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- Ultra-sonographers

Contact responsible for implementation and monitoring compliance:
- Clinical Lead for O&G

**Education/ training will be provided by:**
- Screening co-ordinator
- Screening support ultra-sonographer

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2. **Introduction**

This document sets out Northern Devon Healthcare NHS Trust’s best practice guidelines to ensure that all antenatal ultrasound procedures are correctly carried out.

3. **Purpose**

This guideline provides the guidance in

- screening to all pregnant women to assess the risk of the baby being born with Down’s syndrome or a number of fetal anomalies according to NHS fetal anomaly screening programme
- scanning common obstetric problems in accordance with British Medical Ultrasound Society, Fetal Medicine Foundation and Royal College of Obstetricians and Gynaecologists

This guideline applies to all maternity staff and ultra-sonographers who are involved in care of pregnant women and must be adhered to. Non-compliance with this guideline may be for valid clinical reasons only. The reason for non-compliance must be documented clearly in the patient’s notes.

4. **Abbreviations**

- **AC** Abdominal circumference
- **CRL** Crown-Rump Length
- **EDF** End diastolic flow
- **FGR** Fetal growth restriction
- **FL** Femur length
- **FSC** Fetal scanning clinic
- **GA** Gestational age
- **HC** Head circumference
- **NT** Nuchal translucency
- **PI** Pulsitility index
- **RPD** Renal pelvic dilatation
- **UA** Umbilical artery
5. **General Principles**

5.1 **Consent**

Before conducting any ultrasound, the operator must assess the patient’s understanding and briefly explain the purpose and procedure of the scan.

5.2 **Dating Scan**

- Should be performed on all patients and ideally between 10 and 13 weeks by measuring CRL
- However, to perform NT scan simultaneously, appointment will be given within 11+2 to 14+1 week
- If the EDD has not been previously assigned in the first trimester, the pregnancy should be dated by HC and FL
- If the first scan was carried out at or after 21 weeks, midwife in the ANC should be informed to arrange another scan to check fetal growth after a 2 week interval

5.3 **Nuchal Translucency**

- Please follow the National Screening Committee guidelines
- If nuchal translucency cannot be measured because of fetal position, the woman should be asked to walk around and re-scanned again after 15 minutes later
- Link to: G:/radiology/ultrasound/protocols and guidelines/ANC protocols.

5.4 **Anomaly Scanning**

- An anomaly scan should be offered to all pregnant patients and is ideally performed between 18-20+6 weeks GA
- Fetal anatomy should be checked against the “NHS fetal anomaly screening programme (England) 2010” standards
- If normal anatomy cannot be seen due to fetal position, try again after a little time if you can. Otherwise, a repeat scan should be booked at the next available appointment before 23 weeks
- If detailed scan cannot be complete because of maternal BMI, a repeat scan should be booked at 23 weeks gestation
- However, if the detailed scan was not completed and anomaly was suspected, the repeat scan should be arranged as soon as possible.
- Detailed scans are booked at 30 minutes duration for singletons, 45 minutes for multiple pregnancies
- As soon as you are sure that the fetus appears normal, make sure that you share this with the parents
- 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 5 centile on national charts).

All suspected fetal abnormalities detected should be referred to ante-natal clinic midwife who will then book an urgent appointment in FSC, NDDH within 3 working days or Tertiary fetal medicine unit within 5 working days. These will be recorded in departmental audit system. All confirmed fetal abnormalities must be reported to the South West Regional Anomaly Register.

5.5. Placental Localisation

The placenta should be localised at the detailed scan and its position can be described as below.
- Anterior high / low
- Posterior high/ low
- Lateral high/ low
- Fundal

Minor placenta praevia is defined as the situation, where lower edge of the placenta encroaches into lower uterine segment (3 cm from the internal os by TAS or 2 cm by TVS). It is called major placenta praevia where the leading edge of the placenta encroaching to or covering the internal cervical os.

Ultrasound criteria for diagnosis of morbidly adherent placenta are as follows:

Greyscale:
- loss of the retroplacental sonolucent zone
- irregular retroplacental sonolucent zone
- thinning or disruption of the hyperechoic serosa–bladder interface
- presence of focal exophytic masses invading the urinary bladder
- abnormal placental lacunae.

Colour Doppler:
- diffuse or focal lacunar flow
- vascular lakes with turbulent flow (peak systolic velocity over 15 cm/s)
- hypervascularity of serosa–bladder interface
- markedly dilated vessels over peripheral subplacental zone.
Antenatal sonographic imaging can be complemented by magnetic resonance imaging in equivocal cases to distinguish those women at special risk of placenta accreta. Please see Appendix 1 for Algorithm for scanning pathway of placenta praevia. Link to G: /radiology/ultrasound/protocols and guidelines/ANC protocols.

