fetal Cardiology – A third Fetal Cardiologist (Dr Anna Seale from the Royal Brompton Hospital) has taken up post July 2013.

6.2 Research and Development 2011-2012.

There are a number of basic science projects and NIHR recognized portfolio studies that encompass 'Fetal Medicine' activity within the Foundation Trust. This is an important part of the

Centres working and within the NIHR ethos both directly and indirectly improves patient care. We are one of the most research active Fetal Medicine Centres in Europe.
Present studies include:
a) The **PLUTO study** (Funded by the HTA and PI M Kilby). Assessment of percutaneous vesicoamniotic shunting in fetuses with congenital bladder neck obstruction. Completed in December 2011 and published in August 2013.

b) **Birmingham BAC Microarray study** (funded by SPARKS and PI M Kilby). Assessment of a focused and high-resolution microarray platform and whole exome sequencing in diagnosis of chromosomal (and gene) anomalies in babies with structural abnormalities. Completed and published May 2013. This is continuing as the **EACH study** (funded by the MRC EME).

c) RCT to assess **timing of transfusions in babies with alloimmunisation** (Funded by MRC in Australia and PIs S Pretlove & M Kilby). Complete September 2013.

d) **SOLOMON Trial**. (EU funding. PIs S Pretlove and M Kilby). RCT to assess selective versus non-selective laser ablation in fetoscopic laser ablation in the treatment of TTTS (Complete September 2012). Submitted for publication in the Lancet August 2013.

e) **Maternal HAIR study**. (NIHR funding and PI B Martin). Assessment of drug metabolites in human hair in mothers with babies who have structural malformations. Completed October 2012.

f) **TABLET study**. (MRC/HTA EME funding and PIs A Coomarasamy and M Kilby). In collaboration with EAPU to study thyroid autoantibody status and thyroid hormone replacement in women who have had miscarriage (pregnancy loss before 24 weeks), stillbirth and preterm labour.

g) **The Meridian Study**: comparing diagnostic accuracy of prenatal ultrasound and magnetic resonance imaging for fetal brain abnormities (CI. M Kilby).

There is also a range of laboratory based basic science projects performed in the Institute of Biomedical Research at the University of Birmingham, using patients from the centre and funded by grants to Professor Kilby.

h) **The PAGE study:** evaluating the role of whole and exome sequencing in babies with congenital malformation was funded by the Wellcome Trust HICF scheme for £4.1 million. This is a collaborative study with GOSH and the Sanger Institute, Cambridge. Professor Kilby is a co-applicant and the PI for the West Midlands.

7. Activity Report

7.1 Overall Clinical Activity

The West Midlands Fetal Medicine Centre operates as the regional referral centre for the West Midlands and also treats an increasing number of patients from outside the West Midlands area (mainly for fetal Cardiology opinions and most significantly for the management of twin to twin transfusion syndrome). West Midlands patients are funded under a block contract with the Specialist Commissioning Group and further income is received from out of area patients in line with a set tariff.

A total of 7378 examinations and procedures were undertaken in the Fetal Medicine Centre in 2012-2013, which is an increase on the previous two years. The majority of this activity (91%) was from within the West Midlands and funded through the block contract.

Table 1 below shows the number of examinations performed over the last three financial years.

	2010-2011	2011-2012	2012-2013
WMSSA	6003	6582	6695
Other Region	385	591	683
Total	**6388**	**7173**	**7378**

A full breakdown of scans/procedures performed in the Fetal Medicine within 2012-2013 is shown in Appendix 3.
Appendix 4 shows Fetal Medicine examinations broken down by PCT.

Fetal Medicine is a consultant lead service; Figure 1 demonstrates the expertise given to patients by individual consultants, associate specialists, specialist sonographer's and midwives performing amniocentesis (excluding pre pregnancy clinics). The clinical care delivered by subspecialty trainees is supervised, usually by consultants.

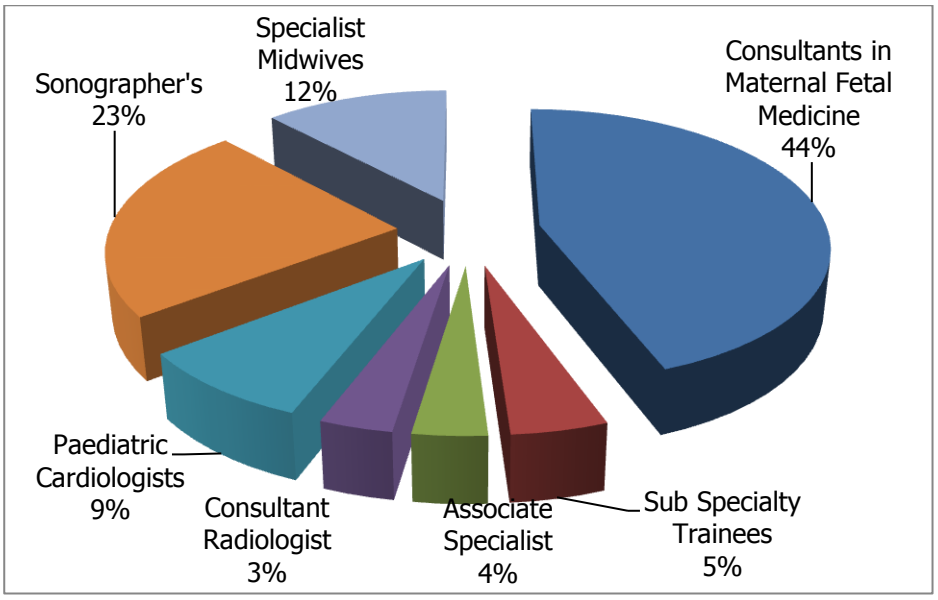

Figure 1 Total workload by Operator. 2012-2013
*Associate Specialist retired in August 2012

The Fetal Medicine Service also covers the pre pregnancy counselling/pregnancy loss clinics (PPCC). This also involves a proportion of patients seen for consultations prior to a pregnancy who have serious medical disorders. In 2012-2013 there were 1064 attendances to the PPCC department (outpatient appointments) which was made up of new and follow up patients.

8. Detailed Scans *Miss Sam Pretlove*

4298 detailed scans were performed on 1897 patients by the Fetal Medicine Consultants, SSTS, Sonographers and Midwives; this figure includes 97 patients for Rhesus disease, 7 undertaken due to raised AFP on serum screening and 132 for 1st Trimester detailed scan, this is shown in comparison with two previous years in table 2.

	2010-2011	2011-2012	2012-2013
Detailed Scans	3893	4036	4062
Raised AFP	26	7	7
Detailed Rhesus	95	198	97
1st Trimester Scan	0*	151	132
	4014	**4392**	**4298**

Table 2 Fetal Medicine Detailed Ultrasound Scans 2010-2013. (1st Trimester commenced early 2011)

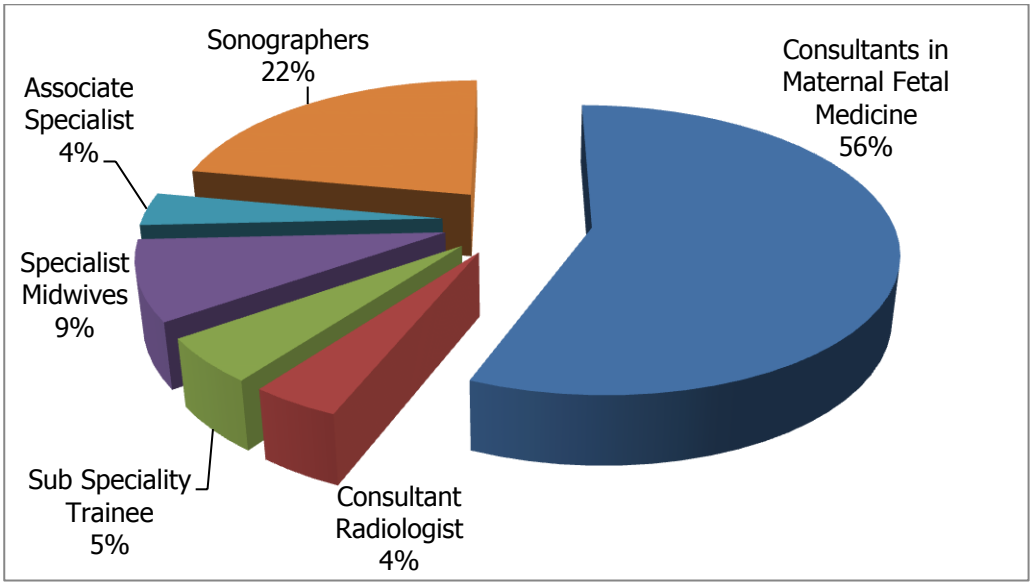

Figure 2 Detailed Scans by Operator 2012-2013

Appendix 5 details all the abnormalities detected at the centre in 2012-2013.

9. Perinatal / Paediatric Cardiology *Marguerite Usher Somers, Dr Tracey Johnston & Dr Paul Miller*

Paediatric Cardiology continues to provide a regional and supraregional service. It is provided primarily by two consultant paediatric cardiologists, Dr Paul Miller and Dr Tarak Desai, who are based at Birmingham Children's Hospital. The lists are supported by two fetal medicine consultants, Dr Tracey Johnston and Dr Sam Pretlove, providing patients with a comprehensive diagnostic service. The fetal echocardiogram scans are performed by 3 Specialist Midwife sonographers and a Specialist sonographer trained in perinatal cardiology.

