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# Fetal Growth Assessment (GAP Protocol and GROW Charts)

## Introduction and Aim

Fetal growth restriction (FGR) is associated with stillbirth, neonatal death and perinatal morbidity. Confidential Enquiries have demonstrated that most stillbirths due to FGR are associated with suboptimal care and are potentially avoidable. An epidemiological analysis based on the comprehensive West Midlands database 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 birthweight and fetal growth has been recommended by the RCOG since 2002 and is re-emphasised in the 2013 revision of the Green Top Guidelines. Most studies use a one off measurement to predict FGR however it is the growth trend that is of more value in predicting poor fetal outcome.

## Objectives

- To ensure that there is accurate fetal surveillance through standardised fundal height (SFH) measurements of low risk women and serial growth scans for high risk women.
- To ensure that SFH measurements are plotted correctly on customised growth charts.
- To ensure that patterns of fundal height measurements suggestive of growth problems are recognised and referral for a growth scan is made.
- To ensure that problems of fetal growth on ultrasound are identified and an appropriate care plan is made.
- To ensure that there is identification of all infants born below the 10$^{th}$ customised centile at birth and appropriate management initiated postnatally.

## 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

- Production and use of a customised growth chart
- Risk assessment and care planning
- When and how to measure fundal height using a standardised technique
- When to refer for ultrasound assessment of fetal growth
- Serial growth scans for women at high risk of fetal growth restriction

This guideline does *not* seek to cover management of pregnancy once FGR has been diagnosed. This is covered in detail in the Small for Gestational Age (SGA) Guideline

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| **Equality Health Impact Assessment** | *An Equality Health Impact Assessment (EHIA) has not been completed.* |
| **Documents to read alongside this Procedure** | *Antenatal Care Guideline* |
| **Approved by** | *Maternity Professional Forum* |

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| **Accountable Executive or Clinical Board Director** | *Ruth Walker, Executive Nurse Director* |
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**Disclaimer**

**If the review date of this document has passed please ensure that the version you are using is the most up to date either by contacting the document author or the Governance Directorate.**

| **Summary of reviews/amendments** | | | |
|---|---|---|---|
| **Version Number** | **Date of Review Approved** | **Date Published** | **Summary of Amendments** |
| 1 | April 2015 | April 2015 | New Document |
| 2 | Nov 2017 | Nov 2017 | Amended to incorporate new practice |
| 3 | Jul 2018 | Nov 2018 | Amended to incorporate new scanning frequency |
| 4 | Sept 2019 | 06/09/2019 | Updated to reflect current practice. |
| 4a | Sept 2020 | | Updated Risk Factors |
| 4b | Dec 2021 | Jan 2022 | Updated Risk Factors |
| 5 | | | • Move to GROW 2.0<br>• Use of 97th centile rather than 95th in line with All Wales MLC guidance<br>• Clarify use of centiles for neonatal care<br>• Reference to All Wales MLC Guideline re: SFH in labour assessment |

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# 2 Customised Growth Charts

Each woman will have a customised growth chart created following her dating scan via the GROW 2.0 web-based application at https://uk.growapp.org . **The EDD entered into the software will be the one calculated by the dating ultrasound scan except in the case of pregnancy following IVF where the EDD calculated from treatment dates should be used.** The unique chart number, (a G followed by an 8 digit number) must be added to the handheld record and Maternity Information System to allow access to the record in the case of errors in demographics or any interruption in service affecting the web-based app.

The online chart displays the 3rdh, 10th, 50th, 90th and 97th centile lines related to the calculated Gestation Related Optimal Weight for the current pregnancy, as determined by the software using the woman's height, weight, ethnicity and parity. Details of previous pregnancies are entered and a customised centile is calculated for each previous baby to identify previous small for gestational age (SGA) babies but this does not affect the chart produced.

