OBSTETRIC ULTRASOUND SCHEME OF WORK AND PROTOCOLS

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Approved by: Antenatal Forum

Approval Date: January 2019

Review Date: January 2022

Contents

1. Aim

To provide a framework to enable those Sonographers employed in ABM University Health board to perform and report obstetric ultrasound examinations independently.

2. Objectives

- To provide a scheme of work outlining the operational management arrangements of the Obstetric Ultrasound Department.
- To provide an agreed set of scanning protocols that comply with Antenatal Screening Wales guidelines.
- To standardise the service offered to women across all sites in ABM University Health Board

3. Scheme of Work

The following scheme of work represents a three-way agreement between the Trust management, Clinical Director of Radiology and the Sonographers who work independently for ABM University Health Board.
Scanning protocols have been devised and agreed jointly by the Radiology and Obstetric departments.

3.1 Delegation

Performing and reporting obstetric ultrasound examinations is delegated to sonographers.

The decision to allow Sonographers to scan and report independently, i.e. deem that they are competent to do so, is a joint decision between the Clinical Director of Radiology and the departmental Superintendent Sonographer.

Overall responsibility for the Sonographer-led Obstetric Ultrasound service is held by the Clinical Director of Radiology.

Responsibility for individual ultrasound examinations and reports is borne by the Sonographer performing the examination.

If a Radiologist or Obstetrician has been consulted for advice, has reviewed the images or scanned the patient, then co-responsibility is borne by the Sonographer and that Radiologist or Obstetrician. This fact should be recorded appropriately in the report. (See section on reporting)

A Consultant Radiologist should be contacted when a Sonographer requires a Radiological opinion.

A Consultant Obstetrician with a special interest in fetal medicine should be contacted when a fetal anomaly is suspected or referral to a Tertiary Centre arranged if appropriate.

3.2 Qualification/Training

Sonographers who work independently must possess a post-graduate qualification in obstetric ultrasound.

Trainees must be supervised by an experienced Sonographer who is responsible for the examination and issuing the report. The patient should be informed that the person performing the examination is in training and, as technical aspects of the examination may be discussed, be given the opportunity to discuss any concerns.

3.3 Continuing Professional Development

Sonographers should be able to demonstrate that they are upholding expected standards of practice by producing evidence of continuing professional development and participation in departmental audit.

3.4 Referrals

In accordance with Antenatal Screening Wales (ASW) guidelines, all women will be offered a routine early pregnancy dating scan between 11+2 and 14+1 week's gestation and a routine fetal anomaly scan between 18 and 20 weeks +6 days. Outpatient requests for routine scans will be accepted from Community and Antenatal Clinic Midwives.

All other outpatient requests e.g. scans for fetal viability, growth, liquor volume, placental site and Doppler will be accepted from Obstetricians and Clinic /Antenatal Day Assessment Unit midwives. Referrals from community midwives will be accepted if a local agreement exists.

In-patient requests will only be accepted from Obstetricians.

3.5 Reporting

As a result of the examination, a printed report will be issued by the Sonographer. This report will identify the Sonographer and their status. If the examination has been performed by a trainee, the names and status of both trainee and supervising Sonographer should be made clear on the report.

The Sonographer is responsible for the accuracy of the report and for ensuring that it is appropriately issued.

If a Radiologist or Obstetrician has been asked for advice on the scan, this must be recorded in the report. The Radiologist/Obstetrician should be named in the report and their level of supervision/involvement made clear as indicated below.

- Advice sought from Consultant Radiologist/Obstetrician
- Images reviewed with Consultant Radiologist/Obstetrician
- Scan supervised by Consultant Radiologist/Obstetrician
- Patient also scanned by Consultant Radiologist/Obstetrician
- Patient re-called for scan by Consultant Radiologist/Obstetrician

The report should be written as soon as possible after the examination has been completed. The Sonographer should also complete an obstetric record chart or issue a RADIS report which is included in the patient's case notes and for routine scans complete the screening section in the patient's case notes.
If appropriate, a CARIS notification card for suspected congenital anomaly should be completed and sent to the CARIS co-ordinator.

3.6 Disclosure of Ultrasound Findings to Patients

The Sonographer should explain the ultrasound image to the patient and reassure her when all appears well. ASW leaflets are available to give to patients following the early pregnancy and anomaly scans, these explain the limitations of the scan and give advice on how to obtain more information.

The sex of the fetus may be disclosed to the patient during the anomaly scan if requested but the Sonographer should explain that 100% accuracy cannot be guaranteed and this fact should be recorded on the formal report.

When a problem is detected, the Sonographer should inform the patient of any concerns and arrange for her to be seen immediately by a clinic midwife who will arrange further management. In such cases, the patient and her partner or other relatives should be given some time in private.

3.7 People Accompanying Patients During the Scan

This is currently limited to two adults plus their children but is at the discretion of the Sonographer performing the scan.

