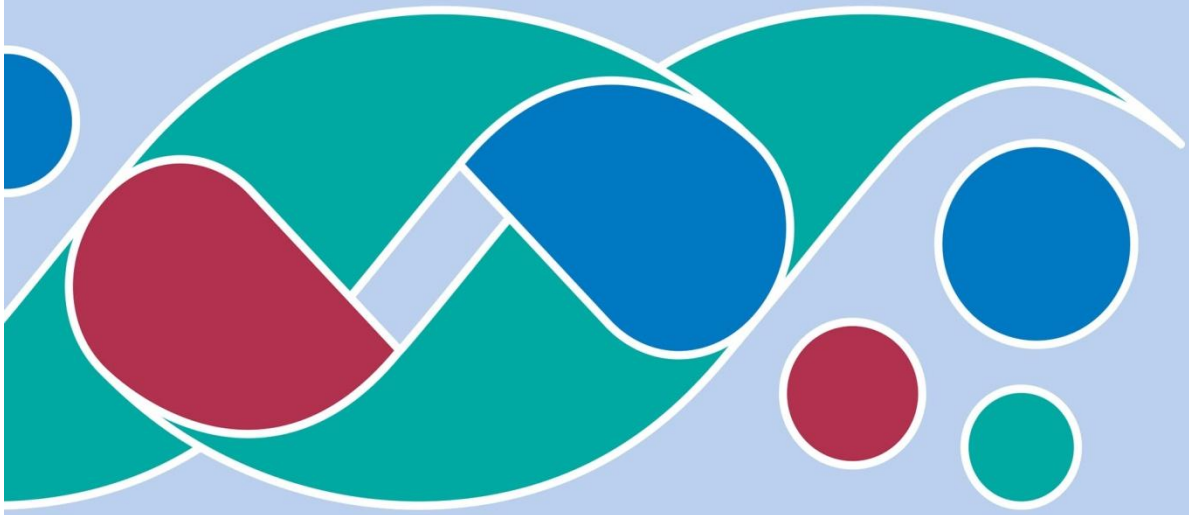
Birmingham Women's NHS
NHS Foundation Trust

The Fetal Medicine Centre

Birmingham and the West Midlands Region

ANNUAL REPORT APRIL 2013 - MARCH 2014



local care:
global impact

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 the 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 and 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.

Although NHS England are managing 'fetal medicine' as a national specialist service, presently (2014/2015) funding is within the national maternity services tariff. This is presently being discussed further at a regional and national level.

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 and makes up one of the best known international centres.

2. Midwifery Report Veronica Donovan

The midwives continue to support the fetal medicine 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.

The midwives participate in audit of all routine procedures and referrals for other services such as MRI imaging and antenatal paediatric surgical review.
Further audit for Fetal Medicine CQUIN has been successfully completed by fetal medicine midwife and two retrospective audits around documentation for termination of pregnancy in readiness for inspection by a representative from the Department of Health.

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

- Amniocentesis clinic and clinical teaching
- Sonographer led fetal 'screening' echo cardiology service
- NT scans in multiple pregnancy
- Detailed rhesus scan clinic (i.e. serial MCA PSV)

The third Annual Fetal Echo Cardiology Conference is scheduled to take place in September this year. Once again the midwives will participate in this with the provision of hands on training, interactive sessions and lectures.

In collaboration with a private company we have implemented Non Invasive Prenatal Testing (Details in the activity report).

3. Patient and Public Involvement

The centre 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 and 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 and 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.

In quarter 1 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.

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 timescales 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.

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.

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 & Gynaecologists (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 (2013/2014)

Dr Katie Morris – RCOG Subspecialty Trainee & NIHR Lecturer (to complete in December 2014)

Dr Caroline Fox – RCOG Subspecialty Trainee (successful mid-term review in May 2014)

In addition we have Dr Amal Ayed (from Kuwait) visiting us as a two year clinical research fellow. She has two clinical sessions by which to complete her Fetal Medicine ATSM. In September we have a clinical fellow (Dr Balagi), who is focusing her research on the use of first trimester biochemical markers in screening for SGA and a new international fellow, Dr Joel Baron (from Israel for two years). We also have our ongoing collaboration to train SPRs in Subspecialty training for MFM from Hong Kong. The next trainee is due in March 2015.

4.3 Incident Reporting/Serious Untoward Incident

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.

5. Human Resources

The service is provided on a sessional basis by a team of NHS consultants 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 2013-2014 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 2014. This report has

outlined there are significant uncertainties in national funding of these commissioned services.

6.1 Service Developments 2013-2014

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.

6.2 Research and Development 2013-2014

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 Centre's 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.

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). Other publications, four further in all published in 2014.

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 – analysis on-going.

d) **SOLOMON trial** (EU funding and PIs S Pretlove & M Kilby). RCT to assess selective versus non-selective laser ablation in fetoscopic laser ablation in the treatment of TTTS (complete September 2012). Publication in The Lancet March 2014.

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

f) **The Meridian study**: comparing diagnostic accuracy of prenatal ultrasound and magnetic resonance imaging for fetal brain abnormalities (CI M Kilby). On-going.
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.

g) **The PAGE study**: evaluating the role of whole and exome sequencing in babies with congenital malformation was funded by the Welcome 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. To start October 2014.

h) **STOPPIT2**. RCT of insertion of Arabin pessary in twin pregnancy with maternal cervix $\leq$2.5 cm. HTA funded. July 2014. Local PI Mark Kilby. To start January 2015. With University of Edinburgh.

i) **STRIDER study**: study of the use of Sildenafil in severe early-onset IUGR. MRC/EME study. Local PI M Kilby. To start February 2015. With University of Liverpool.

7. Activity Report

The West Midlands Fetal Medicine Centre operates as the regional referral centre for the West Midlands and also treats an increasing number of patients form 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 7957 examinations and procedures were undertaken in the Fetal Medicine Centre in 2013-2014, which is an increase on the previous 2 years. The majority of the activity (93%) 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.

	2011-2012	2012-2013	2013-2014
WMSSA	6582	6695	7414
Other Region	591	683	543
Total	**7173**	**7378**	**7957**

A full breakdown of scans/procedures performed in the Fetal Medicine Centre within 2013-2014 is shown in Appendix 2.

Appendix 3 shows Fetal Medicine examinations broken down by PCT (in which the referring patients lives).
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.

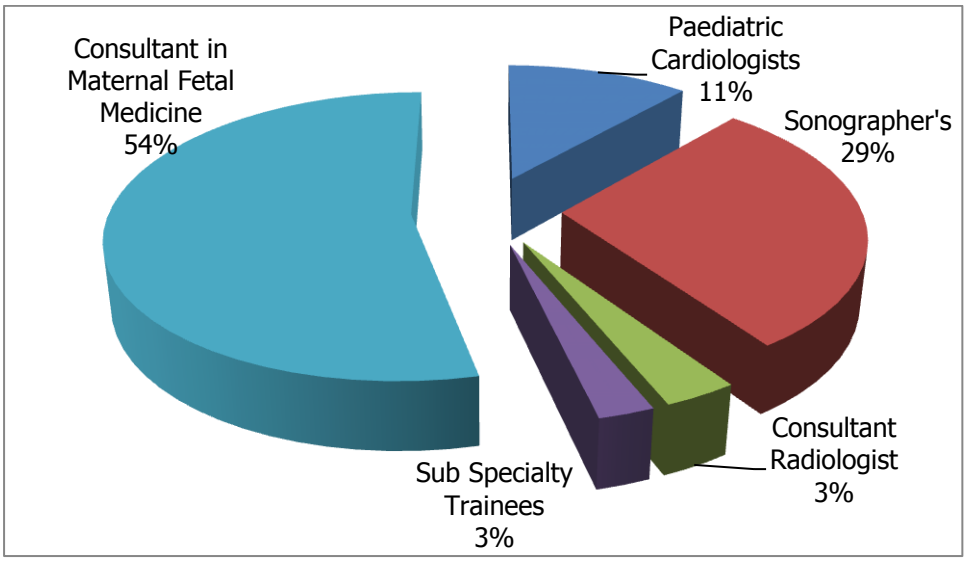


Figure 1 Total workload by Operator. 2013-2014

The Fetal Medicine Service also covers the pre-pregnancy counseling / pregnancy loss clinics (PPCC). This also involves a proportion of patients seen for consultations prior to a pregnancy who have serious medical disorders. In 2013-2014 there were 1109 attendances to the PPCC department (outpatient appointments) which was made up of new and follow up patients.

In collaboration with a private company, West Midlands Fetal Medicine Centre offer a private Non-Invasive Prenatal Testing Service. This was implemented in October 2013. In the period 01st October 2013 to 31st March 2014 we have undertaken 28 NIPT's.

8. Detailed Scans: Miss Tara Selman

3812 detailed scans were performed on 2057 patients by the Fetal Medicine Consultants, SSTS, Sonographers and Midwives. There were 106 Rhesus scans, 4 undertaken due to raised AFP on Serum screening and 176 detailed 1st Trimester scans. This is shown in comparison with the two previous years in Table 2.

	2011-2012	2012-2013	2013-2014
Detailed Scans	4036	4062	3812
Detailed Rhesus	198	97	106
Detailed 1st Trimester	151	132	176
Raised AFP	7	7	4
	4392	**4298**	**4098**

Table 2 Fetal Medicine Detailed ultrasound scans 2011-2014.

