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Ultrasound for Suspected SGA

Classification:	Guideline
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Departments/Group this Document applies to:	Maternity

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Unique Identifier: MIDW/GL/180	**Status:** Approved	**Version No:** 2

Guideline to be followed by (target staff): Midwives and obstetricians

To be read in conjunction with the following documents:

Are there any eCARE implications? No

CQC Fundamental standards:
Regulation 9 – person centered care
Regulation 10 – dignity and respect
Regulation 11 – Need for consent
Regulation 12 – Safe care and treatment
Regulation 13 – Safeguarding service users from abuse and improper treatment
Regulation 14 – Meeting nutritional and hydration needs
Regulation 15 – Premises and equipment
Regulation 16 – Receiving and acting on complaints
Regulation 17 – Good governance
Regulation 18 – Staffing
Regulation 19 – Fit and proper

Disclaimer

Since every patient's history is different, and even the most exhaustive sources of information cannot cover every possible eventuality, you should be aware that all information is provided in this document on the basis that the healthcare professionals responsible for patient care will retain full and sole responsibility for decisions relating to patient care; the document is intended to supplement, not substitute for, the expertise and judgment of physicians, pharmacists or other healthcare professionals and should not be taken as an indication of suitability of a particular treatment for a particular individual.

The ultimate responsibility for the use of the guideline, dosage of drugs and correct following of instructions as well as the interpretation of the published material **lies solely with you** as the medical practitioner.

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Guideline Statement

Prenatal ultrasound for fetal biometry and Doppler is the method of choice for the evaluation of the suspected small fetus. Small for gestational age (SGA) is defined as the fetus whose estimated fetal weight (EFW) on prenatal ultrasound is less than the 10th centile. At Milton Keynes University Hospital (MKUH), customised GAP/GROW charts and centiles are used, rather than population based centiles.

A significant proportion of SGA babies are constitutionally small but healthy fetuses. Unnecessary medical intervention in those pregnancies will not improve perinatal outcome. Conversely, SGA babies who are growth restricted due to placental insufficiency carry an increased risk of stillbirth and these are most likely to benefit from early delivery. There is also a very small proportion of SGA fetuses which have an underlying chromosomal or genetic abnormality but these babies are beyond the scope of this guideline

Executive Summary

The objective of this guideline is to define the follow up and management of ultrasound findings suggestive of SGA beyond 24+0 weeks gestation within MKUH. This guideline does not cover the management of babies with congenital or genetic abnormalities; or the management of large for gestational age fetus (LGA).

Treatment and care should take into account women's needs and preferences. Pregnant women should be offered evidence-based information and support to enable them to make informed decisions about their care and treatment.

1.0 Implementation and dissemination of document

This Guideline has followed the Guideline review process and is accessible via the Trust Intranet.

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2.0 Definitions

Table 1. Definitions	
SGA	Small for gestational age: estimated fetal weight below the 10th centile on customized GAP-GROW chart
AC	Abdominal circumference
AC deceleration	Clinically significant alteration of the AC percentile position by more than 40 percentile points since the anomaly scan
c-EFW	Estimated fetal weight plotted on the patient's customized GAP-GROW chart
Umb PI	Umbilical artery pulsatility index
MCA PI	Middle cerebral artery pulsatility index
CPR	Cerebroplacental ratio = MCA PI / Umb PI
Normal Umbilical Doppler	Umb PI < 95th centile
Normal CPR	CPR > 1.1
Abnormal Umbilical Doppler	Umbilical PI > 95th centile **OR** Absent EDF **OR** Reversed EDF
Abnormal CPR	CPR < 1.1
CTG	Cardiotocogram
c-CTG	Computerised CTG where Dawes Redman criteria are recorded
EDF	End diastolic flow
PAPP-A	Pregnancy associated plasma protein A

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3.0 Roles and Responsibilities

3.1 Ultrasound Department

The reporting sonographer is responsible for appropriate follow-up at the end of the ultrasound examination. The algorithm in Appendix 1 should be followed.