The West Midlands Fetal Medicine Centre also continues to offer a First Trimester Cardiac screening service to those women who have congenital heart disease (CHD), family history of CHD, previous affected pregnancy with CHD, pregnancies where the nuchal translucency (NT) is greater than or equal to 3.5mm, pregnancies where a chromosomal anomaly has been identified but are continuing with the pregnancy.

There has been a 4% increase in the total number of examinations performed since 2011/2012 with the increase lying within the WMSSA group of patients. There has been a decrease in the number of fetal echoes performed from outside the region (11 for 2012/13 period, 32 for 2011/12 period).

Clinical governance is maintained through regular reviewing, by a consultant cardiologist, of a random selection of screening echoes.

The West Midlands Fetal Medicine centre also ran a successful cardiology course on 31st January for two days

	2010-2011	2011-2012	2012-2013
WMSSA	1233	1445	1526
Out of region	17	32	11
	1250	**1477**	**1537**

Table 3 Fetal Echocardiography including First Trimester Cardiac Scans activity 2010-2013 by referral area.

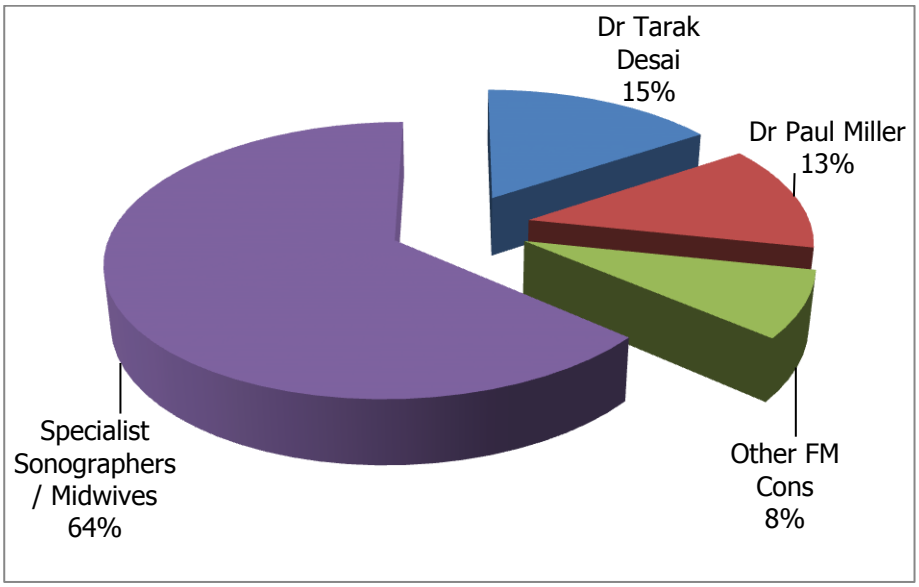

Figure 3 Fetal Cardiac Scans by Operator 2012-2013

Appendix 6 details all the cardiac abnormalities detected at the centre in 2012-2013.

10. First trimester Chorionic Villus Sampling (CVS)

The table below shows the indication for CVS for the past 3 years.

Indication	2010-2011	2011-2012	2012-2013
Maternal Age	11	8	8
Clinical Genetics	40*	50	39
Previous Chromosome Anomaly	21	13	9***
Previous Fetal Abnormality	0	0	1
Increased 1st Trimester (T21 risk)	14*	53**	46
Cystic Hygroma / >NT	55*	69	63**
Other:	0	5	7
Total CVS Performed	**141**	**198**	**173**

Table 4 BWH indications for CVS 2010-2013

* incl 1 twin pregnancy
** incl 2 twin pregnancies
*** incl 1 quadruplet pregnancy

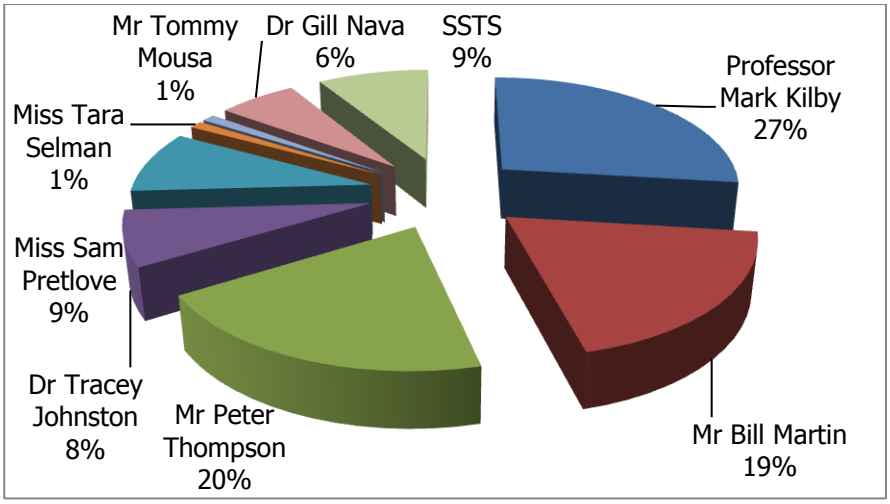

Figure 4 CVS by Operator 2012-2013

Abnormality	Number	Outcome
T13	3	TOP x 2 Misc x 1
T16	1	TOP
T18	6	TOP x4 Misc x 1 IUD prior to CVS
T21	19	TOP x 19
47XXY	1	TOP
47XYY	1	LB
Monosomy X	5	TOP x3 Misc x 2
Triploidy	1	TOP
Mosaic	3	TOP x 2 LB
Balanced Translocation	1	LB
Unbalanced Translocation	1	TOP

Table 5 Abnormalities detected on first trimester CVS – non Clinical Genetics Patients

Abnormality	Number	Outcome
Achondrogenesis	1	TOP
Balanced Translocation	1	Misc at 16 weeks
Duchene Muscular Dystrophy	1	TOP
Donohue Syndrome	1	LB
Finnish Nephrotic Syndrome	1	TOP
Huntington's	1	TOP
Myotubular Disorder	1	TOP
OTC Deficiency	1	TOP
Piebaldism	1	TOP
Sickle Cell Disease	1	LB

Table 6 Abnormalities detected on first trimester CVS – Clinical Genetics patients

There were 63 CVS performed for cystic hygroma / increased NT; of those 27 (43%) had chromosome abnormalities. 23 out of the 27 (85.2%) parents opted for termination of pregnancy.

The table below shows outcome data for first trimester CVS for the past two years.

Outcome after CVS	2011-2012	2012-2013
TOP for chromosome or genetics anomaly	30%	19.7%
TOP for abnormality – normal chromosomes	1%	11.6%
Miscarriage	2.5%	1.7%
NND	0%	1.2%
SB/IUD	2%	1.2%
Live Birth	64%	55%

Table 7 Outcome information for first trimester CVS % is quoted as known outcomes.

There were 163/173 known outcomes (of the ten missing outcomes, all pregnancies are viable and are greater than 36 weeks gestation) at the time of the annual report 2012-2013.

Of the total 173 CVS performed nine miscarriages were reported, of these;
One was for increased risk from Down's syndrome screening with normal karyotype.
Three were for Clinical Genetics, two with normal karyotypes and one with a Mosaic result.
Of the remaining five, all fetuses were phenotypically abnormal on scan; four of these had abnormal karyotypes and one normal karyotype.

One CVS was performed following IUD in the presence of Cystic Hygroma, karyotype showed T18.

Three miscarriages were within 14 days of the procedure, of these two pregnancies were phenotypically abnormal with abnormal karyotypes, giving a procedure related miscarriage rate of 1.7%. Of all the pregnancy losses, all were prior to 24 weeks and the fetal loss rate overall was 5.2%. (5/9 were phenotypically abnormal).

These figures are again to be collated into the Regional audit of CVS services (chaired by Professor Kilby http://www.pi.nhs.uk/CVS/)

10.1 Second Trimester (>14 weeks) placental biopsy for fetal abnormality

There were 19 Chorionic Villus Sampling performed because of abnormalities detected on ultrasound after 14 weeks gestation.

Indication	Number	Chromosome Result	Outcome
Cystic Hygroma/>NT	5	T21 x 3 Monosomy X x 2	TOP x 5
Fragile X	1	NK. Not affected	TOP
Skeletal Dysplasia	2	NK x 2	LB x 1 TOP x 1
Megacystis	1	NK	Misc 15+4
Twin1 – Anencephaly	1	NK	Selective reduction – T1 LB twin 2
Hydrops fetalis	1	Turners	SB
Twin 1 – Body stalk anomaly	1	NK	Selective Reduction – T1. IUD of T2
Ventriculomegaly	1	NK	TOP
Diaphragmatic Hernia	1	Triploidy	TOP
Bilateral renal agenesis	1	NK	Misc 21+2

Oligohydramnious	1	NK	TOP
Congenital bladder neck obstruction	2	NK x 2	TOP x 1 LB x 1
Duplex kidney & VSD	1	T13	SB

Table 8 Indications and outcomes for placental biopsy 2012-2013
(NK = normal karyotype)

11. Amniocentesis

The Amniocentesis service continues to be provided by a group of specialist staff. All operators are trained to the basic standard as recommended by the RCOG. The department provides a training service for SPR's rotating through the hospital.