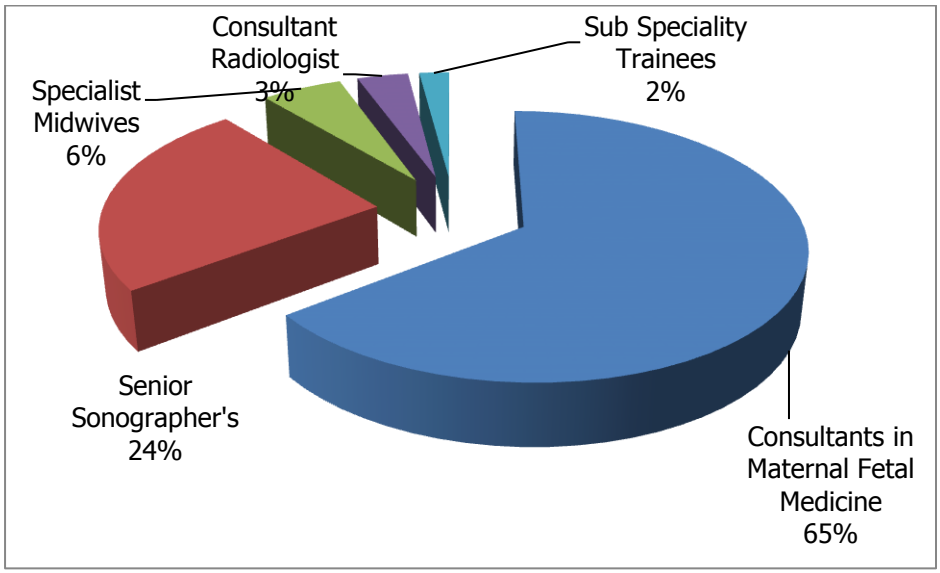


Figure 2 Detailed Scans by Operator 2013-2014.

Appendix 4 details all the abnormalities detected at the centre in 2013-2014.

9. Perinatal / Paediatric Cardiology: Dr Paul Miller, Dr Tarak Desai, Dr Anna Seale, Dr Sam Pretlove

The fetal echocardiography service at the WMFMC is provided by a team of three paediatric cardiologists (from Birmingham Children's Hospital BCH), two fetal medicine consultants and four specialist sonographer / midwife sonographers. There is also a specialist cardiac nurse based at BCH. In 2013 a new paediatric cardiologist was appointed, Dr Anna Seale.

The service is for women that have been identified as having a fetus with suspected congenital heart disease (CHD). In addition the service assesses women who are at increased risk of having a baby with CHD with scans being performed at different times during the pregnancy depending on the presenting history.

Birmingham Women's Hospital runs a unique system in the UK in that highly trained specialist sonographer / midwife sonographers screen ladies whose fetus is considered to be at relatively high risk of CHD. This includes foetuses with an increased nuchal translucency, family history of CHD, maternal and paternal CHD, maternal diabetes and maternal epilepsy. Clinical governance continues to be

maintained through regular random reviewing of approximately 10% of screening echoes. A recent audit of screening echoes showed that this system is extremely effective. The paediatric cardiologists see patients where there is a suspicion of a fetal cardiac abnormality.

There has been a 6% increase in the number of fetal echoes undertaken in the last year and a 30% increase since 2010. Due to changes in national screening policies such as outflow tract screening, which has been widely taken up in the Midlands since 2011, there has been an increase in the number of referrals. As a consequence pregnant women and their families are given better and more appropriate information helping them in making difficult decisions whether to continue or interrupt the pregnancy. In addition, it allows for optimal post natal management.

	2011-2012	2012-2013	2013-2014
WMSSA	1445	1526	1617
Out of region	32	11	11
	1477	**1537**	**1628**

Table 3 Fetal Echocardiography including First Trimester Cardiac Scans activity 2011-2014 by referral area.

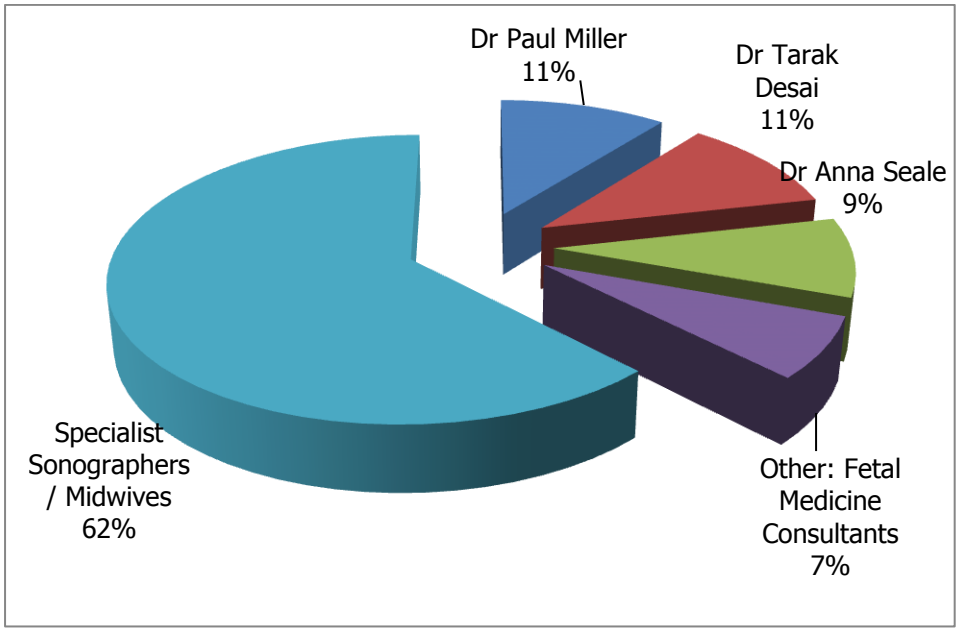


Figure 3 Fetal Cardiac Scans by Operator 2013-2014

10. Chorionic Villus Sampling (CVS)

There were 243 referrals for CVS in 2013-2014. Of these 19 were not performed due to 10 women declined, 7 non-viable pregnancies, 2 women opted for Amniocentesis. 207 were performed in the first trimester and 17 after 14 weeks gestation.

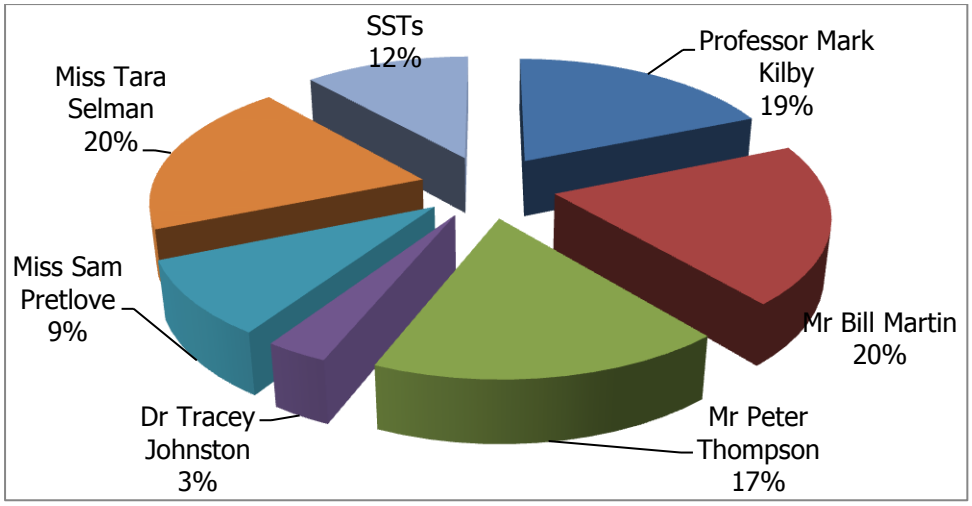


Figure 4 CVS by Operator 2013-2014 (n=224)

10.1 First trimester CVS

The Table below shows the indications for CVS for the past 3 years.

Indication	2011-2012	2012-2013	2013-2014
Maternal Age	8	8	3
Clinical genetics	50	39	43[$]
Previous Chromosome Anomaly	13	9**	13
Previous or Current Fetal Abnormality	0	1	10
Increased Down's risk 1st trimester: Combined test Non-invasive prenatal testing (NIPT)	53*	46	69[$] (68) (1)
Cystic Hygroma / Increased Nuchal Translucency	69	63*	69
Other:	5	7	0
Total CVS Performed	**198**	**173**	**207 (205 pregnancies)**

Table 4 BWH Indications for CVS 2011-2014
(*incl 2 twin pregnancies **incl 1 quadruplet pregnancy $ Two patients total two samples each due to small sample first attempt no villi)

Chromosome Abnormality	Scan Finding	Number	Pregnancy Outcome
Trisomy 13	Increased Nuchal NT	3	TOP n= 3
Trisomy 18	Increased NT n=5 Exomphalos n=2 Exomphalos and increased NT n=1 Exomphalos and ? cardiac defect n=2 Skin oedema and abnormal brain n=1 Hydrops fetalis n=1	12	TOP n= 11 Pregnancy Loss< 24 weeks n=1
Trisomy 21	Increased NT n=11 Increased Down's risk first trimester n=8 Increased risk NIPT n=1	20	TOP n=18 LB n= 2
Trisomy 21 + Balanced	Increased NT	1	LB

Translocation			
Monosomy X	Increased Down's risk first trimester n=2 Increased NT/cystic hygroma n=4	6	TOP n= 4 Pregnancy Loss < 24 weeks n= 2
Mosaic	Increased NT	2	TOP n= 2
Triploidy	Cystic hygroma	1	TOP
Total Chromosome Abnormality detected		**45**	**LB n=3 TOP n=39 Pregnancy Loss < 24 weeks n=3**

Table 5 Abnormalities detected on first trimester CVS – non Clinical Genetics patients. **(LB live birth, TOP termination of pregnancy,NT nuchal translucency, NIPT non-invasive prenatal testing)**

Referral indication	Abnormality at birth or on karyotype	Number	Pregnancy Outcome
Parental balanced translocation	Balanced Translocation	7	LB n=6 Unknown n= 1
Parental balanced translocation	Unbalanced Translocation	2	TOP n= 2
Parent carrier	Glanzmann Thrombasthenia	1	TOP
Parent carrier	Beta Thalassemia	1	TOP
Parent carrier	Lesch Nyhan Syndrome	1	TOP
Previous baby fragile X	Fragile X	1	LB
Parent carrier	Sickle Cell	1	LB
Parent affected	Mutation consistent with Tuberous Sclerosis	1	TOP
Paternal balanced translocation	46,XX,t(4;10)(q25;q26.3)mat	1	LB
Parent carrier	Pericentric inversion of one chromosome 6	1	LB
Total Abnormalities detected		**17**	**LB n=10 TOP n=6 Unknown =1**

Table 6 Abnormalities detected at first trimester CVS – Clinical Genetics patients. **(LB live birth, TOP termination of pregnancy, unknown patients not yet delivered)**

There were 69 CVS performed for Cystic Hygroma / increased NT; of those 29 (42%) had chromosome abnormalities (Trisomy 21 n=12, Trisomy 13 n=3, Trisomy 18 n=6, Triploidy n=1, Monosomy X n=5, Mosaic n=2). Of these pregnancies; 25 out of the 29 (86%) parents opted for termination of pregnancy, in the remainder there were 2 pregnancy loss <24 weeks (1 within 14 days of procedure T18, 1 >14 days from procedure Monosomy X) and 2 live births.