3.8 Imaging

Further advice on imaging is included with the protocols for each referral category but as a general rule, the resultant images should, when interpreted with the Sonographer's report, be able to stand up to peer review and audit.

3.9 Sale of Images

Obstetric images are available for patients to purchase following the scan depending on local agreements

<u>Local Rules – Sale of images.</u>
Images can be purchased at the EP dating scan and anomaly scans only. The cost of the images is £3 per print. The number of images per examination is at the discretion of the sonographer.

3.10 Safety of Ultrasound

Although diagnostic ultrasound is considered to be a safe technique, Sonographers should make every effort to minimise the length of time that the fetus is exposed to ultrasound. The following publications are available in the department for reference. Statement on the Safe Use, and Potential Hazards of Diagnostic Ultrasound (BMUS 2012) *Clinical Safety Statement for Diagnostic Ultrasound (European Committee of Medical Ultrasound Safety 2008)*

4. Scanning Protocols

4.1 1st Trimester Ultrasound Scans

In accordance with Antenatal Screening Wales guidelines, all patients will be offered an early pregnancy-dating scan between 11+2 and 14 weeks +1 day.
*** NB. Please see separate protocol/guidelines for referrals before 10 weeks gestation.**

4.1.1 Early Pregnancy Dating Scan

Purpose

- To assess viability
- To establish gestational age
- To establish the estimated date of delivery (EDD) – however if patient is having
- nuchal translucency do not give scan EDD until NT scan.
- To exclude multiple pregnancy/ establish chorionicity
- Some major fetal anomalies may be excluded

Procedure

The examination should be performed trans-abdominally; however, if an appropriate image is unobtainable the woman should be offered a transvaginal scan. If this is declined, a further abdominal scan should be arranged. This should be recorded in the typed report.

The Sonographer should establish the following:

- That the pregnancy is intra-uterine
- Viability
- Placental site if possible
- Liquor volume
- Number of fetuses/chorionicity (see separate Twins Protocol)
- Gestational age using CRL – 45.0 mm -> 84.0 mm (11+2 weeks -> 14 weeks +1).
- If CRL measurement is above 84.0 mm HC measurements must be used. HC measurements cannot be used if they are below 88.0mm (13 weeks 0 days)
- The EDD – this should be calculated from the ultrasound measurements i.e. CRL or HC as appropriate in accordance with NICE Guidelines (2008)
- Exclude a major fetal abnormality if possible.
  NB. The nuchal translucency should not be routinely measured unless patient has consented to combined Down's screening test. However, if a cystic hygroma is present or if the nuchal translucency appears enlarged (3.5mm or above) this is a clinical finding and the woman should be referred to the clinic midwife for further management.

4.1.2 Down's, Edwards' and Patau's Syndromes Screening

Ultrasound assessment of gestational age is required for Down's, Edwards' and Patau's Screening tests:

The First Trimester Combined Test can be offered in Singleton and Twin Pregnancies
The CRL must be between 45.0 mm -> 84.0 mm. If the CRL is less than 45.0 mm the woman must be recalled for a further scan at the correct gestation.

If the CRL is greater than 84.0 mm the second trimester quadruple (quad) test should be offered and an HC measurement must be obtained (quad test not offered in twins). Where it is not possible to obtain the nuchal translucency measurements (NT) on the same day as the CRL the woman should be referred for the quad test. The CRL measurement obtained can be used for the subsequent quad test provided it is not greater than 84.0mm

For guidance on obtaining correct images refer to the Careful Campaign (2010)

Management of Down's, Edward's and Patau's Syndromes Screening in Twin/Failing Twin Pregnancies
Ultrasound assessment of gestational age is required for Down's, Edwards' and Patau's syndromes screening tests.

ASW Guidelines
Where the ultrasound-dating scan shows that there is an empty second pregnancy sac, Down's, Edwards' and Patau's syndromes screening can be offered. The combined screening test can be offered between 11 weeks and 2 days and 14 weeks and 1 day of pregnancy and the quadruple test between 15 weeks and 3 days and 18 weeks and 0 days of pregnancy.

Non-invasive prenatal testing (NIPT) cannot be offered in this instance for higher chance results and the woman can only be offered an invasive test.

Down's, Edwards' and Patau's Syndromes Screening when the Second Sac contains a Non-Viable Fetus
Where the ultrasound-dating scan shows that there is a second pregnancy sac containing a non-viable fetus, Down's, Edwards' and Patau's (combined) screening should **NOT** be offered (ASW 2018). Women should **NOT** be offered a further scan for the purposes of Down's, Edwards' and Patau's syndrome (quadruple) screening because there would be a combination to the maternal biochemical markers for many weeks (FASP 2010, Huang 2015) and therefore the screening result would not be accurate.

Twin Pregnancy First Trimester Screening
The combined test is offered for Down's, Edwards' and Patau's syndromes in a twin pregnancy.