The table below shows the number of Amniocentesis performed in comparison with the previous 2 years.

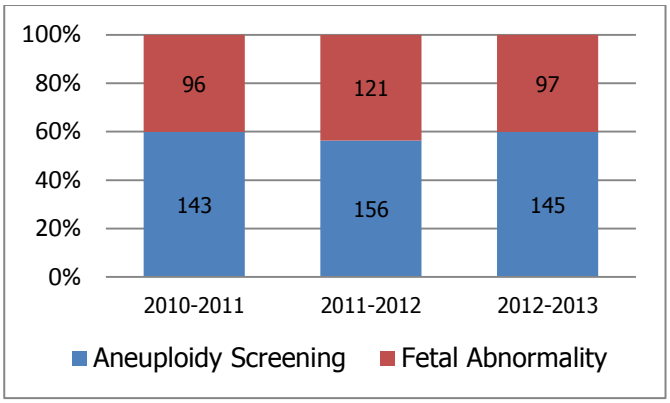

Table 9 Total number of amniocentesis performed 2010 - 2013

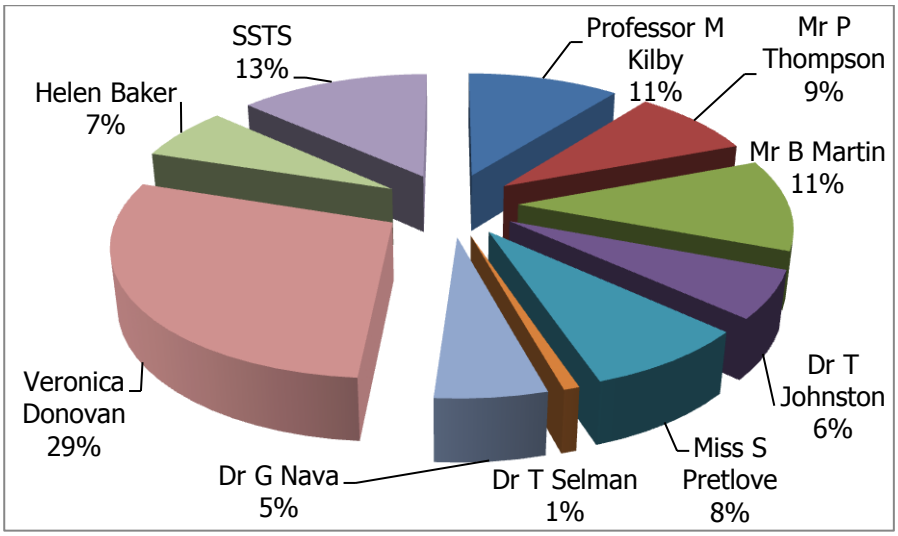

Figure 5 Amniocentesis shown by operator 2012-2013

Amniocentesis for Aneuploidy

There were 145 amniocentesis performed for screening for aneuploidy. The main indications are illustrated in figure 6 compared with the 2 previous years. (NB. Figures include West Midlands and out of area patients)

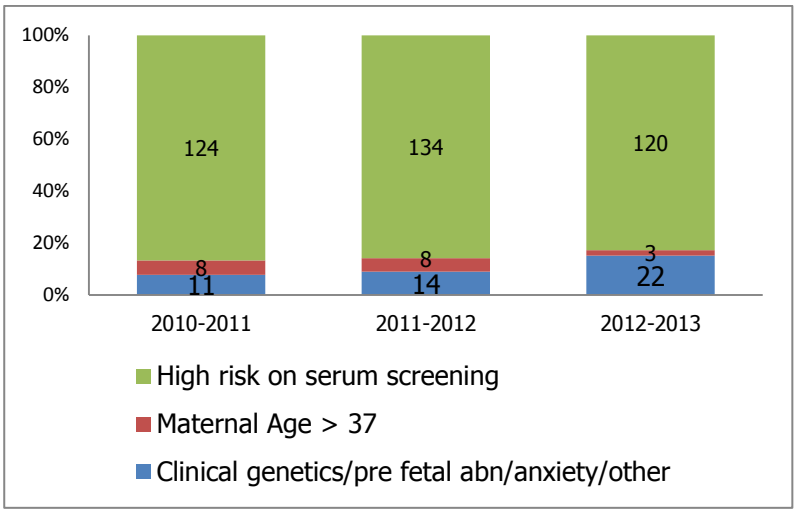

Figure 6 Indications for amniocentesis for aneuploidy screening 2010-2013.

Indication	Number	Aneuploidy / genetic condition detected	Outcome
High risk serum screening	121	T21 x 12 T13 x1 Pericentric Inversion of chromosome X Balanced Translocation	TOP x9,LB x3 TOP LB LB
Maternal Age > 37	3	All normal karyotypes	LB x 3
Prev FA, anxiety, CG, Other	22	Balanced Translocation x 2 Affected Haemophilia A Affected Sickle Cell	LB x2 LB SB at 24 weeks
Total	**146**		

Table 10 Aneuploidy detected by indication (for screening Amniocentesis)

Amniocentesis for karyotyping in Fetal abnormality / suspected fetal abnormality.

97 amniocentesis were performed for karyotyping on patients with a fetal abnormality or a suspected fetal abnormality following detailed scan, Inc. 5 twin pregnancies. The chromosome abnormalities detected and pregnancy outcomes are detailed in table 11.

Abnormality	Number	Outcome
47, XXY	1	LB
47, XYY	1	LB
46 chromosomes with no abnormality detected by G banding	1	LB
16p13.3(3,760,480-3,817,940)x1 dn	1	TOP
Small duplication within the short arm of the X chromosome	1	LB
46 XY inv(3)(p21q21)	1	LB
46,XY.ish del(22)(q11.2q11.2)(TUPLE1-)	1	TOP
Mosaic T16	1	TOP
NK-T1. T21 - T2	1	TOP of T2.
T13	3	TOP x 3
T18	1	TOP
T21	5	TOP x 3 LB IUD at 26 weeks

Triploidy	2	TOP x 2
Monosomy X	2	LB x 1 TOP x 1
Unbalanced Mosaic	1	TOP

Table 11 Chromosome abnormalities detected on amniocentesis for fetal abnormality

Outcomes after amniocentesis

Outcome	Amnio for fetal abnormality	Amnio for screening	Amnio for Mat age, CG, Other	Total births from Amnio
LB	65	105	23	193
TOP	26	13	0	39
Misc	0	0	1	1
SB/IUD/NND	6	0	1	7
Unknown(not del)	0	2	0	2*

Table 12 *There are two unknown outcomes, both pregnancies are viable and are greater than 36 weeks gestation at the time of the annual report 2012-2013.

There was one miscarriage following amniocentesis. The karyotype and genetic result was normal. The pregnancy miscarried 4 weeks following the procedure. The fetal loss rate is 0.4%.

Amniocentesis for Maternal age

A total of 3 amniocentesis were performed for maternal age. All 3 were Birmingham Women's Hospital patients. The ages ranged between 41 and 50 years. All had been appropriately counselled with regard to the risks.

12. Fetal Blood Sampling: *B Martin*

A total of 30 fetal blood samples were performed on 28 patients in 2012-2013. Twelve of these were in association with late termination of pregnancy. Twenty were performed for the investigation of structural anomalies identified on ultrasound including 1 for the investigation of possible CMV infection. A total of 10 were performed for the investigation of suspected fetal anaemia. Of those 4 had parvovirus infection; 1 had rhesus disease; 2 had Trisomy 13 and for 1 the reason for hydrops was unknown.

In 16 the sample was intracardiac, in 5 from the intrahepatic vein and in 9 from the umbilical cord (cordocentesis).

The karyotype was normal in 18 (although in one an amniocentesis performed at the same time showed a mosaic 16 result), abnormal in 3, not performed in 8 and in 1 it could not be performed due to a small sample.

The outcomes were that 13 underwent termination of pregnancy for severe fetal anomaly; there were 2 miscarriages; 2 neonatal deaths and 11 live births.

The indications for fetal blood samples compared with previous years are shown in figure 7.