- Ultrasound scan reports for singleton pregnancies > 24+0 weeks gestation should include assessment of biparietal diameter (BPD); head circumference (HC); abdominal circumference (AC); femur length (FL); and estimated fetal weight (EFW). The amniotic fluid should be assessed by maximum vertical pool depth (MVP). The report should include fetal presentation, placental position and umbilical artery Doppler assessment by pulsatility index (PI) and resistance index (RI).
- The second page of the ultrasound report should include four (4) charts, displayed as two (2) charts per line: HC, AC, MVP and Umb PI.
- The EFW should be manually entered in the patient's notes, on the printed customized EFW chart page.
- If the scan demonstrates normal growth the woman should return to the care of her lead professional.
    - If previously under low risk midwifery-led care, no further scans are required and should return to midwife follow up.
    - If under Consultant care or under the Saving Babies Lives care bundle, the woman should return to the next scheduled clinic or scan appointment.
- **c-EFW < 10th centile** or **AC deceleration > 40 points from the anomaly scan** with normal umbilical Doppler: refer to Antenatal Clinic.
- **Umb PI > 95th centile:** please book repeat Doppler in Fetal Medicine within 4 days.
- **Absent or Reversed umbilical EDF:** please inform the on call Registrar or Consultant and refer the patient urgently to ADAU for c-CTG and admission.

3.2 ADAU and Antenatal Clinic

The obstetricians and midwives are responsible for appropriate follow-up and management once the woman is reviewed in ADAU or Antenatal clinic. The algorithms in Appendix 1 and 2 should be followed.

- **SGA between 24+0 and 35+6 weeks with normal umbilical Doppler** should be seen in Antenatal Clinic fortnightly with scan in Ultrasound Department; follow the algorithm in Appendix 1.
- If umbilical Doppler is normal, referral to Fetal Medicine is usually not required.
- **Criteria for referral to Fetal Medicine**:
    - EFW < 3rd centile (see Appendix 3)
    - Umbilical PI > 95th centile (within 4 days)
    - Absent or reversed umbilical EDF: admit and see Appendix 4
    - SGA at ≥ 36+0 weeks (within 7 days)

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3.3 Fetal Medicine

The obstetricians and midwives in Fetal Medicine are responsible for appropriate management and follow-up once the woman is referred to Fetal Medicine.

- Women should be referred to Fetal Medicine if:
  - EFW < 3rd centile (see Appendix 3)
  - Umbilical PI > 95th centile (within 4 days)
  - Absent or reversed umbilical EDF: admit and see Appendix 4
  - SGA at ≥ 36+0 weeks (within 7 days)
- The management of SGA after 36+0 weeks should follow the principles outlined in Appendix 2.

4.0 Processes and Procedures

4.1 SGA at 24+0 - 35+6 weeks

The follow up and management of preterm SGA should follow the principles outlined in Appendices 1 and 4.

- **Normal umbilical Doppler and normal movements:** the risk of stillbirth is very low and therefore c-CTG or admission are not required. Organise fortnightly scan in Ultrasound Department with same day appointment in Antenatal Clinic. Only refer to Fetal Medicine for criteria in paragraph 3.3.
- **Umbilical PI > 95th centile**: offer c-CTG in ADAU and arrange repeat doppler in Fetal Medicine within 4 days.
- **Absent or reversed EDF**: organize urgent medical review and c-CTG in ADAU. The patient should be admitted for daily c-CTG. Please discuss with Fetal Medicine. Subsequent management should depend on gestational age, fetal size, c-CTG and the presence of any maternal co-morbidity such as preeclampsia, diabetes etc. Please also refer to Appendix 4 for management in line with the AHSN guideline on severe preterm IUGR.

  In particular:
  - EFW < 500g and/or < 26 weeks: do not perform CTG, do not give steroids but discuss with Fetal Medicine.
  - EFW < 800g and/or < 28 weeks: give steroids, do c-CTG and then organise transfer to tertiary neonatal care unit i.e. Oxford University Hospitals (OUH).
  - EFW > 800g and gestation <32 weeks: give steroids, do c-CTG and consider the options of either local care in MKUH or transfer to OUH.
  - EFW > 800g and > 32 weeks: give steroids, do c-CTG and deliver by cesarean section within 24-48 hours in MKUH.
  - If c-CTG is abnormal discuss with Consultant Obstetician, Fetal Medicine and Neonatologist: urgent delivery may be required if the baby has viable weight.