ASW Guidance:

- Women known to have a twin pregnancy prior to their early scan should have had a specific counselling for screening in twin pregnancy and consented to that screening test prior to their scan – sonographer should check for consent.
- If a woman consents to screening for Down's, Edwards' and Patau's syndromes and is then diagnosed as having a twin pregnancy during her early scan, the health board will have a pathway for arranging an appointment with the nominated health board professional for screening in twin pregnancies.
- If a woman has requested screening for Down's, Edwards' and Patau's syndromes and the process for obtaining both NT measurements is unsuccessful or CRL is greater than 84.0mm the woman must be informed that screening cannot be offered.
- If only one NT measurement can be obtained, combined screening can be offered but the result will be less accurate. Monochorionic twins will receive the result for the pregnancy. Dichorionic twins will receive the result for the one fetus for which both measurements were obtained.
- If either CRL is below 45.0mm a further scan appointment should be offered.

The Quadruple Test
The quadruple test is NOT offered in a twin pregnancy.

This can be offered when a woman presents for ultrasound and is more than 14 weeks 1 day but less than 18 week 0 days or the NT measurement has been unobtainable

CRL measurement must not be below 45.0mm or above 84.0mm. HC measurement must be between 88.0 mm – 147.0mm.

The quad test can only be carried out in Wales when the gestation is between 15 weeks 3 days and 18 weeks 0 days. The quadruple test will give a result for Down's screening only and not a result for Edwards' and Patau's syndromes.

Down's screening can only be performed when midwifery staff are available. Following ultrasound examination the CRL and NT measurements are documented on the patients ultrasound chart along with the sonographer DQASS number and the patient is referred to ANC midwives to complete the Down's screening procedure.

4.1.3 Non Screening 1st Trimester Ultrasound Scans

- Reassurance ultrasound scans are not offered in asymptomatic patients.
- Ultrasound examination for recurrent miscarriage can be requested by ANC midwives if the patient is under a named consultant obstetrician. Only one scan will be offered.
- A history of previous ectopic pregnancy an early scan can be offered at approximately 7-8 weeks gestation in asymptomatic women and will be performed in WWB Ultrasound Department. Symptomatic patient will be referred to EPU.

- A woman who is suffering from hyperemesis and is an inpatient may be scanned in the WWB Ultrasound Department if an early pregnancy scan has not already been performed. This can only be requested by ward doctors.
- Patients needing early dating for CVS – may be requested by ANC midwives from 8 weeks gestation (the LMP must be documented where possible).

Imaging
All images along with the report should be archived on the Radiology SYNAPSE. As a general guide, images should include:

- Mid line longitudinal section to demonstrate intra-uterine pregnancy
- Fetal biometry
- Placental site where appropriate
- Any fetal abnormality
- Any associated pelvic pathology
- Image of both adnexae

Results
The woman should be given verbal information about the scan by the Sonographer.

If no problem is detected, the woman should be reassured that all is well and also given a post scan information leaflet.

If a problem is detected i.e. fetal abnormality or fetal demise, the sonographer should inform the woman of her concerns and make arrangements for her to be seen immediately by a clinic midwife for further management.

If a woman presents in ANC for dating and the pregnancy is found to be of uncertain viability/PUL, she should be informed of these findings and referred to ANC midwives who will arrange for follow-up in the EPU.

4.2 2nd Trimester Scans

4.2.1 Patients Presenting with Pain/Bleeding

Patients that present with pain and/or bleeding that are more than 14 weeks gestation, are not eligible for referral to the Early Pregnancy Unit.

Those patients who do not require hospital admission should be referred to the Antenatal Clinic Midwife for assessment. If the fetal heart cannot be auscultated, an ultrasound scan to assess fetal viability should be arranged. Wherever possible, this should be done on the day of referral.

Following the scan, the patient should be referred back to the referring clinician, ward or clinic Midwife for further management.
If FH is auscultated a scan is not indicated.

4.2.2 Patients Presenting with Fluid Loss Before Anomaly Scan

If liquor loss is suspected a scan in the WWB Ultrasound Department or Acute Gynae Clinic may be performed.

4.2.3. Cervical Length Imaging

Registrar or Consultant request only. To be performed on high-risk patients' i.e. previous late miscarriage, previous cervical surgery, clinical suspicion.

This should not be performed before 16 weeks. Then fortnightly scans until 24/26 weeks gestation with review by Obstetrician in Clinic. A Transabdominal scan can be performed as long as the sonographer is confident with the imaging and findings. If not, proceed to transvaginal scan and comment on any funnelling/fluid in cervix etc. Any queries/problems – refer patient to Mr M Moselhi's clinic.

4.2.4 Routine Anomaly Scan

In accordance with Antenatal Screening Wales Guidelines, all women are offered this scan between 18 and 20 weeks +6 days.