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

Pregnancy Outcome after CVS	Abnormality	2013-2014	
		Number	**Percentage**
TOP for chromosome or genetics abnormality		46	22.4%
TOP for abnormality – normal chromosomes		4	2.0%
Miscarriage within 14 days of procedure (pregnancy <24 weeks)	T18 n=1, Monosomy X n= 1, Normal Karyotype n=2	4	2.0%
Pregnancy loss < 24 weeks but > 14 days after procedure	Normal Karyotype/No abnormality n=1, Normal Karyotype / Hydrops n=1, Monosomy X n=1	3	1.5%
NND		0	0
SB (after 24 weeks)	Hydrops / Normal Karyotype n=2	2	1.0%
LB		135	66.0%
Unknown – not yet delivered		11	5.4%
Total		**205**	**100%**

Table 7 Outcome information for first trimester CVS. **(LB live birth, TOP termination of pregnancy, IUD intra-uterine death, NT nuchal translucency, SB stillbirth, NND neonatal death)**

There were 194/205 known outcomes (of the eleven missing outcomes, all pregnancies are viable and are greater than 36 weeks gestation. EDDs are late September / early October) at the time of the annual report 2013-2014.

Of the total 207 First Trimester CVS performed there were seven pregnancy losses < 24 weeks, of these, four were within 14 days of the procedure but only two were a normal pregnancy (normal karyotype, no structural abnormality). This gives an overall pregnancy loss rate of 3.4% but a normal pregnancy loss rate of 1.0%.

There were two stillbirths (pregnancy loss>24 weeks) both were phenotypically abnormal with a normal karyotype.

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

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

There were 17 Chorionic Villus Sampling performed because of fetal abnormalities detected on ultrasound after 14 weeks gestation.

Indication	Number	Chromosome Result	Outcome
Cystic Hygroma/Increased NT	8	NK n= 7 T18 n= 1	TOP n= 1 LB n= 5 Unknown n= 1 TOP n= 1

Nuchal Oedema / Cardiac Defect	2	NK n=1 T21 n= 1	LB n= 1 TOP n= 1
Exomphalos	1	NK	TOP
Isolated Right pleural effusion	1	NK	LB
Megacystis	1	Mosaic	LB
Trap Sequence	1	NK	Unknown
Cardiac defect, Encephalocele, Absent Stomach	1	NK	TOP
Hyperechogenic bowel, reduced liquor volume, SGA, Curled up fetus	1	NK	Pregnancy loss < 24 weeks within 14 days of procedure
Severe early onset IUGR	1	NK	LB
Total	**17**	**T18 n=1** **T21 n=1** **Mosaic n=1** **NK n=14**	**TOP n= 5** **Pregnancy Loss n=1** **LB n=9** **Unknown n=2**

Table 8 Indications and outcomes for placental biopsy 2013-2014 **(NK normal karyotype, SGA small for gestational age, IUGR intra-uterine growth restriction)**

Thus of the total 224 CVS performed in the year 2013-2014, there were five pregnancy losses within 14 days of the procedure giving an overall pregnancy loss rate of 2.2%. However the procedural loss rate for phenotypically and/or karyotypically normal pregnancies was 1.0%.

11. **Amniocentesis** Dr Tracey Johnston

The Amniocentesis service continues to be provided by a group of specialist staff. All operators are trained to the RCOG recommended standards. The department provides training in amniocentesis to individuals undergoing specialist training within the department.

Table 9 below shows the number of amniocentesis performed in comparison with the previous two years. There continues to be a decrease in the number of amniocentesis performed, with a year on year decrease of approximately 15% per annum. The decrease is within those performed for aneuploidy screening, as expected from improved screening for Trisomy 21. Figure 5 shows amniocentesis by operator.

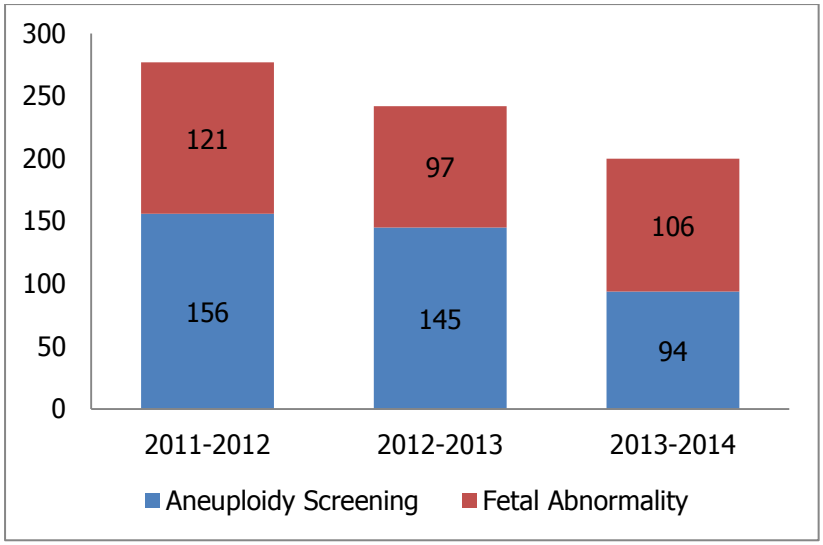


Table 9 Total number of amniocentesis performed 2011-2014

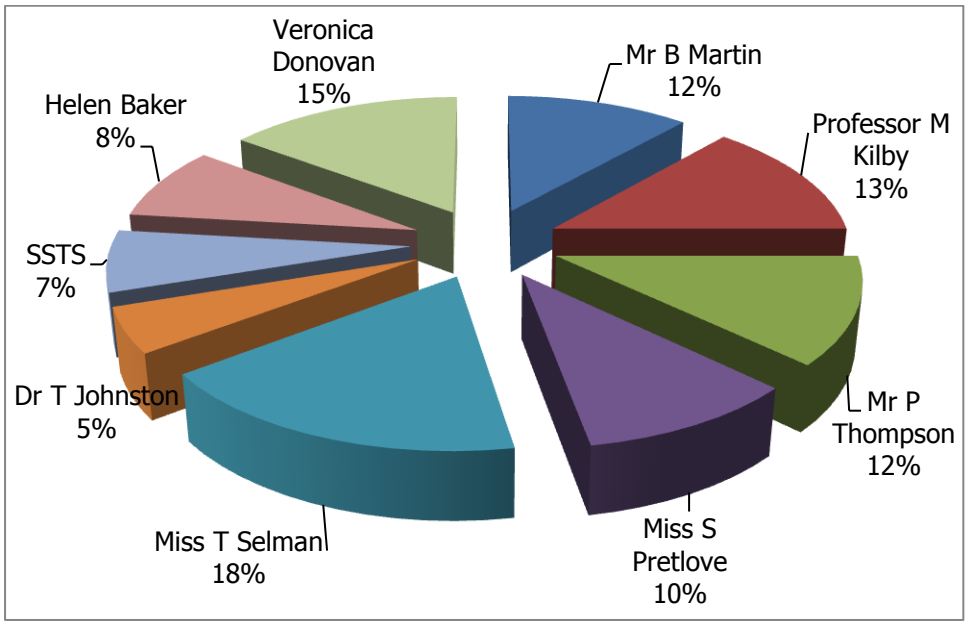


Figure 5 Amniocentesis shown by Operator 2013-2014

Amniocentesis for Aneuploidy

There were 94 amniocentesis performed for screening for aneuploidy. The main indications are illustrated in Figure 6 and are compared with the two previous years. Again, this demonstrates the reduction in the number of amniocentesis performed for high risk serum screening. The abnormal outcomes are detailed in Table 10.

