Sherwood Forest Hospitals
NHS Foundation Trust

Customised Growth Charts for use in Pregnancy Guideline

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Document Type:	**GUIDELINE**

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6.0	06-November-2024	November-2027

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Approved by (committee/group):	MGCG	**Date Approved:**	14-10-2024

Scope/ Target Audience: (delete as applicable and/ or describe)	**Specialty/ Department** • Maternity
Evidence Base/ References:	• See section 8
Lead Division:	Women and Children's Division
Lead Specialty/ Department: (Or Division if 'divisionally' owned)	Maternity
Lead Author: (position/ role and name)	Leanne Butler: Antenatal Suite coordinator
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Sponsor (position/ role):	Obs and Gynae Head of Service

	Name the documents here or record not applicable
Associated Policy	N/A
Associated Procedure(s)	N/A
Associated Pathway(s)	N/A
Associated Standard Operating Procedure(s)	N/A
Other associated documents e.g. documentation/ forms	Customised growth chart (held/ maintained locally within maternity services)

Consultation Undertaken:	Antenatal Clinical governance group members
Template control:	v2.0 September 2023

Amendments from previous version(s)

Version	Issue Date	Section(s) involved	Amendment
6.1	26/08/2025	Minor Amendment	Content updated in line with update to Saving Babies Lives Care Bundle V3.2.
6.0	06-11-2024	Planned review undertaken	• Guideline updated to include move to electronic CGC generation and plotting using GROW v2.0 on EPR BadgerNet • Example charts updated • Inclusive language updated • Plot SFH measurement to 0.5cm • Slow growth definition now includes no or static growth
5.1	Nov 2023	Introduction/ 2nd paragraph	• Review undertaken to ensure content up to date in line with RCOG green top guideline number 31 (2024)
		Whole document	• Review undertaken to ensure content up to date in line with Saving Babies' Lives v3 and evidence base updated

CONTENTS

1 INTRODUCTION/ BACKGROUND

Antenatal surveillance of fetal growth is an essential part of good maternity care, as lack of detection of fetal growth restriction is directly associated with stillbirth and perinatal morbidity. The use of the Customised Growth Chart (CGC) is designed to facilitate improved surveillance of the fetal growth in pregnancy. The importance of identifying the Small for Gestational Age Fetus (SGA) and those with Fetal Growth Restriction (FGR) is crucial [1, 2].

The Royal College of Obstetricians and Gynaecologists greentop guideline (RCOG) number 31 published in 2024, provides detailed recommendations for the monitoring of SGA when EFW is <10th centile.Trusts should either follow this guidance or a similar protocol which has been agreed with local commissioners following advice from the provider's Clinical Network as to whether the variation is acceptable [1].

The following are important features for management[1]:

- Absent or reversed end diastolic flow in the umbilical artery is a feature of FGR prior to 32 weeks.
- Ductus venosus (DV) Doppler is less predictive after 32 weeks in the management
  of the FGR fetus.
- A normal umbilical artery Doppler after 32 weeks of gestation does not mean that
  the fetus is not growth restricted, nor that there is no evidence of fetal compromise.
- After 34 weeks providers with capacity may wish to use assessment of Middle Cerebral Artery (MCA) Doppler pulsatility indices (PI) to help identify and act upon potential fetal compromise in later pregnancy

Stillbirth and extended perinatal mortality rates decreased in the UK in 2022, following the increases seen in 2021. There was a small increase in neonatal mortality. The extended perinatal mortality rate for 2022 across the UK as a whole was 5.04 per 1,000 total births (5.19 in 2021); comprising 3.35 stillbirths per 1,000 total births (3.54 in 2021) and 1.69 neonatal deaths per 1,000 live births (1.65 in 2021) [3].

Stillbirth rates for babies born to mothers from the most deprived areas decreased (from 4.69 per 1,000 total births in 2021 to 4.60 per 1,000 total births in 2022), but remain much higher than those for babies born to mothers from the least deprived areas (2.61 per 1,000 total births) [3].

Nottinghamshire has high levels of deprivation, with a significant proportion of our local population living in areas of high deprivation, with Mid Nottinghamshire being more deprived overall than the England average [4].

In particular, there is a need to address inequitable outcomes associated with ethnicity and levels of deprivation. MBRRACE-UK (MBRRACE-UK: Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK | MBRRACE-UK | NPEU (ox.ac.uk) perinatal mortality surveillance data show that the lowest stillbirth rates were for babies of White ethnicity from the least deprived areas, at 2.78 per 1,000 total births. The highest stillbirth rates were for babies of Black African and Black Caribbean ethnicity from the most deprived areas, at around 8 per 1,000 total births [5].

CGC allow serial plotting of symphysis fundal height (SFH) measurement on all pregnancies, as well as ultrasound derived estimated fetal weight (EFW). Their use increases the antenatal detection rate of growth problems while reducing the number of unnecessary investigations [6].

Pregnant women and birthing people who are at low risk of FGR following risk assessment should have surveillance using antenatal symphis fundal height (SFH) measurement commenced before 28+6 weeks gestation. Measurements should be plotted or recorded on charts by clinicians trained in their use [5]. At Sherwood Forest Hospitas NHS Foundation Trust (SFHFT) the electronic patient records incorporates the Gestation Related Optimum Weight (GROW) v2.0 software that automatically plots the measurements of SFH and EFW onto a customised growth chart.