Purpose

- To detect significant structural fetal abnormalities
- To determine the placental site
- To assess liquor volume

Procedure

The examination is performed trans-abdominally. The patient should be reminded of the purpose of the scan at the start of the examination.

The Sonographer should establish the following:

- Fetal viability
- Number of fetuses
- Placental site
- Liquor volume
- Fetal biometry (HC and FL) – if these are < 5th centile on ultrasound machine charts then refer to consultant obstetrician with an interest in fetal medicine or fetal medicine unit.
- Standard fetal anatomy checklist to include:
  - Cranium
  - Cerebral ventricles (including measurement of atria of lateral ventricles)
  - Cavum Septum Pellucidum
  - Cerebellum (including measurement)
  - Lips
  - Spine
  - Presence of 2 hands and 2 feet
  - Stomach
  - Kidneys

- Bladder
- Cord insertion
- Fetal heart – 5 views (situs,4cv, LVOT, RVOT & (3 vessel view), 3 VT view)
- Thorax – chest shape and lungs

Imaging
Images should include the following:

- All fetal biometry
- Placental site demonstrating the relationship of the lower edge of the placenta to the internal cervical os
- Fetal anatomy to include all aspects of the standard checklist

For correct image guidance refer to Obstetric Ultrasound Handbook for Sonographers delivering the Antenatal Screening Programme in Wales (2017)

Results
The woman should be given verbal information about the scan by the Sonographer and the ultrasound chart in her noted completed.

If no problem is detected, the women should be reassured that all is well.
If a problem is detected, the sonographer should tell the woman of her concerns and make arrangements for her to be seen within 24 hours by an appropriately trained midwife or obstetrician for further management.

If appropriate images cannot be obtained to allow the standard checklist to be completed the woman should be offered one further ultrasound scan. The woman should be informed there are a number of reasons why this might happen e.g. suboptimal fetal position, maternal habitus or body mass index, and the second examination should be performed and completed before 23 weeks gestation. Where it is not possible for the sonographer to complete the standard checklist on the second scan, the woman should be informed of this and ASW leaflet attached to her personal ultrasound chart.

A third scan will not be arranged.

(Any patient who does not consent to an anomaly scan will be scanned for viability, growth, placental liquor at 20 weeks).

Reporting
The ultrasound report should be written as soon as possible after the examination has been completed.

A printed report is issued to the referrer and an electronic copy of this stored on the Radiology Information System.

The Sonographer should also complete the patient's hand held record sheet or issue a RADIS report and complete the screening section in the case notes.
If a fetal anomaly is suspected a CARIS information card should be completed and sent to the CARIS co-ordinator and secretary to send copy of report if ticked on report pro forma.

4.2.5 Specific Ultrasound Findings

Low Lying Placenta
When the placenta is found to be covering the internal os on the routine anomaly scan, the Sonographer should describe the relationship of the placenta to the internal cervical os.

A repeat scan should be organised at 32 weeks gestation in accordance with NICE guidelines (2008).

Any women at 32 weeks with low lying placenta and previous C. Section should also be reviewed by a consultant obstetrician - an opinion from a consultant with experience in placental imaging should be sought.

Absent Fetal Stomach
If the fetal stomach cannot be identified and an abnormal site excluded, the Sonographer should re-scan in approximately ½ hr. If the stomach is still not seen a repeat scan should be performed in I week. If it is still absent on this scan, the woman should be referred to the clinic midwife for further management including referral to a consultant.

Renal Pelvi-Calyceal Dilatation (PCD)
Where mild unilateral or bi-lateral PCD is detected (i.e. an AP diameter of 5-9mm) as an isolated finding, a repeat scan should be arranged at 32 weeks gestation.

If PCD is still present at 32 weeks, the woman should be informed of the result and told that the baby will be scanned in the neonatal period. She should also be given an information leaflet on renal pyelectasis and referred to the clinic midwife.

If PCD of 10mm or more is detected, the patient should be referred to the ANC clinic midwife immediately for further management including referral to a consultant.

Talipes
If talipes is found at the anomaly scan a clinic referral to consultant obstetrician should be made.

Fetal Cardiac Abnormalities
See separate protocol for referral to the University Hospital of Wales – women with suspected fetal cardiac anomaly must be seen within three working days by fetal cardiologist (ASW 2017).

Ultrasound Markers
Scanning for ultrasound markers is not recommended as part of the routine 18-20 week anomaly scan however, markers may be unavoidably detected during the scan. In line with Antenatal Screening Wales guidelines, the following findings should be reported and further investigations offered:

- Echogenic Gut (as bright as bone)
- Mild Ventriculomegaly (cerebral ventricles measuring 10 mm -14.9 mm at the atria) > 15mm should be reported as hydrocephalus
- Short Femur < 5th centile – sonographer should proceed to assess long bones and chest.