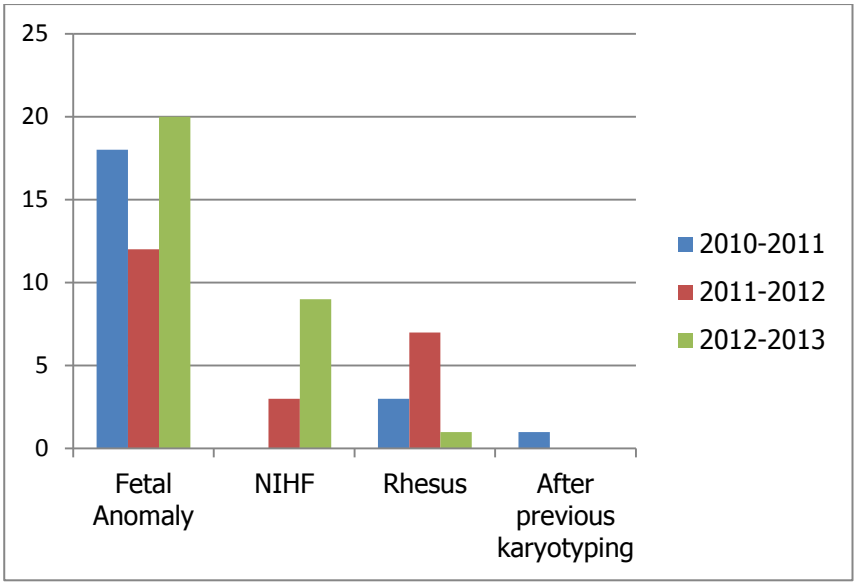

Figure 7 Indication for Fetal Blood Sampling 2010-2013

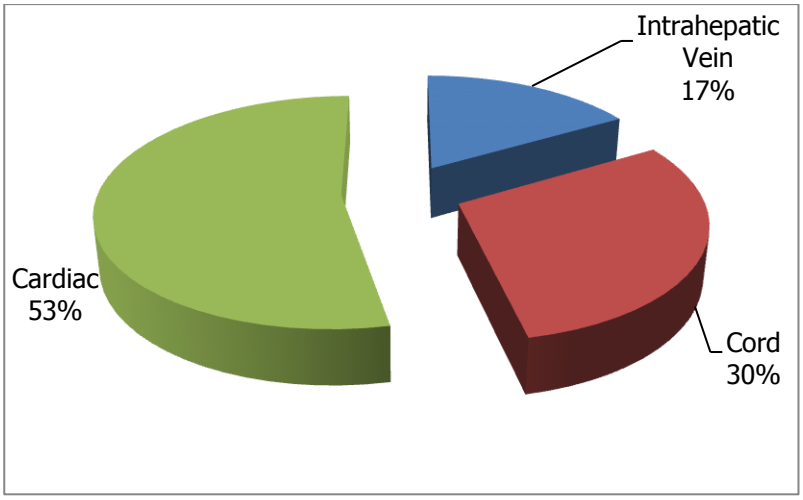

Figure 8 Site of sampling 2012-2013 (many taken at time of late termination of pregnancy)

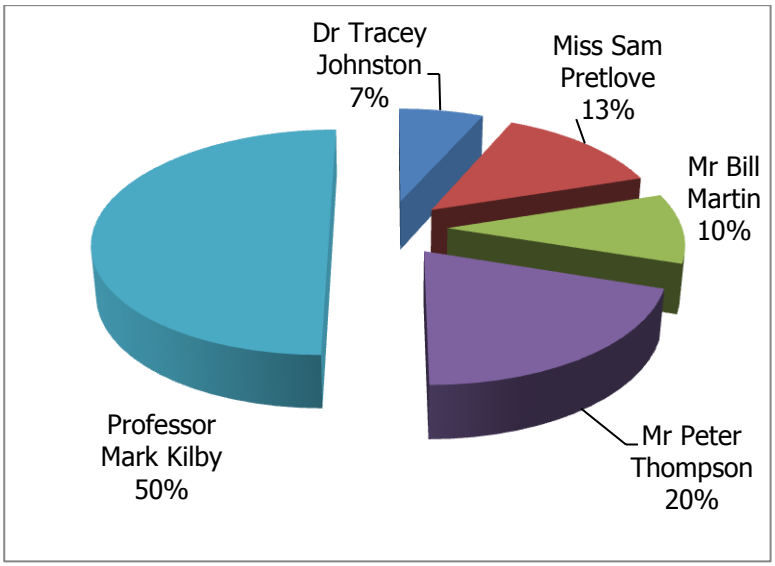

Figure 9 Fetal Blood Sampling by operator 2012 -2013

13. In-utero blood transfusions: *M Kilby*

Between April 2012 and March 2013 there were 34 in-utero transfusions performed on thirteen† pregnancies with fetal anaemia (secondary to maternal alloimmunisation)(†additional transfusion a fetal with placental chorioangioma).

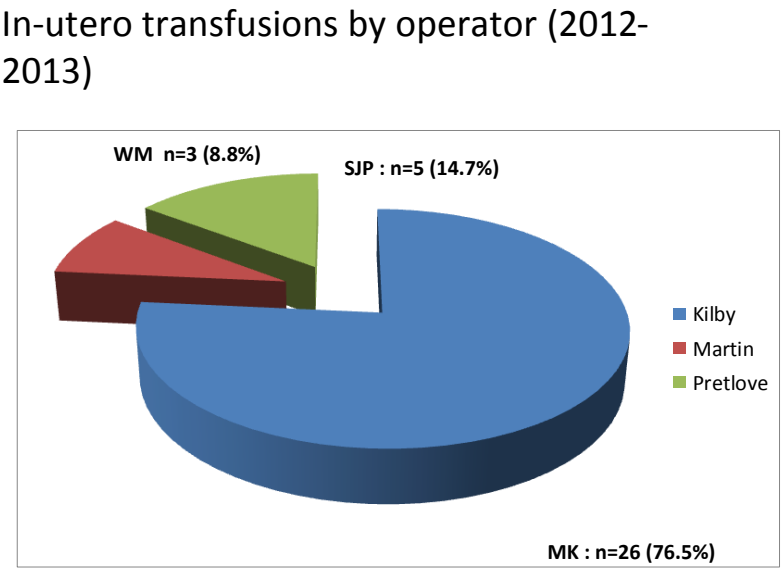

Figure 10

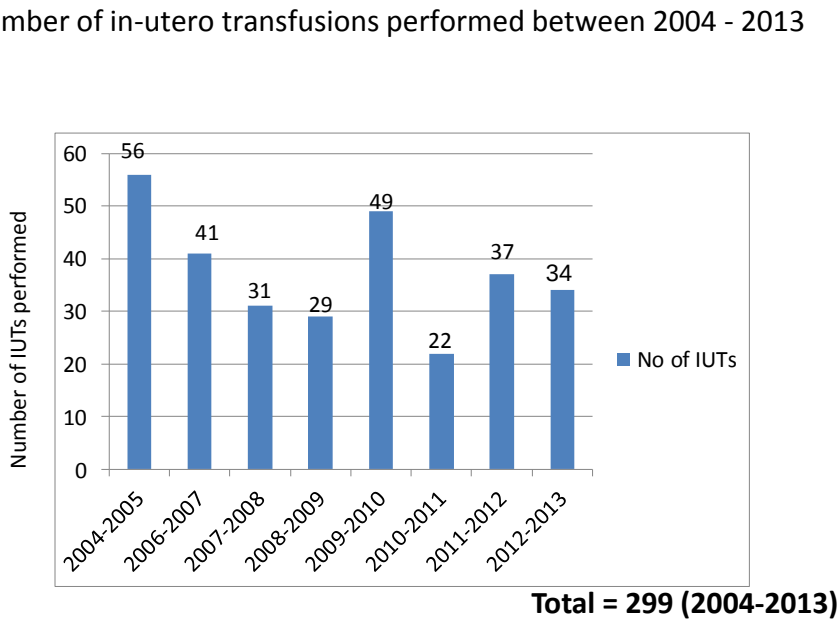

Figure 11.

Of these 4/13 (30.8%) of pregnancies had red cell alloimmunisation complicated by Anti-D antibodies (3/4; 75%) or anti-Kell antibodies (1/4, 25%). In 8/13 pregnancies requiring in-utero transfusions there was transplacental infection with maternal human parvovirus B19 infection (61.5%). In addition, there was an IUT for severe fetal anaemia with a baby presenting with ultrasound appearances of hydrops fetalis and a placental chorioangioma

Indications for in-utero transfusion

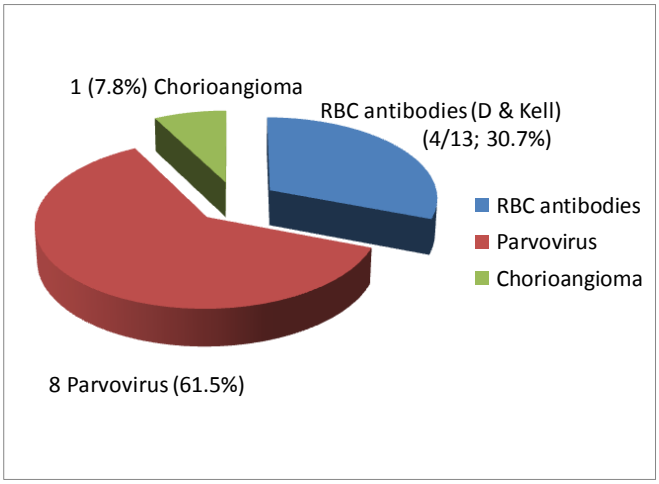

Figure 12.

The gestational age (GA, median) at first transfusion was 21.9 weeks (95%CI 20.4 – 26.4). A total of thirty four in-utero transfusions were performed (twenty seven (79.4%) were intravascular and seven (20.6%) were intraperitoneal (IPT), performed prior to 20 weeks. All these patients had adjuvant IVIG (1g/Kg/wk) until intravascular transfusions were initiated (range of doses 2- 4).

Of the intravascular transfusions, 74.1% (n=20) were performed via the intrahepatic vein, 14.8% (n=4) were performed after cordocentesis and in 11.1% (n=3) cardiocentesis and transfusion was performed in hydrops fetalis and severe parvovirus infection <20 weeks. The median fetal haemoglobin (excluded the babies who had IPT prior to 20 weeks) prior to transfusion was 3.2g% (range 1.8 – 6.8 g%) (all below 5th centile for GA). All babies were live born at median GA of 34weeks (95%CI 32.9 – 36.1). There were two neonatal deaths both associated with severe cardiomyopathy secondary to parvovirus infection and were not complications of therapy.