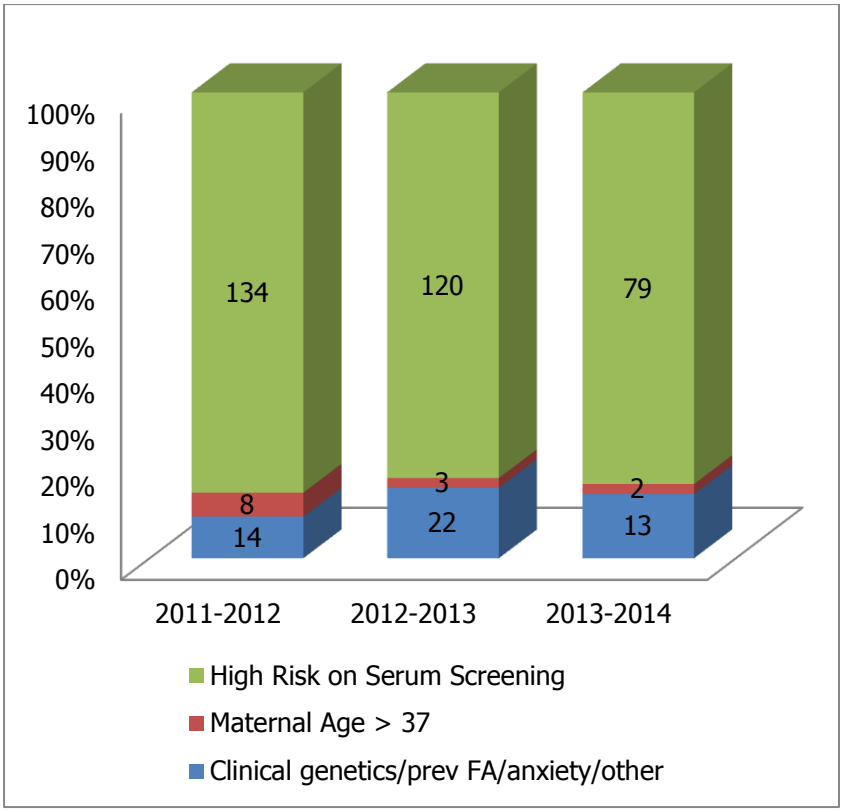


Figure 6 Indications for amniocentesis for aneuploidy screening 2011-2014

Indication	Number	Aneuploidy / genetic condition	Outcome
High risk Serum Screening	79	47,XY,+r(7)/46,XY(3) X 1 T21 x 7	TOP x 1 TOP x 7
Maternal Age > 37	2	Normal Karyotype x 2	Live Birth x 2
Clinical genetics/Prev FA/anxiety/other	13	Morquio x 1 Niemann Pick x 1	TOP x1 Live Birth x 1
Total	94	12 (13%)	

Table 10 Results of amniocentesis performed for aneuploidy / genetic screening

Amniocentesis for karyotyping in Fetal abnormality / suspected fetal abnormality

106 amniocentesis were performed for karyotyping on pregnancies with a fetal abnormality or a suspected fetal abnormality following detailed scan, including 4 twin pregnancies. There were 18 chromosome abnormalities detected, which are detailed with the pregnancy outcomes in Table 11.

Abnormality	Number	Outcome
46XX.ish del(22)(q11.2q11.2)(TUPLE1-)	1	TOP
47 XXX	1	Live Birth
Di George	2	Live Birth x 1 TOP x 1
Mosaic Trisomy 15	1	TOP
Mosaic Trisomy 20	1	TOP

Mosaic Trisomy 14	1	TOP
Twin 1 – Normal Karyotype, Twin 2 – T18	1	Selective TOP of Twin 2
T13	1	TOP x 1
T18	3	TOP x 3
T21	4	TOP x 3 Live Birth x 1
Balanced Translocation	1	Live Birth x 1
Unbalanced Translocation	1	Live Birth

Table 11 Chromosome abnormalities detected on amniocentesis following abnormal scan

Pregnancy Outcomes after Amniocentesis

Outcome	Amnio for fetal abnormality	Amnio for screening	Amnio for Mat age, CG, other	Total births from Amnio
Live Birth	77	67	13	157
TOP	21	9	1	31
Miscarriage	2*	2	0	4
SB/IUD/NND	5	1	0	6
Unknown (not del)	1	0	1	2

Table 12 Outcomes following amniocentesis.

There are 2 unknown outcomes, both women have returned to their home country for delivery. At the time of leaving the UK they were both in the third trimester and pregnancies were uncomplicated.

There were four miscarriages following amniocentesis. All were < 24 weeks gestation.

There were two miscarriages following amniocentesis performed for screening. Both had normal karyotypes and were structurally normal on scan; of these one miscarriage was within 14 days of the procedure.

The remaining two miscarriages were from amniocentesis performed for Fetal Abnormality. One fetus had exomphalos with a normal karyotype. The miscarriage was > 14 days following procedure. A further amniocentesis; performed alongside a Fetal Blood Transfusion was on a fetus who was severely anaemic. The baby died few hours post procedure.

Numbers are too small to draw conclusions regarding procedure related loss rates, but different operators were involved.

Amniocentesis for Maternal Age

Although no longer recommended as a first line investigation, a total of 2 amniocentesis were performed for maternal age without screening. Of these; one was referred from the West Midlands area and the other was a Birmingham

Women's Hospital patient. The maternal ages were 39 and 44 years. Both had been appropriately counselled regarding the risks, but were clear that they wished to proceed to diagnostic testing without screening. In both cases the karyotype was normal and both pregnancies proceeded to live births.

12. Fetal Blood Sampling: Mr B Martin

A total of 14 Fetal Blood Samples were performed on 13 patients during 2013-2014. Five of those were in association with late termination of pregnancy. Seven were performed for the investigation of structural anomalies identified on ultrasound, including 1 for the investigation of possible CMV infection.

A total of seven samples were performed for the investigation of suspected fetal anaemia; of those 3 had rhesus disease (with one patient being sampled twice), 2 had parvovirus infection and for 1 the reason for hydrops was unknown.

In 6 cases the blood sample was from the intrahepatic vein, in 3 from the umbilical cord and 5 was intracardiac. The figure below shows the site of sampling.

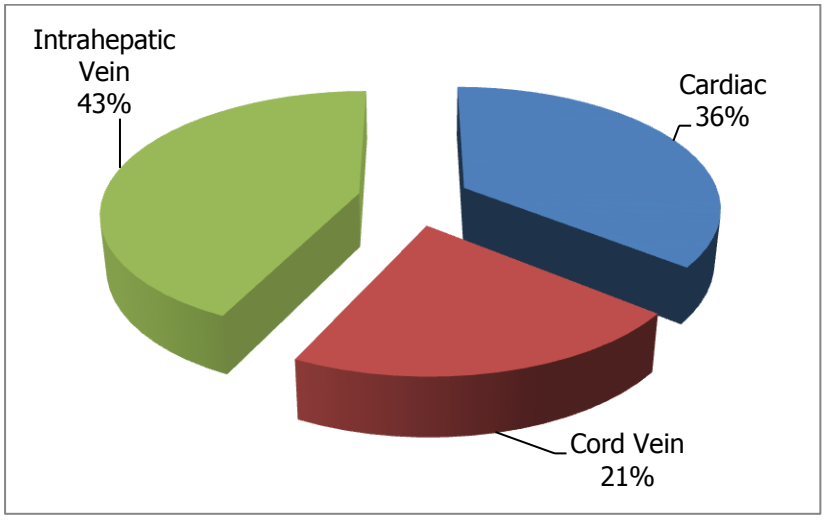


Figure 8 Site of Sampling. 2013-2014

The indication for Fetal Blood Samples compared with previous years is shown in Figure 9.

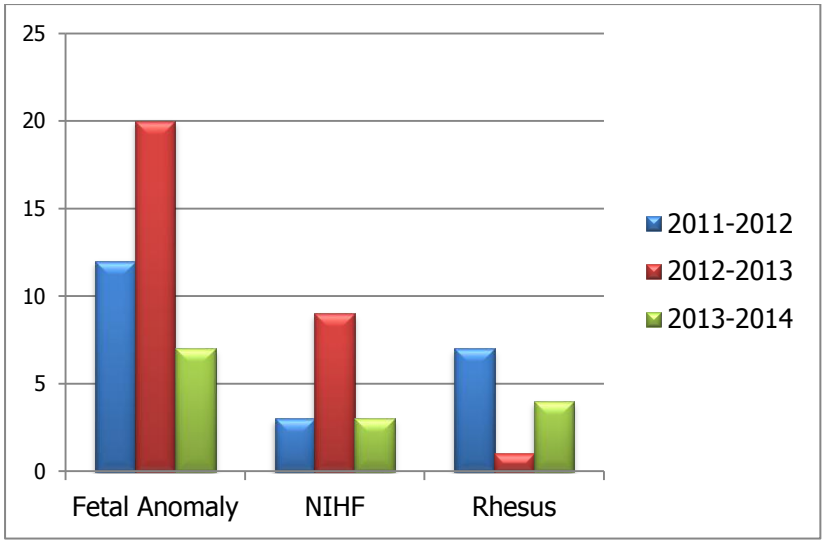


Figure 9 Indication for Fetal Blood Sampling. 2011-2014

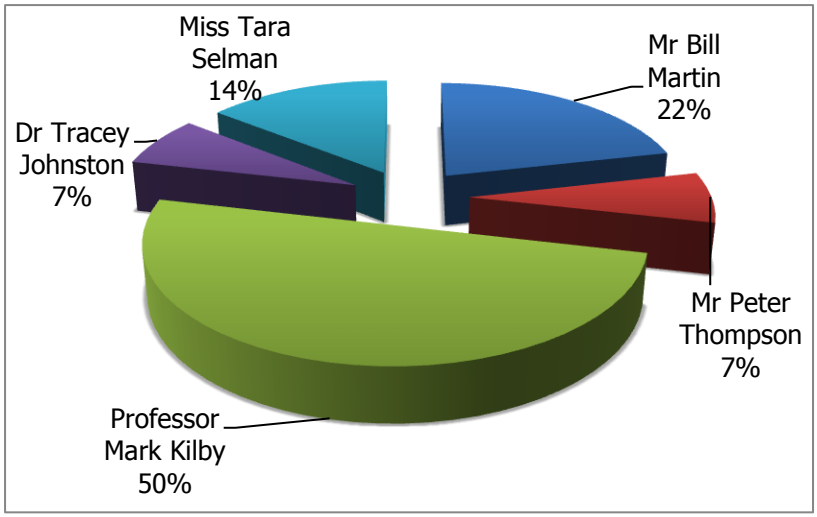


Figure 10 Fetal Blood Sampling by Operator. 2013-2014

The karyotype was normal in 8, abnormal in 2 and not performed in 3.