Healthcare professionals who perform SFH measurements should be competent in measuring, plotting (or recording), interpreting appropriately and referring when indicated. Healthcare professionals who perform SFH measurements need to meet SFH measurement training competencies.

The CGC is generated under licence using GROW V2 software from the West Midlands Perinatal Institute [7].

2 AIMS/ OBJECTIVES/ PURPOSE/ SCOPE (including Trust Related Documents)

This guideline is relevant to all healthcare professionals involved in the care of pregnant people/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 symphysis fundal height using a standardised technique
- When to refer to ultrasound for a growth scan
- Serial growth scans for pregnant women and birthing people at high risk of fetal growth restriction

This guideline template does *not* seek to cover management of pregnancy once FGR has been diagnosed.

Staff groups

- Midwives
- Obstetricians
- Ultrasonographers
- Imaging assistants

Clinical areas

- Community midwifery
- Antenatal Suite/Pregnancy Day Care (PDC) and Sherwood Women's Centre (SWC)
- Maternity Ward
- Sherwood Birthing Unit (SBU) & Triage

Patient groups

- Pregnant people/women

Exclusions

- None

Related Trust Documents

- Provision of Antenatal Care
- Routine tests (investigations) in maternity guideline
- Identification and management of the Small for Gestational Age (SGA) fetus and the fetus with fetal growth restriction (FGR) guideline
- Diabetes – Gestational diabetes mellitus management guideline
- CARE OF NEWBORN

3 DEFINITIONS/ ABBREVIATIONS

Definitions:

Trust	Sherwood Forest Hospitals NHS Foundation Trust
Staff	All employers of the Trust including those managed by a third party on behalf of the Trust
Centile lines	The lines of growth on the customised growth chart are estimated fetal weight centile lines, 3rd, 10th, 50th, 90th, 97th centile.
FGR	Fetal growth restriction
SGA	Small for Gestational Age <10th centile (includes constitutional and pathological causes)
Hadlock's 3	The use of femur length (FL), abdominal circumference (AC) and head circumference (HC) to calculate the estimated fetal weight (EFW) by ultrasound.

Abbreviations:

CGC: Customised growth chart
EDB: Estimated date of birth
SGA: Small for gestational age
LGA: Large for gestational age
FGR: Fetal growth restriction
EFW: Estimated fetal weight
SFH: Symphysis Fundal Height
M EPR: Maternity Electronic Patient Record
ANC: Antenatal Clinic
PDC: Pregnancy Day Care
KMH: King's Mill Hospital
SWC: Sherwood Women's Centre
SFHFT: Sherwood Forest Hospitals NHS Foundation Trust
MW: Midwife
CMW: Community midwife
US: Ultrasound
GAP: Growth Assessment Programme
GROW: Gestation Related Optimum Weight
BMI: Body Mass Index

GTT: Glucose Tolerance Test

4 ROLES AND RESPONSIBILITIES

All staff involved with the care of pregnant people/women:

- Keep appropriate records.
- Practice according to the guideline.

It is the responsibility of:

- The midwife completing the booking to ensure the M EPR contains the information required to generate the CGC at the time of the dating scan. This information includes that the customised growth chart has been discussed with the pregnant woman/birthing person, ethnicity, height, weight at booking and previous babies' details.
- The ultrasonographer to add EDB and 'number babies by scan' to the M EPR at the time of the dating scan and the CGG will be generated.
- Review the CGC for previous SGA babies using the parity box by clicking on the drop down arrow.
- All healthcare professionals performing an antenatal examination to review and update the CGC through the M EPR. For example to identify perevious SGA babies and assess the requirement for antenatal aspirin as per Saving Babies Lives v3.2 criteria
- All healthcare professionals to refer for further investigations as per these guidelines.
- Obstetricians to assess abnormal results and provide an appropriate management plan according to approved guidelines.
- To ensure that there is identification of all infants born below the 10th customised centile at birth follow the appropriate management pathway initiated in the postnatal period.

5 GUIDELINE DETAILS (including Flowcharts)

5.1 Management

- At the booking appointment the community midwife will record the pregnant persons **parity, height in cm, weight in kg and ethnicity** in the M EPR. An initial dating scan is offered as part of the Antenatal Screening Pathway and the CGC will be generated if the box has been ticked ont M EPR to indicate the chart has been discussed with them.

- All pregnant women and birthing people booked for care at SFHFT are offered an anomaly scan, which is arranged at the dating scan appointment.

- The CGC can be generated at any point following the dating scan prior to the first SFH or EFW plot. If the booking data is not complete in the M EPR, a chart can not be generated.

- Pregnant women/birthing people who are booked to give birth at Trusts other then SFHFT should have a CGC generated before 20/52, so that the CMW can identify previous SGA babies and commence SFH measurments by 28+6/52.

- The CGC will show the centile lines. There are 3 boxes above the CGC. One will display the pregnant woman/birthing person's name, date of birth, NHS number, height, weight and BMI. The other two show the Estimated Date of Birth (EDB) and gestation; and parity. Previous births and centiles will be listed in the parity box using the drop down arrow feature.

- In a multiple pregnancy, fetal wellbeing will be assessed by serial scans using one chart.