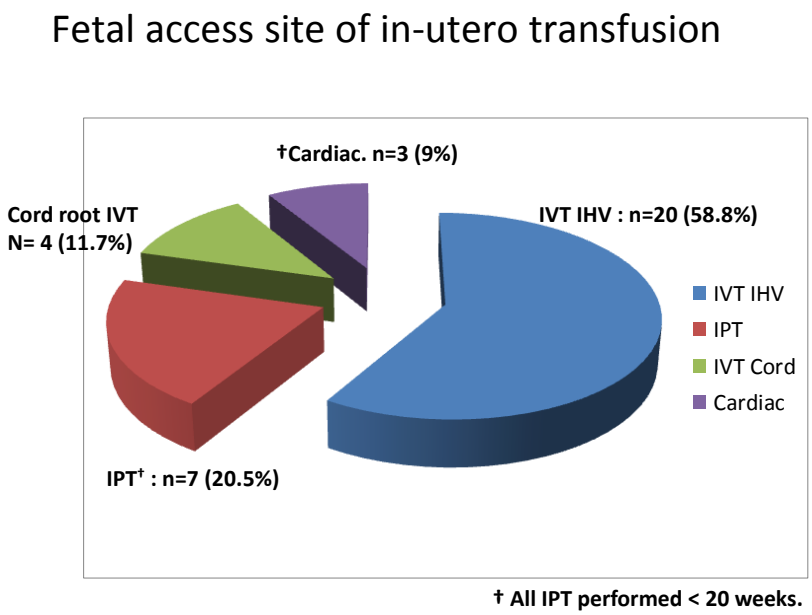

Figure 13.

In seven cases, who had a past history of hydrops and IUD prior to 20 weeks (in a previous pregnancy) maternal IVIG therapy and intraperitoneal transfusions were commenced at 16-18 weeks.

In addition, there was a case of placental chorioangioma with fetal hydrops. The fetal platelet count was $70x10^9$/L and the fetus was anaemic with haemoglobin of 6.4g%. The baby was delivered by caesarean section at 31 weeks because of IUGR.

Thus, overall 34 transfusions were performed in thirteen pregnancies, all with live-births. In one there was an emergency caesarean section at 30 weeks due to recurrent maternal 'collapse'. This is an increase over previous years (and reflects pandemic of human parvovirus infection).

14. Management of Twin-twin transfusion syndrome (TTTS) M Kilby.

Between 1st April 2012 and 31st March 2013, there were 38 pregnancies with TTTS considered for fetoscopic laser coagulation; all were monochorionic (MC) twins. Seven MC twins had stage II disease (15.8%), 31 pregnancies had Quintero Stage III (81.6%) and one pregnancy had stage IV (2.6%). These women whose pregnancies were complicated by severe TTTS (presentation at <26 weeks) were all offered and accepted fetoscopic laser ablation (FLA).

The principle operators were MK in 21/38 (55%) and WM in 6/38 (15.8%). Another consultant (SP) is presently being trained and performed 11/38 (29.2% [mostly supervised by one or the other operators]).

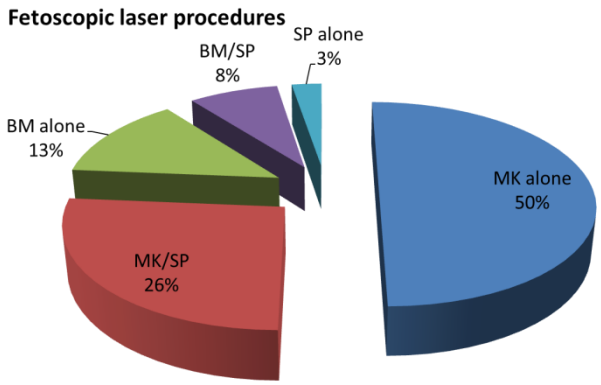

Figure 14

In 44.7% of pregnancies a selective technique was utilized and in 55.3% the "Solomon technique" was used. A median of seven AVA were coagulated using a Diode laser (range 5 - 12 AVA) and amniodrainage post-procedure to a maximum pool depth of 6cms.

The median gestational age at presentation and operation was weeks 20.45 (95% CI 19.7 – 21.5 wks). Of the pregnancies complicated by double fetal loss; this complication occurred at a range of between 1-6 weeks post-FLA. Most of these were miscarriages (3/3 [100%]) were associated with bleeding and/or PPROM (rather than immediate double IUD).

Following examination of the cohort in total (2012-2013), the overall fetal survival post-FLA 68.4% (52/76 fetuses). Of these, there were single survivors in 47.4% of pregnancies (17/38). In 47.4 % (17/38) of pregnancies there were two survivors and in 7.8% of pregnancies there was a double pregnancy loss (3/38).

Thus, in 92.2% of pregnancies there was at least one survivor. The median prolongation of pregnancy in weeks was 16 weeks (95%CI 11.4 – 16.5wks). The median gestation of delivery (of pregnancies with at least one survivor) was 33 wks (95% CI 31.8 – 33.8 wks). This was with a policy of 'elective delivery' between 34 - 36 weeks, usually by caesarean section.

Two pregnancies were delivered at 29 and 31 weeks at external/referring centres with two survivors. There was a significant discordancy in fetal haemoglobin concentration (>5g%) and therefore the diagnosis of TAPS (twin anaemia-polycythemia) was made.

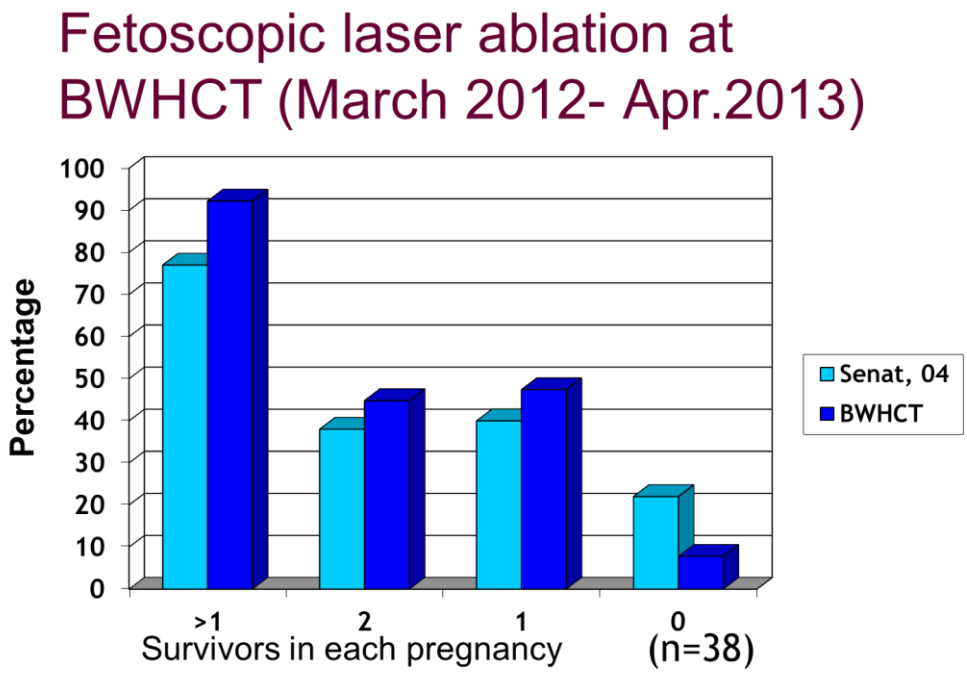

Figure 15.

These data indicate that outcomes in this single centre cohort are similar to internationally published data (and those published previously by our group)(BJOG. 2010;117(11):1350-7. doi: 10.1111/j.1471-0528.2010.02680.x).

14.1 Radio-interstitial thermal ablation (2011-2012) *M Kilby*

This was performed in seven monochorionic, diamniotic twin pregnancies. There was thus only the possibility of seven singleton survivors. The median age of women was 28 years (95%CI 22.7 – 34.8). In four (57.1%), this procedure was performed as a 'selective' termination procedure for a severe discordant anomaly in monochorionic twins. In three cases (42.9%) this procedure was performed because of the presence of an acardiac twin in a Twin reversed arterial perfusion sequence (TRAP). The median gestation of the procedure was 18.1 weeks (95%CI 14.8 – 21.9). The median gestation of survivors was 33 weeks (95%CI 29.9 – 36.2). Of the seven possible survivors, five were live-born (71.4%), with an overall loss rate of 28.5%.

The indications for RITA are shown in Figure 16.

