NORTH WEST GUIDELINE for the Detection and Management of FETAL GROWTH RESTRICTION

This guideline is for use in conjunction with the North West eFGR Integrated Care Pathway

Version 2.4
15/12/23

A collaborative guideline developed through contributions of Obstetric and Midwifery experts across the Strategic Clinical Networks (SCNs) in the North West of England.

Produced by

- Greater Manchester and Eastern Cheshire SCN
- North West Coast SCN

Document Control

Ownership

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Version control

Title	**North West Regional Guideline for the Detection and Management of Fetal Growth Restriction**
V2.1	Ratified September 2020
	Revisions: • Inclusion to risk factors for FGR (Previous FGR (<10th centile **AND** born <34 weeks); Inhibin A (2nd Trimester) >2MoM; aFP (2nd Trimester) >2.2MoM • Aspirin: the gestation for aspirin to 8-12 (previous version stated 8); criteria for the prescription of aspirin now includes; <10th centile **AND** born <34 weeks • Inclusion of follow up relating to UAD>95th centile • Change to the calculation of static growth; EFW from 32 weeks can now be used to calculate static growth. A scan interval of more than 4 weeks should not be used. • Clarification of the pathway for static growth (<20g per day by EFW) provided. • Clarification of timing of delivery for women ≥34 weeks based on clinical presentation • Inclusion of; when a baby is born with a birthweight less than the 3rd centile, the placenta should be sent for histology • 5th centile changes to 3rd centile as per text in the main body of the guideline. • Clarification of the pathway for high risk women including management of differing sub-groups • Reference to the 5th centile has been changed to the 3rd centile as per Saving Babies Lives care bundle version 2. This is reflected in the changes to the management lines on the Perinatal Institute customised growth chart
V2.2	**Ratified May 2021**
	Revision to section 2.2.2 Women at risk of FGR • Addition of advice for women who have an unknown pregnancy history
V2.2i	**Ratified December 2021**
V2.3	updated to include changes in line with SBLv3 and to ensure compliance with all elements of CNST Year 5; circulated to NW and GMEC SCNs for comments 6/10/23
V2.3	Updated to include further changes in line with SBLv3

Endorsement process

Ratification	V2.2 by GMEC SCN Maternity Steering Group on 4 June 2021 **V2.2i circulated December 2021**
	V2.4 by GMEC SCN maternity Steering Group on 15 December 2023
Review	Review Date: 15th December 2023 Responsibility of: North West FGR Network

Acknowledgements

We would like to thank the members of the NW FGR Group for their commitment and contribution to the development of this NW FGR Guideline. We would also like to acknowledge and thank the families who gave their time and experience to create this guideline; together we are committed to driving better outcomes for babies across our region.

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Contents

1 Introduction

Up to 40% of 'unexplained' stillbirths are small for gestation age (SGA) and thought to have suffered fetal growth restriction (FGR sometimes known as IUGR) (Gardosi et al, 2005). In addition, these infants are at increased risk of perinatal hypoxia and acidaemia, operative delivery, neonatal encephalopathy, and cerebral palsy (Ribbert et al. 2005, Jacobsson et al 2008).

Not all babies who are SGA (<10th centile birth weight) will have FGR, but the lower the centile the higher the chance that FGR will be present. The management strategies within this guideline reflect those recommended in SBLCBv2 and have been partially updated to include recommendations from SBLCBv3. This approach aims to increase identification of high-risk pregnancies whilst at the same time reducing unnecessary investigations and iatrogenic deliveries in lower risk women.

2 Detail of the Guideline

2.1 Monitor and review the risk of FGR throughout pregnancy

2.1.1 A risk assessment for FGR should be performed by 14 weeks gestation using the agreed pathway (Appendix 3) in all singleton pregnancies. In multiparous women risk assessment should include the calculation of previous birthweight centiles. These should be recorded in the woman's obstetric history section.

2.2.1 As part of the risk assessment for FGR, blood pressure should be recorded, at each contact, using a digital BP monitor that has been validated for use in pregnancy.

2.3.1 The risk of FGR should be reviewed throughout pregnancy and maternity providers should ensure that processes are in place to enable the movement of women between risk pathways dependent on current risk.

2.4.1 Women who are at increased risk of FGR should have ultrasound surveillance of fetal growth at 3-4 weekly intervals until delivery.

2.2 Women who are at low risk of FGR following initial risk assessment

2.2.1 Women who are at low risk of FGR following risk assessment should have surveillance using antenatal fundal height (FH) measurement, which should be started before 28+6 weeks gestation. Measurements should be plotted to the nearest 0.5cm and or recorded on charts by clinicians trained in their use. Staff who perform FH measurement should be competent in measuring, plotting (or recording), interpreting appropriately and referring when indicated. Only Staff who perform FH measurements need to undergo annual practical training in FH measurement and pass the competency assessment.

2.2.2 Where the FH is less than the 10th centile at the first plot or there is slowing or static velocity on the fetal growth chart and fetal movements are normal, the woman must be seen, within 72 hours for ultrasound scan of fetal growth, LV and umbilical artery

Doppler (UAD) (See Appendix 1). Where movements are reduced the woman must be seen in **INSERT NAME OF LOCAL SERVICE** on the same day where they should have a computerised CTG performed and ultrasound scan of fetal growth, LV and umbilical artery Doppler (UAD) arranged for the next working day (See Appendix1).