The web app must be used to plot all risk assessments, care plans and clinical examinations related to fetal growth assessment. Use of the GROW 2.0 system is detailed in the online User Guide: GROW_2.0_user_guide.pdf (perinatal.org.uk)

# 3 Risk Assessment

Some pregnancies will be at increased risk of fetal growth restriction because of risk factors in the current pregnancy, past medical history or obstetric history. Others will be unsuitable for surveillance by fundal height measurement due to factors such as large fibroids or high maternal BMI.

All women should be assessed for risk factors for fetal growth restriction at the dating scan appointment and throughout pregnancy if the clinical situation changes. Women who have one or more risk factors or are unsuitable for fundal height measurements will require an obstetric referral and serial ultrasound scans. The risk factors and care plan should be documented in the handheld record and on the GROW 2.0 system.

## 3.1 Risk factors for fetal growth restriction

**Personal**

Maternal age 40 or above at conception

Smoker (any amount)

Substance misuse

**Medical History**

Diabetes

Renal impairment

Maternal medical autoimmune disease (SLE/ APLS/ Cyanotic heart disease)

Chronic hypertension

Use of Beta Blockers (e.g. Propanolol, Labetalol)

**Obstetric History**

Previous SGA baby (*see below re: previous baby <10$^{th}$ centile but >3kg)

Previous stillbirth

*In women who are referred for serial scans because of a previous baby <10$^{th}$ centile, AND that baby was >3kg AND that woman has no other risk factors for serial scans (including BMI under 35 so that SFH can be assessed), then scans will be offered at 36 and 39 weeks only instead of from 28 weeks. These women WILL have SFH measurements from 28 weeks until delivery and referral if indicated.

**Current Pregnancy**

Multiple pregnancy

Fetal echogenic bowel

Fetal two vessel cord

PAPP-A <0.415 MoM

Heavy bleeding in pregnancy

Gestational diabetes

Pregnancy induced hypertension (requiring treatment)

Pre-eclampsia

## 3.2 Factors making SFH measurement unsuitable

Uterine fibroid >6cm

BMI ≥35

# 4 Standardised fundal height (SFH) measurement

Women who do not require serial ultrasound scans should have standardised fundal height measurements undertaken as a primary screening test for fetal growth. These should be taken 2-3 weekly and commence from 28 weeks gestation, the usual pattern being 28, 31, 34, 36, 38, 40 and 42 weeks. All women having SFH measurement should be seen with this frequency, regardless of their parity. No SFH measurement should be done before 26 weeks.

Measurements must be taken and acted upon whether the woman is attending her community midwife or the antenatal clinic for her appointment. To ensure accurate measurements are taken, clinicians should use standard paper tape measures. Each woman should be given a tape measure at booking to be stored in her hand held records and used for each measurement.

## 4.1 How to measure

The fundal height measurement should be performed with the mother in a semi- recumbent position, with an empty bladder and the uterus relaxed and non-contracting. It is recommended that 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. A paper 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 from the tape measure. To reduce the possibility of bias, the tape measure should be used with the cm side hidden, and the measurement should be taken once only.

The measurement should be made only once and the result recorded on the customised growth chart within the GROW 2.0 app using the exact measurement obtained, including one decimal place if applicable. **Measurements should not be rounded up or down to the nearest centimetre.**

## 4.2 Referral for growth scan following SFH measurement

The GROW 2.0 software will highlight the SFH plot in red if it meets these criteria for a growth USS:

- First SFH measurement below 10$^{th}$ centile
- Static growth: no increase in sequential measurements
- Slow growth: growth velocity slower than expected

