About the NHS Screening Programmes

NHS Screening Programmes identify apparently health people who may be at increased risk or a disease or condition, enabling earlier treatment and better informed decisions. They are implemented on the advice of the UK National Screening Committee (UK NSC), which oversees screening policy in all four nations, and works with the different implementation bodies to support delivery.

Public Health England (PHE) is responsible for the NHS Screening Programmes. PHE is an executive agency of the Department of Health and works to protect and improve the nation’s health and wellbeing, and reduce health inequalities.

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You can download this publication from www.gov.uk/government/publications/fetal-anomaly-screening-programme-handbook

Gateway ref: 2015002
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1 Introduction

The purpose of this handbook is to bring together in one publication the Fetal Anomaly Screening Programme’s (FASP) guidelines and recommendations that relate to the screening pathway and are not covered in detail in the other handbooks.

1.1 Conventions
Throughout the document the following are used interchangeably:

- Down’s syndrome is referred to as T21
- Edwards’ syndrome as T18
- Patau’s syndrome as T13

1.2 Related documents

a. Handbook for laboratories
This sets out the requirements for laboratory staff involved in the pathways for first trimester screening for Down’s, Edwards’ and Patau’s syndromes and second trimester biochemical screening for Down’s syndrome.


b. Ultrasound Practitioner’s Handbook
This sets out the requirements for ultrasound practitioners involved in the pathway for first trimester screening for Down’s, Edwards’ and Patau’s syndromes.


c. Department of Health / NHS England Service – Specification for Screening for Down’s, Edwards’ and Patau’s syndromes (No. 16) and Specification for 18\(^{\text{th}}\) to 20\(^{\text{th}}\) fetal anomaly scan (No.17)

These outline the service and quality indicators expected by NHS England for the population for whom it is responsible and which meets the policies, recommendations and standards of the UK National Screening Committee (UK NSC). It is relevant for both commissioners and providers of the screening service to enable an understanding of the care pathway pregnant women should expect and how that service should be delivered.

Both documents should be read in full to gain a better understanding of the expected roles and responsibilities for the various healthcare professionals involved in providing the screening pathway. These are updated annually and new versions posted to the website.


d. Standards
These define a set of standards relating to screening for Down’s, Edwards’ and Patau’s syndromes and the 18\(^{\text{th}}\) to 20\(^{\text{th}}\) week fetal anomaly scan.

2 The Fetal Anomaly Screening Programme (FASP)

2.1 General principles of screening
Screening is a process of identifying apparently healthy people who may be at increased risk of a disease or condition. They can then be offered information, further tests and appropriate treatment to reduce their risk and/or any complications arising from the disease or condition.

Further information regarding the general principles of screening can be found at: screening.nhs.uk

2.2 Background
NHS FASP, based in Public Health England, is an expert team that ensures national consistency and provides expertise. They support and manage on-going roll out, technical and professional development of the programme and ensure quality and safety standards are maintained and continuously improved.

The screening programme has evolved from its establishment in 2001 when the majority of screening was performed using maternal biochemistry in the second trimester. The recommended method of screening is now first trimester screening, combining maternal age, biochemistry and ultrasound measurement of fetal nuchal translucency to provide a pregnant woman with the risk of having a baby with Down’s, or Edwards’/Patau’s syndromes.

The offer of a fetal anomaly scan is recommended and where accepted should be undertaken between 18+0 to 20+6 weeks of pregnancy. The fetal anomaly scan base menu sets out the fetal anatomy to be examined. The fetal anomaly scan screens for 11 conditions. For further information see section 5.6 of this handbook.

FASP has established standardisation of the following to enable commissioners and quality assurance teams to assess the quality of the service provided. These include:

- national standards, guidance and risk cut-off for Down’s, Edwards’ and Patau’s syndromes screening programme in the light of emerging evidence
- a statistical service to ensure that laboratories have access to the best advice in maintaining their population medians
- specifications for risk calculation software to make sure that all laboratories calculate risks in a uniform way
- use of a base menu and fetal cardiac protocol to enable consistency in the structures examined as part of the 18+0 to 20+6 week fetal anomaly scan

2.3 The policy
FASP offers screening to all eligible pregnant women in England to assess the risk of the baby being born with Down’s, or Edwards’/Patau’s syndromes or a number of fetal anomalies (structural abnormalities of the developing fetus).

FASP aims to ensure there is equal access to uniform and quality-assured screening across England and women are provided with high quality information so they can make an informed choice about their screening and pregnancy options. Education and training resources are available for staff covering all stages of the process, from informing women of test availability, through to understanding and supporting their decisions.

The screening policy is to offer screening to assess the risk of the baby being born with Down’s or Edwards’/Patau’s syndromes. The test
of choice for both singleton and twin pregnancies is first trimester combined screening. Women can choose:

- not to have screening
- to have screening for T21 and T18 / T13
- to have screening for T21 only
- to have screening for T18 / T13 only

The first scan usually takes place between 10 to 14 weeks and includes a blood sample taken to test for Down’s, Edwards’/Patau’s syndromes, with a second scan for fetal anomalies between 18 to 20 weeks. The timing of the scans allows for further diagnostic tests if required and ensures women have time to consider decisions about continuing their pregnancy.

The second scan is designed to identify abnormalities which indicate the baby may die shortly after birth, conditions that may benefit from treatment before birth, to plan delivery in an appropriate hospital/centre and/or to optimise treatment after the baby is born. Some women may choose not to be screened at all, or only for some conditions and it is important that this choice is respected.
3 Markers used in screening tests

3.1 Maternal age

All women have a chance of having a baby with Down’s, Edwards’ or Patau’s syndrome and this chance increases with age. The older a mother, the more chance she has of having a baby with the condition.