2.2.3 Women who are undergoing planned serial scan surveillance should cease FH measurement after serial surveillance begins. FH measurement should also cease if women are moved onto a scan surveillance pathway in later pregnancy for a developing pregnancy risk (e.g., recurrent reduced fetal movements).

2.2.4 SFH should be measured from the highest fetal pole to the top of the symphysis pubis, following the longitudinal lie of the fetus. Only in the few cases of a true transverse lie should direct referral for ultrasound scan take place.

2.3 Women at moderate risk of FGR

2.3.1 Women at moderate risk of FGR should have a one-off fundal height measurement to assess fetal growth at 28 weeks of pregnancy. If this measurement plots above the 10th centile on a growth chart no further action is required until the commencement of ultrasound assessment of fetal growth at 32 weeks' gestation. If the fundal height measurement plots below the 10th centile and fetal movements are normal, the woman must be seen within 72 hours for ultrasound scan of fetal growth, LV and umbilical artery Doppler (UAD) (See Appendix 1). Where movements are reduced the woman must be seen in **INSERT NAME OF LOCAL SERVICE** on the same day where they should have a computerised CTG performed and ultrasound scan of fetal growth, LV and umbilical artery Doppler (UAD) arranged for the next working day (See Appendix1).

2.3.2 Ultrasound assessment of fetal growth, umbilical artery Doppler assessment and LV should start from 32 weeks gestation and be repeated every 3-4 weeks (but not exceeding 4 weeks) until delivery. The scan should be reviewed by an appropriately trained person (sonographer / Midwife / Midwife Ultrasound Practitioner / Clinician). See Appendix 1, 2 and Appendix 4 for the management of abnormal findings.

2.3.3 Women who smoke at any gestation in pregnancy, regardless of if they have quit since conception should have serial scan surveillance throughout pregnancy from 32 weeks gestation until delivery.

2.4 Women at high risk of FGR

2.4.1 Women at high risk of FGR should have Uterine Artery Doppler (UtAD), Umbilical Artery Doppler (UAD) and assessment of fetal growth by abdominal ultrasound at 18+0 - 23+6 weeks gestation. Women who are high classified as risk should be considered for Aspirin 150mg ON from 8-12 weeks until 36 weeks gestation. A PGD is in place to allow direct midwifery prescription of this drug (Aspirin in Pregnancy PGD). Vitamin D should be offered to all women for the duration of their pregnancies as per trust guidance (Vitamin D in Pregnancy PGD).

2.4.2 Women will be assigned a "positive" screen if they have the following: EFW <10th centile, mean uterine artery PI>95th centile for gestation (use Gomez chart; Appendix 5) or uterine artery notching. If only one uterine is obtained, then the PI from this will be used. If neither is obtained, then this should be considered a positive

finding (i.e., high risk).

Follow up will be arranged 2-6 weekly depending on the findings:

- Normal uterine artery doppler & EFW <10th centile requires serial ultrasound scans from 26 weeks until delivery.
- Abnormal uterine artery doppler (as described above) & EFW >10th centile requires serial ultrasound scans from 28 weeks every 3 weeks until delivery.
- Abnormal uterine artery doppler and AC or EFW<10th centile - discuss with **INSERT NAME OF LOCAL GROWTH SERVICE**

2.4.3 Women with none of these features (negative screen) should be seen for ultrasound assessment of fetal growth at 32 weeks gestation unless abnormal serum markers have been identified in this pregnancy (low PAPP-A, raised inhibin, raised aFP) in which case scans should start and from 35 weeks. Ultrasound scans should continue every 3 weeks until delivery. Fundal height measurements should be conducted, where suitable, until the commencement of serial ultrasound scans.

2.5 Women who are unsuitable for assessment of fetal growth by fundal height measurement or with special circumstances

2.5.1 Women with BMI ≥35 should have serial scans from 32 weeks at 3-4 weekly until delivery.

2.5.2 Women who have multiple fibroids identified on ultrasound (defined as >2 fibroids > 5cm diameter) should undergo serial scans from 32 weeks' gestation 3-4 weekly until delivery.

2.5.3 Women with multiple pregnancy should be risk assessed using the trust Multiple pregnancy guideline **REFERENCE LOCAL GUIDELINE**

2.5.4 Women with pre-existing diabetes should be risk assessed using the trust diabetes in pregnancy guideline. **REFERENCE LOCAL GUIDELINE** . Women who develop diabetes in pregnancy should be monitored with ultrasound scans 3-4 weekly from 28 weeks. If women with diabetes develop FGR then management decisions should be made in partnership with the Consultant leads.

2.5.5 Women with significant part or complete uteri didelphys do not require uterine artery Dopplers but should receive serial ultrasound assessment from 28 weeks gestation until delivery. This category does not include women with minor septal abnormalities or bicornuate uteruses.

2.6 Provide the correct surveillance when FGR is suspected and delivery at the right time

2.6.1 Management of women when SGA/FGR is detected

When FGR is suspected an assessment of fetal wellbeing should be made including a discussion regarding fetal movements (see Element 3) and if required computerised CTG (cCTG). A maternal assessment should be performed at each contact this should include blood pressure measurement using a digital monitor that has been validated for use in pregnancy and a urine dipstick assessment for

proteinuria. In the presence of hypertension NICE guidance on the use of PlGF/sflt1 testing should be followed.

2.6.2 Women diagnosed with SGA or FGR (<3rd centile) should be managed in accordance with Appendix 2 and if <32 weeks the NW eFGR integrated care pathway should be commenced.