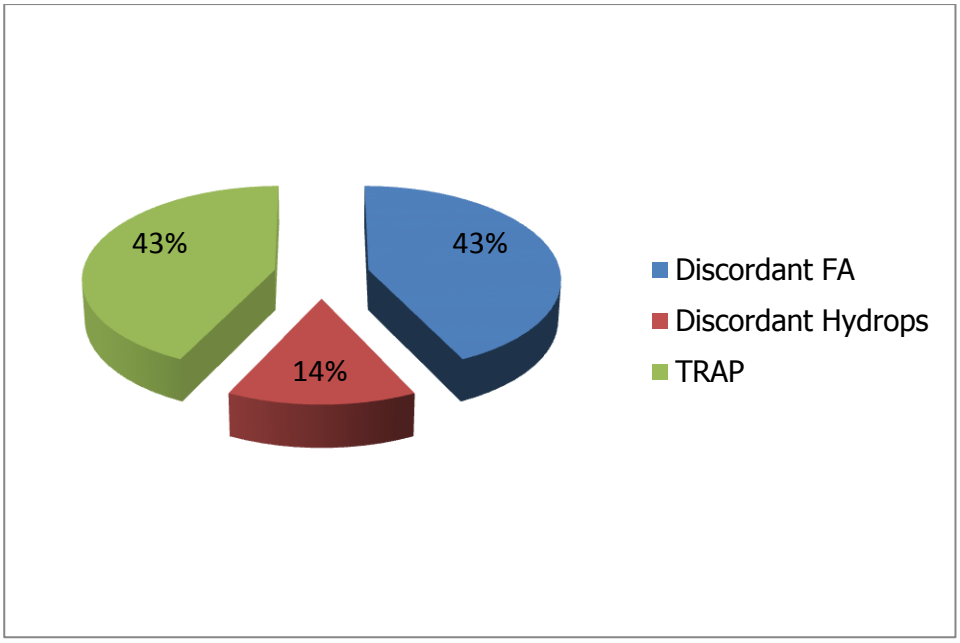

Figure 16 Indications for RITA procedure.

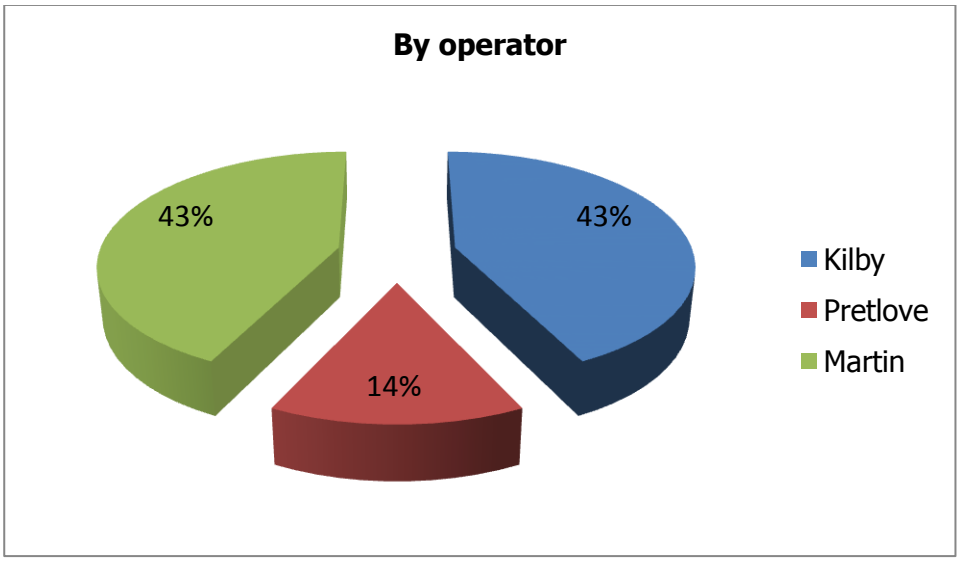

Figure 17 RITA procedures performed by operator.

15. Other invasive fetal therapy

During the course of 2012-2013 there were 7 procedures performed on 5 patients. Four patients were from the West Midlands area and one from out of area.

Four fetal drainages were performed; one due to congenital bladder neck obstruction, one for hydrops fetalis and two on a fetus with bilateral pleural effusions and hydrops. This fetus also had a fetal shunt inserted.

There was a further shunt inserted on a fetus diagnosed with isolated pleural effusions.

There was one amniodrainage performed on a fetus with polyhydramnious secondary to cleft lip

16. Pre-pregnancy Counselling / Pregnancy Loss Clinic (PPCC)

Ruth Kirchmeier Specialist Midwife Counsellor

Within the Fetal Medicine Department, the PPCC continues to provide a regional service for couples who have experienced the following:

- Recurrent first trimester miscarriages
- Second trimester miscarriages
- Stillbirth or neonatal death
- Fetal anomaly
- Pre-existing maternal disease
- Previous severe pre-eclampsia

The aims of the clinic are:

- To carry out relevant investigations to identify any causes of pregnancy loss.
- To suggest any treatment which might be beneficial in a subsequent pregnancy.
- To make an individualised plan of care, treatment and support for a subsequent pregnancy.
- To provide support and counseling following pregnancy loss and in any subsequent pregnancy.
- To provide pre-pregnancy counselling for women with maternal disease.

Midwifery input and bereavement support are provided by the team of specialist midwives in Fetal Medicine, Ruth Kirchmeier (Lead midwife), Gill Jongman, Brenda Bolger, Nia Carnevale, Jane Meredith, Sarah Bourne, Linda Buckley and Ruth Cavey-Wilcox. Invaluable to the smooth running of the clinic, secretarial support is provided by Vicki Morrison-Thomas.

There were 1064 attendances to the Pre-Pregnancy Counselling / Pregnancy Loss Clinic in 2012-2013. This is made up of new and follow up patients. PCT breakdown is shown in Appendix 7.

The reasons for referral fall into 3 main categories:

- Pregnancy loss
- Fetal anomaly
- Maternal disease

However due to the complex nature of the work which is carried out within the PPCC department, it is difficult to accurately give precise figures and categorize patients into referral reasons as many of these patients fall into several categories.

Pregnancy Loss

Women who experience recurrent first trimester miscarriages are comprehensively investigated in the clinic according to the RCOG Guidelines. If all the tests are normal, this service is midwifery led and support and reassurance scans will be offered in future pregnancies.

All women booked under the Fetal Medicine Team who experiences a second trimester pregnancy loss, stillbirth or neonatal death will be followed up in monthly clinics carried out by the Fetal Medicine Consultants, and these clinics are shown in appendix 2.

Women who have experienced unexplained fetal loss will have a preliminary appointment with the midwives, to carry out appropriate pregnancy loss investigations prior to their review appointment with the consultant.
Support, reassurance scans and counseling will be offered in subsequent pregnancies.

Fetal Anomaly
All women booked under the Fetal Medicine Team who terminate a pregnancy or whose baby's die following birth due to fetal anomaly, will be offered follow up in one of the consultant clinics. In addition a number of women booked elsewhere who have been seen for diagnosis in the Fetal Medicine Department and who opt for a post mortem after termination of pregnancy, will be offered follow up in one of the Fetal Medicine consultant clinics.

If it is a complex anomaly where a possible genetic reason is suspected, they will be seen in the combined Genetic/ Fetal Medicine Loss Clinic held once a month by Professor Mark Kilby and Consultant Geneticist Dr Denise Williams.

Maternal disease:

- **SLE/Rheumatological/Immunological disease**

Once a month Professor in Rheumatology Dr Caroline Gordon and either Consultant Obstetrician Dr Tracey Johnson or Dr Ellen Knox carry out a combined Rheumatology/Obstetric clinic, to provide pre-pregnancy counseling for women with pre-existing rheumatological or immunological disease who are planning future pregnancies.

- **Renal disease**

Once a month Consultant Renal Physicians Dr Graham Lipkin and Dr Clara Day and Consultant Obstetricians Dr Tracey Johnson and Dr Ellen Knox carry out a combined Renal/ Obstetric clinic, to provide pre-pregnancy counseling for women with pre-existing renal disease who are planning future pregnancies.

- **Haematological disease**

Once a month Consultant Haematologist Dr Will Lester provides pre-pregnancy counseling for women with pre-existing haematological disease, who are planning future pregnancies. Many of these women will need to commence clexane thromboprophylaxis as soon as they know they are pregnant and are advised to contact PPCC specialist midwives directly to coordinate this.
In addition when required, Dr Lester has joint appointments with the obstetricians to provide haematology advice in making a plan of care for future pregnancies.

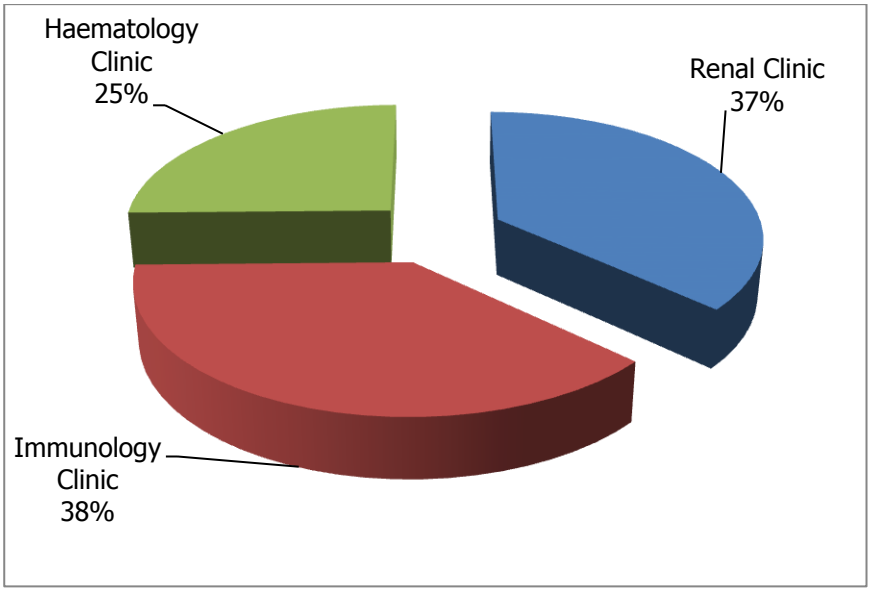

Figure 18 Number of patients seen in each Specialist Clinic – 2012-2013

For all of these clinics an initial work up is carried out by the PPCC specialist midwives to ensure that all relevant investigations are carried out and are up to date.