Table 1: Example for a woman who is 16 weeks pregnant

<table>
<thead>
<tr>
<th>Maternal age</th>
<th>Chances of having a pregnancy affected by Down’s syndrome</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 years</td>
<td>1 in 1500</td>
<td>0.07%</td>
</tr>
<tr>
<td>30 years</td>
<td>1 in 900</td>
<td>0.1%</td>
</tr>
<tr>
<td>40 years</td>
<td>1 in 100</td>
<td>1%</td>
</tr>
</tbody>
</table>

Figure 1: Graph to illustrate the likelihood of a pregnancy affected by Down’s, Edwards’ or Patau’s syndromes according to maternal age showing T21 (black line), T18 (blue line), T13 (green line). Risks are at the time of the 12 weeks scan.
Table 2: Reframing risk

<table>
<thead>
<tr>
<th>Chance of an affected pregnancy</th>
<th>Chance of an unaffected pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 4 25%</td>
<td>3 in 4 75%</td>
</tr>
<tr>
<td>1 in 5 20%</td>
<td>4 in 5 80%</td>
</tr>
<tr>
<td>1 in 10 10%</td>
<td>9 in 10 90%</td>
</tr>
<tr>
<td>1 in 20 5%</td>
<td>19 in 20 95%</td>
</tr>
<tr>
<td>1 in 30 3%</td>
<td>29 in 30 97%</td>
</tr>
<tr>
<td>1 in 50 2%</td>
<td>49 in 50 98%</td>
</tr>
<tr>
<td>1 in 100 1%</td>
<td>99 in 100 99%</td>
</tr>
<tr>
<td>1 in 200 0.5%</td>
<td>199 in 200 99.5%</td>
</tr>
</tbody>
</table>

Can be applied to any screening test where the result is reported as a probability

3.2 Biochemical markers

There are five analytes (commonly referred to as markers) measured by the laboratory that are used to calculate the likelihood of a pregnancy being affected by Down’s, Edwards’ or Patau’s syndromes – six if human chorionic gonadotropin (hCG) and its free beta subunit are considered as two separate analytes. Please refer to the laboratory handbook for more information on biochemical markers see:


3.3 Effect of vaginal bleeding on biochemical markers

There are concerns that a history of significant maternal vaginal bleeding might change the levels of biochemical markers used in the combined test. FASP recommends women are offered the combined test in the normal way (calculating the risk based on maternal age, NT, free beta hCG and PAPP-A levels), as current evidence suggests that the biochemical marker levels are not significantly different in women with this history.

3.4 Effect of ‘vanished twin’ on biochemical markers

When ultrasound shows there is an empty second pregnancy sac, the biochemical markers appear no different to those in a singleton pregnancy and the combined test of NT, PAPP-A and free beta HCG can be used to calculate the risk.

When ultrasound shows that there is a second sac containing a non-viable fetus (sometimes called ‘vanished’ twin), it is possible there could be a contribution to the maternal biochemical markers for many weeks. It is recommended that in this event services undertake the risk calculation based on the maternal age and nuchal translucency only (ie without biochemistry).
3.5 Ultrasound markers

Please refer to the laboratory and ultrasound practitioner’s handbooks for more detailed information on ultrasound markers:

fetalanomaly.screening.nhs.uk/publications

FASP aims to ensure there is equal access to uniform and quality-assured screening across England and women are provided with high quality information so they can make an informed choice about their screening and pregnancy options. Education and training resources are available for staff covering all stages of the process, from informing women of test availability, through to understanding and supporting their decisions.

The screening policy is to offer screening to assess the risk of the baby being born with Down’s or Edwards’/Patau’s syndromes. The test of choice for both singleton and twin pregnancies is first trimester combined screening. Women can choose:

- not to have screening
- to have screening for T21 and T18 / T13
- to have screening for T21 only
- to have screening for T18 / T13 only

The first scan usually takes place between 10 to 14 weeks and includes a blood sample taken to test for Down’s, Edwards’/Patau’s syndromes, with a second scan for fetal anomalies between 18+0 to 20+6 weeks. The timing of the scans allows for further diagnostic tests if required and ensures women have time to consider decisions about continuing their pregnancy.

The second scan is designed to identify abnormalities which indicate the baby may die shortly after birth, conditions that may benefit from treatment before birth, to plan delivery in an appropriate hospital/centre and/or to optimise treatment after the baby is born. Some women may choose not to be screened at all, or only for some conditions and it is important that this choice is respected.
4 Down’s, Edwards’ and Patau’s syndromes

Inside the cells of our bodies there are tiny structures called chromosomes. These chromosomes carry the genes that determine how we develop. There are 23 pairs of chromosomes in each cell. Problems can occur when the sperm or egg cells are produced which can lead to a baby having an extra chromosome.

4.1 Down’s syndrome

People with Down’s syndrome (T21) have extra chromosome 21 in the cells of their body. A baby born with T21 will have a learning disability. They may have communication problems and difficulty managing some everyday tasks. It is impossible to know what level of learning disability a baby with T21 will have. It can vary from mild to severe.

Some health problems are more common in people with T21, for example, heart conditions, and problems with the digestive system, hearing and vision. Some problems can be serious but many can be treated. With good healthcare, someone with Down’s syndrome is expected to live to around 60 years. People with Down’s syndrome have distinctive facial features including almond shaped eyes. Like all children, they also inherit features from their parents. T21 affects 1 in every 1000 births.

www.gov.uk/topic/population-screening-programmes/fetal-anomaly

4.2 Edwards’ and Patau’s syndromes

Sadly, most babies with T18 or T13 will die before they are born, be stillborn or die shortly after birth. Some babies may survive to adulthood but this is rare.

In Edwards’ syndrome (T18) there is an extra copy of chromosome 18 in each cell. All babies born with T18 will have a wide range of problems, which are usually extremely serious - these may include major brain abnormalities. Babies affected by T18 can have heart problems, unusual head and facial features, growth problems and be unable to stand or walk. T18 affects about 3 of every 10,000 births.

In Patau’s syndrome (T13) there is an extra copy of chromosome 13 in each cell. All babies born with T13 will have a wide range of problems, which are usually extremely serious - these may include major brain abnormalities. Babies affected by T13 can have heart problems, a cleft lip and palate, growth problems, poorly formed eyes and ears, problems with their kidneys and are unable to stand or walk. T13 affects about 2 of every 10,000 births.
5 Screening tests

5.1 The early pregnancy scan
The scan has several purposes. It is to:
- confirm viability
- ascertain if it is a singleton or multiple pregnancy
- estimate gestational age
- detect major structural anomalies that may be identified in early pregnancy eg anencephaly

If the woman accepts screening for T21, T18/T13 syndromes the scan is one component of the screening test. Ultrasound scanning in pregnancy should, in the first instance, be performed transabdominally.