4.3 3rd Trimester Scans

Requests will be accepted from Obstetricians, Clinic Midwives and ADAU Midwives. Community midwives may only refer if local agreements exist.

4.3.1 Assessment of Fetal Growth

Background and Introduction
Fetal growth restriction is associated with stillbirth, neonatal death and perinatal morbidity. Confidential Enquiries have demonstrated that most stillbirths due to fetal growth restriction are potentially avoidable. A recent analysis based on the West Midlands database has underlined the impact that fetal growth restriction has on stillbirth rates, and the significant reduction which can be achieved through antenatal detection of pregnancies at risk.

Customised assessment of birth weight and fetal growth has been recommended by the RCOG since 2002 and is re-emphasised in the 2013 revision of the Green Top Guideline. The growth trend on serial measurement is of most value in predicting poor fetal outcome.

Scope
This guideline is relevant to all healthcare professionals involved in the care of pregnant women including Midwives, General Practitioners, Obstetricians and Sonographers.

This guideline addresses:

- Use and production of a customised growth chart
- Booking risk assessment
- When and how to measure fundal height using a standardised technique
- When to refer for a growth scan
- Timing and documentation of serial growth scans for women at high risk of fetal growth restriction.

The guideline does not cover management when growth restriction is diagnosed – the ABMU Guideline will be revised in line with All-Wales guidance from the Maternity Forum (in preparation). This will refer to the RCOG Green Top Guideline 31 (2013).

Objectives

- To ensure that there is screening through standardised fundal height measurements of low risk women and surveillance through serial growth scans for high risk women
- To ensure that serial fundal height measurements are plotted correctly on customised growth charts
- Where growth problems are suspected from fundal height measurements, referral for a growth scan and appropriate further investigations to assess fetal wellbeing should be undertaken as soon as possible and within 3 working days
- Where a problem has been identified, to ensure referral is made as soon as possible to an obstetrician for discussion and agreement of an appropriate management plan.

Abbreviations and Definitions

BMI	Body Mass Index (kg/m2)
Centile Lines	The lines of growth on the customised growth chard are 10th, 50th and 90th centiles of Estimated Fetal Weight
EDD	Estimated Date of Delivery
EFW	Estimated Fetal Weight by growth scan.
FH	Fundal Height
FGR/IUGR	Fetal Growth Restriction/Intrauterine Growth Restriction Defined by any of the following: • Estimated weight for gestation below the 10th centile • Slow growth on serial scans • Abnormal Doppler • Histopathology (post-mortem and/or placental examination)
OGTT	ORAL Glucose Tolerance Test
Sonographer	PROFESSIONAL qualified to perform growth scans

Roles and Responsibilities

Action	By
To risk assess at booking, during pregnancy and arrange serial growth scanning if high risk of fetal growth problems or if fundal height measurements not accurate (e.g. BMI >40)	All antenatal care providers (Midwives, Obstetricians, GP's)
To generate Customised growth charts and place in	ANC Midwife

patient-held record, with chard ID recorded on Myrddin	
To undertake fundal height measurements and plot on customised charts	All GAP trained antenatal care providers (Midwives, Obstetricians, GP's)
To calculate EFW and plot on customised charts	Sonographer and Obstetricians

Clinical Content

Customised Growth Charts
The charts are used to plot both FH (x) measurements obtained during clinical examination and EFW (0) following an ultrasound examination. They are customised to each individual taking into account the height, weight, ethnicity and parity of the woman. Birth weights of previous children are used to identify previous problems with growth, but do not affect the centiles produced.

Chart production
Each woman will have a customised fetal growth chart printed following her dating scan and secured in her patient-held notes. The EDD entered into the software will be the one calculated by the dating ultrasound scan. The chart will show the 10th, 50th and 90th centile lines, (5th and 95th centiles can be printed as an option if required).

There is a box in the top left hand corner where her height, weight, ethnicity and parity are shown. A customised centile will be calculated for all previous children; if they were small for gestational age (SGA) or large for gestational age (LGA) this will also be highlighted. Mother's name, reference number, chart ID and date of birth will appear above the chart. The ID of this chart is to be recorded on the electronic maternity record.
The charts are very easy to produce and can be generated at any time during pregnancy. These are available online at grow@perinatal.org.uk.

Measuring fundal height (FH)

Who to measure

Women who are recognised as low risk and suitable for midwifery led care should have serial fundal height measurements undertaken as a primary screen for fetal wellbeing. These should commence from 26 - 28 weeks gestation.
Not all pregnancies are suitable for screening by fundal height measurement, and require ultrasound biometry instead. In most instances, these pregnancies fall into the following categories:

1. Fundal height measurement unsuitable / inaccurate e.g.
    - large fibroids
    - high maternal BMI (>35)
    - Multiple pregnancy.