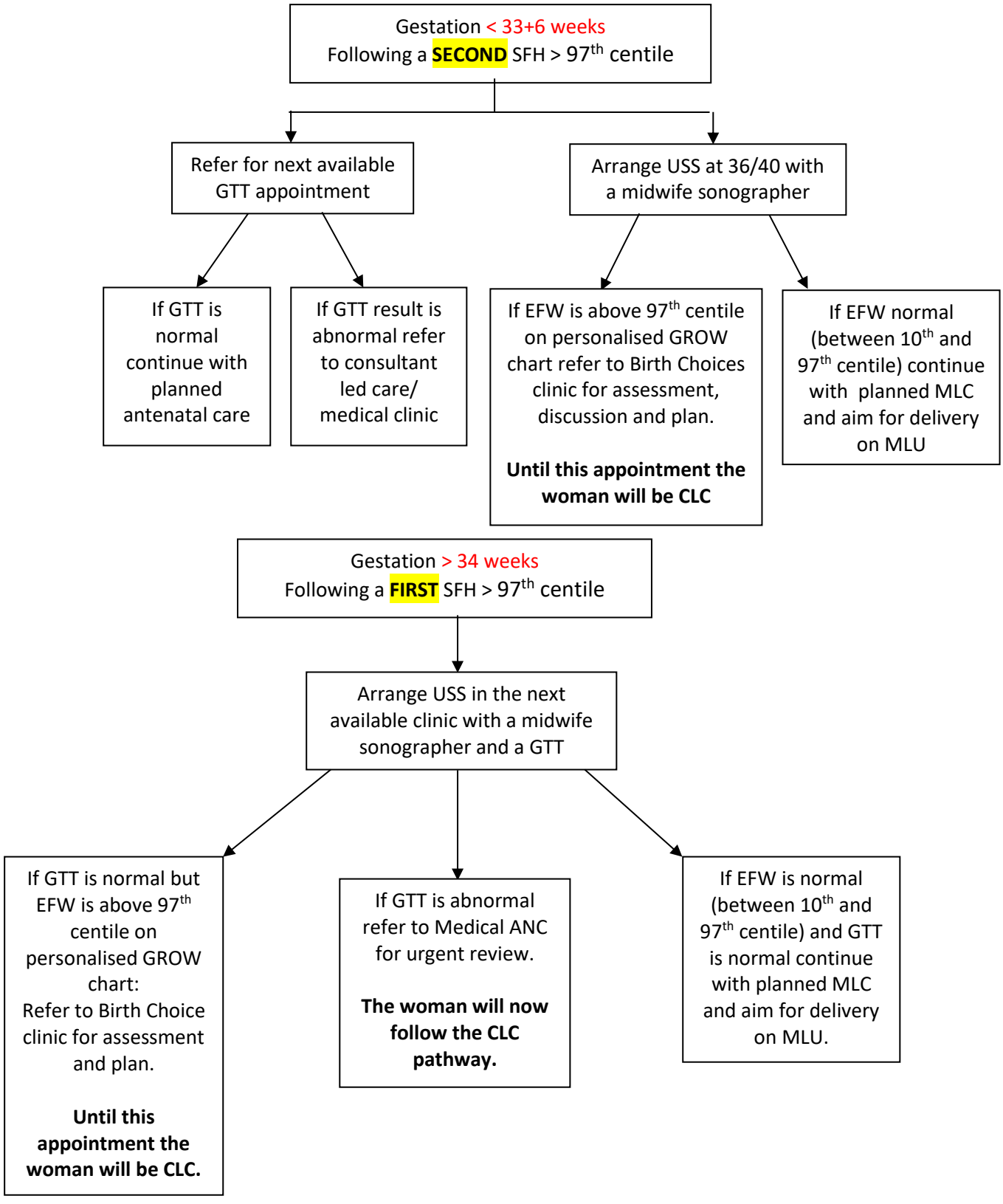
Requests for a growth scan should be made directly to the antenatal clinic via the online referral form on the midwifery sharepoint pages. Requests will be triaged and prioritised by a midwife sonographer and an appointment will be arranged. Where possible this should be within 72 hours.

Arrangements for follow up by the referrer should be made at the time of the referral. The SFH should be measured again 2-3 weeks after the measurement that prompted the referral. If this measurement does not show adequate growth (using the most recent SFH measurement as the new baseline) then another referral for USS should be made to assess the rate of growth between two EFW measurements.

**There is no reason to delay or omit an SFH measurement if a USS has been performed recently, provided that it has been at least 2 weeks since the last SFH measurement.**

## 4.3 Referral process for SFH > 97th centile

A first measurement above the 97th centile is NOT an indication for a growth scan, see the flow chart below. An ultrasound would however be indicated if there was clinical suspicion of polyhydramnios or there was excessive growth on subsequent measurements.