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4.2 SGA at 36+0 weeks

There is no conclusive evidence from randomized controlled trials to inform the decision or timing of delivery for near term SGA. According to the RCOG Guideline No 31, delivery may be offered at 37 weeks but additional Doppler investigations and senior clinician involvement can be used in order to determine the timing of delivery.

A significant proportion of SGA babies are constitutionally small but healthy fetuses. Unnecessary medical intervention in those pregnancies will not improve perinatal outcome. With appropriate ultrasound and Doppler surveillance, these fetuses can be monitored expectantly beyond 37+0 weeks.

Conversely, SGA babies who are growth restricted due to placental insufficiency carry an increased risk of perinatal death and these are most likely to benefit from early delivery at 37+0 or even earlier if required. Near term the umbilical artery Doppler is often normal and it is not useful in isolation in order to distinguish between the small healthy fetus and the fetus at risk. The management of SGA at this gestation should be based on the presence or absence of the complicating factors included in Table 2 and in particular the **cerebroplacental ratio (CPR)** and the **AC deceleration,** both of which are potent predictors of placental insufficiency and adverse perinatal outcome.

Table 2. SGA plus at least one of the following
AC deceleration > 40 points since the anomaly scan
Abnormal CPR < 1.1
Low PAPP-A < 0.41 MoM
Abnormal uterine Doppler
Umbilical Doppler PI > 95th centile
Maternal age > 40
Smoking > 10 cigarettes daily
Hypertension or Diabetes

Management after 36+ weeks should be overseen by Fetal Medicine and should follow the principles outlined in Appendix 2. In particular:

- **Uncomplicated SGA** when the c-EFW is less than the 10th centile but there is none of the above complicating factors: requires fortnightly assessment and delivery when CPR becomes < 1.1 or by 39+6 weeks.
- **Complicated SGA** is when any of the above complicating factors are present: delivery should be offered at ≥ 37+0. If SGA with umbilical PI > 95th centile or CPR < 1.1 deliver at ≥ 36+0 weeks.
- **Induction of labour** can be offered if at the time of decision EFW > 1500g **and** gestation > 34 weeks **and** there is no other obstetric contraindication. If the fetus is very small and near

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those thresholds, a vaginal assessment is useful to decide between induction of labour or cesarean section. Steroids are not required for induction of labour at > 34+0 weeks.

- **Cesarean section** should be offered if at the time of decision EFW < 1500g **or** gestation < 34 weeks **or** absent / reversed umbilical EDF **or** other specific obstetric indication. Steroids are required if CS booked at less than 37+0 weeks gestation.

5.0 Statement of evidence/references

1. RCOG Green top Guideline No 31. The Investigation and Management of the Small–for–Gestational–Age Fetus. 2014

2. DeVore GR The importance of the cerebroplacental ratio in the evaluation of fetal well-being in SGA and AGA fetuses. Am J Obstet Gynecol. 2015 Jul;213(1):5-15. doi: 10.1016/j.ajog.2015.05.024.

3. Khalil A, Thilaganathan B. Role of uteroplacental and fetal Doppler in identifying fetal growth restriction at term. Best Pract Res Clin Obstet Gynaecol. 2017 Jan;38:38-47. doi: 10.1016/j.bpobgyn.2016.09.003. Epub 2016 Sep 23.

4. NHS England. Saving Babies' Lives Version Two: A care bundle for reducing perinatal mortality. March 2019

6.0 Governance

6.1 Record of changes to document

Version number	Review date	Reviewed by	Changes made
1	02/2018	Christos Ioannou	Complete review
2	04/2021	Christos Ioannou	Complete review

6.2 Consultation History

Stakeholders Name/Board	Area of Expertise	Date Sent	Date Received	Comments	Endorsed Yes/No
Imaging		30/04/21			
Womens digital group		30/04/21			
Women's Health CIG		02/06/21		Approved	

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6.3 Audit and monitoring

This Guideline outlines the process for document development will be monitored on an ongoing basis. The centralisation of the process for development of documents will enable the Trust to audit more effectively. The centralisation in recording documents onto a Quality Management database will ensure the process is robust.