The outcomes were:

6 underwent termination of pregnancy for severe fetal anomaly

1 suffered an intrauterine death. The baby was profoundly anaemic secondary to parvovirus infection

6 were live births. Five were anaemic. Three due to rhesus alloimmunisation, 1 to parvovirus and in one the cause of anaemia remains unknown. The other was suspected of having CMV infection and postnatal investigation results showed IgG - Positive and IgM – Negative.

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

Between April 2013 and March 2014 there were 45 in-utero transfusions performed on fourteen women with fifteen pregnancies (one set of dichorionic twins) with fetal anaemia. This is noted an annual increase and demonstrates a three/four "cycle" demonstrating a pandemic of human parvovirus B19 infection (Figure). The majority of pregnancies were complicated by anaemia secondary to : a) maternal alloimmunisation (50%; this year all causes being secondary to anti-D); b) human parvovirus infection B19 with transplacental infection (42.9%) and c) a single case of selective TOP in a monochorionic twins, where the survivor required IUT (7.1%)(Figure).

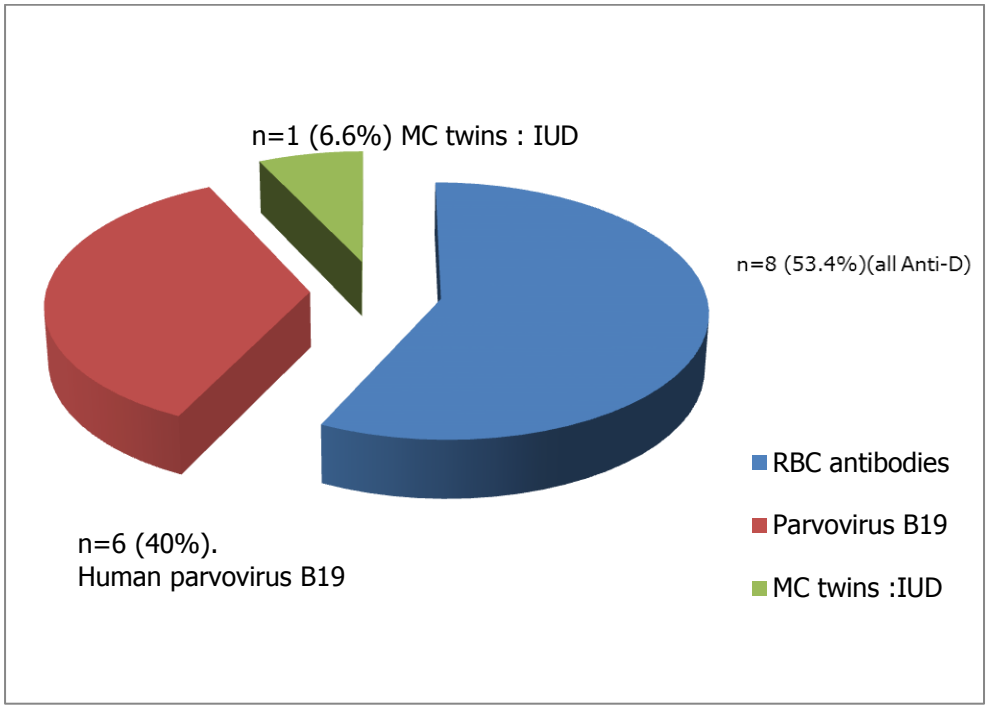


Figure 11 Underlying causes n=15 fetuses in n=14 pregnancies

The gestational age (GA, median) at first transfusion was 21.1 weeks (95%CI 19.7 – 23.9 weeks). A total of forty five in-utero transfusions were performed (twenty seven (73.3%) were intravascular and seven (26.6%) were intraperitoneal (IPT), most commonly performed prior to 20 weeks. All these patients had adjuvant IVIG (1g/Kg/wk) until intravascular transfusions were initiated (range of doses 1 - 5).

Of the intravascular transfusions, 44.4% (n=20) were performed via the intrahepatic vein, 20.6% (n=9) were performed after cordocentesis and in 8.8% (n=4) cardiocentesis and transfusion was performed in hydrops fetalis and severe parvovirus infection <20 weeks. All intraperitoneal transfusions were performed in fetus with a considerable risk of developing anaemia prior to 20 weeks gestation (Figure 12).

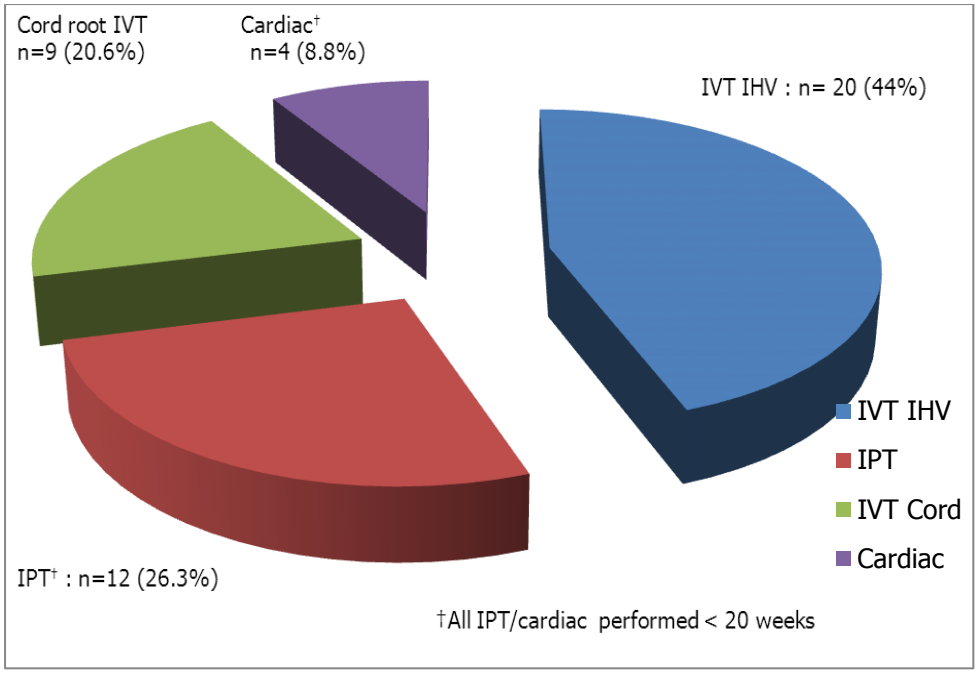


Figure 12

The median fetal haemoglobin prior to intravascular transfusion was 4.9g% (range <0.1 - 10 g%) (all below 5th centile for GA). However, 5 fetuses had intraperitoneal transfusions prior to first fetal blood sampling. All babies were live born at median GA of 33.5 weeks (95%CI 32.8 – 36.4 weeks).

A breakdown by operator performing in-utero transfusions is indicated (Figure 13).

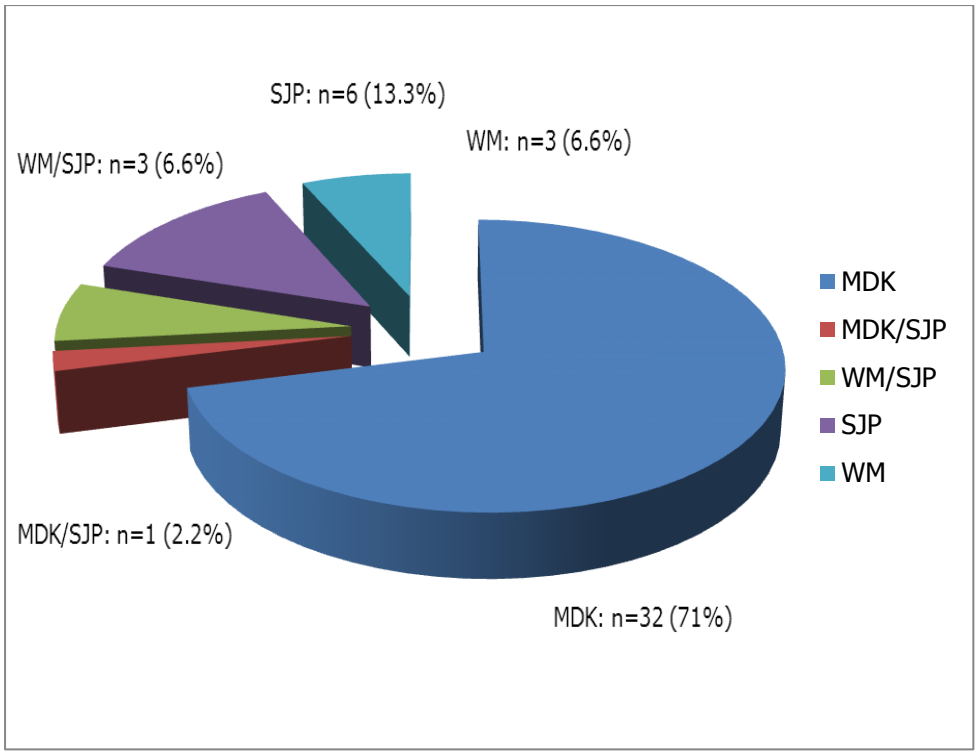


Figure 13

There was no fetal or perinatal mortality in the babies transfused for red cell alloimmunisation (100% survival). There were three in-utero deaths: two associated within 6 hours of IUT for severe parvovirus infection and fetal blood samples <1g% and a single case at 30 weeks in a surviving monochorionic twin after selective termination. In those babies undergoing in-utero transfusion for human parvovirus B19 infection there was a 66% survival.