5.2 First trimester combined test
The combined test uses maternal age, the nuchal translucency measurement (NT) and two biochemical tests, free beta hCG and PAPP-A, together with the gestational age calculated from the crown rump length (CRL) measurement, to calculate the risk of the pregnancy being affected by T21or T18/T13. The optimal time to perform the combined test is between 11 weeks 2 days to 14 weeks 1 day of gestation, which corresponds to a CRL of 45.0 mm to 84.0 mm.

In cases where screening is accepted but it is not possible to obtain the NT measurement at the first appointment, at least one other attempt should be offered, this may be on the same day or at a later date. If it is not possible to obtain an accurate NT measurement despite ‘twice on the couch’ then further attempts do not have to be offered and the woman should be referred in to the second trimester screening pathway.

If the ultrasound measurement shows that the CRL is less than 45.0 mm, the woman should be recalled for a further scan to measure the NT. If the CRL is greater than 84.0 mm, the second trimester quadruple test should be offered.

The first trimester combined test allows earlier decision making for parents. In practice, two models are available for performing the combined test:
- a maternal blood specimen may be taken (from 10 weeks onwards) prior to the ultrasound scan. The biochemistry results can then be made available at the time of the NT scan and the combined test result can be calculated at the time of the appointment. Although the result may be calculated by the sonographer, it is recommended that the laboratory take primary responsibility for the risk calculation software and audit all results
- a maternal blood specimen may be taken at the time of the ultrasound scan and the combined test result made available within a few days of the biochemistry results being authorised by the laboratory

When calculating a risk for T21 and/or T18/T13 syndromes, the nuchal translucency measurement must be used in combination with a maternal serum screening test.

The nuchal translucency measurement must not be used in isolation.

Where women have chosen not to accept screening for Down’s, Edwards’ and Patau’s syndromes, but choose to accept an early pregnancy scan, structural anomalies may still be identified, including an NT of ≥ 3.5mm. It is not within FASP’s remit to provide guidance regarding the clinical care of women who have declined screening but they should be aware that any such anomaly will be reported and signposted as per local clinical guidelines for care and management.
FASP recommends that the Down’s and/or Edwards'/Patau’s screening risk generated from first trimester combined screening must not to be recalculated up or down following the initial screening test or at the 18+0 to 20+6 fetal anomaly ultrasound scan due to the presence or absence of a single ultrasound marker of less predictive power than increased nuchal fold (Smith-Bindman et al, 2001).

For further information regarding the scan element of the combined screening test please see the Ultrasound practitioner’s handbook.


5.3 Second trimester quadruple test

The quadruple test uses maternal age and four biochemical markers measured from 14 weeks 2 days until 20 weeks 0 days - AFP, hCG (total, intact or free beta subunit), uE3 and Inhibin-A. Although this combination of markers has a lower detection and standardised screen positive rate than the combined test, it is the nationally recommended screening strategy in the second trimester. The optimum time for testing in the second trimester is around 16 week’s gestational age.

There will always be a need for a screening test in the second trimester for those women who book too late for first trimester testing or when an NT measurement cannot be obtained (despite twice on the couch) in the first trimester. An ultrasound scan will be required to date the pregnancy and a fetal head circumference is the recommended measurement used for women presenting in the second trimester. Further information regarding the practicalities of a solution to combining dating and screening requirements at the early pregnancy scan are explored in more detail in the following article: Chudleigh et al (2011), A practical solution to combining dating and screening for Down’s syndrome.

5.4 Screening in twin pregnancies

Women with a twin pregnancy are eligible for combined screening or quadruple screening dependent on gestational age. For detailed information regarding screening in twin pregnancies please see section 6 of the Laboratory Handbook at:


5.5 National standards for T21/T18/T13 screening

The national standards seen in Table 3 state the threshold for the national programme and will be reported on each year by the Down’s syndrome screening Quality Assurance Support Service (DQASS).
### Screening strategy

<table>
<thead>
<tr>
<th>Screening strategy</th>
<th>Thresholds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acceptable</td>
</tr>
<tr>
<td>T21</td>
<td>Standardised DR 85%</td>
</tr>
<tr>
<td></td>
<td>Standardised SPR 1.9-2.4%</td>
</tr>
<tr>
<td>T18/T13</td>
<td>Standardised DR 80%</td>
</tr>
<tr>
<td></td>
<td>Standardised SPR 0.13-0.17%</td>
</tr>
<tr>
<td>T21/T18/T13</td>
<td>Standardised SPR 1.8-2.5%</td>
</tr>
<tr>
<td>Quadruple (T21)</td>
<td>Standardised DR 80%</td>
</tr>
<tr>
<td></td>
<td>Standardised SPR 2.7-3.3%</td>
</tr>
</tbody>
</table>

*The DR and SPR for the quadruple test relate to singleton pregnancies only*

### 5.6 The 18<sup>–</sup>0 to 20<sup>+</sup>6 week fetal anomaly ultrasound scan

FASP recommends a mid-pregnancy scan which is undertaken between 18<sup>–</sup>0 to 20<sup>+</sup>6 weeks of pregnancy to screen for major fetal anomalies. The examination should be undertaken in accordance with the 18<sup>–</sup>0 to 20<sup>+</sup>6 FASP ultrasound scan base menu and fetal cardiac protocol.

Some providers are able to arrange the fetal anomaly scan later within the recommended window ie closer to 20 weeks as opposed to 18 weeks - where this occurs services must be able to facilitate referrals for further investigations and options for pregnancy choices in a timely manner and within the required national timeframes. Ongoing audit of practice should be in place to monitor conformity. FASP recommends the screening pathway must be completed by 23<sup>+</sup>0 weeks of pregnancy.

Women who wish to have a fetal anomaly ultrasound scan, but do not wish to be informed if abnormalities are found, should be advised that all significant findings seen on scan will be reported and therefore should consider not having fetal anomaly ultrasound screening.