- Where there is a suspected growth anomaly (see method for SFH assessment) the pregnant woman/ birthing person should be referred for assessment.
    - Contact ANC/SWC for an appointment for a fetal growth scan and midwife review
    - Advise the pregnant woman/birthing person to attend PDC/SWC for a growth scan at the pre arranged appointment time.
    - PDC/SWC staff will arrange the scan request with the US department
    - Those pregnant women/birthing people who have booked to give birth at other maternity units will have their growth scan and assessment performed at that hopsital and the midwife should liaise with the appropriate antenatal clinic to request an appointment.

5.2 Method for SFH measurement [1.4.5]

Note
SFH measurements are not required once the pregnant woman/birthing person commences serial growth scans.
However, should the serial scanning pathway not commence until 32 weeks, a SFH measurement is required by 28+6 prior to the 1st serial growth scan.
SFH measurement is unreliable if the fetus is not a longitudinal lie.
SFH measurement is unreliable in multiple pregnancies, but the CGC will be used to plot scan findings.
Plot to 0.5cm
Do not repeat SFH measurement within 2 weeks of growth scan.

The method of measuring and recording SFH measurements is detailed in the video link and images below [7].

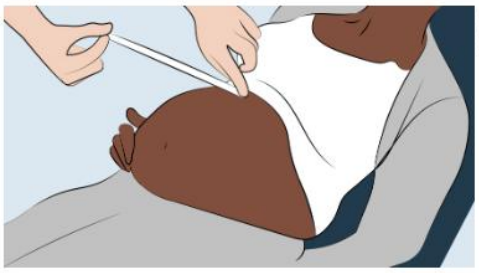
https://www.youtube.com/embed/nyfUh5zlB1U

Standardised Fundal Height (SFH) ▸

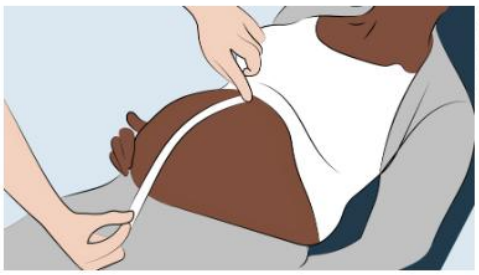
GAP guidance recommends standardised fundal height measurements every 2-3 weeks, from 26-28 weeks gestation; preferably undertaken by the same care provider.

- Explain the procedure to the mother and gain verbal consent
- Ensure the mother is comfortable and in a semi-recumbent position
- Ensure a mother's bladder is empty
- Expose enough of the abdomen to allow a thorough examination

- Ensure the abdomen is soft
- Perform two-handed abdominal palpation
- Ensure accurate identification of the fundus



- Use a non elastic tape measure
- Turn the centimetres on the underside to reduce bias
- Secure the tape at the top of the fundus with one hand



- Measure from top of fundus to the top of the symphysis pubis
- Measure along the longitudinal axis without correcting to the midline
- The tape measure should stay in contact with the skin
- Measure only once
- Record the measurement to one decimal place

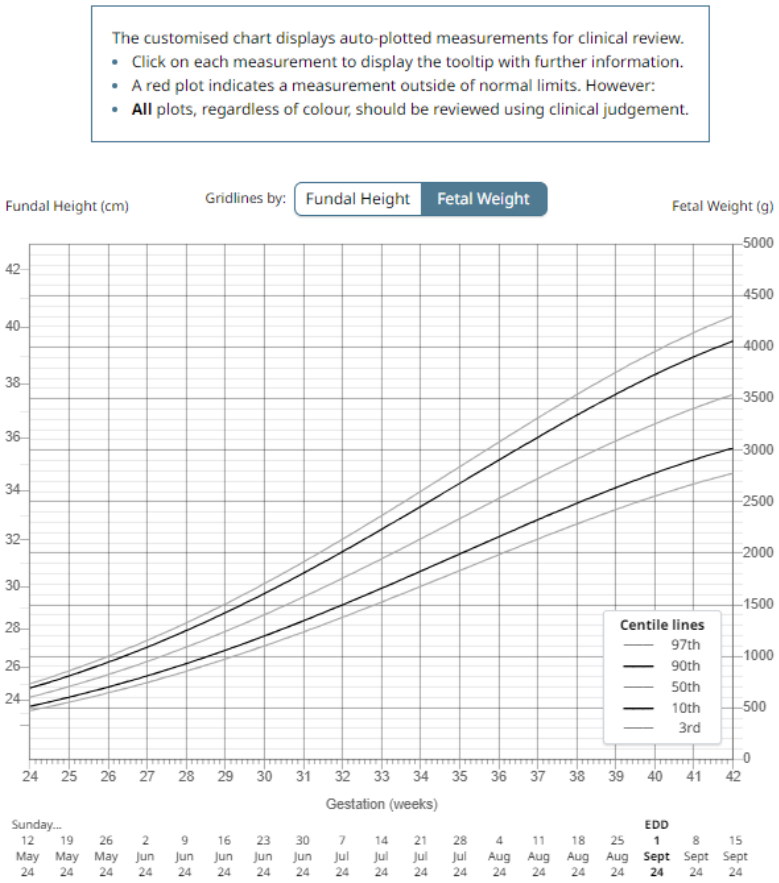
For more information see - https://www.perinatal.org.uk/FetalGrowth/FundalHeightMeasurement

Once obtained, enter the SFH measurement into the M EPR, which will populate the measurement onto the CGC. Repeat measurements at **2-3 week intervals** with full antenatal asssment from **26-28 weeks** gestation.