2. Pregnancy considered high risk requiring serial ultrasound e.g. pre-existing diabetes.

How to measure

1. The fundal height measurement should be performed with the mother in a semi-recumbent position, with an empty bladder and the uterus relaxed.
2. The clinician uses both hands to perform an abdominal palpation, identifies the highest point of the uterine fundus then leaves one hand on the fundus.
3. A non-elastic tape measure, starting at zero, is placed on the uterine fundus at the highest point (which may or may not be in the midline). The tape measure should then be drawn down to the top of the symphysis pubis (in the midline) and the number read in whole centimetres.
4. To reduce the possibility of bias, the tape measure should be used with the metric side hidden, and the measurement should be taken once only. The result should be recorded in centimetres on the customised growth chart and the value plotted using a cross. The method for measuring FH is explained below the customised growth chart to support standardised practice.
5. Serial fundal height measurements should be carried out 2-3 weekly from 26-28 weeks gestation until delivery.

Referral to Ultrasound

Indications for a growth scan are:

- First FH measurement below 10th centile (preferably between 26-28 weeks)
- Static growth: no increase in sequential measurements
- Slow growth: curve crossing centiles in a downward direction
- Excessive growth: curve crossing centiles in an upward direction.

Note that a first measurement above the 90th centile is not an indication for a growth scan. A scan would however be indicated if there was clinical suspicion of polyhydramnios or there was excessive growth on subsequent measurements.
A scan should be organised via the Day Assessment Unit in office hours and via Antenatal Assessment Unit out of hours. From Neath Port Talbot Hospital ANC midwives should be contacted to organise scans. The appointment for scan should be as soon as possible and within 3 working days. Arrangements for follow-up by the referrer should be made assuming the scan is normal. If there are concerns regarding the scan, see below.

Serial growth scans for those at high risk of growth restriction

Some women will be at increased risk of developing fetal growth restriction because of risk factors in the current pregnancy, past medical history or past obstetric history.

All women should be assessed at booking for risk factors to identify those who need increased surveillance. Women who fall into these categories will need referral to a consultant obstetrician.

The consultant-led team will arrange for serial scans every three weeks from 26-28 weeks until delivery (earlier gestation or higher frequency if required in individual

cases). **These women will not require plotting of fundal height measurements while such a serial scanning protocol is being followed.**

Growth scan requests related to obstetric history include:

- Previous birth weight(s) <10th customised centile – birth weight at term <2.5kg.
- Previous stillbirth.

Growth scan requests related to maternal medical history include:

- Pre-existing Diabetes
- Chronic maternal disease e.g. renal impairment, vascular disease
- Uterine fibroids >6cm diameter
- BMI >35

RCOG Green Top guideline 31 lists major and minor risk factors for women requiring serial growth scans.

Growth scan requests related to current pregnancy:

- Late booker (>20 weeks gestation)
- Maternal smoking (>10 cigarettes/day)
- Substance misuse including alcohol
- Multiple pregnancy
- Known or suspected fetal anomaly
- Fetal echogenic bowel
- Clinical suspicion of oligohydramnios or polyhydramnios
- Pre-eclampsia
- Unexplained APH
- Concerns related to growth measurements, as listed above.

Referral following a growth scan

These referrals will be made by the clinician once the growth scan has been completed and the EFW plotted on the customised growth chart with a dot.

If the EFW plots between the 10th and 90th centile and is following the centile curve, and the liquor volume is normal, the woman will be asked to attend her next antenatal appointment as planned. This should already have been confirmed with the woman by the referring carer.

If the EFW does not plot within the 10th and 90th centile or is not following a centile curve, or there are concerns regarding the liquor volume or umbilical artery Doppler, then the following referrals should be made:

1. Significantly increased growth velocity with first measurement having been >90th centile: Refer for obstetric review and repeat scan in 2-3 weeks.

2. EFW below 10th centile or reduced growth velocity, normal liquor volume, normal umbilical artery Doppler: Refer for obstetric review and repeat scan in 2 weeks.

3. EFW below 10th centile or reduced growth velocity with oligohydramnios and/or abnormal umbilical artery Doppler: For immediate (same day) obstetric review for plan of care.

4. If EFW > 90th centile but following centiles further scans should be no more frequent than 3 weekly

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Possible Reasons for 3rd Trimester Scan Requests

- Bleeding / Pain
- Small for Gestational Age
- Large for Gestational Age / Polyhydramnios
- Presentation
- Poor Obstetric History e.g. Previous IUD, Abnormality, Growth Problems
- Maternal Illness e.g. Diabetes, Cardiac Disease, Renal Disease, Drug/Alcohol Abuse, etc.
- PET
- Reduced Fetal Movements
- Oligohydramnios
- Abnormal Doppler
- Placental Site
- Fibroids/ Cysts/ Uterine Abnormality
- Obesity – where clinical examination is considered unreliable

Purpose

To establish:

- Fetal well being
- Size
- Presentation
- Placental site
- Liquor volume
- Assess associated pelvic pathology

Procedure

The examination is performed trans-abdominally. The Sonographer should confirm the following:

- Fetal viability
- Presentation
- Placental site and presence of haematoma if patient presents with pain or bleeding
- Liquor volume – Amniotic Fluid Index (AFI) should be measured if the Sonographer feels that the liquor volume is increased or reduced
- Fetal size – fetal biometry should include HC, AC, and FL (according to local preference)

Doppler examination will be performed on all patients after 28 weeks gestation.
Before 32 weeks Umbilical Artery Doppler examinations should be reported as end diastolic flow present, absent or reversed as appropriate.
After 32 weeks gestation end diastolic flow is present, reduced (ie. RI 0.75 and above), absent or reversed.