The main structures to be assessed at the 18<sup>–</sup>0 to 20<sup>+</sup>6 week scan are defined. Abnormalities of these structures can indicate a number of specific conditions. Other conditions may be detected using this ultrasound screening test, but there are insufficient data to confidently predict the standard which should be achieved.

11 conditions are specified that indicate that:

- the baby may die shortly after birth
- are conditions that may benefit from treatment before birth
- to facilitate planned delivery in an appropriate hospital/centre
- and/or to optimise treatment after the baby is born
- and have detection rates (DR) which exceed 50%.

*(Fetal Anomaly Ultrasound Screening Programme Study: Literature Survey June 2007 Bryant L, Fisher A and Vicente F Social Research and Regeneration Unit A University of Plymouth Centre)*
Table 4: The conditions screened for as a minimum in England

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Detection rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anencephaly</td>
<td>98</td>
</tr>
<tr>
<td>Open spina bifida</td>
<td>90</td>
</tr>
<tr>
<td>Cleft lip</td>
<td>75</td>
</tr>
<tr>
<td>Diaphragmatic hernia</td>
<td>60</td>
</tr>
<tr>
<td>Gastrochosis</td>
<td>98</td>
</tr>
<tr>
<td>Exomphalos</td>
<td>80</td>
</tr>
<tr>
<td>Serious cardiac anomalies includes the following:</td>
<td>50</td>
</tr>
<tr>
<td>• Transposition of the Great Arteries (TGA)</td>
<td></td>
</tr>
<tr>
<td>• Atrioventricular Septal Defect (AVSD)</td>
<td></td>
</tr>
<tr>
<td>• Tetralogy of Fallot (TOF)</td>
<td></td>
</tr>
<tr>
<td>• Hypoplastic Left Heart Syndrome (HLHS)</td>
<td></td>
</tr>
<tr>
<td>Bilateral renal agenesis</td>
<td>84</td>
</tr>
<tr>
<td>Lethal skeletal dysplasia</td>
<td>60</td>
</tr>
<tr>
<td>Edwards’ syndrome (Trisomy 18)</td>
<td>95**</td>
</tr>
<tr>
<td>Patau’s syndrome (Trisomy 13)</td>
<td>95**</td>
</tr>
</tbody>
</table>

**Detection rates will be reviewed following implementation of screening as part of the combined screening strategy

It is accepted that an ultrasound scan at this time can also constitute part of general clinical practice and management as well as screening. The two are closely linked.

Although it is not the remit of the screening programme to set out standards or guidance on the management of these areas, it is acknowledged that by not incorporating a reference to them in the 18+0 to 20+6 FASP ultrasound scan base menu, it may give the impression that they should not be noted during the ultrasound scan. The examination of placental position and amniotic fluid whilst not part of the screening protocol is good clinical practice.

There is no requirement to determine fetal gender within the FASP in England; it is not part of the 18+0 to 20+6 FASP ultrasound scan base menu. There is no programme requirement to recall the woman if the fetal sex is not identified due to poor visualisation or difficult fetal position.

5.6.1 18+0 to 20+6 FASP ultrasound scan base menu (See Appendix 1)

The 18+0 to 20+6 FASP ultrasound scan base menu specifies measuring techniques and defines the anatomical structures to be assessed. This promotes consistency in the examination.

The fetal anatomy to be examined is:

1. head circumference demonstrating HC measurement and measurement of the atrium of the lateral ventricle
2. suboccipito-bregmatic view demonstrating measurement of the transcerebellar diameter
3. coronal view of lips with nasal tip
4. abdominal circumference demonstrating AC measurement
5. femur length demonstrating FL measurement
6. sagittal view of spine including sacrum and skin covering
Six specific fetal anatomical sections should be identified at examination. A hard copy image and report should be recorded and appropriately stored in any combination of the following formats:

- ultrasound clinical information storage system
- auditable electronic hospital information system
- ultrasound request/report form
- in the woman’s hand-held notes

The head circumference (HC), abdominal circumference (AC) and femur length (FL) measurements should be taken to assess growth velocity in a pregnancy where the expected date of delivery (EDD) was previously assigned in line with nationally approved charts and tables.

If the EDD was not previously assigned, the pregnancy should be dated by HC or FL.


5.6.2 Fetal cardiac protocol

The views required are:

1. Situs/Laterality

2. Four-Chamber: Transverse section of the thorax including a complete rib and crux of the heart

3. Aorta/Left Ventricular Outflow Tract: This view shows the outflow tract of the left ventricle

4. Pulmonary/Right Ventricular Outflow Tract: This view shows the outflow tract of the right ventricle only or the Three-Vessel View (3VV): This view shows the outflow tract of the right ventricle including the pulmonary artery

5. The 3 vessel and trachea view (3VT): a transverse view of the fetal upper mediastinum; it depicts the main pulmonary artery in direct communication with the ductus arteriosus, the transverse aortic arch and the superior vena cava

A single repeat scan must be offered and completed by 23+0 weeks gestation. In cases where the image quality of the first examination is compromised by one of the following:

- increased maternal body mass index (BMI)
- uterine fibroids
- abdominal scarring
- sub-optimal fetal position

The woman should be rescanned on the same day or offered a new appointment according to local clinical assessment.

If first examination is sub-optimal and the sonographer is suspicious of a possible fetal abnormality, a second opinion should be sought. This should be documented.

Where an adequate assessment of the fetal anatomy remains compromised after the repeat scan, the woman should be told that the screening is incomplete and this should be recorded.

5.6.3 Normal variant

The introduction of a national Down’s, Edwards’ and Patau’s syndromes screening programme in early pregnancy has changed the way in which the 18+0 to 20+6 fetal anomaly scan findings are interpreted. FASP recommends that an established screening test result should not be recalculated at this time.

The screening programme is increasingly delivering higher detection rates for lower screen positive rates. Therefore, women who are found to be ‘lower risk’ through testing in either first or second trimesters, or who have declined screening for Down’s, Edwards’ and Patau’s syndromes should not be referred for further assessment of chromosomal abnormality even if normal variants such as the examples below (whether one or more are identified) are seen at the 18+0 to 20+6 week fetal anomaly screening scan. The term ultrasound “soft marker” should no longer be used.