Audit/Monitoring Criteria	Tool	Audit Lead	Frequency of Audit	Responsible Committee/Board
1. Sample of growth scan examinations 24-42 weeks: percentage of examinations which have a valid umbilical artery PI/RI recording	Viewpoint stats download	F Nizami/ C Ioannou	Annually	Women's Health CIG
2. Sample of growth scan examinations 24-36 weeks where the EFW is <10th centile: percentage of examination episodes which have appropriate follow up booked in either US Department, Fetal Medicine or ADAU according to Appendix 1	Viewpoint stats download	F Nizami/ C Ioannou	Annually	Women's Health CIG

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6.4 Equality Impact Assessment

This document has been assessed using the Trust's Equality Impact Assessment Screening Tool. No detailed action plan is required. Any ad-hoc incident which highlights a potential problem will be addressed by the monitoring committee.

Equality Impact Assessment			
Division	Women and children	Department	Maternity
Person completing the EqIA		Contact No.	
Others involved:	No	Date of assessment:	30/04/21
Existing policy/service	Yes	New policy/service	No

Will patients, carers, the public or staff be affected by the policy/service?	Yes
If staff, how many/which groups will be affected?	*For example: community midwives, phlebotomists, all staff*

Protected characteristic	Any impact?	Comments
Age	NO	Positive impact as the policy aims to recognise diversity, promote inclusion and fair treatment for patients and staff
Disability	NO	
Gender reassignment	NO	
Marriage and civil partnership	NO	
Pregnancy and maternity	NO	
Race	NO	
Religion or belief	NO	
Sex	NO	
Sexual orientation	NO	

What consultation method(s) have you carried out?			
Emails and meetings			
How are the changes/amendments to the policies/services communicated?			
Meetings and emails			
What future actions need to be taken to overcome any barriers or discrimination?			
What?	Who will lead this?	Date of completion	Resources needed
Review date of EqIA			

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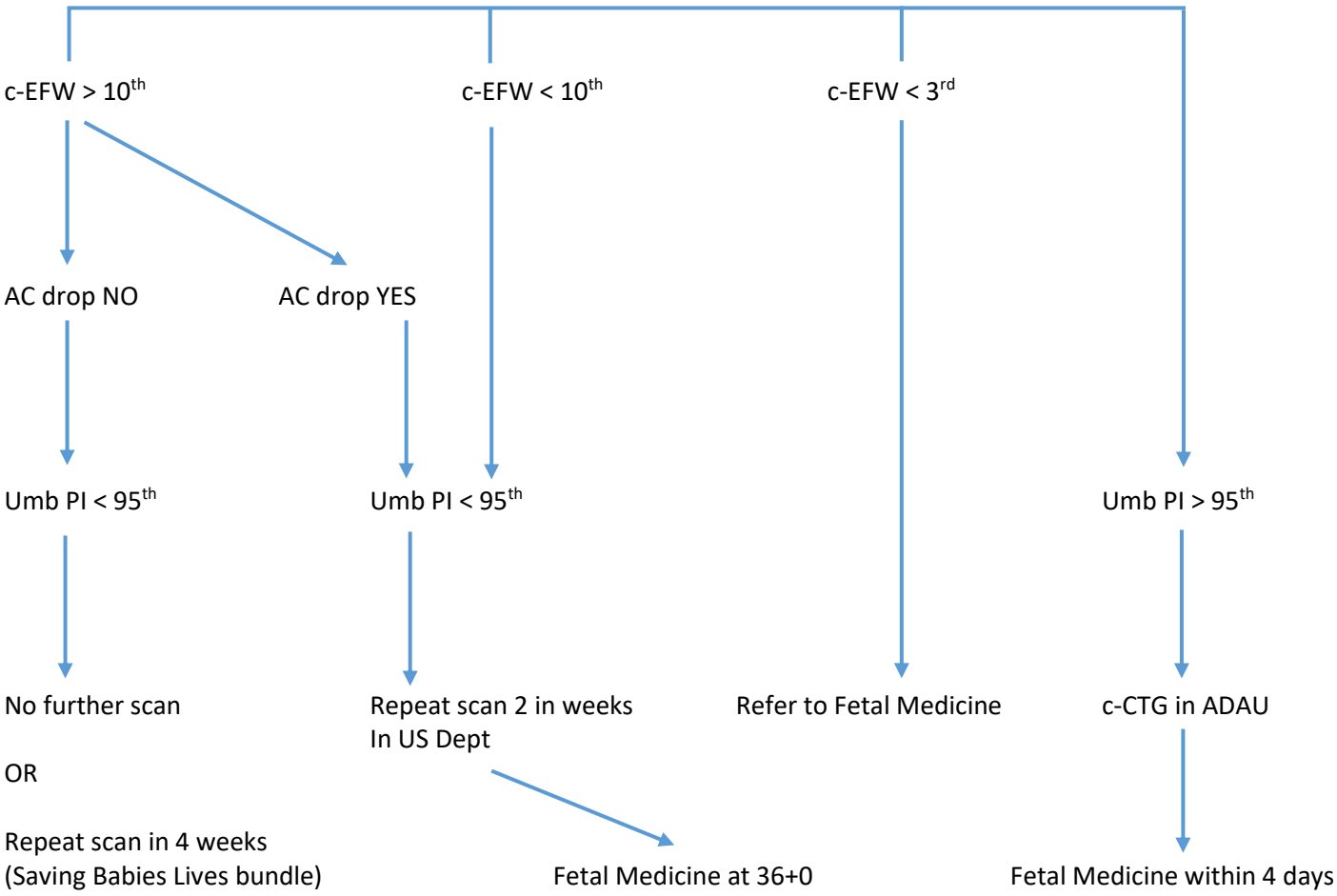
Appendix 1 - Suspected SGA at 24+0 to 35+6 weeks