- Comment on any fetal abnormality if detected
- If possible, comment on any associated pelvic pathology

Imaging

Images should include the following:

- All fetal biometry and Doppler after 28 weeks gestation
- Placental site demonstrating the relationship of the lower edge of the placenta to the internal cervical os or the presenting part.
- Fetal abnormality if detected
- Any pelvic pathology

4.3.2 Frequency of Scans

This will depend on the indication. As a general guide, see below. If more frequent scans are required, the referring clinician should liaise directly with the sonographers.

Bleeding/Pain
Single scan
Recurrent APH –
Growth
If growth is suboptimal fetal biometry should be repeated at 2 weekly intervals – (*see assessment of fetal growth protocols)*
Poor Obstetric History
Initial scan and if all parameters are normal, scans should not normally be more often than 4 weekly.

Reduced Fetal Movement
Second episode of reduced fetal movement – women will be offered same day scan for growth, liquor and Doppler where possible but always within 72 hours. Follow up if necessary will be dependent on scan findings and management care plan. Gestation should be 23+6 weeks +, however if patient less than 23+6 weeks and is not reassured by fetal heart beat heard then a scan may have to be considered. Doppler will not be performed at gestation less than 23+6 weeks.
(Please see separate protocol for reduced fetal movement)

Multiple Pregnancy
Chorionicity should be confirmed at the dating scan and documented to enable correct management.
Di-chorionic twin pregnancy – two separate sacs ? lambda sign present ? two placenta.
Monochorionic twin pregnancy – single sac ? thin membrane/septum ? single placenta.

Monochorionic twin pregnancies will be scanned fortnightly from 16 weeks gestation and Doppler performed from 22 weeks gestation. The deepest pool of liquor should be measured and imaged along with the septum if possible.
Di-chorionic twin pregnancies should be scanned no more frequently than 3 weekly unless clinically indicated or ultrasound findings suggest more regularly .
EFW's should be plotted for all twin pregnancies.

Oligohydramnios
Up to 37 weeks gestation. In women who have not had confirmed ruptured membranes but who have an ultrasound scan result of:

1) Normal growth, normal EDF, AFI below the 5th centile but 50 and above, fortnightly scans are recommended.
2) Normal growth, normal EDF, AFI below the 5th centile and below 50, weekly scans (for AFI and Doppler) should be performed with fetal biometry fortnightly.

After 37 weeks gestation the frequency of ultrasound examination for women with Oligohydramnios is at the discretion of the consultant obstetrician.

Doppler Examinations

Abnormal findings:
Reduced EDF – Twice weekly unless increased frequency clinically indicated.
Absent EDF – Daily – consultant request.
Reversed EDF – Daily Dopplers – consultant request and review.

Ultrasound - ? Intrauterine Death

During normal working hours, on receiving the request for ultrasound, the sonographer will perform the scan as soon as possible.
Out of hours – if IUD is suspected and confirmation required the consultant radiologist on-call will be contacted by consultant obstetrician on-call. The radiologist will try and contact a sonographer to come and perform the scan.

Placental Site

Repeat scans for placental site where the placenta was reported as covering the internal os on the routine anomaly scan should be performed at 32 weeks gestation in line with NICE guidelines (2008)
If the placenta is still low lying, a repeat scan in 4 weeks is indicated. At this stage, the Sonographer should measure the distance between the lower edge of the placenta and the internal cervical os wherever possible.
NB. In cases of suspected placenta praevia where the lower edge is difficult to demonstrate, a transvaginal scan should be considered. This will be done on Consultant request only and should be organised in conjunction with a Consultant Obstetrician.
Cases of low lying placenta and history of previous C/S should be referred for an opinion from an obstetrician with experience in placental ultrasound to exclude accreta spectrum.

Presentation

When a scan for presentation is requested fetal biometry and Doppler should be performed in all cases, unless measurements have been done within the last 2 weeks.

"Late Bookers"

Women who first present for ultrasound examination at 20 weeks + are considered to be late bookers. They will require serial growth scans, which will be arranged by their obstetrician from 28 weeks gestation.

Large for Dates (LFD)

Any request for patients with a previous large baby – not for serial scanning/GAP Grow.
Fundal height measurements should be performed 2-3 weekly in the community as per protocol.
An ultrasound can may be offer in late pregnancy.