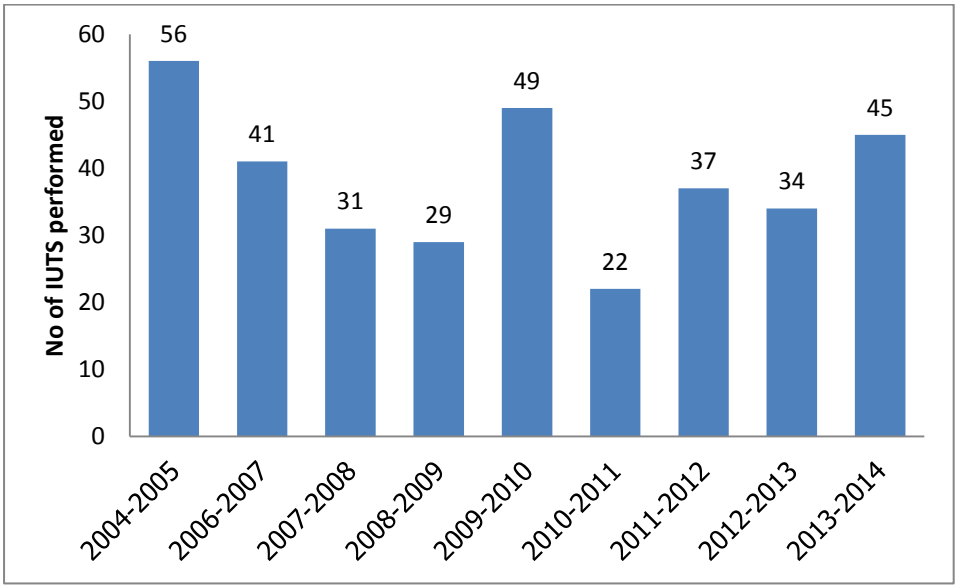


Figure 14 Total = 344 (2004-2014).

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

Between 1st April 2013 and 31st March 2014, there were 46 pregnancies with TTTS considered for fetoscopic laser coagulation; n=44 (95.6%) were monochorionic, diamniotic (MC/DA) twins and n=2 were dichorionic triamniotic triplets (4.4%).

Of these 2.2% (n=1) were Quintero stage I, 17.4% (n=8) has stage II disease, 73.9% (n=34) had Quintero Stage III and three pregnancies had stage IV disease (6.5%). The majority of women whose pregnancies were complicated by severe TTTS presented at <26weeks)(95.5%) were all offered and accepted fetoscopic laser ablation (FLA). The other pregnancies (n=2; 4.5%) were>26 weeks. In 43.5% (n=20) the placenta was anteriorly sited and in 56.5% (n=26) it was posteriorly sited. When MK was operating (alone or with another consultant) local skin infiltration with 1% lignocaine was used with a remifentyl infusion for sedation (47.5%). The other operators used a spinal anaesthetic (52.2%).

The operators were MDK, WM and SJP. They operated independently and with each other as indicated below.

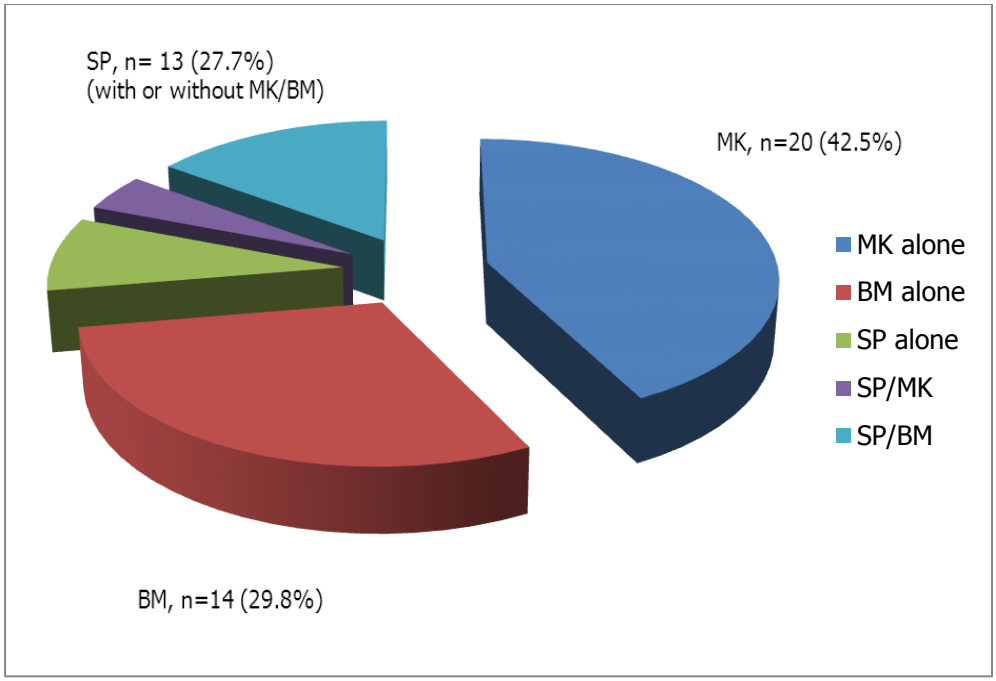


Figure 15 Fetoscopic laser ablation by operator.

In 34% of fetoscopic laser ablations performed a selective technique was utilized and in 66% 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 21 weeks (95% CI 20.2 – 21.7 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 (5/7 [71.4%]) were associated with bleeding and/or PPROM. However there were two cases where double IUDs were diagnosed within 6 hours of the laser procedure.

Following examination of the cohort in total (2013-2014), the overall fetal survival post-FLA 67.02% (63/94 fetuses). Of these, there were single survivors in 36.2% of pregnancies (17/46). In 48.9 % (23/46) of pregnancies there were two survivors and in 14.9% of pregnancies there was a double pregnancy loss (7/46).

Thus, in 86.9% of pregnancies there was at least one survivor. The median prolongation of pregnancy in weeks was 17 weeks (95%CI 11.1 – 18.5wks). The median gestation of delivery (of pregnancies with at least one survivor) was 34 wks (95% CI 32.2 – 34.2 wks). This was with a policy of 'elective delivery' between 34 - 36 weeks, usually by caesarean section.

One pregnancy was delivered at 29 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-polycythaemia) was made (2.1% of fetoscopic laser procedures).

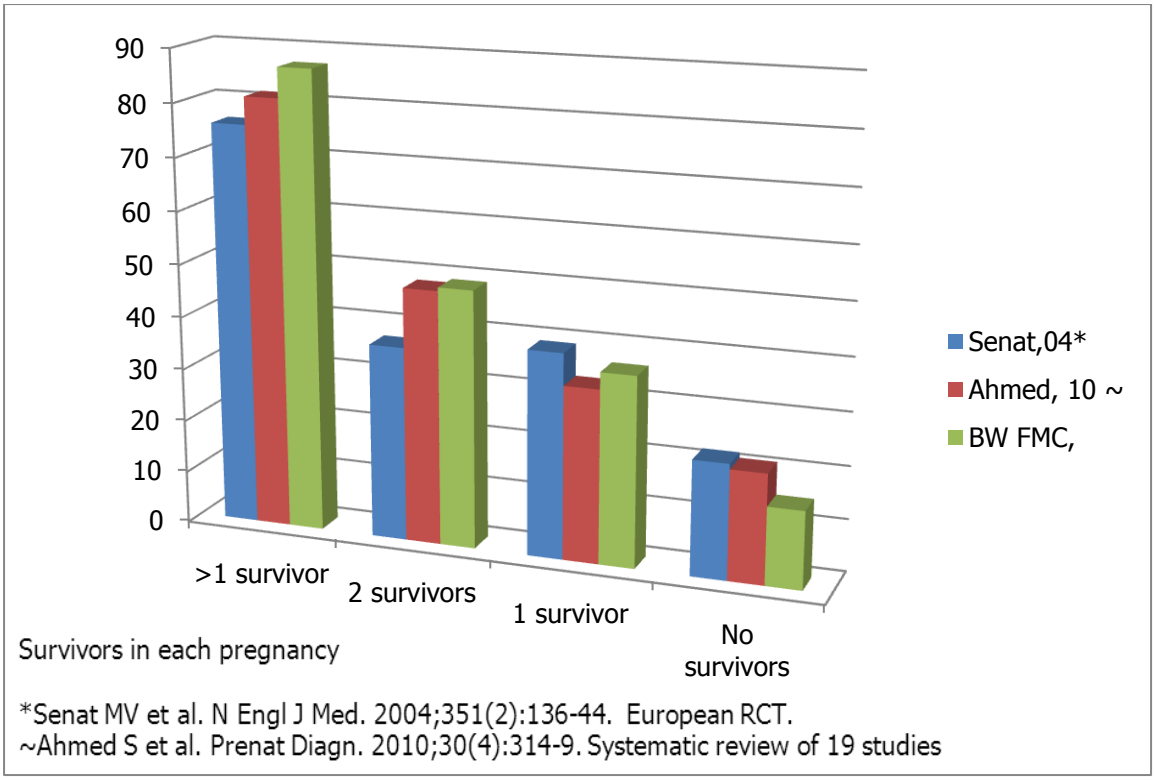


Figure 16 Outcome of fetoscopic laser ablation.

These data indicate that outcomes in this single centre cohort are similar to internationally published data (and those published previously published).

14.1 Radio-interstitial thermal ablation (RITA)

There were 9 RITA procedures. In n=5 cases this was performed because of an acardiac monochorionic twin pregnancy with twin reverse arterial perfusion sequence with 80% (4/5) survival of pump twin (in one pregnancy fetoscopic laser ablation was simultaneously performed). There were n=4 cases of selective TOP for discordant fetal anomalies.

15. Other Invasive fetal therapy

During the course of 2013-2014 there were 13 procedures performed on 10 patients. Eight patients were from the West Midlands area and two from out of area.