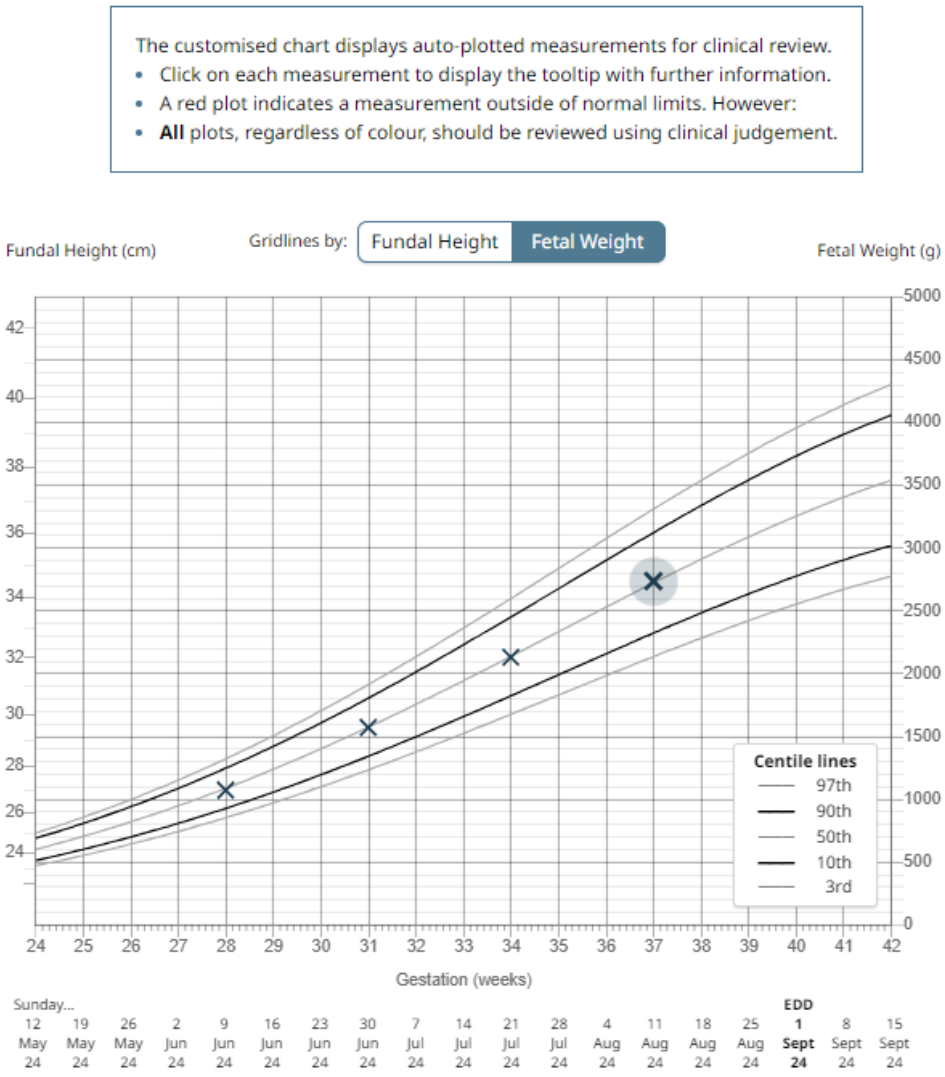
5.3 Examples of SFH patterns

The following examples of growth patterns have been obtained from the Perinatal Institute GROW training site.