1. Choroid plexus cyst(s)
2. Dilated cisterna magna
3. Echogenic foci in the heart
4. Two vessel cord
However, the appearances listed below (previously classified as “markers”) are examples of findings which should be reported and the woman referred for further assessment and treated as for any other suspected fetal anomaly.

1. Nuchal fold (greater than 6mm)
2. Ventriculomegaly (atrium greater than 10mm)
3. Echogenic bowel (with density equivalent to bone)
4. Renal pelvic dilatation (AP measurement greater than 7 mm)
5. Small measurements compared to dating scan (significantly less than 5th centile on national charts)

All providers should have multidisciplinary education and training programmes for health professionals involved in obstetric ultrasound and antenatal screening.

All diagnostic ultrasound procedures must be undertaken by health professionals who are fully trained in the use of the specialised equipment and in the safe use of ultrasound.

All practitioners undertaking ultrasound screening should be funded by the provider to attend relevant continuous professional development (CPD) training.

### 5.6.4 Image capture, storage and archiving

The required images are detailed on the 18\(^{+6}\) to 20\(^{+6}\) FASP ultrasound scan base menu (see appendix 1). Ultrasound images should be captured, stored and archived on an electronic reporting system. There should be a permanent electronic record of all imaging studies. All imaging studies should be accompanied by an electronic report available with the images. Every provider should be able to upload ultrasound scan reports and images on an auditable electronic reporting system in order to provide minimum audit data. All required images should be captured, stored and archived for the purposes of a complete maternal record and to fulfil medico-legal requirements.

### 5.6.5 Training and professional competence

All ultrasound practitioners must hold minimum certification as specified by FASP in Service Specification No 17:


All health professionals working with ultrasound equipment should be aware of the Royal College of Radiologists (RCR) and Society and College of Radiographer’s (SCoR) standards for the provision of an ultrasound service:

www.rcr.ac.uk/standards-provision-ultrasound-service

All health professionals should adhere to the British Medical Ultrasound Society (BMUS) recommended scanning time limits for obstetric scanning. British Medical Ultrasound Society Guidelines for the safe use of diagnostic ultrasound equipment November 2009. BMUS bmus.org

Ultrasound machinery used for the 18\(^{+6}\) to 20\(^{+6}\) weeks fetal anomaly scan should be capable of producing images of diagnostic quality and include the following features (as a minimum):

- adequate display/screen size for sufficient clear visualisation
- magnification facility
- cineloop function
- callipers that have a precision to one decimal point (ie 0.1 mm)
- adjustable signal processing facilities
- tissue-specific pre-sets for individual clinical applications
- appropriate probe relevant to gestational age
- doppler and harmonic function
6 Diagnostic testing

Pregnant women should not be offered a diagnostic test for Down’s, Edwards’ and Patau’s syndromes based on their age-related risk alone.

Diagnostic testing can include Chorionic Villus Sampling or amniocentesis. The procedure should be performed by specially trained health professionals and women may be required to attend a tertiary centre for the procedure.

Chorionic Villus Sampling (CVS) is an abdominal or sometimes cervical invasive procedure performed under continuous ultrasound guidance. The CVS can be performed from 10 weeks but is usually only performed from 11 weeks of pregnancy to obtain a sample of placental tissue for chromosomal or genetic analysis. For every 100 women who have this test one will miscarry.

Amniocentesis is an invasive procedure undertaken from about 15 completed weeks (15⁰) onwards to obtain a sample of amniotic fluid surrounding the fetus. Using an aseptic technique whilst under continuous ultrasound guidance, a sterile needle is passed through the mother’s abdomen, uterus and amniotic sac. A sample of amniotic fluid is aspirated and sent for chromosomal or genetic analysis. For every 100 women who have this test one will miscarry.

The reason for offering the woman the test should be explained, for example:

- a history of an inherited disorder
- a previous pregnancy or a child with a chromosome disorder
- a raised chance of Down’s and/or Edwards’/Patau’s syndromes following screening
- suspected anomaly following an ultrasound scan

In twin pregnancies invasive prenatal diagnosis should be conducted at a tertiary fetal medicine unit due to the specialised nature of the procedures and the increased risk of miscarriage and in line with Royal College of Obstetrics and Gynaecology and National Institute for Health and Care Excellence (NICE) guidelines.

If karyotyping is offered, the woman should be informed that subtle chromosomal changes and single gene defects will not normally be detected. The implications of this should be explained, ie not all inherited conditions will be identified.

The woman should be informed of the usual reporting times for karyotyping and/or QF-PCR before the procedure.

Further information regarding the procedure for diagnostic testing can be found at www.rcog.org.uk/globalassets/documents/guidelines/gtg_8.pdf

6.1 Results of diagnostic testing

All providers should have a written pathway for communication of results. The process for communicating results should be discussed and agreed with the woman before the procedure. All women must be informed of the CVS or amniocentesis result by an appropriately trained person. When a CVS or amniocentesis is performed at a tertiary centre, that centre should provide written results to the referring clinician. The woman should be informed of the results of diagnostic testing as per local policy.

6.2 Audit

Each department performing amniocentesis and CVS procedures should maintain a register of CVS and amniocentesis procedures performed and outcome of pregnancy. To facilitate audit, pregnancy outcome forms should be completed and returned to the screening laboratory, or other locally agreed collating centre, at the end of the pregnancy. The provider should develop a written pathway for the completion and return of pregnancy outcome forms to the centre collecting the data.
Patient evaluation of service provision is an integral aspect of overall service audit and should be included as part of the audit and performance management framework. Information should be shared with the National Congenital Anomaly and Rare Disease Registration Service for quality and monitoring.
7 Non-invasive prenatal testing (NIPT)

NIPT is a new way of identifying pregnant women who are at higher risk of having a baby with Down’s, Edwards’ and Patau’s syndromes. The test detects DNA from a baby in a sample of blood taken from the mother.

7.1 Current availability of NIPT

NIPT is currently only available privately in the UK. Most studies conducted so far have been in high risk women and further work in larger groups of pregnant women is required to evaluate the accuracy of the new test, in particular the false positive rate (that is the number of women incorrectly identified as being at risk).