There were three amniodrainages performed; one due to twin twin transfusion syndrome, one on a fetus diagnosed with small bowel obstruction and one performed on a fetus with polyhydramnious secondary to a complex cardiac anomaly.

Eight fetal drainages were performed; one due to diaphragmatic hernia with a complex cardiac defect. Two were on the same fetus diagnosed with fetal ascites. Another was due to cloacal plate anomaly. A further two drainages were performed on a fetus with Spina Bifida and a fetus with sacrococcygeal teratoma. The

remaining two were on the same fetus diagnosed with Noonan's Syndrome & bilateral hydrothoraces. This fetus also had a shunt inserted.

There was a further shunt inserted on a fetus with congenital bladder neck obstruction.

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

Ruth Kirchmeier Lead 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 counseling for women with maternal disease.

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

There were 1109 attendances to the Pre-Pregnancy Counselling / Pregnancy Loss Clinic in 2013-2014. This is made up of new and follow up patients.

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 6.

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 counselling will be offered in subsequent pregnancies.

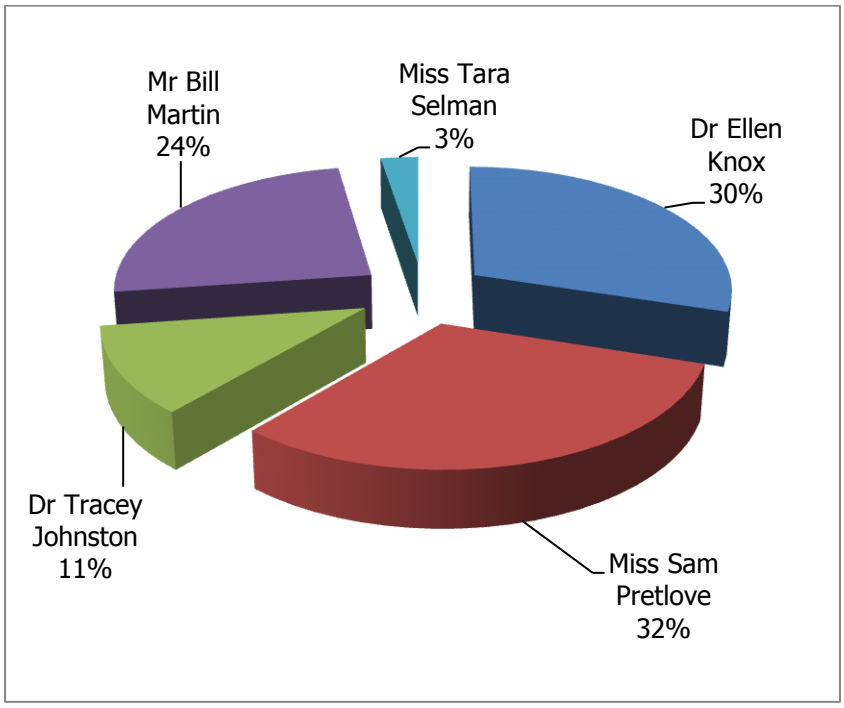


Figure 17 Percentage of patients seen in each Consultant Clinic – 2013-2014

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.

Combined Fetal Medicine / genetics Clinic:
These patients are seen by Mark Kilby and Dr Denise Williams (Consultant Clinical Geneticist). The patients are either:
i) Postnatal or pre pregnancy patients who have a strong person (or family) history of genetic disease or in whom a pregnancy has been complicated by a known or suspected genetic aetiology.

ii) on-going pregnancies with a 'cluster' of ultrasound signs that make a genetic diagnosis possible.

19% of the total pre-pregnancy/pregnancy counselling service workload was from this source.

Maternal disease:
SLE/Rheumatological/Immunological disease
Once a month Professor in Rheumatology Dr Caroline Gordon and 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 can 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.

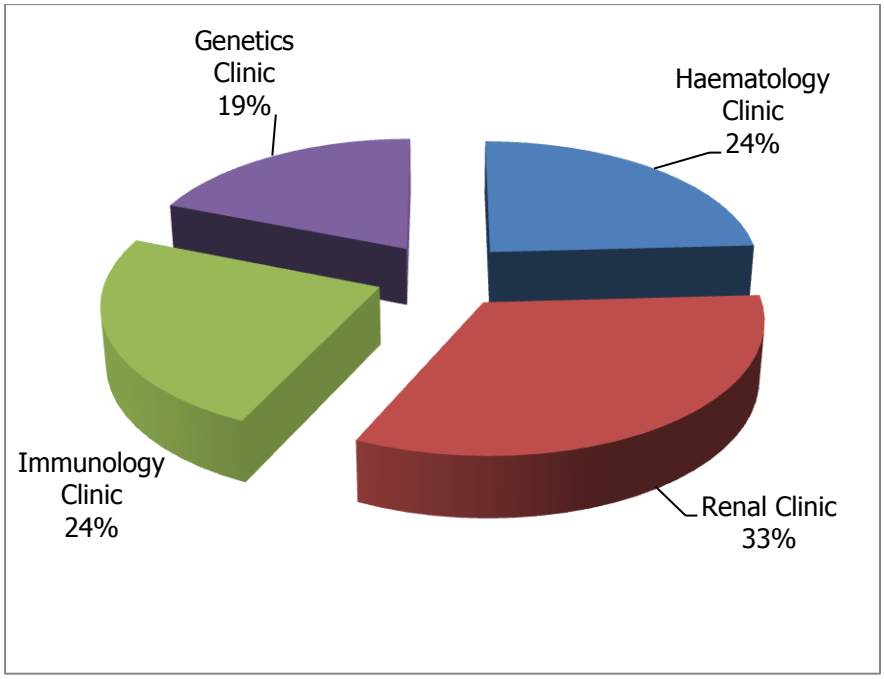


Figure 18 Number of patients seen in each Specialist Clinic – 2013-2014

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 prior to them being seen by the Consultants.

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 is 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.

The CEMACH report (2011) into maternal mortality highlighted the importance of pre-pregnancy counselling for women with complex medical conditions and as a consequence, the numbers being referred from the regional renal and rheumatology clinics has steadily risen.

Previous Pre-eclampsia.
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 Counsellor 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

This has been a busy year with an overall increase in activity. The high workload, complexity of cases and interaction with the academic process makes our centre one of international repute. The staff has worked very hard and I personally would like to thank them for this.

The uncertainty surrounding commissioning of Fetal Medicine Services nationally is a concern and one hopes and works towards minimizing such uncertainty for the future.

Acknowledgements: Thank you to all the section compliers who have worked hard to bring together these metrics. I would like to give special thanks to Mrs. Emma Prentice who has overseen the process and played a major role in the collection of data, their collation and the editing of the final report.

Appendix 1

Academic Staff

- Professor Mark Kilby – Clinical Coordinator in Maternal and Fetal Medicine (NHS); Deputy Head of Division of Reproduction & Child Health (Academic).
- Dr Katie Morris – SST/NIHR Lecturer

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
- Miss Sam Pretlove – Consultant in Fetal Medicine
- Miss Tara Selman – Consultant in Fetal Medicine
- Dr Paul Miller – Consultant Paediatric Cardiologist
- Dr Tarak Desai – Consultant Paediatric Cardiologist
- Dr Anna Seale – Consultant Paediatric Cardiologist

Obstetric Radiology Staff

- Dr Josephine McHugo – Consultant Obstetric Radiologist

Sub Speciality Trainees

- Dr Katie Morris – SST/NIHR Lecturer
- Dr Caroline Fox – 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 / Sonographer
- Sarah Bourne – Midwife
- Linda Buckley – Midwife
- Marguerite Usher-Somers – Specialist Sonographer
- Jill Agnew – Specialist Sonographer
- Sandra Hopkins – Midwifery Assistant
- Frances Rich – Midwifery Assistant / Clerk

Administrative Staff

- Nick Reading / Kerry Forward – General Manager, Maternity

- Emma Prentice – Office Manager / PA / Data Analyst
- Samantha Mostyn – Administrator
- Alison Hill – PA and Secretary to Professor Kilby and Dr Johnston
- Elaine Smith – Secretary to Mr Martin, Mr Thompson and Miss Pretlove
- Vicki Morrison-Thomas – Pre Pregnancy Clerk
- Debbie Caughtry – Receptionist / Clerical Assistant
- Sharon Sams – Receptionist / Clerical Assistant