2.6.3 In women <28 weeks' gestation with an estimated fetal weight <3rd centile, discussion should take place with the Consultant on call within 24 hours regarding a plan of care, and the woman should also be referred to **INSERT NAME OF LOCAL SERVICE** (see Appendix 2).

2.6.4 In the presence of absent/reversed end diastolic flow in Umbilical Artery Doppler (UAD) at less than 32 weeks a Fetal Medicine assessment should be sought within 24 hours. This assessment should include a repeat Umbilical Artery Doppler assessment, Ductus Venosus Doppler assessment and a review of fetal growth. If UAD PI is >95th centile in both vessels (see Appendix 6: Archarya et al, 2005) repeat Doppler twice per week until UAD returns to <95th centile or until delivery is indicated. If unable to obtain a review within 24 hours at the local unit, Manchester Placenta Clinic practitioners must be contacted to see if there is capacity to review there.

2.6.5 Antenatal steroids should not be administered before this assessment has occurred. If assessment is not available within 24 hours, then a computerised CTG should be performed. If computerised CTG criteria are met, then delivery can be postponed until a fetal medicine opinion is obtained at the next possible opportunity. If computerised CTG criteria are not met, then a review of which component this is dependent on should take place by a senior obstetrician. If the component is STV then refer to NW eFGR integrated care pathway, available via the Trust intranet (Appendix 8). If the cCTG does not meet the criteria on another component then the decision regarding whether to proceed to delivery or repeat the cCTG is the responsibility of the consultant obstetrician caring for the patient.

2.6.6 In the presence of absent/reversed end diastolic flow in UAD ≥ 32 weeks delivery should occur as soon as is safely possible following the administration of steroids.

2.7 Delivery planning

2.7.1 All management decisions regarding the timing of FGR infants and the relative risks and benefits of iatrogenic delivery should be discussed and agreed with the mother. When the estimated fetal weight (EFW) is <3rd centile and there are no other risk factors, initiation of labour and/or delivery should occur at 37+0 weeks and no later than 37+6 weeks gestation.

2.7.2 In fetuses with an EFW between the 3rd and <10th centile, delivery should be considered at 39+0 weeks. Birth should be achieved by 39+6 weeks. Other risk factors should be present for birth to be recommended prior to 39 weeks (see 2.20)

2.7.3 If delivery when EFW<1.8kg or gestation <35 weeks is planned due to FGR then the availability of neonatal care should be identified prior to induction or caesarean delivery. If no suitable facilities are available, arrangements can be made for transfer but only if there is a normal computerised CTG and/or a normal Ductus venosus a-wave (if <32 weeks) prior to this occurring. Where this is not the case women must be delivered locally with ex-utero neonatal transfer as needed.

2.7.4 In women <34 weeks' gestation, delivery should usually be by planned by caesarean section 24 hours after the second dose of antenatal steroids. At least 4 hours prior to

caesarean section a magnesium sulphate loading dose and infusion should be offered to all women between 24+0 and 29+6 weeks of pregnancy and considered for women between 30+0 and 33+6 weeks of pregnancy. This has been shown to reduce the incidence of cerebral palsy in high risk pre-term infants (RCOG, 2011).

2.7.5 For women ≥ 34 weeks, timing of delivery depends on the estimated fetal weight centile, growth velocity and the whole clinical picture and input from **INSERT NAME OF LOCAL SERVICE** should be sought.

2.7.6 Infants with likely FGR (<3rd centile EFW), with no additional clinical concerns, should be delivered 37+0-37+6 . Infants with SGA at moderate risk of FGR (3rd - <10th centile), with no additional clinical concerns, should be delivered 39+0–39+6 .

2.7.7 When inadequate growth is suspected in babies >10th centile (defined as <20g/day increase in EFW from serial scans no more than 3 weeks apart ≥32 weeks) other features must be considered before delivery is planned.
In the presence of other concerning features (reduced fetal movements, any umbilical or middle cerebral Doppler abnormality, cCTG that does not meet criteria, maternal hypertensive disease, abnormal PlGF/sFlt1 ratio or reduced liquor volume) delivery should be considered from 36 weeks.
Reassuring features such as current EFW centile >50th centile should also be considered. All cases where delivery is considered should be discussed with the **INSERT NAME OF LOCAL SERVICE** within 72 hours of diagnosis.
The decision to deliver prior to 37 weeks must be made by a Consultant. If there are no concerning features, then attempts should be made to prolong pregnancy until 37+0 weeks gestation with additional cCTG monitoring in place if there are either medical or maternal concerns.

2.7.8 Infants with abnormal dopplers or MDVP <2cm should be reviewed by a consultant obstetrician and delivery planned (see appendix 2).

2.8 Postnatal management

2.8.1 An individual birth weight centile must be calculated for every baby (live born/stillborn/multiples) at birth, this must be documented on the neonatal record and in the child's personal health record (red book).

2.8.2 If a baby is born with a birthweight less than 3rd centile, consideration should be given to histopathological examination of the placenta.