The UK NSC is supporting a study to assess the performance of the test in an NHS setting. Women in five hospitals are offered screening as normal, with those who have a medium-to-high risk then being offered NIPT as a second stage test. If that confirms the woman is at high risk then a diagnostic test would be offered. The introduction of NIPT should mean that fewer women are offered invasive diagnostic tests.

The study aims to discover whether the test can perform as accurately in the general population as previous studies and to determine information needs for both women and health care professionals. The research will report in 2015.

7.2 Additional considerations

As NIPT is a blood test and women have many blood tests in pregnancy, one of the important aspects of the new pilot is looking at ways to ensure women understand the test and the implications of the results. Only then will they be able to make an informed decision about whether the test is right for them. Furthermore, it will be important to ensure that test results can be provided in a timely fashion without causing anxiety or distress.

The current research shows that a percentage of the tests do not produce results at all because there is not enough of the baby’s DNA present in the mother’s blood sample. This outcome is more common among larger women and can range from as few as 1% to as many as 12% of results. This is one of the reasons why NIPT is likely to work best as a second stage of the screening process, for women already found to be at higher risk.

The UK NSC will review the use of NIPT as a screening test against the agreed criteria.

8 Quality assurance (QA)

Each NHS screening programme has a defined set of standards that providers have to meet to ensure that local programmes are safe and effective. Quality assurance (QA) is the process of checking that these standards are met and encouraging continuous improvement and includes:

- advising on the development of national quality standards
- monitoring of how services meet (or fail to meet) standards
- providing expert screening advice for incident management
- facilitating quality review of services, including peer advice
- supporting on a day-to-day basis, those involved in commissioning or providing screening services

QA covers the entire screening pathway; from identifying who is eligible to be invited to screening, through to referral and treatment where required/appropriate.

The aim of QA is to maintain minimum standards and drive continuous improvement in the performance of all aspects of screening to ensure that all women and their babies have access to high quality screening wherever they live. QA is essential in order to minimise harm and maximise benefits of screening.

Formal QA visits to local screening programmes provide the forum for a peer review of the whole multidisciplinary screening pathway, and an assessment of the effectiveness of team working within the local screening programme and associated referral sites.

- regional teams advise providers and commissioners about reducing risks in local screening programmes
- they assess the robustness of local arrangements through audit, as part of peer review and in the investigation of any incidents as they occur
- they act as a conduit for information and dialogue at national, regional and local levels, additionally sharing good practice
- participation in a formal process of QA is the responsibility of each local screening programme
- the performance of the local programmes is monitored in a variety of ways such as review of statistics, regional meetings or informal visits, all of which offer a valuable insight into the activity of a local programme
9 Key performance indicators (KPIs)

Key performance indicators (KPIs) for the NHS screening programmes were introduced to provide a way of measuring how well the screening programmes are doing in important areas. They contribute to the quality assurance of screening programmes but are not, in themselves, sufficient to quality assure or performance manage screening services. They help local screening services to identify potential problems so they can be put right and have led to changes in practice and implementation of measures to prevent errors occurring in the screening pathway.

There is currently one KPI for the fetal anomaly screening programme, but work is currently ongoing to develop additional KPIs.

More information on KPIs can be found at www.gov.uk/government/collections/nhs-screening-programmes-national-data-reporting
10 Screening safety incidents

A screening safety incident is any unintended or unexpected incident(s) that could have or did lead to harm to one or more persons who are eligible for NHS screening; or to staff working in the screening programme.

A screening safety incident can affect populations as well as individuals. It is an actual or possible failure in the screening pathway and at the interface between screening and the next stage of care. Although the level of risk to an individual in an incident may be low, because of the large numbers of people offered screening, this may equate to a high corporate risk. It is important to ensure that there is a proportionate response based on an accurate investigation and assessment of the risk of harm. Due to the public interest in screening, the likelihood of adverse media coverage with resulting public concern is high even if no harm occurs.

More information about managing screening safety incidents is available at


cpd.screening.nhs.uk/incident-resource
Glossary

**Amniocentesis**
An invasive procedure undertaken from about 15 completed weeks (15 + 0) onwards to obtain a sample of amniotic fluid (liquor) surrounding the fetus. Using an aseptic technique whilst under continuous ultrasound guidance, a sterile needle is passed through the mother's abdomen, uterus and amniotic sac. A sample of amniotic fluid is aspirated with a syringe and sent for analysis to test for a range of chromosomal and inherited disorders. Out of 100 women who have this test from 15 weeks it is likely that one will miscarry as a direct consequence of the procedure.

**Amniotic fluid**
Also known as ‘liquor’, this is the fluid surrounding the fetus during pregnancy. It contains substances and cells from the fetus, which can be removed by amniocentesis and examined.

**Anomaly**
An aberration or change often used related to a gene or physical structure that may or may not result in a disease or condition.

**Biochemical markers**
Analytes (commonly referred to as markers) measured by the laboratory that are used to calculate the likelihood of a pregnancy being affected by a condition or syndrome.

**Chorionic Villus Sampling (CVS)**
An abdominal or cervical procedure performed under continuous ultrasound guidance after 10 completed weeks in pregnancy to obtain a sample of placental tissue for chromosomal or genetic analysis. The range of chromosomal and genetic conditions that can be detected is similar to those for amniocentesis. For every 100 women who have this test one will miscarry.

**Combined test**
Between 11 weeks and 2 days and 14 weeks and 1 day of pregnancy, a combination of the nuchal scan measurement and a blood sample from the mother which measures the concentration of pregnancy associated plasma protein-A (PAPP-A), and free beta human chorionic gonadotrophin (Free beta hCG). Together with the mother’s age and the gestation of the pregnancy, these are used to estimate the chances that the fetus is affected with Down’s syndrome.

**Crown rump length (CRL)**
Ultrasound measurement between the top of the head (crown) to the bottom of the buttocks (rump)

**Detection rate**
The proportion of affected individuals with a positive screening result.

**Diagnostic test**
Refers to the process involved in obtaining a definite diagnosis. For example the diagnostic test on an amniocentesis sample (invasive procedure) is the full karyotype or QF-PCR.