The subsequent review with the consultants addresses the following issues:

- Is there current active disease and if so what would the risks of embarking on a pregnancy be, both for the mother and baby?
- If disease currently stable is medication suitable for pregnancy?
- If not, appropriate alternative medication is discussed and the importance of allowing time to assess whether remaining stable on these drugs is stressed.
- General pre-pregnancy lifestyle advice.

As the importance of pre-pregnancy counselling for women with complex medical conditions is recognised, the numbers being referred from the regional renal and rheumatology clinics has steadily risen.

Previous PET
In collaboration with AEPC, the PPCC is the designated regional centre for the investigation of women who have experienced severe pre-eclampsia in previous pregnancy.

16.1 Miscarriage Support Group

A Miscarriage Support Group in conjunction with the Miscarriage Association continues to be held on a monthly basis at Birmingham Women's Hospital. The group is coordinated by Alison Noakes, a previous patient of the clinic. Ruth Kirchmeier, Specialist Midwife provides professional support. Patients seem to greatly appreciate the opportunity to be able to discuss their experiences informally with others who have been through similar events.

17. Conclusion *M Kilby*

This is a comprehensive report that baselines by a summary the multidisplinary work taking place in the Fetal Medicine centre at the Birmingham Women's Foundation Trust. There is an outline of annual activity (2012-13) and the report documents the funding arrangements and activity by old PCT. This is a time of transition but the data within this unique report and the audits contained within stand us in good stead for the challenges imposed by national commissioning of this service.

There is much to be proud of when evaluating this service within the Foundation Trust, but there are also many opportunities and potential changes which need to be considered in strategic planning. In particular, I would like to thank everyone who works in the Fetal Medicine centre and aids in the delivery of care to couples at an extremely vulnerable time in their lives.

I would also like to thank all the administrative staff who work to compile the metrics which populate the individual sections of this report and especially Mrs Emma Prentice who works tirelessly to produce and check the Report.

The report is a testament to multidisplinary working and we acknowledge the contribution of all the healthcare professional teams that work with us as well as those who refer patients for our opinions.

1st September 2013

Mark Kilby DSc, MD, MRCOG
Professor of Maternal & Fetal Medicine,
Birmingham Women's Hospital, University of Birmingham, Metchley Park Rd, Edgbaston, BIRMINGHAM, UK, B15 2TG.

Appendix 1
Academic Staff

- Professor Mark Kilby – Clinical Coordinator in Maternal and Fetal Medicine(NHS); Deputy Head of Division of Reproduction & Child Health (Academic)

NHS Staff

- Mr Peter Thompson – Consultant Obstetrician and Medical Director
- Mr Bill Martin – Consultant in Fetal Medicine
- Dr Tracey Johnston – Consultant in Fetal Medicine and Clinical Director of Maternity Services
- Dr Gill Nava – Associate Specialist
- Dr Paul Miller – Consultant Paediatric Cardiologist
- Dr Tarak Desai – Consultant Paediatric Cardiologist
- Dr Sam Pretlove – Consultant in Fetal Medicine.
- Dr Tara Selman- Consultant in Fetal Medicine.
- Dr Anna Seale- Consultant Paediatric Cardiologist.

Obstetric Radiology Staff

- Dr Josephine McHugo – Consultant Obstetric Radiologist

Sub Specialty Trainees

- Dr Katie Morris – SST/NIHR Clinical lecturer
- Dr Cesar Mellor – SST
- Dr Noel Shek – SST

Midwifery/ Sonographer Staff

- Veronica Donovan – Clinical Midwife Manager / Sonographer
- Helen Baker – Specialist Midwife / Sonographer
- Ruth Kirchmeier – Specialist Midwife
- Nia Carnevale – Midwife
- Gill Jongman – Midwife
- Brenda Bolger – Midwife
- Jane Meredith – Midwife
- Sarah Bourne – Midwife
- Linda Buckley – Midwife
- Ruth Cavey-Wilcox - Midwife
- Marguerite Usher-Somers – Specialist Sonographer
- Jill Agnew – Specialist Sonographer
- Sandra Hopkins – Midwifery Assistant
- Frances Rich – Midwifery Assistant / Clerk

Administrative Staff

- Nick Reading – General Manager, Maternity
- Emma Prentice – Clinic Secretary / Audit
- Samantha Mostyn – Administrator
- Alison Hill – PA and Secretary to Prof Kilby & Dr Johnston

- Elaine Smith – PA and Secretary to Mr Martin, Mr Thompson and Dr Pretlove
- Jacqueline McKenzie (locate) – Secretary Mr Martin, Mr Thompson and Dr Pretlove
- Vicki Morrison-Thomas – Pre-pregnancy clerk
- Debbie Caughtry – Clerical Assistant / Receptionist
- Sharon Sams – Receptionist

Appendix 2

Consultants supporting the Pre Pregnancy Counselling / Pregnancy Loss Clinic

- Mr Bill Martin carries out a monthly Pre-Pregnancy Counselling/ Pregnancy Loss Clinic.
- Dr Tracey Johnston carries out a monthly Pre-pregnancy Counselling/ Pregnancy Loss Clinic and in addition is the lead Consultant Obstetrician for the regional Immunology and Renal clinics.
- Professor Mark Kilby carries out a monthly combined Genetic/Pregnancy Loss Clinic with Dr Denise Williams.
- Mr Peter Thompson is the lead Consultant Obstetrician for the regional adult cardiology clinic.
- Dr Sam Pretlove carries out a monthly Pre-Pregnancy Counselling/ Pregnancy Loss Clinic.
- Dr Ellen Knox carries out a monthly Pre Pregnancy Counselling/ Pregnancy Loss Clinic and in addition covers the immunology and renal clinic and is also the lead in the multiple pregnancy clinics.
- Dr Will Lester carries out a sporadic Pre Pregnancy Counselling /Pregnancy Loss Clinic and in addition is the lead in Haematology

The following consultants are available for combined appointments with the Maternal Fetal Medicine Consultants:

- Dr Denise Williams (Consultant Geneticist)
- Dr Graham Lipkin (Consultant Renal Physician)
- Dr Sarah Thorne (Consultant Cardiologist)
- Dr Caroline Gordon (Consultant Rheumatologist)

Appendix 3

Exam description	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Total
Amnio drainage	0	0	1	0	0	0	0	0	0	0	0	0	1
Amniocentesis	25	30	24	24	29	29	21	25	11	14	10	12	254
Ascites Scan	0	0	0	0	0	0	0	0	0	0	0	0	0
Cervix assessment	0	0	2	1	0	1	0	0	0	1	0	6	11
Chorionic villus sampling	15	28	18	13	18	15	15	14	18	23	15	18	210
Consultant 1st Trimester	0	0	0	1	1	0	1	0	0	0	0	0	3
Consultant Fetal Cardiac	53	58	45	49	41	46	37	53	31	54	45	48	560
Dating scan	1	1	3	2	3	1	3	1	4	3	4	1	27
Detailed 1st Trimester	3	14	13	7	10	9	12	13	16	13	10	12	132
Detailed Rhesus scan	12	14	6	3	5	4	10	14	6	8	8	7	97
Detailed scan	319	386	359	357	381	329	365	319	292	344	296	315	4062
Ductus Venosus Doppler	5	3	4	8	11	13	17	5	8	11	8	12	105
Early Pregnancy Scan	0	0	1	3	1	0	0	2	0	0	0	0	7
Fetal blood sample	3	2	4	1	2	0	3	5	4	3	0	3	30
Fetal blood transfusion	0	3	3	3	1	1	6	3	4	2	3	4	33
Fetal drainage	0	1	0	1	0	1	0	0	0	0	0	1	4
Fetal heart rate	0	0	0	0	4	0	1	0	0	0	2	1	8
Fetal shunt	0	0	0	1	0	0	1	0	0	0	0	0	2
Fetal Therapy	0	0	0	0	0	0	0	0	0	0	0	1	1
RITA	1	0	1	0	0	1	1	0	0	2	1	0	7
Fetocide	1	2	4	2	1	0	1	3	2	7	1	4	28
Fetoscopy	2	2	2	4	4	4	1	4	4	3	4	4	38
Growth scan	4	5	3	4	11	4	7	3	5	9	7	8	70
Liquor volume	1	2	7	3	1	8	5	3	5	4	8	16	63
MCA doppler	11	22	12	12	14	13	18	8	9	14	16	17	166
Nuchal translucency scan	8	6	9	5	11	7	11	13	15	8	5	3	101
Placenta Site	1	2	0	0	0	1	0	1	0	0	3	0	8
Radiographer 1st Trimester	4	0	1	3	0	1	3	0	1	5	3	3	24
Radiographer fetal cardiac	56	74	86	76	100	68	100	84	66	90	72	78	950
Raised AFP detailed scan	1	0	2	1	0	2	0	0	0	1	0	0	7
Selective reduction	1	1	2	0	0	0	1	1	0	0	0	1	7
Umbilical artery doppler	4	9	13	13	17	22	21	17	22	29	27	34	228
Uterine artery doppler	0	1	2	2	1	3	0	0	2	3	2	3	19
Viability scan post procedure	0	1	2	5	3	2	2	6	4	6	5	8	44
Viability scan	3	6	10	7	4	7	5	3	8	7	5	6	71
	534	673	639	611	674	592	668	600	537	664	560	626	7378