Appendix 2

Exam desc	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total	Actual No Performed
Amnio drainage	0	0	1	0	0	0	0	0	1	1	0	0	3	
Amniocentesis	20	26	19	16	14	16	22	17	15	16	19	20	220	216
Ascites Scan	0	0	0	0	0	0	0	0	0	1	0	0	1	
Cervix assessment	3	3	0	1	0	0	1	1	1	0	0	0	10	
Chorionic villus sampling	12	21	20	20	26	17	24	25	22	16	20	20	243	224
Consultant 1st Trimester	0	0	0	0	0	0	1	1	0	0	0	0	2	
Consultant Fetal Cardiac	52	45	50	50	53	45	59	37	52	61	48	50	602	
Dating scan	5	3	5	4	3	3	2	9	2	8	8	8	60	
Detailed 1st Trimester	10	14	5	11	14	13	18	14	23	18	18	18	176	
Detailed Rhesus scan	11	18	12	8	6	3	4	5	8	8	16	7	106	
Detailed scan	381	311	310	313	304	277	352	322	303	344	298	297	3812	
Ductus Venosus Doppler	13	10	10	15	13	18	36	17	21	15	14	7	189	
Early Pregnancy Scan	7	1	1	0	1	2	2	1	0	1	0	2	18	
Fetal blood sample	3	3	0	1	1	0	2	1	1	1	0	1	14	
Fetal blood transfusion	3	8	3	2	5	0	0	3	4	3	1	2	34	35
Fetal drainage	0	0	0	1	0	0	2	0	2	3	0	0	8	
Fetal heart rate	4	3	2	1	0	0	2	2	1	2	1	0	18	
Fetal shunt	0	0	0	0	0	0	0	1	0	1	0	0	2	
Fetal Therapy	0	0	0	0	0	0	0	0	0	0	0	0	0	
RITA	1	1	0	1	2	1	0	1	0	0	0	1	8	9
Fetocide	0	2	1	3	2	0	5	3	0	3	1	3	23	
Fetoscopy	2	1	3	8	4	4	5	4	7	4	4	1	47	46
Growth scan	7	2	6	4	3	5	8	8	7	6	9	8	73	
Liquor volume	14	11	11	10	16	21	48	21	16	25	11	10	214	
MCA Doppler	19	16	18	16	15	18	42	22	26	17	26	11	246	
Nuchal translucency scan	14	10	7	5	6	6	7	5	6	12	9	8	95	
Placenta Site	0	0	3	0	0	0	0	1	0	1	0	0	5	
Radiographer 1st Trimester	1	1	2	4	1	1	2	1	1	0	4	3	21	
Radiographer fetal cardiac	113	85	93	71	82	60	90	103	74	92	72	68	1003	
Raised AFP detailed scan	0	1	1	2	0	0	0	0	0	0	0	0	4	
Selective reduction	1	1	0	0	0	0	0	1	1	0	1	0	5	
Umbilical artery Doppler	52	30	37	32	43	43	83	37	43	46	30	25	501	
Uterine artery Doppler	10	6	3	1	4	7	4	2	4	4	1	1	47	
Viability scan post procedure	0	6	3	7	5	4	1	5	6	3	4	2	46	
Viability scan	6	10	8	7	3	10	16	8	10	9	7	7	101	
	764	**649**	**634**	**614**	**626**	**574**	**838**	**678**	**657**	**721**	**622**	**580**	**7957**	

Fetal Medicine Scan procedures – 2013-2014

Actual No performed: This is the number of procedures actually performed 2013-2014. Explanation has been given within each section.

Appendix 3

Region	CCG	Clinical_Commissioning_Group_Name	Count
West Mids	13P	NHS BIRMINGHAM CROSSCITY CCG	1494
West Mids	04X	NHS BIRMINGHAM SOUTH AND CENTRAL CCG	1044
West Mids	04Y	NHS CANNOCK CHASE CCG	114
West Mids	05A	NHS COVENTRY AND RUGBY CCG	83
West Mids	05C	NHS DUDLEY CCG	633
West Mids	05D	NHS EAST STAFFORDSHIRE CCG	245
West Mids	05F	NHS HEREFORDSHIRE CCG	210
West Mids	05G	NHS NORTH STAFFORDSHIRE CCG	57
West Mids	05J	NHS REDDITCH AND BROMSGROVE CCG	247
West Mids	05L	NHS SANDWELL AND WEST BIRMINGHAM CCG	862
West Mids	05N	NHS SHROPSHIRE CCG	102
West Mids	05P	NHS SOLIHULL CCG	228
West Mids	05Q	NHS SOUTH EAST STAFFORDSHIRE AND SEISDON PENINSULA CCG	192
West Mids	05R	NHS SOUTH WARWICKSHIRE CCG	357
West Mids	05T	NHS SOUTH WORCESTERSHIRE CCG	307
West Mids	05V	NHS STAFFORD AND SURROUNDS CCG	148
West Mids	05W	NHS STOKE ON TRENT CCG	72
West Mids	05X	NHS TELFORD AND WREKIN CCG	47
West Mids	05Y	NHS WALSALL CCG	374
West Mids	05H	NHS WARWICKSHIRE NORTH CCG	322
West Mids	06A	NHS WOLVERHAMPTON CCG	167
West Mids	06D	NHS WYRE FOREST CCG	109

Region	CCG	Clinical_Commissioning_Group_Name	Count
OATS	00R	NHS BLACKPOOL CCG	5
OATS	00V	NHS BURY CCG	9
OATS	10H	NHS CHILTERN CCG	7
OATS	00X	NHS CHORLEY AND SOUTH RIBBLE CCG	2
OATS	03V	NHS CORBY CCG	4
OATS	02X	NHS DONCASTER CCG	8
OATS	03W	NHS EAST LEICESTERSHIRE AND RUTLAND CCG	6
OATS	03X	NHS EREWASH CCG	3
OATS	03A	NHS GREATER HUDDERSFIELD CCG	15
OATS	01E	NHS GREATER PRESTON CCG	13
OATS	03Y	NHS HARDWICK CCG	4
OATS	08D	NHS HARINGEY CCG	1
OATS	00K	NHS HARTLEPOOL AND STOCKTON-ON-TEES CCG	5
OATS	08H	NHS ISLINGTON CCG	1

OATS	11N	NHS KERNOW CCG	5
OATS	02V	NHS LEEDS NORTH CCG	9
OATS	03C	NHS LEEDS WEST CCG	5
OATS	04C	NHS LEICESTER CITY CCG	28
OATS	04D	NHS LINCOLNSHIRE WEST CCG	3
OATS	99A	NHS LIVERPOOL CCG	2
OATS	04E	NHS MANSFIELD AND ASHFIELD CCG	8
OATS	04G	NHS NENE CCG	8
OATS	04H	NHS NEWARK & SHERWOOD CCG	4
OATS	00H	NHS NEWCASTLE WEST CCG	14
OATS	04J	NHS NORTH DERBYSHIRE CCG	11
OATS	03H	NHS NORTH EAST LINCOLNSHIRE CCG	5
OATS	03J	NHS NORTH KIRKLEES CCG	3
OATS	01M	NHS NORTH MANCHESTER CCG	8
OATS	99C	NHS NORTH TYNESIDE CCG	7
OATS	04K	NHS NOTTINGHAM CITY CCG	21
OATS	10Q	NHS OXFORDSHIRE CCG	1
OATS	03L	NHS ROTHERHAM CCG	4
OATS	04N	NHS RUSHCLIFFE CCG	5
OATS	03N	NHS SHEFFIELD CCG	3
OATS	10V	NHS SOUTH EASTERN HAMPSHIRE CCG	6
OATS	01N	NHS SOUTH MANCHESTER CCG	2
OATS	04R	NHS SOUTHERN DERBYSHIRE CCG	90
OATS	01W	NHS STOCKPORT CCG	7
OATS	12D	NHS SWINDON CCG	6
OATS	02A	NHS TRAFFORD CCG	3
OATS	07H	NHS WEST ESSEX CCG	3
OATS	02G	NHS WEST LANCASHIRE CCG	4
OATS	04V	NHS WEST LEICESTERSHIRE CCG	81
OATS	99N	NHS WILTSHIRE CCG	13
OATS	11C	NHS WINDSOR, ASCOT AND MAIDENHEAD CCG	3
OATS	Other	Other	88

Fetal Medicine Activity by CCG - 2013-2014

Appendix 4

Fetal Anomalies detected on ultrasound scans:

Fetal abnormality	2013-2014	
	BWH	Regional
RENAL		
Renal	38	65
CARDIAC*		
Cardiac	7	20
ABDOMINAL		
Gastroschisis	4	14
Diaphragmatic Hernia	3	13
Exomphalos	8	8
Ovarian Cyst	2	5
Other Abdomen	4	6
RESPIRATORY		
Cystic Lung Lesion	1	12
Other Respiratory		
SKELETAL		
skeletal	9	28
LIMB	3	14
Talipes	16	22
Other Limb		
HEAD AND NECK		
Cystic Hygroma	4	9
Other Head and Neck		
Facial	8	19
Nuchal oedema / thickness	21	88
HYDROPS (and pleural eff / ascites)		
Hydrops (and pleural eff / ascites)	9	25
GASTROINTESTINAL		
Gastrointestinal (inc hyperechogenic bowel)	12	23
CNS		
Anencephaly	3	3
Spina Bifida and / or Hydrocephalus	7	12
Encephalocele	2	5
Microcephaly	1	2
Holoprosencephaly	2	5
Dandy Walker Cyst	1	1
Agenesis of corpus callosum	2	4
CPC	2	4
Ventriculomegaly	15	39
other CNS	9	26
TWIN COMPLICATIONS NOT TTTS		
Twin complications not TTTS	3	8
SACROCCYGEAL TERATOMA		
Sacroccygeal teratoma	1	2
OTHER - Miscellaneous	2	4

Anomalies picked up from ultrasound scans 2013-2014

*(Cardiac plus additional structural anomaly)

Appendix 5

Echo Diagnosis	Total
Aortic Override	1
Aortic Stenosis	4
Arrhythmia	25
Arterial disproportion	2
Atrioventricular Septal Defect	16
Cardiomegaly	1
Cardiomyopathy	2
Coarctation of the Aorta	19
Common Arterial Trunk	4
Common Atrioventricular Junction	7
Complex Cardiac anomaly	19
Double Inlet Left Ventricle	6
Double Outlet Right Ventricle	5
Ebsteins anomaly	1
Hypoplastic Arch	9
Hypoplastic Left Heart Syndrome	27
Hypoplastic Right Heart	2
Left Atrial Isomerism	4
Left SVC	2
Normal	797
Other:	14
PAIVS	1
Pulmonary Atresia	14
Pulmonary Stenosis	11
Ventricular Disproportion	25
Tetralogy of Fallot	15
Transposition of the Great Arteries	17
Tricuspid Atresia	6
Tricuspid Dysplasia	3
Tricuspid Regurgitation	3
Univentricular Heart	6
Ventricular Septal Defect	50

Cardiac anomalies detected – 2013-2014

Appendix 6

Consultants supporting the Pre Pregnancy Counselling / Pregnancy Loss Clinic

- Mr Bill Martin carries out a monthly Pre-Pregnancy Counselling/ Pregnancy Loss Clinic.
- Miss Tara Selman 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)