**Down’s Syndrome (trisomy 21)**
A disorder caused by the presence of an extra copy (three instead of two) of chromosome 21. It affects all population groups and is distinguished by a number of features occurring together including low muscle tone, a face that appears flatter with eyes slanting upward, small ears and an unusually wide neck and a deep crease across the palm of the hand. Some may have heart problems or visual problems or may develop Alzheimer’s disease. Although people with Down’s syndrome have learning difficulties, these vary in severity.

**Edwards’ Syndrome (trisomy 18)**
A syndrome caused by the presence of an extra copy (three instead of two) of chromosome 18. The combination of features present in babies affected with trisomy 18 can lead to many different problems including growth deficiency, feeding and breathing difficulties, developmental delays, learning difficulties, undescended testes in males, kidney malformations, heart defects. They may also have malformations in the bones.
Survival of infants with trisomy 18 depends on how severely they are affected. Most do not survive the first year of life.

**Fetal anomaly**
Structural abnormalities with how the fetus has developed.

**Fetal anomaly ultrasound scan**
A screening test offered to pregnant women to monitor the growth and development of the fetus before birth by producing a real-time visual image. Scans before 16 weeks are useful for dating and assessing the viability of the pregnancy (and are able to detect some major malformations). Detailed scanning at 18 weeks, 0 days to 20 weeks, 6 days should show up most malformations as well as some minor ones.

**Gestational age**
The duration of an ongoing or completed pregnancy, measured from the first day of the last menstrual period (usually about two weeks longer than that measured from conception). Gestational age is usually measured in weeks and days.

**Invasive diagnostic procedure**
A method used to obtain a sample used to aid diagnosis, for example, amniocentesis or chorionic villus sampling.

**Marker**
An identifiable physical location on a chromosome whose inheritance can be monitored. Markers can be expressed regions of DNA (genes) or some segment of DNA with no known coding function but whose pattern of inheritance can be determined.

**Nuchal scan (Nuchal translucency scan NT)**
Between 11 weeks and 2 days and 14 weeks and 1 day of pregnancy the thickness of fluid in the tissue space within the nape of the fetal neck, the nuchal translucency can be measured. An increased amount of fluid may indicate that the fetus has Down’s syndrome, structural or genetic anomaly. By combining the mother’s age and the gestation of the pregnancy with information from the scan an individual statistical chance of an anomaly can be given for that particular pregnancy. If the chance is one in 150 or higher a diagnostic test, such as CVS, will be offered.

**Patau’s Syndrome (trisomy 13)**
A disorder caused by the presence of an extra copy (three instead of two) of chromosome 13. The disorder is characterised by low birth weight, cleft lip or palate, defects of the heart, eye structure, spine, scalp and abdomen, abnormal genitalia, low set ears, abnormal palm pattern, extra digits and overlapping of fingers over thumb. Between 80 per cent and 90 per cent of babies do not survive infancy and those that do survive have learning disabilities.

**Prenatal**
Relating to the period before birth.

**Quadruple test**
Second trimester test to calculate the risk of Down’s syndrome, usually based on the measurement of AFP, uE3, free b-hCG (or total hCG), and inhibin-A together with the woman’s age.

**Quality assurance (QA)**
A system for monitoring and maintaining high standards in every aspect of a screening programme.

**Risk**
Risk is usually taken to mean the chance of an event happening. It can be be expressed in a number of ways, see diagrams in the UK NSC Resource Cards for Midwives Nos 3 and 5.

**Risk cut-off**
Determines those women who are in the ‘higher risk’ group and considered ‘screen positive’.

**Screen positive rate (SPR)**
The number of women who receive a higher risk result.

**Screening**
Testing people who do not have or have not recognised the signs or symptoms of the condition being tested for, either with the aim of reducing risk of an adverse outcome, or with the aim of giving information about risk.
Screening pathway
The whole system of activities needed to deliver high quality screening. It ranges from identifying and informing those to be offered screening through to the treatment and follow up of those found to have abnormality, and support for those who develop disease despite screening.

Screening programme
The whole system of activities needed to deliver high quality screening. It ranges from identifying and informing those to be offered screening through to the treatment and follow up of those found to have abnormality, and support for those who develop disease despite screening.

Screening safety incident
An unintended or unexpected incident(s) that could have or did lead to harm to one or more persons who are eligible for NHS screening; or to staff working in the screening programme.

Screening test
A test or inquiry used on people who do not have or have not recognised the signs or symptoms of the condition being tested for. It divides people into low and higher risk groups.

Syndrome
Combination of symptoms and signs grouped together to form a disorder.

Throughput
Number of samples undertaken per cycle.

Trisomy
Three copies of a particular chromosome rather than the usual pair.

Ultrasound scan
A ultrasound scan is a safe and painless test that uses sound waves to make images. It is like radar.
Resources

Pathway for screening for Down’s, Edwards’ and Patau’s syndromes

Pathway for the 18\textsuperscript{th} to 20\textsuperscript{th} week scan

Having a mid-pregnancy scan – Tear off pad
www.gov.uk/government/collections/fetal-anomaly-screening-providing-services
Appendix 1 – 18+0 to 20+6 FASP ultrasound scan base menu