Absent or Reversed Umbilical EDF at any stage: admit, inform Consultant Obstetrician and Fetal Medicine. See paragraph 4.1 for subsequent management and also AHSN guideline (Appendix 4).

AC: Abdominal circumference
AC drop: Change of the AC percentile position by 40 points or more (i.e. from 60th to 20th) since the anomaly scan
EDF: End-diastolic flow in the umbilical artery Doppler
Umb PI: Umbilical artery pulsatility index
c-EFW: Estimated fetal weight plotted manually at the GAP-GROW customised EFW chart
CTG: Computerised cardiotocogram
ADAU: Antenatal Day Assessment Unit
US Dept: Ultrasound Department

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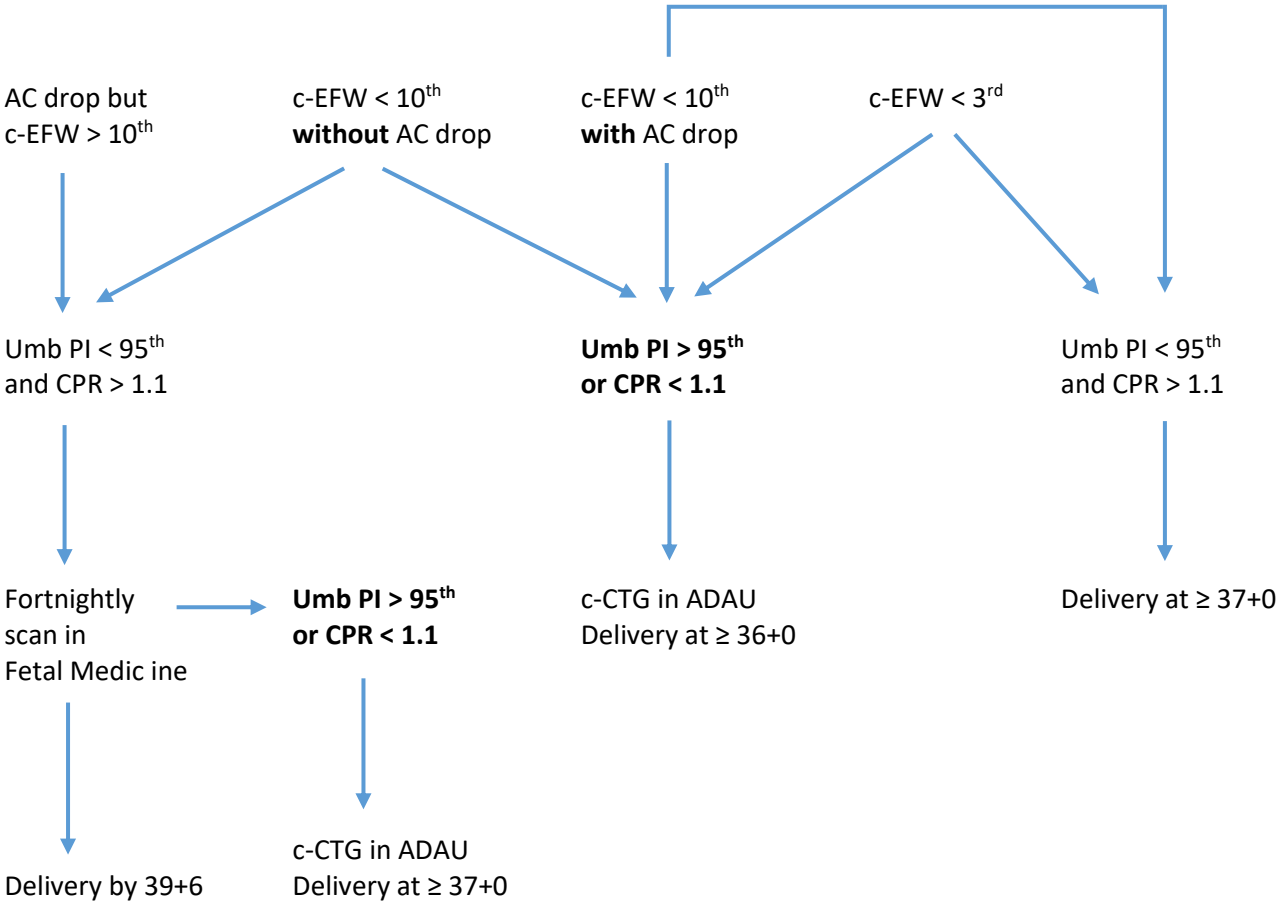
Appendix 2 - Suspected SGA at or over 36+0 weeks



If SGA with complicating factors (any factor listed in Table 2) then offer delivery at 37+0 weeks.

AC: Abdominal circumference
AC drop: Change of the AC percentile position by 40 points or more (i.e. from 60th to 20th) since the anomaly scan
Umb PI: Umbilical artery pulsatility index
c-EFW: Estimated fetal weight plotted manually at the GAP-GROW customised EFW chart
CPR: Cerebroplacental ratio i.e. MCA PI / Umb PI