Example 1: Blank chart



Example 2: Expected/normal growth pattern

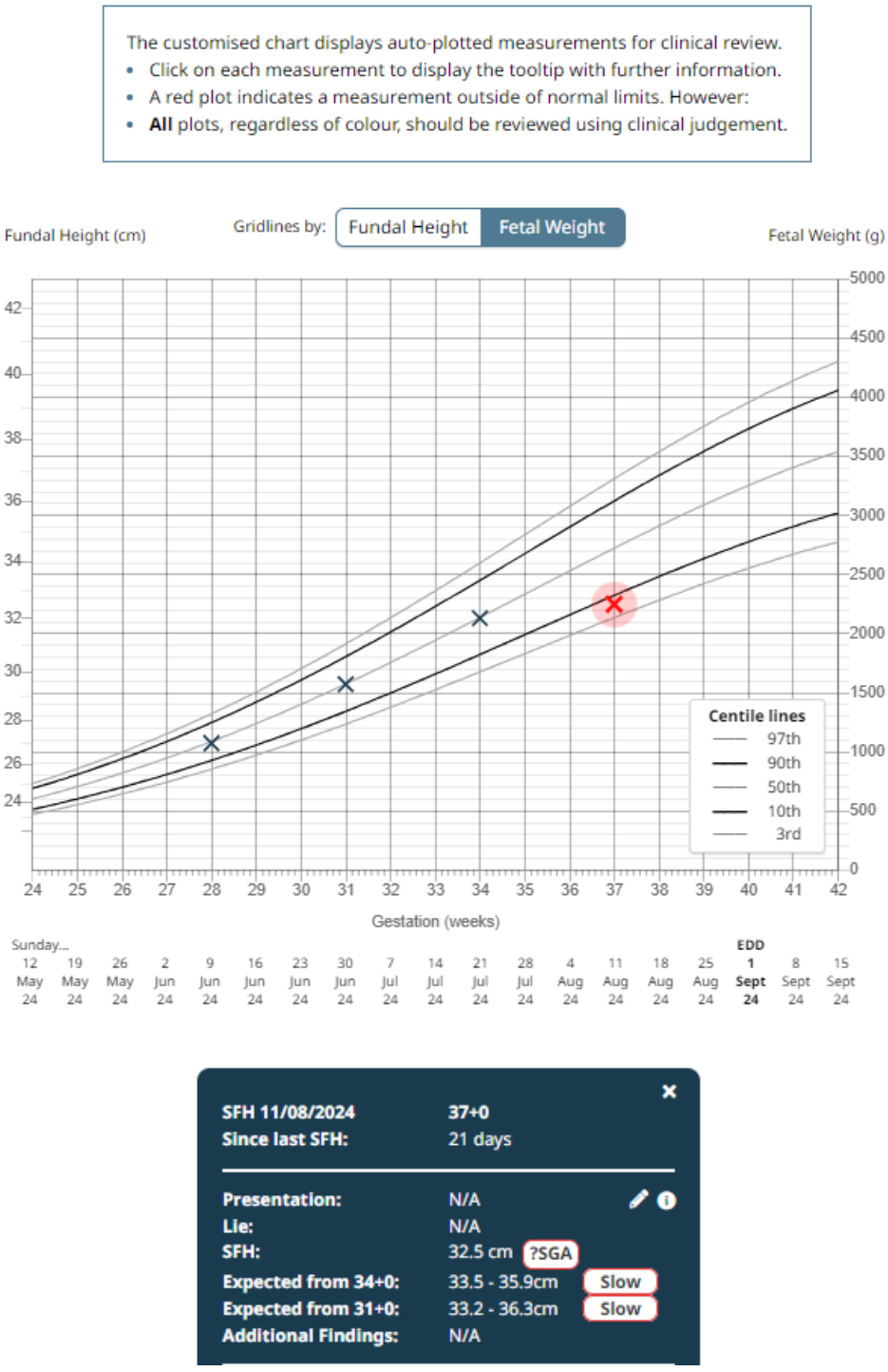


We recommend using the 90th and 10th centile lines as the upper and lower limits to define 'normal growth'. Normal growth rate / velocity varies with gestational age and is highest in the middle of the third trimester. It also varies with the customised growth potential of each fetus and will alter from one measurement to another.

SFH measurements within expected ranges will display as a black 'X'. Embeded into GROW v2.0 software there is a fetal growth rate tool. This provides additional information when clicking on a SFH of choice as seen below.

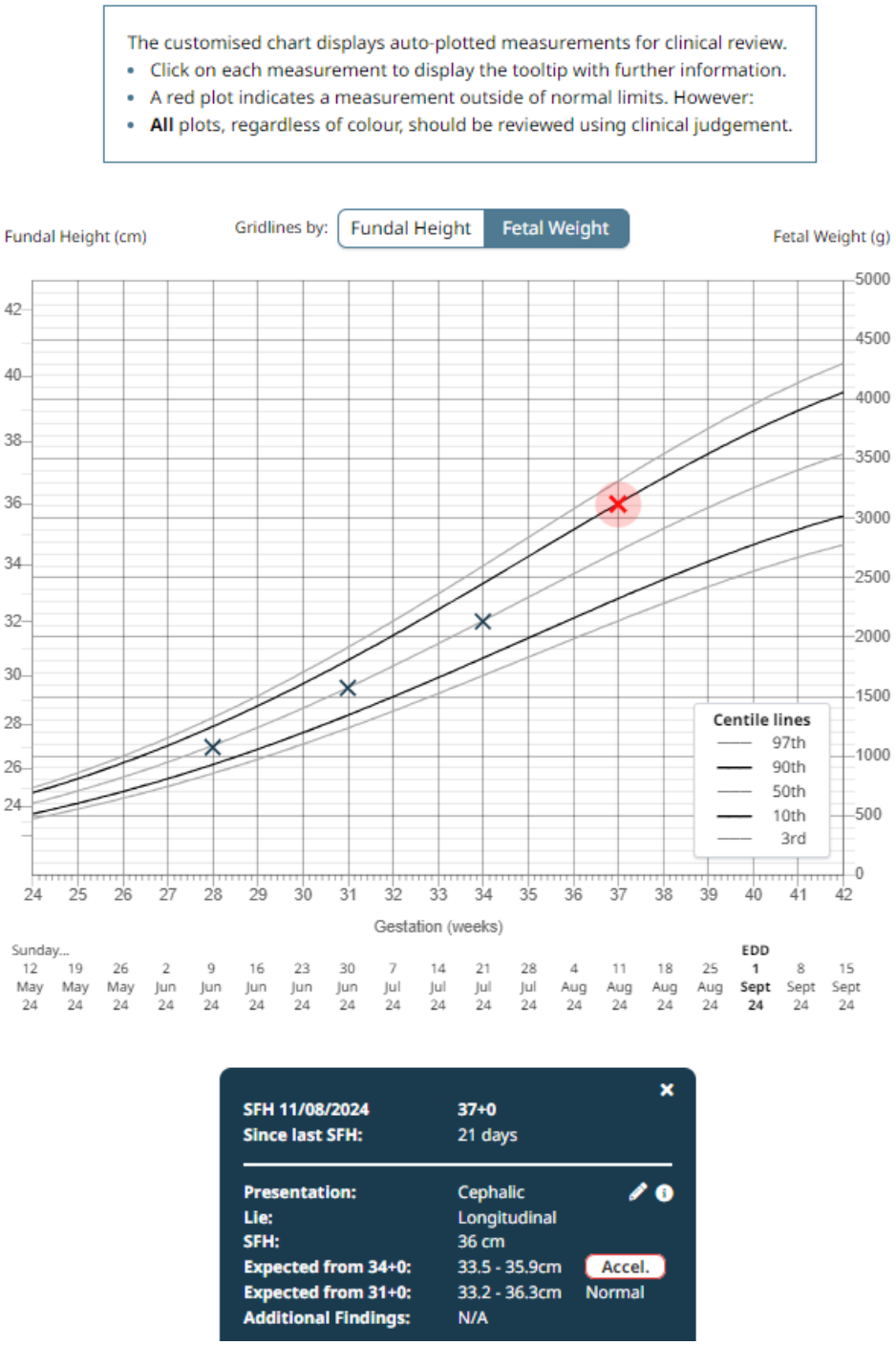
SFH measurements outside expected ranges will display as a red '**X**'as detailed in the following charts.