2.8.3 All low-risk woman who deliver a baby with a birth weight less than the 3rd centile and less than 32+6 weeks must be offered a follow up postnatal appointment.
At this time any potentially identifiable risk factor for FGR in future pregnancies will be discussed. Scientific data supporting a causal association between either methylenetetrahydrofolate reductase (MTHFR) polymorphisms or other common inherited thrombophilias and adverse pregnancy outcomes, such as recurrent pregnancy loss, severe preeclampsia and FGR, are lacking. Specific testing for antiphospholipid antibodies, when clinically indicated, should be limited to lupus anticoagulant, anticardiolipin antibodies and beta 2 glycoprotein antibodies.
Babies with a birthweight centile of 2 or less should have their care managed INSERT NAME OF LOCAL GUIDELINE (e.g. hypoglycaemia prevention and thermoregulation following birth).

3 Communication and Documentation

All women with learning disabilities, visual or hearing impairments or those whose first language is not English must be offered assistance with interpretation where applicable, and where appropriate a telephone interpreter must be used. It is paramount that clear channels of communication are maintained at all times between all staff, the women and their families. Once any decisions have been made/agreed, comprehensive and clear details must be given to the woman thereby confirming the wishes of the women and their families. The contents of any leaflet issued must be explained in full at the time it is issued. All communication difficulties (including learning difficulties) and language barriers must be addressed as outlined in the previous paragraph at the time the leaflet is issued.

Ensure the provision and discussion of information of the risks and benefits with women during the antenatal, intrapartum and postnatal periods.

Staff should aim to foster a culturally sensitive care approach in accordance with the religious and cultural beliefs of the parents and families in our care. All women with learning disabilities, visual or hearing impairments or those whose first language is not English must be offered assistance with interpretation where applicable, and where appropriate a telephone interpreter must be used. It is paramount that clear channels of communication are maintained at all times between all staff, the women and their families. Once any decisions have been made/agreed, comprehensive and clear details must be given to the woman thereby confirming the wishes of the women and their families. The contents of any leaflet issued must be explained in full at the time it is issued. All communication difficulties (including learning difficulties) and language barriers must be addressed as outlined in the previous paragraph at the time the leaflet is issued.

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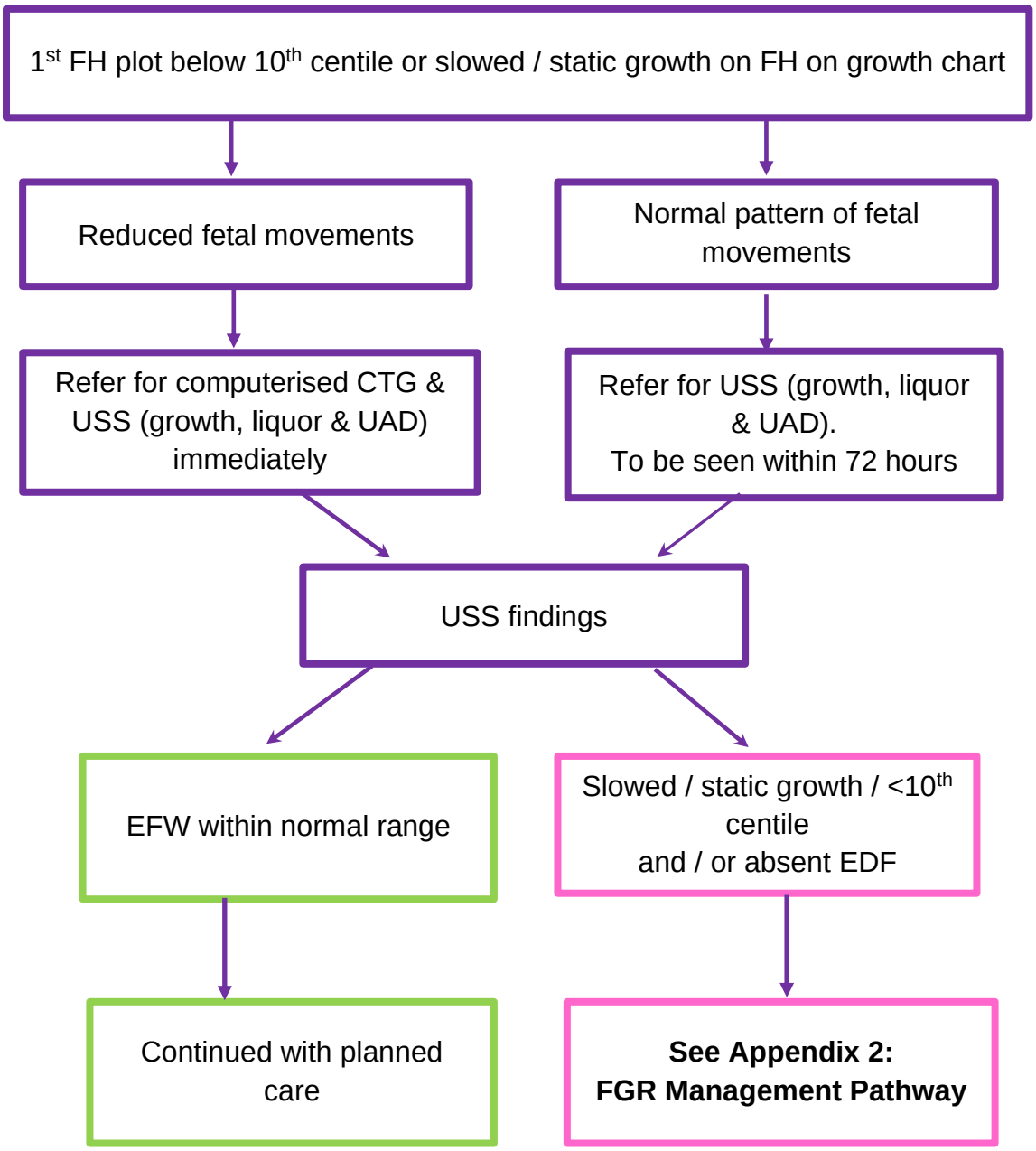
4 Equality, Diversity and Human Rights Impact Assessment

The EqIA score fell into low priority; no significant issues in relation to equality, diversity, gender, colour, race or religion are identified as raising a concern.