Fetal Medicine Scan Procedures 2012-2013

Appendix 4

Region	PURCHASER	PCT Name	Count
West Mids	5PG	BIRMINGHAM EAST AND NORTH PCT	267
West Mids	5MD	COVENTRY TEACHING PCT	87
West Mids	5PE	DUDLEY PCT	630
West Mids	5MX	HEART OF BIRMINGHAM TEACHING PCT	753
West Mids	5CN	HEREFORDSHIRE PCT	227
West Mids	5PH	NORTH STAFFORDSHIRE PCT	53
West Mids	5PF	SANDWELL PCT	666
West Mids	5M2	SHROPSHIRE COUNTY PCT	45
West Mids	5QW	SOLIHULL PCT	170
West Mids	5M1	SOUTH BIRMINGHAM PCT	1383
West Mids	5PK	SOUTH STAFFORDSHIRE PCT	757
West Mids	5PJ	STOKE ON TRENT PCT	100
West Mids	5MK	TELFORD AND WREKIN PCT	50
West Mids	5M3	WALSALL TEACHING PCT	302
West Mids	5PM	WARWICKSHIRE PCT	645
West Mids	5MV	WOLVERHAMPTON CITY PCT	57
West Mids	5PL	WORCESTERSHIRE PCT	648

Region	PURCHASER	PCT Name	Count
OATS	7A3	ABERTAWE BRO MORGANNWG UNIVERSITY LHB	4
OATS	7A6	ANEURIN BEVAN LHB	6
OATS	5P2	BEDFORDSHIRE PCT	1
OATS	5HQ	BOLTON PCT	2
OATS	5NY	BRADFORD AND AIREDALE TEACHING PCT	7
OATS	5J6	CALDERDALE PCT	3
OATS	5PP	CAMBRIDGESHIRE PCT	5
OATS	7A4	CARDIFF & VALE UNIVERSITY LHB	8
OATS	5NP	CENTRAL AND EASTERN CHESHIRE PCT	22
OATS	7A5	CWM TAF LHB	7
OATS	5N7	DERBY CITY PCT	16
OATS	5N6	DERBYSHIRE COUNTY PCT	83
OATS	5NH	EAST LANCASHIRE TEACHING PCT	1
OATS	5KF	GATESHEAD PCT	1
OATS	5C9	HARINGEY TEACHING PCT	6
OATS	5K6	HARROW PCT	4
OATS	5AT	HILLINGDON PCT	1
OATS	7A2	HYWEL DDA LHB	1
OATS	5QT	ISLE OF WIGHT NHS PCT	2

OATS	5N2	KIRKLEES PCT	5
OATS	5N1	LEEDS PCT	24
OATS	5PC	LEICESTER CITY PCT	11
OATS	5PA	LEICESTERSHIRE COUNTY AND RUTLAND PCT	120
OATS	5N9	LINCOLNSHIRE TEACHING PCT	16
OATS	5NT	MANCHESTER PCT	12
OATS	5C5	NEWHAM PCT	2
OATS	5PW	NORTH EAST ESSEX PCT	5
OATS	5EF	NORTH LINCOLNSHIRE PCT	8
OATS	5PD	NORTHAMPTONSHIRE TEACHING PCT	8
OATS	5N8	NOTTINGHAMSHIRE COUNTY TEACHING PCT	16
OATS	5J5	OLDHAM PCT	11
OATS	7A7	POWYS TEACHING LHB	18
OATS	5NA	REDBRIDGE PCT	3
OATS	5F5	SALFORD PCT	8
OATS	5N4	SHEFFIELD PCT	2
OATS	5QW	SOLIHULL PCT	170
OATS	5F7	STOCKPORT PCT	3
OATS	5LH	TAMESIDE AND GLOSSOP PCT	5
OATS	5NR	TRAFFORD PCT	4
OATS	5N3	WAKEFIELD DISTRICT PCT	3
OATS	5QK	WILTSHIRE PCT	7
OATS	Other	Other	67

Fetal Medicine Activity by PCT – 2012-2013

Appendix 5
Fetal Anomalies detected on ultrasound scans:

Fetal abnormality	2012-2013	
	BWH	Regional
RENAL		
Renal	35	77
CARDIAC*		
Cardiac	6	14
ABDOMINAL		
Gastroschisis	6	21
Diaphragmatic Hernia	4	12
Exomphalos	9	10
Ovarian Cyst	3	1
Other Abdomen	2	14
RESPIRATORY		
Cystic Lung Lesion	2	13
Other Respiratory	1	4
SKELETAL		
skeletal	11	33
LIMB	2	8
Talipes	16	28
Other Limb		
HEAD AND NECK		
Cystic Hygroma	2	14
Other Head and Neck		
Facial	8	24
Nuchal oedema / thickness	22	78
HYDROPS (and pleural eff / ascites)		
Hydrops (and pleural eff / ascites)	9	33
GASTROINTESTINAL		
Gastrointestinal (inc hyperechogenic bowel)	23	27
CNS		
Anencephaly	6	6
Spina Bifida and / or Hydrocephalus	4	15
Encephalocele	1	6
Microcephaly	2	1
Holoprosencephaly	2	3
Dandy Walker Cyst		
Agenesis of corpus callosum	3	8
CPC		8
Ventriculomegaly	16	41
other CNS	10	13
TWIN COMPLICATIONS NOT TTTS		
Twin complications not TTTS	1	9
SACROCCYGEAL TERATOMA		
Sacroccygeal teratoma		2
OTHER - Miscellaneous	2	8

Anomalies picked up from ultrasound scans 2012-2013
*(Cardiac plus additional structural anomaly)

Appendix 6

Echo Diagnosis	Total
Aortic Stenosis	5
Arrhythmia	12
Atrioventricular Septal Defect	14
Cardiomyopathy	2
Coarctation of the Aorta	16
Common Arterial Trunk	6
Common Atrioventricular Junction	2
Double Inlet Left Ventricle	4
Double Outlet Right Ventricle	12
Hypoplastic Arch	6
Hypoplastic Left Heart Syndrome	25
Hypoplastic Right Heart	1
Mitral Atresia	1
Normal	818
Other:	13
Pulmonary Atresia	9
Pulmonary Stenosis	8
RV>LV disproportion	29
TAPVD	2
Tetralogy of Fallot	11
Transposition of the Great Arteries	31
Tricuspid Atresia	3
Tricuspid Dysplasia	2
Tricuspid Regurgitation	8
Tricuspid Stenosis	2
Univentricular Heart	9
Ventricular Septal Defect	44

Cardiac anomalies detected - 2012-2013

Appendix 7

PCT	PCT Name	Clinic	Number
5CN	HEREFORDSHIRE PCT	PPCCMW	3
5CN	HEREFORDSHIRE PCT	PPCCCON	3
5HX	EALING PCT	PPCCMW	2
5HX	EALING PCT	PPCCCON	1
5M1	SOUTH BIRMINGHAM PCT	PPCCMW	229
5M1	SOUTH BIRMINGHAM PCT	PPCCCON	77
5M3	WALSALL TEACHING PCT	PPCCMW	5
5M3	WALSALL TEACHING PCT	PPCCCON	4
5MK	TELFORD AND WREKIN PCT	PPCCCON	3
5MV	WOLVERHAMPTON CITY PCT	PPCCMW	2
5MX	HEART OF BIRMINGHAM TEACHING PCT	PPCCMW	81
5MX	HEART OF BIRMINGHAM TEACHING PCT	PPCCCON	36
5NX	HULL TEACHING PCT	PPCCMW	1
5PE	DUDLEY PCT	PPCCMW	43
5PE	DUDLEY PCT	PPCCCON	17
5PF	SANDWELL PCT	PPCCMW	76
5PF	SANDWELL PCT	PPCCCON	17
5PG	BIRMINGHAM EAST AND NORTH PCT	PPCCMW	35
5PG	BIRMINGHAM EAST AND NORTH PCT	PPCCCON	8
5PJ	STOKE ON TRENT PCT	PPCCMW	1
5PK	SOUTH STAFFORDSHIRE PCT	PPCCMW	18
5PK	SOUTH STAFFORDSHIRE PCT	PPCCCON	11
5PL	WORCESTERSHIRE PCT	PPCCMW	46
5PL	WORCESTERSHIRE PCT	PPCCCON	17
5PM	WARWICKSHIRE PCT	PPCCMW	4
5PM	WARWICKSHIRE PCT	PPCCCON	3
5QH	GLOUCESTERSHIRE PCT	PPCCMW	2
5QH	GLOUCESTERSHIRE PCT	PPCCCON	1
5QJ	BRISTOL PCT	PPCCMW	1
5QW	SOLIHULL PCT	PPCCMW	25
5QW	SOLIHULL PCT	PPCCCON	7
7A6	ANEURIN BEVAN LHB	PPCCMW1	1

PPCC attendances by PCT 2012-2013.