Example 3: Slow growth (this includes no or static growth)



In this example, the measurement is displayed as a red '**X**' and is almost identical in two measurements separated by 3 weeks. We would consider this to be slow growth as detailed by the fetal growth rate tool. This requires prompt referral for ultrasound assessment.

Example 4: Accelerated growth

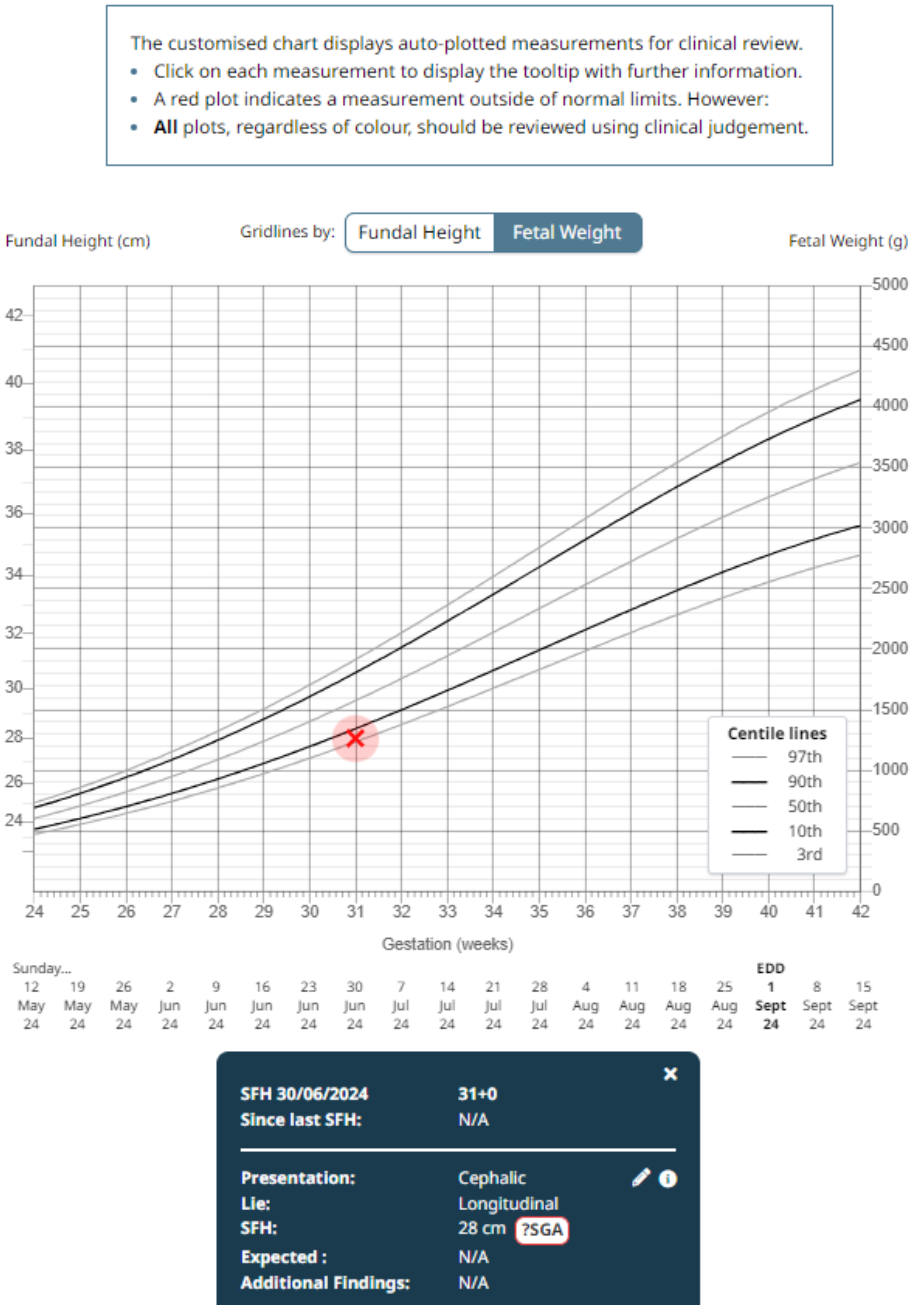


Displayed as a red '**X**'. The clinical concerns about large for gestational age (LGA) are very much less than small for dates (SGA). The SFH measurement is known to have considerable variability, often being above the 90th centile on the CGC in the 24 – 30 week range. We therefore recommend that an initial measurement above the 90th centile does **not prompt** ultrasound referral, but is repeated and is **only assessed by ultrasound examination if the plot increases steeply** >2cm above expected trajectory (which might occur with polyhydramnios or gestational diabetes). **NB Accelerated growth pattern can occur across any centiles, not exclusively >90th.**

Good communication is essential, one message, which can be quite frightening to a pregnant person, is that she is having a 'big baby.' The term 'big baby' **should not be used**. It is appropriate to reassure her and repeat the SFH measurement at next AN assessment.