US Dept: Ultrasound Department
ADAU: Antenatal Day Assessment Unit

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Appendix 3 - Hadlock estimated fetal weight chart

Menstrual Week	Percentiles (g)				
	3rd	10th	50th	90th	97th
10	26	29	35	41	44
11	34	37	45	53	56
12	43	48	58	68	73
13	55	61	73	85	91
14	70	77	93	109	116
15	88	97	117	137	146
16	110	121	146	171	183
17	136	150	181	212	226
18	167	185	223	261	279
19	205	227	273	319	341
20	248	275	331	387	414
21	299	331	399	467	499
22	359	398	478	559	598
23	426	471	568	665	710
24	503	556	670	784	838
25	589	652	785	918	981
26	685	758	913	1,068	1,141
27	791	876	1,055	1,234	1,319
28	908	1,004	1,210	1,416	1,513
29	1,034	1,145	1,379	1,613	1,724
30	1,169	1,294	1,559	1,824	1,649
31	1,313	1,453	1,751	2,049	2,189
32	1,465	1,621	1,953	2,285	2,441
33	1,622	1,794	2,162	2,530	2,703
34	1,783	1,973	2,377	2,781	2,971
35	1,946	2,154	2,595	3,036	3,244
36	2,110	2,335	2,813	3,291	3,516
37	2,271	2,513	3,028	3,543	3,785
38	2,427	2,686	3,236	3,786	4,045
39	2,576	2,851	3,435	4,019	4,294
40	2,714	3,004	3,619	4,234	4,524

Reproduced from Hadlock FP, et al., In utero analysis of fetal growth: a sonographic weight standard. Radiology. 1991 Oct;181(1):129-33.