5 Consultation, Approval and Ratification Process

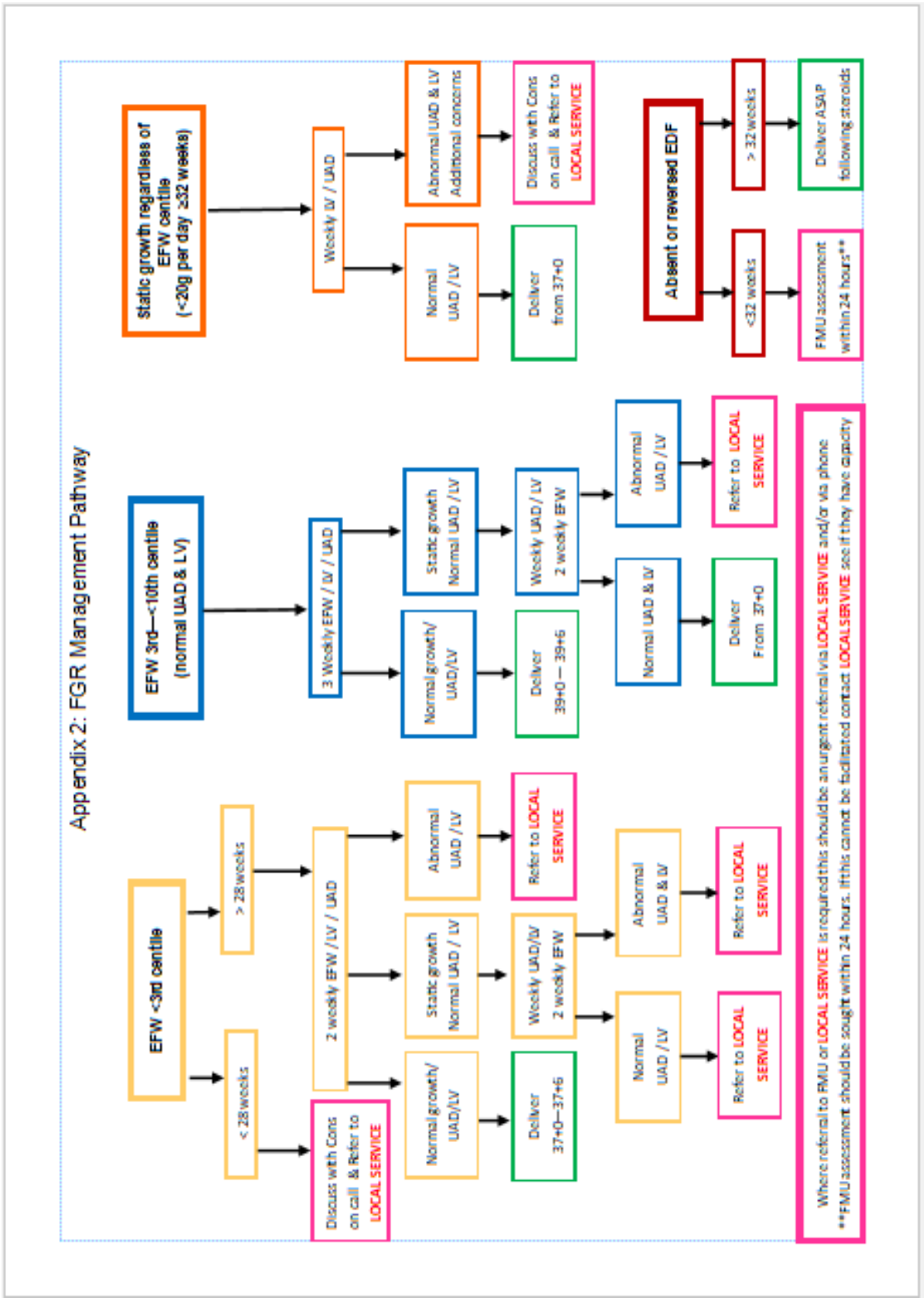
This guideline has been approved and ratified in accordance with the agreed process. Refer to Guideline for the Introduction or *Re-approval of a Clinical Guideline for Obstetric Practice.*