Remember the use of ultrasound is to **estimate** fetal weight and therefore is not exact; therefore a calming reassuring approach is very important

Example 6: First plot below the 10th centile



Displayed as a red '**X**'. The first fundal height plot represents the initial assessment as well as the baseline for subsequent measurements, which are interpreted on the basis of the slope or velocity of growth.

If the first fundal height plot is below the 10th centile, this warrants a referral for an ultrasound assessment. An estimated fetal weight (EFW) and liquor volume should be calculated and plotted onto the customised growth chart.

If the EFW is between the 10th and 90th centiles, clinicians and mother can be reassured, and surveillance for fetal growth can return to fundal height measurements, with the subsequent plot trajectory continuing from the initial measurement. Subsequent fundal height measurements under the 10th centile do not require another referral for scan unless the trajectory of growth changes.

If the EFW is below the 10th centile, but normal liquor volume and normal umbilical artery Doppler, obstetric review is needed and a repeat ultrasound should be carried out in 2 weeks.

If the EFW is below the 10th centile with oligohydramnios and/or abnormal umbilical artery Doppler, this requires an immediate obstetric review.

5.4 Referral for further investigation [7]

Referral will be to Pregnancy Day Care or SWC for ultrasound biometry, amniotic fluid assessment +/- doppler assessment.

The sonographer will use 'Hadlock's 3' to determine the estimated fetal weight and if the head circumference (HC) is undeterminable the abdominal circumference (AC) and femur length (FL) will be used to estimate fetal weight. The ultrasound derived EFW will be entered into M EPR and populated onto the CGC using (**O**), therefore this will be identifiable from the plotted SFH measurement (**X**).

When to refer:

- If the first SFH measurement is below the 10th centile on the CGC.
- Slow growth
- If based on consecutive SFH measurements, there is concern about accelerated growth that is >2cm above expected trajectory.

Note
A first SFH measurement above the 90th centile **does not** need referral for scan for large for gestation age, unless there are other suspected clinical symptoms like polyhydramnios.

5.5 Follow up care following ultrasound

The ultrasound scan result will be reviewed by the PDC/SWC midwife in the first instance

- Normal fetal biometry: refer back to the community midwife who will continue to assess fetal growth by SFH measurement. Do not repeat SFH for 2 weeks and use the trajectory of the last SFH measurement as that is the one that reflects the EFW from the scan.
- 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. EFW >4.5kgs or AC >95th centile on scan

- GTT arranged within 1 week

If the GTT is impaired referral to the next Endocrine Consultant clinic for management plan.

2. EFW below 10th centile or reduced growth velocity, normal liquor volume, normal umbilical artery doppler

- For obstetric review

3. EFW below 10th centile or reduced growth velocity with oligohydramnios and/or abnormal umbilical artery doppler

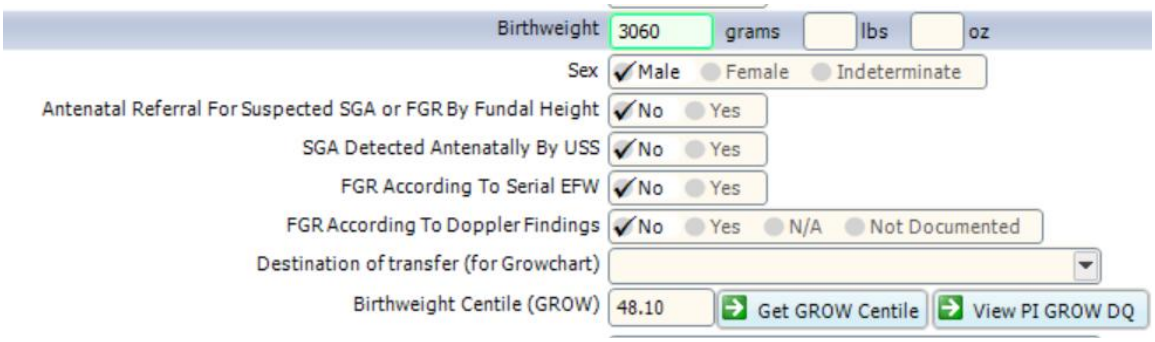
- For *immediate* senior obstetric review
- Middle cerebral artery doppler assessment will only be performed by a feto-

maternal medicine consultant.

Management in labour
Early admission should be recommended for pregnant women/birthing people in spontaneous labour with a fetus where growth problems have been identified, in order to instigate early fetal heart rate monitoring.

Following birth

- Calculate birth weight centile by entering the data in the M EPR.



All 4 questions relating to referral and diagnosis for SGA and/or FGA must be completed.