# 5 Serial Ultrasound Scans

Serial ultrasound assessment of fetal growth will be arranged from 28 weeks until delivery, with the usual pattern being 28, 32, 36 and 39 weeks (earlier gestation or higher frequency if required in individual cases as decided by an obstetrician). A growth scan will include calculation of an Estimated Fetal Weight (EFW) from fetal biometry measurements, assessment of amniotic fluid volume and umbilical artery doppler.

All women having serial ultrasound will *not* have fundal height measurements taken. Once fetal growth is being monitored by serial ultrasound scan it should usually continue with this method until the baby is born, it is not possible to adequately assess fetal growth through SFH measurements commenced in the mid to late 3rd trimester of pregnancy due to the lack of baseline measurement(s) to compare to.

## 5.1 Serial scans for otherwise low risk women

Women who are otherwise suitable for Midwifery Led Care but trigger a risk factor for serial ultrasound (e.g. a previous baby below the 10th centile) should be referred to a consultant antenatal clinic with the reason for referral clearly documented. These women will attend the antenatal clinic for their ultrasound as scheduled, if the results of the ultrasound are normal they may be recorded on the GROW 2.0 system by a midwife and the woman will not need to be reviewed by an obstetrician.

Women who are otherwise low risk will be suitable to plan birth on the MLU if all ultrasound results are normal up to and including 37 weeks, they will still attend the antenatal clinic for their final ultrasound at 39 weeks if they have not yet given birth.

## 5.2 Referral following a growth scan

Once the growth scan has been completed the EFW will be plotted on the growth chart within the GROW 2.0 app by the midwifery sonographer or obstetrician providing care.

If the finding of the growth scan fit the following parameters it should be considered normal and the woman should be asked to attend her next antenatal appointment as planned:

- EFW between the 10th and 97th centile
- Where a previous EFW is available for comparison, growth velocity is normal (as assessed by the GROW 2.0 software)
- liquor volume and umbilical artery doppler findings are normal

If any of these parameters are not met the following care plans should be made:

- **EFW > 97th centile or significantly increased growth velocity**
  Plan glucose tolerance test (GTT) within 1 week.
  Refer to either the Diabetic ANC or Birth Choices Clinic depending on outcome of GTT (see section 9.2)

- **EFW between 5th and 10th centile (or reduced growth velocity) with normal liquor volume and normal umbilical artery doppler**

< 36/40 - refer for obstetric review and repeat scan in 2 weeks
> 36/40 - refer for urgent obstetric review to consider mode and timing of delivery with reference to SGA guideline

- **EFW between 5th and 10th centile or (reduced growth velocity) with oligohydramnios and/or abnormal umbilical artery Doppler and/or abnormal middle cerebral artery doppler**
  Refer immediately to OAU or ANC for senior obstetric review (ST6 or above) to consider mode and timing of birth with reference to SGA guideline

- **EFW < 5th centile**
  Refer immediately to OAU or ANC for senior obstetric review (ST6 or above) to consider mode and timing of birth with reference to SGA guideline

# 6 Management in labour

Early admission should be recommended for women in spontaneous labour with a fetus where growth problems have been identified, in order to assess fetal wellbeing and offer continuous fetal heart rate monitoring.

For women giving birth under midwife led care, staff should refer to part 6 of the All Wales MLC Guideline regarding measurement of SFH as part of labour assessment.

# 7 Following birth

The baby's birthweight centile must be calculated within the GROW 2.0 app and the requested baby details entered for audit purposes.

The birthweight centile must be entered into the maternity information system when completing the birth details.

At present additional neonatal care in CAVUHB, such as the hypoglycaemia policy, is triggered based on the WHO standardised centile charts for birthweight and head circumference rather than the customised centile from GROW. However, clinicians should use their clinical judgement and request review by a neonatologist if a baby is born < 10th customised centile and appears clinically wasted.

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