Appendix 1 - Abnormal Fundal Height (FH) Measurement pathway



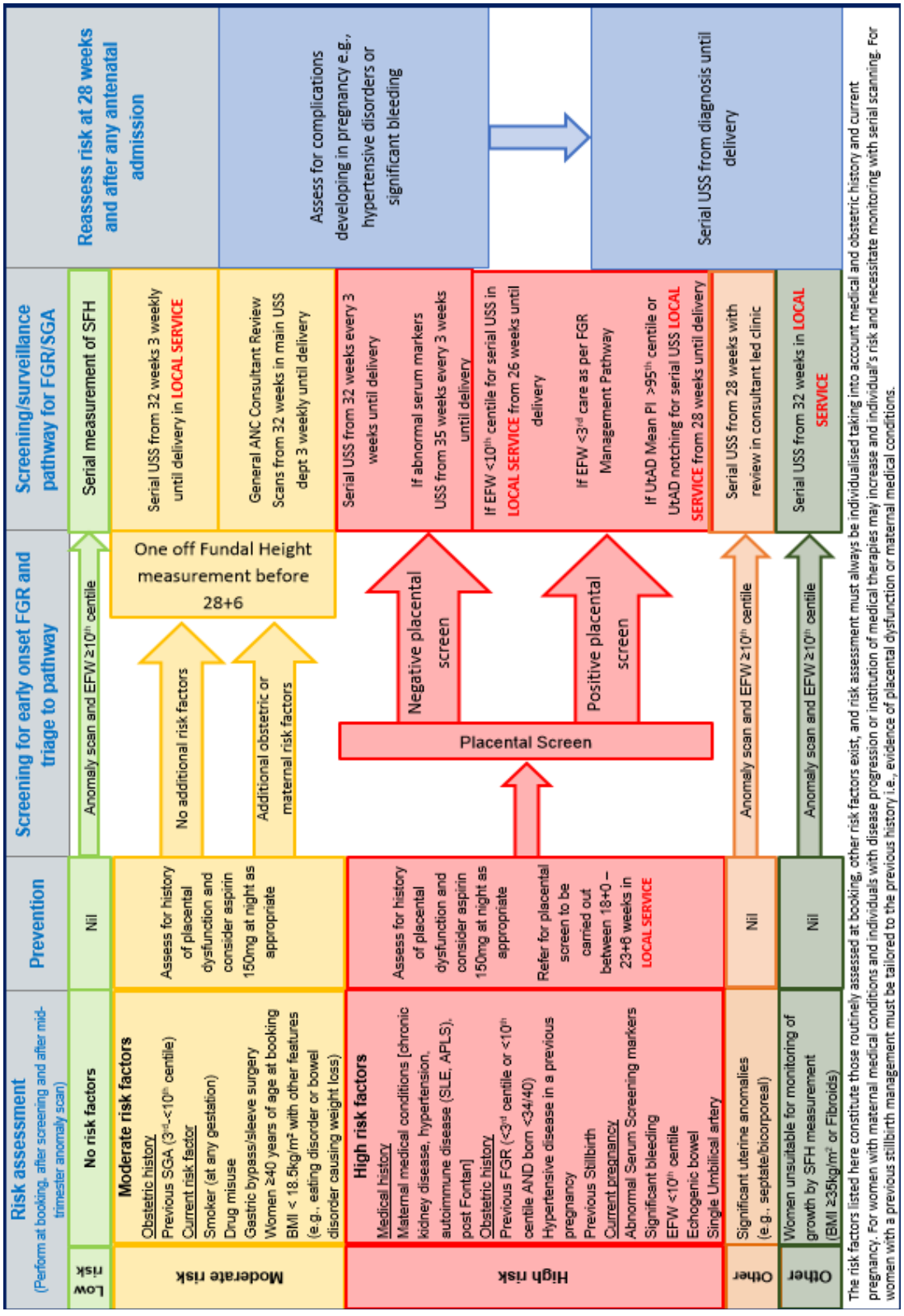
Appendix 2 - FGR Management Pathway

Updated October 2023

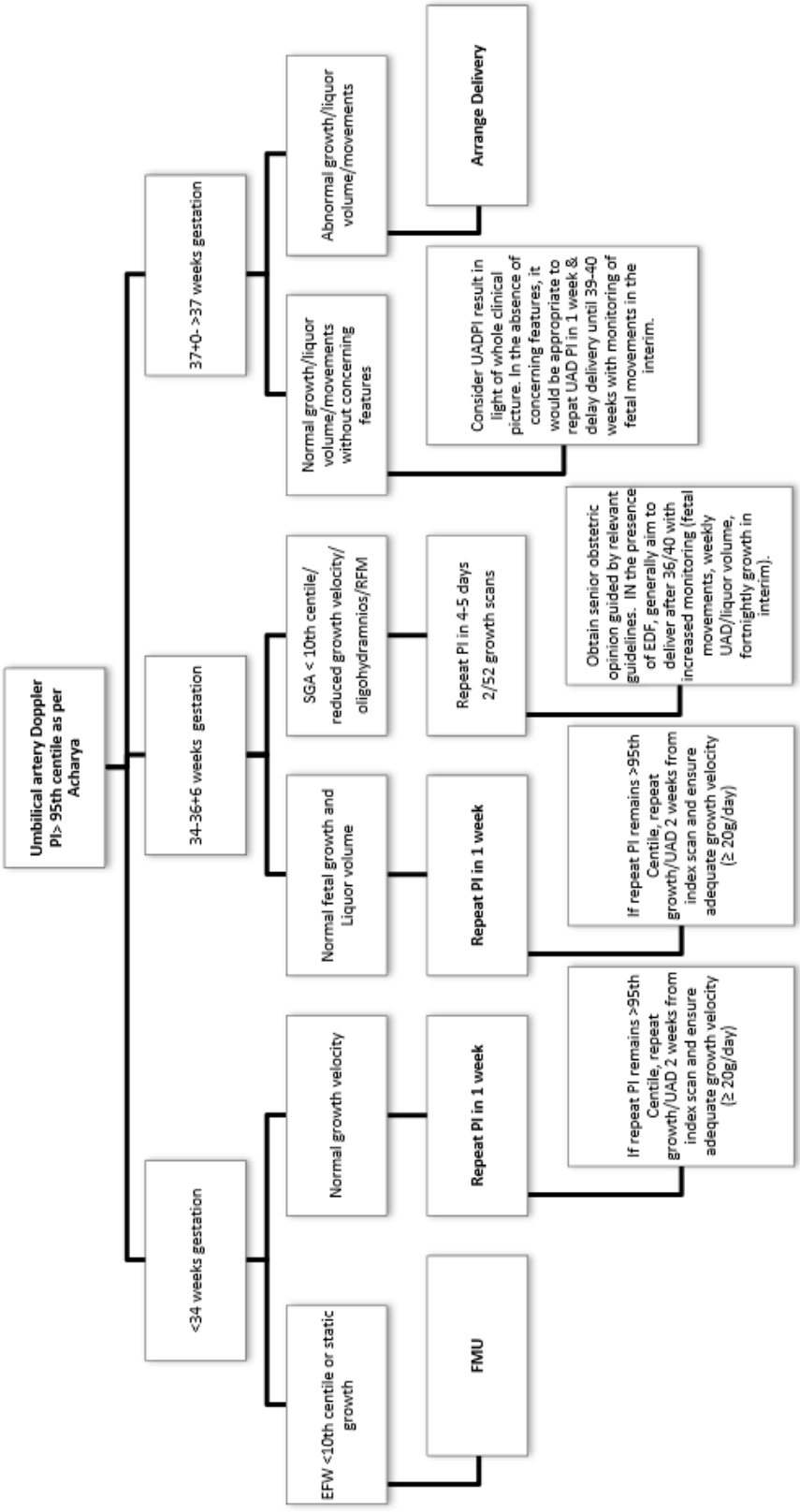


Appendix 3 - Risk assessment, surveillance pathway and management of FGR

Updates October 2023



Appendix 4 – Umbilical Artery Doppler Pathway



Appendix 5 - Reference ranges for uterine artery mean pulsatility index at 11 – 41 weeks of gestation

Table 2 Reference intervals for mean uterine artery pulsatility index

GA (weeks)	*5th centile*	*50th centile*	*95th centile*
11	1.18	1.79	2.70
12	1.11	1.68	2.53
13	1.05	1.58	2.38
14	0.99	1.49	2.24
15	0.94	1.41	2.11
16	0.89	1.33	1.99
17	0.85	1.27	1.88
18	0.81	1.20	1.79
19	0.78	1.15	1.70
20	0.74	1.10	1.61
21	0.71	1.05	1.54
22	0.69	1.00	1.47
23	0.66	0.96	1.41
24	0.64	0.93	1.35
25	0.62	0.89	1.30
26	0.60	0.86	1.25
27	0.58	0.84	1.21
28	0.56	0.81	1.17
29	0.55	0.79	1.13
30	0.54	0.77	1.10
31	0.52	0.75	1.06
32	0.51	0.73	1.04
33	0.50	0.71	1.01
34	0.50	0.70	0.99
35	0.49	0.69	0.97
36	0.48	0.68	0.95
37	0.48	0.67	0.94
38	0.47	0.66	0.92
39	0.47	0.65	0.91
40	0.47	0.65	0.90
41	0.47	0.65	0.89

Transvaginal and transabdominal ultrasound examinations were performed on pregnancies at 11–14 weeks and 15–41 weeks, respectively. GA, gestational age.

Gómez, O (2008). Reference ranges for uterine artery mean pulsatility index at 11 – 41 weeks of gestation. *Ultrasound Obstet Gynaecol,* 32: 128 – 132. DOI:10.1002/uog.5315. Published online 6th May 2008.