- **If birth centile <3rd centile or any other neonatal concerns refer to the care of the newborn guideline or paedatric review**.

5.6 GAP and GROW v2.0[7]

The Perinatal Institute's **Growth Assessment Protocol** (GAP) provides a tool for the assessment of fetal growth; **Growth Related Optimum Weight** (GROW v2.0) software. SFHFT uses this tool under licence to produce customised birth weight centiles and the CGC for plotting results. Please refer to their website for full information and as a resource for fetal growth https://www.perinatal.org.uk

6 EDUCATION AND TRAINING

1. Obstetricians and midwives to attend GAP/GROW study days (as required) at the Perinatal Institute and cascade the correct use of the GROW programme.
2. Annual update e-learning package recommended for all midwives, Obsetricians and registrarants in training, who provide antenatal care. E-learning package managed by the Perinatal Institute and the training database managed by the Practice Development Midwives.

7 MONITORING COMPLIANCE AND EFFECTIVENESS

1. Compliance will be monitored through ongoing review of practice and review of incidents.

2. e-learning package completion to be monitored annually by the Practice Development Midwives.
3. Peer review at time of scan review for appropriate SFH measurements and referral criteria for ultrasound assessment.
4. SFH measurement practical assesment during face to face Saving Babies Lives mandatory annual training.
5. Annual auditing of GAP/GROW data by SBLV3.2 Element 2 lead for:
    a. Antenatal referral for suspected SGA or FGR by fundal height
    b. SGA or FGR detected antenatally by USS recorded at time of birth weight centile calculation.
6. GAP score data: quarterly review by SFHFT nominated GAP/GROW admin lead.

8 EVIDENCE BASE/ REFERENCES

1. RCOG (2024) The Investigation and Management of the Small-for-Gestational-Age Fetus. Green-top Guideline No.31. https://www.rcog.org.uk/globalassets/documents/guidelines/gtg_31.pdf [accessed 11.7.24]

2. National Institute for Clinical Excellence (NICE) (2021) NICE Guideline (NG201) Antenatal Care https://www.nice.org.uk/guidance/ng201 [11.7.24]

3. MBRRACE-UK (2022) MBRRACE-UK Perinatal Mortality Surveillance Report UK perinatal deaths of babies born in 2022 https://timms.le.ac.uk/mbrrace-uk-perinatal-mortality/surveillance/ [11.7.24]

4. Sherwood Forest Hospitals (2024) What is driving us to do better https://www.sfh-tr.nhs.uk/about-us/our-strategy-2024-2029/what-is-driving-us-to-do-better/ [11.7.24]

5. NHS England. Saving Babies' Lives Version Three 2025.

6. Gardosi. J.O et al (2017) *Customised growthcharts: rational, vaslidation and clinical benefits.* AJOG https://www.ajog.org/article/S0002-9378(17)32486-9/pdf [accessed 11.7.24]

7. West Midlands Perinatal Institute website portal for documents (2024) https://www.perinatal.org.uk [accessed 11.7.24]

9 EQUALITY IMPACT ASSESSMENT (please complete all sections)

Name of service/policy/procedure being reviewed: Guideline for use of customised growth charts in pregnancy V6
New or existing service/policy/procedure: Existing

Date of Assessment: 28.8.24			
For the service/policy/procedure and its implementation answer the questions a – c below against each characteristic (if relevant consider breaking the policy or implementation down into areas)			
Protected Characteristic	a) Using data and supporting information, what issues, needs or barriers could the protected characteristic groups' experience? For example, are there any known health inequality or access issues to consider?	b) What is already in place in the policy or its implementation to address any inequalities or barriers to access including under representation at clinics, screening?	c) Please state any barriers that still need to be addressed and any proposed actions to eliminate inequality
The area of policy or its implementation being assessed: Implementation of the procedure of measuring SFH or accessing ultrasound examination service			
Race and Ethnicity:	None	N/A	N/A
Gender:	Pregnant women/birthing people only	N/A	N/A
Age:	none	N/A	N/A
Religion:	none	N/A	N/A
Disability:	Individual care plan for Pregnant women/birthing people with mobility /sensory /learning difficulty needs to enable the SFH measurement or ultrasound scan. Initial assessment to be performed by community midwife.	Individualised care plan to be recorded on the EPR. Liaison with other health care professionals dependant on the person's need.	None
Sexuality:	none	N/A	N/A
Pregnancy and Maternity:	Only for Pregnant women/birthing people	N/A	N/A
Gender Reassignment:	N/A	N/A	N/A
Marriage and Civil Partnership:	N/A	N/A	N/A
Socio-Economic Factors (i.e. living in a poorer neighbourhood / social deprivation):	N/A	N/A	N/A
What consultation with protected characteristic groups including patient groups have you carried out? • None			
What data or information did you use in support of this EqIA? • Experience of caring for pregnant women/birthing people with complex needs accessing maternity services			
As far as you are aware are there any Human Rights issues be taken into account such as arising from surveys, questionnaires, comments, concerns, complaints or compliments? • None			

Level of impact From the information provided above and following EqIA guidance document please indicate the perceived level of impact: Low Level of Impact For high or medium levels of impact, please forward a copy of this form to the HR Secretaries for inclusion at the next Diversity and Inclusivity meeting.

Name of Responsible Person undertaking this assessment: Claire Allison
Signature: Claire Allison
Date: 28.8.24