5.6. Fetal Growth Scan

Assessments include AC, HC, FL, EFW, presentation and placenta localisation. All measurements should be routinely plotted on the graphs and also estimated fetal weight in personalised growth chart. Fetal abdominal circumference (AC) or estimated fetal weight (EFW) < 10th centile on personalised growth chart can be used to diagnose a small for gestational age fetus. When using two measurements of AC or EFW to estimate growth velocity, they should be at least 3 weeks apart to minimize false–positive rates for diagnosing FGR. More frequent measurements of fetal size may be appropriate in severe SFD/FGR and where birth weight prediction is relevant outside of the context of diagnosing SGA/FGR. Link to G: /radiology/ultrasound/protocols and guidelines/ANC protocols.

5.7. Fetal wellbeing scan

Fetal wellbeing scan include assessment of amniotic fluid volume, umbilical artery Doppler and detection of fetal movements. Amniotic fluid volume can be assessed by measuring AFI or maximal vertical pool depth. Where the fetal AC or EFW is < 10th centile or there is evidence of reduced growth velocity, fetal wellbeing scan together with serial measurements of fetal growth should be advised. Fetal wellbeing scan should be performed if
a. AC is 10th centile or has crossed centiles
b. The pregnancy is classified as “high risk”
Management
A. If UA Doppler flow indices are normal but there is marked reduction in growth (AC crossing centiles), a repeat scan in 2 weeks should be arranged. More frequent Doppler surveillance may be appropriate in severe SGA.
B. If UA Doppler flow indices are abnormal inform consultant of the team or consultant on call via a midwife in the ANC.

5.8. Multiple Pregnancies

4.8.1. Determining gestational age
First trimester ultrasound scan should be offered to women with multiple pregnancy when crown–rump length measures from 45 mm to 84 mm (at approximately 11 weeks 0 days to 13 weeks 6 days) to estimate gestational age. To determine gestational age, measurement
of the largest baby should be used in case of discordant CRL to avoid the risk of estimating it from a baby with early growth pathology. When gestational age is determined, the babies should also be labelled as upper and lower, or left and right in twin and triplet pregnancies and document this clearly in the woman’s notes to ensure consistency throughout pregnancy.

4.8.2. Determining chorionicity
Chorionicity and amnionicity must be determined at the time of detecting twin and triplet pregnancies (or between 11 weeks 0 days and 13 weeks 6 days, whichever is earlier) by ultrasound using the number of placental masses, the lambda or T-sign and membrane thickness and it must be documented. If a woman with a twin or triplet pregnancy presents after 14 weeks 0 days, determine chorionicity at the earliest opportunity by ultrasound using all of the following:
- the number of placental masses
- the lambda or T-sign
- membrane thickness
- discordant fetal sex.
If it is not possible to determine chorionicity by ultrasound at the time of detecting the twin or triplet pregnancy, a second opinion should be sought as soon as possible. If it is difficult to determine chorionicity, even after referral (for example, because the woman has booked late in pregnancy), manage the pregnancy as monochorionic until proved otherwise.

4.8.3. Screening for Down’s syndrome
Trained healthcare professional screening co-ordinator or her deputy should offer information and counselling to women before and after every screening test.
The combined screening test for Down’s syndrome should be used when crown–rump length measures from 45 mm to 84 mm (at approximately 11 weeks 0 days to 13 weeks 6 days).

4.8.4. Screening for structural abnormalities
Screening for structural abnormalities should be offered as in routine antenatal care. A short cervical length (< 25 mm) at 18-24 weeks of gestation in twin pregnancies is a good predictor of preterm birth at up to 35 weeks of gestation (high or moderate quality). All monochorionic twins should have a detailed ultrasound scan which includes extended views of the fetal heart.

4.8.5 Subsequent monitoring of fetal complications
Women with a multiple pregnancy are monitored for fetal complications such as FFT and IUGR TAPS, etc. according to the chorionicity and amnionicity of their pregnancy.
- FFT syndrome (for monochorionic pregnancies only)
  - Do not monitor for FFTS in the first trimester
- Monitor from 16 weeks for FFTS. Repeat fortnightly until 24 weeks.

- If intertwine membrane folding or amniotic fluid discordance are found, monitor weekly to allow time to intervene if needed.

Monitoring for FGR
Fetal weight discordance can be estimated by using two or more biometric parameters at each ultrasound scan from 20 weeks. Consider a 25% or greater difference in size between twins or triplets as a clinically important indicator of intrauterine growth restriction.
- Monochorionic diamniotic twins: 24, 26, 28, 30, 32, 34 weeks
- Dichorionic twins: 24, 28, 32, 36 weeks

Fetal death of one twin

- After the single fetal death in a monochorionic pregnancy, the risk to the surviving twin of death or neurological abnormality is of the order of 12% and 18%, respectively.