Ultrasound Scanning of Early Pregnancy Problems

Criteria

Positive pregnancy test.
6 weeks -> 14+0 weeks amenorrhea.
Pain and/or bleeding.
Referred by GP, community midwife, Ward 2 medical staff.
If a woman is < 6 weeks gestation and is symptomatic following discussion with the sonographer an ultrasound scan may be performed.
Venue –
Reporting guidelines –
Images to be recorded – see sheet.

PPH

Patients < 6 weeks post partum will be accepted from ward 18/19.
Patient > 6 weeks post partum will not be accepted in EPU for a scan.

Post TOP/post evacuation

Patients with bleeding and < 6 weeks since procedure.
Patients with bleeding and >6 weeks since procedure will not be accepted in EPU for a scan.

Failed Medical TOP

Patient will not be accepted in EPU. (A Gynae clinic appointment will be made for 2 weeks post procedure, with a scan in main US on the same day).

The following categories of patients are not eligible for EPU.

-ive pregnancy test

Patient not eligible for EPU (patient referred back to GP – no EPU procedure to be performed).

-ive test + pain

Assessment by registrar on ward. Scan in main department if necessary. (By radiologist if IP, sonographer or radiologist if OP).

-ive test + niggling pain

Refer to GP**.**

Previous ectopic, miscarriage or maternal reassurance

Appointment to be arranged via ANC. Appointment will not be given before 6 weeks amenorrhoea and will not be done as a same day referral unless appointment times allow.

Patients > 13 weeks amenorrhoea

Appointment to be arranged via sister in ANC. Appointment will not be given before 6 weeks amenorrhoea and will not be done as a same day referral unless appointment times allow.

Patients who obviously do not fall into this category should not be scanned but referred back to the clinic nurse who should be advised to seek a medical opinion.

Venue
Early Pregnancy Clinic Level 04 – West Ward Block.
Patients attending the clinic will be seen by the EPU nurse on arrival.
The nurse must issue a signed request form with full clinical details for all patients who require ultrasound scans.

A TVS will be performed in women < 8 weeks gestation. Should a patient refuse this type of examination she should be offered an abdominal scan.
A clear explanation of the examination should be given to the patient before the scan and verbal consent obtained.

The patient's partner should be given the opportunity to be present during the scan.
The sonographer performing the scan **must** be chaperoned. The clinic will provide nursing support for this purpose.

Probe preparation and cleaning – as per departmental protocol for TVS.
The sonographer will explain the results of the scan to the patient, but will not discuss clinical management.

A hand-written report should be given to the EPU clinic for the registrar to discuss the diagnosis and treatment.

Should the sonographer require a radiologist's opinion for a non - obstetric query, Dr L McKnight should be contacted – immediately when he is in the hospital or alternatively the patient should be given an appointment on Dr McKnight's next ultrasound list in the main department.

Reporting Guidelines
The uterus will be examined and reported as:
1. Normal.
2. Intra-uterine pregnancy.
3. Non-viable pregnancy.
4. PUL.

The ovaries will be reported as normal or abnormal if they are seen.

The adnexae will be examined to record:
1. The presence or absence of free fluid.
2. An extra uterine or adnexal mass.

At ultrasound examination, the following should be recorded:

1. The number of sacs and their dimensions.
2. The regularity of the sac.

3. The presence of a yolk sac.
4. The presence of any haematoma.
5. The presence of an embryo and whether embryonic heart beat is detected or not.
6. The CRL measurement.
7. The appearance of the ovaries, the presence of any ovarian cyst or any findings suggestive of an ectopic pregnancy, such as a tubal mass or fluid in the Pouch of Douglas

Images to be Recorded

1. M/L longitudinal to include cervix (N.B. when pregnancy demonstrated this is to record site of pregnancy).
2. Transverse uterus.
3. Both ovaries (if not demonstrated then image of adnexa to show region examined).
4. Sac ± embryo to include measurements.
5. Any additional pathology and measurements.

Maternity Services

Checklist for Clinical Guidelines being Submitted for Approval

Title of Guideline:	Obstetric ultrasound protocol
Name(s) of Author:	Mr M Moselhi Mrs D Piritte Mrs C Davies
Chair of Group or Committee approving submission:	Antenatal Forum
Brief outline giving reasons for document being submitted for ratification	New policy
Details of persons included in consultation process:	Antenatal Forum
Name of Pharmacist (mandatory if drugs involved):	n/a
Issue / Version No:	V1
Please list any policies/guidelines this document will supercede:	n/a
Date approved by Group:	11 January 2019
Next Review / Guideline Expiry:	January 2022
Please indicate key words you wish to be linked to document	Ultrasound, Scanning, Scan, Radiology, anomaly
File Name: Used to locate where file is stores on hard drive	