<table>
<thead>
<tr>
<th>Structure/Area</th>
<th>Detail</th>
<th>Fetal Measurements*</th>
<th>Images/measurements to capture/archive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head and neck</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Skull</td>
<td>Head shape</td>
<td>*Head circumference (HC)</td>
<td></td>
</tr>
<tr>
<td>• Brain</td>
<td>Cavum septum pellucidum (CSP)</td>
<td>Measurement not required</td>
<td></td>
</tr>
<tr>
<td>• Neck</td>
<td>Ventricular Atrium (VA)</td>
<td>*Atrium of the lateral Ventricle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cerebellum</td>
<td>*Transcerebellar diameter (TCD)</td>
<td>Yes, to include measurement of the TCD in the suboccipitobregmatic view</td>
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<tr>
<td></td>
<td>Nuchal Fold (NF)</td>
<td>Distance between the outer border of the occipital bone and the outer skin edge</td>
<td>Yes, if measurement ≥ 6mm</td>
</tr>
<tr>
<td>• Facial Features</td>
<td>Coronal view of lips &amp; nasal tip</td>
<td>Measurement not required</td>
<td>Yes</td>
</tr>
<tr>
<td>• Lungs</td>
<td>Visceral situs/laterality of heart</td>
<td>Measurement not required</td>
<td>Annotate “LT” and “RT” on archived images to denote visceral situs/ laterality</td>
</tr>
<tr>
<td>• Heart</td>
<td>a) Four chamber view (FCV)</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>b) Aorta (Ao) arising from left ventricle</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>c) Pulmonary artery (PA) arising from right ventricle, or the 3 vessel view (3VV)</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>d) 3 vessel and trachea view (3VT)</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Structure/Area</td>
<td>Detail</td>
<td>Fetal Measurements*</td>
<td>Images/measurements to capture/archive</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Abdominal content</td>
<td>Stomach &amp; position</td>
<td>Measurement not required</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>*Abdominal circumference (AC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Short intra-hepatic section of the umbilical vein (UV)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abdominal wall and cord insertion</td>
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<tr>
<td></td>
<td>Diaphragm</td>
<td>Measurement not required</td>
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<tr>
<td></td>
<td>Kidneys</td>
<td>Measurement not required unless renal pelvis AP diameter &gt;7mm</td>
<td>Yes, if AP renal pelvis diameter measures &gt;7mm</td>
</tr>
<tr>
<td></td>
<td>Measure AP renal pelvis diameter if it appears large</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bladder</td>
<td>Measurement not required</td>
<td></td>
</tr>
<tr>
<td>Spine</td>
<td>Vertebrae</td>
<td>Measurement not required</td>
<td>Yes, image either sagittal or coronal plane</td>
</tr>
<tr>
<td></td>
<td>Skin covering</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limbs</td>
<td>Femur, tibia &amp; fibula (both legs)</td>
<td>*Femur length</td>
<td>Yes, image and measure a single femur only</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Metatarsals (both feet)</td>
<td>Digit count not required</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Radius, ulna, humerus (both arms)</td>
<td>Measurement not required</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Metacarpals (both hands)</td>
<td>Digit count not required</td>
<td></td>
</tr>
<tr>
<td>Uterine cavity</td>
<td>Placenta</td>
<td>According to local policy/protocol</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amniotic fluid</td>
<td>According to local policy/protocol</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 2 – Ultrasound images and schematics

**Head circumference (HC) and ventricular atrium (VA)**

- **Mid-line echo HC measurement**
  - Measurement of the VA, inner edge to inner edge of the ventricular walls at its widest part, and aligned perpendicular to the long axis of the ventricle.

**Transcerebellar diameter (TCD) and nuchal fold (NF)**

- **TCD measurement**
  - Measurement of the VA, inner edge to inner edge of the ventricular walls at its widest part, and aligned perpendicular to the long axis of the ventricle.

- **NF**: Outer edge of occipital bone to outer surface of skin.
Appendix 2 – Ultrasound images and schematics

Lips and nasal tip

Abdominal circumference (AC)
Femur length (FL)

Sagittal spine
Coronal upper spine

Coronal lower spine
Visceral situs/laterality

4 chamber view (4CH)
Aorta (AO)/left ventricular outflow tract

Pulmonary artery (PA)/right ventricular outflow tract or 3 vessel view (3VV)

3 vessel and trachea view (3VT)
Appendix 3 – Stakeholder and support groups

Antenatal Results and Choices (ARC)
www.arc-uk.org

Antenatal Screening Wales
www.antenatalscreening.org

Association of Congenital Diaphragmatic Hernia Research, Advocacy and Support (CHERUBS)
www.cherubs-cdh.org

AXrEM Associations of Healthcare Technology Providers for Imaging, Radiotherapy and Care
www.axrem.org.uk

British Heart Foundation
www.bhf.org.uk

British Maternal and Fetal Medicine Society (BMUS)
www.bmus.org

Care Quality Commission (CQC)
www.cqc.org.uk

Cleft Lip and Palate Association (CLAPA)
www.clapa.com

Clinical Negligence Scheme for Trusts (CNST)
www.nhsla.com/Claims/Pages/Clinical.aspx

Contact a Family
www.cafamily.org.uk

Department of Health
www.gov.uk/government/organisations/department-of-health

Down’s Syndrome Association
www.downs-syndrome.org.uk

Down’s Syndrome Screening Quality Assurance Service (DQASS)
www.gov.uk/downs-syndrome-screening-quality-assurance-support-service

Genetic Interest Group
www.gig.org.uk

Healthtalk.org
www.healthtalkonline.org

Health Professions Council
www.hpc-uk.org

MBRRACE-UK: Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK
www.npeu.ox.ac.uk/mbrrace-uk
Medicines & Healthcare products Regulatory Agency (MHRA)

Miscarriage Association
www.miscarriageassociation.org.uk

National Institute for Health and Clinical Excellence (NICE)
www.nice.org.uk

National Patient Safety Agency (NPSA)
www.npsa.nhs.uk

UK National Screening Committee
www.gov.uk/guidance/nhs-population-screening-explained

NHS Fetal Anomaly Screening Programme
www.gov.uk/topic/population-screening-programmes/fetal-anomaly

Nursing and Midwifery Council
www.nmc-uk.org

Royal College of Midwives (RCM)
www.rcm.org.uk

Royal College of Nursing (RCN)
www.rcn.org.uk

Royal College of Obstetrics and Gynaecology (RCOG)
www.rcog.org.uk

Royal College of Paediatrics
www.rcpch.ac.uk

Royal College of Radiologists
www.rcr.ac.uk

Shine (previously the Association of Spina Bifida and Hydrocephalus)
www.shinecharity.org.uk

Skills for Health
www.skillsforhealth.org.uk

Society and College of Radiographers (SCoR)
www.sor.org

SOFT UK (Support Organisation for Trisomy 13/18 and related disorders)
www.soft.org.uk

Tiny Tickers
www.tinytickers.org

United Kingdom Accreditation Service
www.ukas.com