- Fetal anaemia may be assessed in the surviving twin by measurement of the fetal MCA-PSV. Fetal MRI may give more detailed information of brain lesions of the surviving twin.

5.9. Renal Pelvic Dilatation

The renal pelvis should be measured in its A-P diameter just below the level for measuring the AC. A-P diameter of 5 mm is commonly taken as upper limit of normal renal pelvic size in second trimester and 10 mm in the third trimester.

RPD of more than 7 mm is present, confirm and record that the bladder and liquor volume is normal. Then, rescan the patient at 32 weeks. If there is evidence of progression at 32 weeks, refer the patient to be seen in FSC, NDDH. If no progression at 32 weeks, further scan is not necessary. Paediatric notification is required when RPD is more than 10 mm in third trimester.

5.10. Fetal Scanning Clinic, NDDH

The Consultant Obstetrician and Gynaecologist with special interest in feto-maternal medicines runs the clinic twice a week and the following patients will be assessed and or reviewed.

- History of significant fetal abnormalities in previous pregnancies or in the family
- Previous poor obstetric history such as intra-uterine fetal death
- Any suspicious fetal abnormalities in current pregnancy
- Fetal abnormalities confirmed and required further monitoring in current pregnancy
- Severe fetal growth restriction (< 3rd centile) with or without abnormal Umbilical Artery Doppler
- Significant Poly-hydramnios or oligo-hydramnios
- Monochorionic twins
- Dichorionic twins with complications in one or both twins
- Abnormal maternal antibodies at risk of fetal haemolytic anaemia
- Suspected anterior placenta praevia with previous caesarean section
- Circumstances where fetal echocardiogram is indicated
- Patients with risk factors for fetal congenital cardiac diseases

Fetal echocardiogram is required for following conditions

- Previous child with CHD
- CHD in first degree relative (patient and her partner)
- Abnormal structure suspected on routine detailed scan
- Abnormal rhythm
- Type 1/2 diabetes mellitus
- Monochorionic twin pregnancy
- Maternal anti-Ro antibodies
- Teratogens especially anticonvulsants, lithium
- Abnormal fetal karyotype
- NT>3.5 mm, with normal karyotype
- Other abnormalities with cardiac associations such as Duodenal atresia, Exomphalos
- Risk of syndrome with cardiac associations (e.g. Noonan syndrome)

6. Monitoring Compliance and Effectiveness

Monitoring is undertaken by an annual audit, as a minimum, supported by specific audits during the year that are triggered by the clinical incident reporting system, or in response to a change in practice. The Audit will be undertaken by screening midwife co-ordinator and sonographers to measure the compliance of the Antenatal Ultrasound Protocols.

There will be continuous auditing of detection rates of following anomalies within the unit.

- Anencephaly
- Open spina bifida
- Cleft lip
- Major cardiac abnormalities
- Diaphragmatic hernia
- Gastrochisis
- Exomphalos
7. **References**

NHS Fetal Anomaly Screening Program 2010

Recommended criteria for measurement of fetal nuchal translucency (NT) as part of combined screening for Trisomy 21 within the NHS in England

NICE, Ante-natal care, routine care for the healthy pregnant woman March 2008,


Placenta Praevia, Placenta Praevia Accreta and Vasa Praevia: Diagnosis and Management. RCOG Green–top Guideline No. 27, January 2011.

8. **Associated Documentation**

- Antenatal and newborn screening guidelines
- Routine Antenatal and Booking Guidelines
- Multiple pregnancy
- 18+ to 20+6 week fetal anomaly scan guidelines
- Antenatal Ultrasound Protocols (Radiology)
Appendix 1 - Algorithm for scanning pathway of placenta praevia

ALGORITHM FOR PLACENTA PRAEVIA (SCANNING PATHWAY)

Detailed scan at 20 wks’ gestation

Leading edge of the placenta encroaching lower uterine segment, 3cm(TAS)/2cm(TVS) away from internal cervical os (Pl Previa)

Yes

Previous CS

No

Minor (Placenta encroaches into LUS)

Post:

Rescan at 36 wks+/- TVS

Ant:

Major (leading edge of the placenta encroaching to or covering the internal cervical os)

Major Pl: Praevia

Major Pl: Praevia

Minor Pl: Praevia

Rescan at 36 wks+/- TVS

Refer to 36 wks+TVS & refer to consultant if still major placenta previa

Please report
- Distance of leading placenta edge from internal cervical os
- Position of presenting part in relation to leading edge of placenta if it is still minor placenta praevia

Repeat scan at 32 wks+ TVS & refer to consultant if still major placenta previa

Repeat scan at 36 wks +TVS

Ant:

Post:

Refer to FMC, NDDH at 28-30 wks for Further management