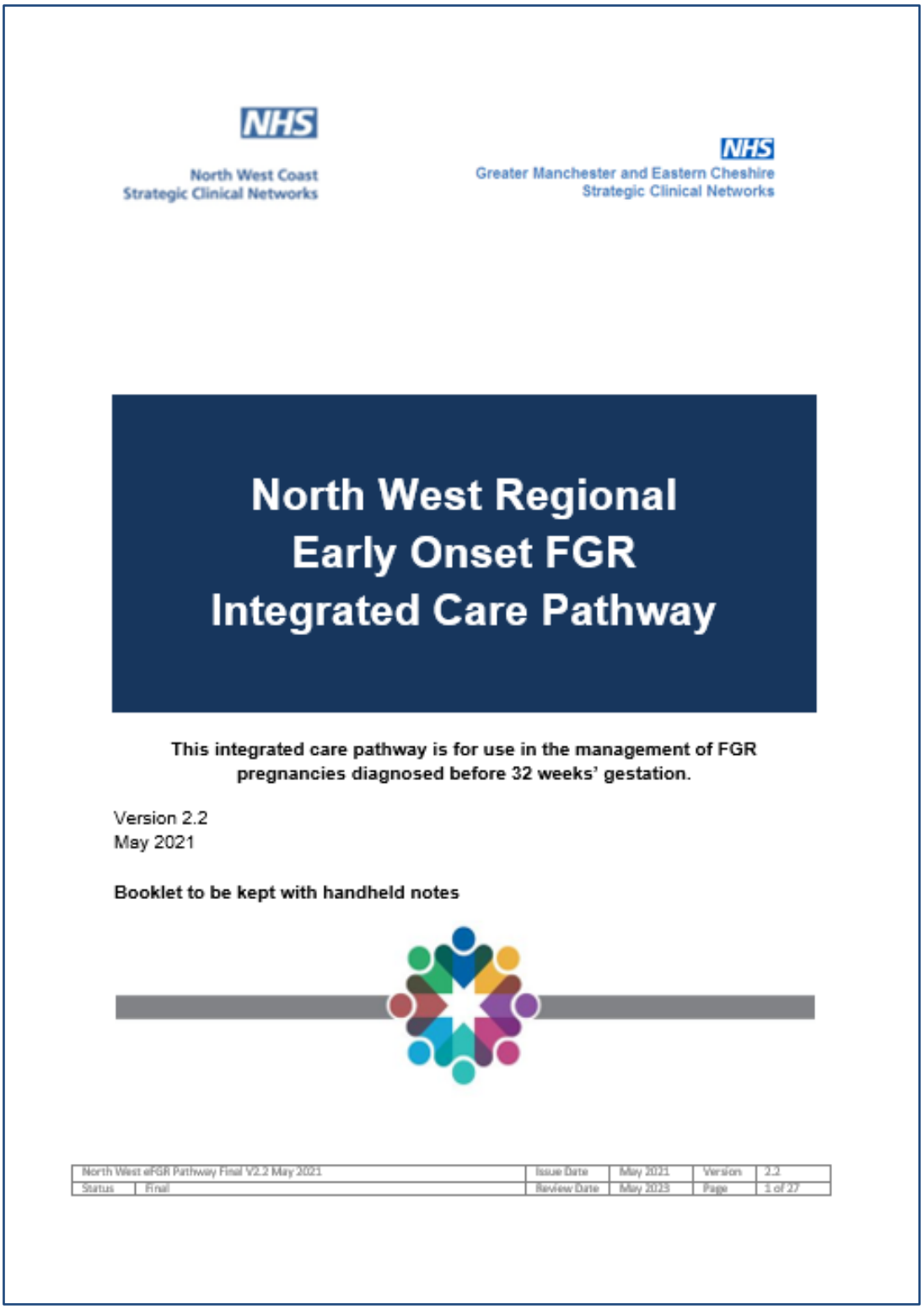
Appendix 6 - Reference range for serial measurements of umbilical artery Doppler indices in the second half of pregnancy

	Percentile								
Gestation (wk)	2.5th	5th	10th	25th	50th	75th	90th	95th	97.5th
19	0.97	1.02	1.08	1.18	1.30	1.44	1.57	1.66	1.74
20	0.94	0.99	1.04	1.14	1.27	1.40	1.54	1.62	1.70
21	0.90	0.95	1.00	1.10	1.22	1.36	1.49	1.58	1.65
22	0.87	0.92	0.97	1.07	1.19	1.32	1.46	1.54	1.62
23	0.84	0.89	0.94	1.04	1.15	1.29	1.42	1.50	1.58
24	0.81	0.86	0.91	1.00	1.12	1.25	1.38	1.47	1.55
25	0.78	0.83	0.88	0.97	1.09	1.22	1.35	1.44	1.51
26	0.76	0.80	0.85	0.94	1.06	1.19	1.32	1.41	1.48
27	0.73	0.77	0.82	0.92	1.03	1.16	1.29	1.38	1.45
28	0.71	0.75	0.80	0.89	1.00	1.13	1.26	1.35	1.43
29	0.68	0.72	0.77	0.86	0.98	1.10	1.23	1.32	1.40
30	0.66	0.70	0.75	0.84	0.95	1.08	1.21	1.29	1.37
31	0.64	0.68	0.73	0.82	0.93	1.05	1.18	1.27	1.35
32	0.62	0.66	0.70	0.79	0.90	1.03	1.16	1.25	1.32
33	0.60	0.64	0.68	0.77	0.88	1.01	1.14	1.22	1.30
34	0.58	0.62	0.66	0.75	0.86	0.99	1.12	1.20	1.28
35	0.56	0.60	0.64	0.73	0.84	0.97	1.09	1.18	1.26
36	0.54	0.58	0.63	0.71	0.82	0.95	1.07	1.16	1.24
37	0.53	0.56	0.61	0.69	0.80	0.93	1.05	1.14	1.22
38	0.51	0.55	0.59	0.68	0.78	0.91	1.04	1.12	1.20
39	0.49	0.53	0.57	0.66	0.76	0.89	1.02	1.10	1.18
40	0.48	0.51	0.56	0.64	0.75	0.87	1.00	1.09	1.17
41	0.47	0.50	0.54	0.63	0.73	0.85	0.98	1.07	1.15

Acharya, G et al (2005). Reference ranges for serial measurements of umbilical artery Doppler indices in the second half of pregnancy. *Am J Obstet Gynecol, Mar; 192(3): 937-44*

Appendix 7 - NW Early Onset FGR Integrated Care Pathway

https://www.england.nhs.uk/north-west/wp-content/uploads/sites/48/2021/06/North-West-eFGR-Pathway-Final-V2.2-May-2021.pdf



NHS
North West Coast
Strategic Clinical Networks

NHS
Greater Manchester and Eastern Cheshire
Strategic Clinical Networks

North West Regional Early Onset FGR Integrated Care Pathway

This integrated care pathway is for use in the management of FGR pregnancies diagnosed before 32 weeks' gestation.

Version 2.2
May 2021

Booklet to be kept with handheld notes

North West eFGR Pathway Final V2.2 May 2021		Issue Date	May 2021	Version	2.2
Status	Final	Review Date	May 2023	Page	1 of 27

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