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Appendix 4 - AHSN guideline for management of Preterm IUGR

Section 2: Management of severe preterm singleton/ DC twin IUGR: with AEDF

UmbA[4] AEDF[6] detected (note significant growth now unlikely)

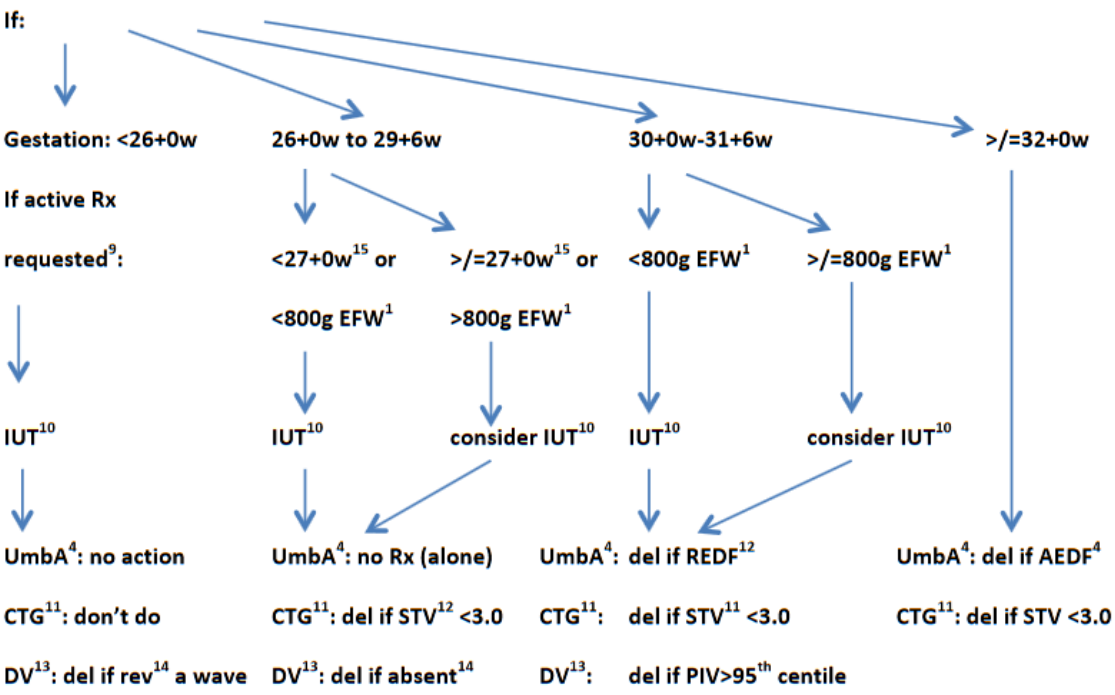
↓

Steroids (may get temporary improvement)

Daily fetal assessment.

Monitor mother BP[8] and urinalysis

If:



NB: pre eclampsia often increases rate of deterioration and may necessitate delivery

1. 1: EFW: estimated fetal weight
2. AC: abdominal circumference
3. Centile. Use current Trust standard, accepting variation, ultimately aim to move to international chart. Avoid customised chart as ethnicity likely independent risk factor (see Intergrowth results)
4. UmbA: umbilical artery
5. RI/PI: resistance index/ pulsatility index. Follow current Trust practice as to which.
6. AEDF: absent end-diastolic flow
7. CS: caesarean section
8. BP: blood pressure
9. If active treatment requested: Following paediatric consultation. Document any discussion regarding IUT with parents. Consider providing Thames Valley Neonatal Network patient information leaflets if available.
10. IUT: in utero transfer. Where neonatal guidelines require IUT this is designated 'IUT'. Where fetal medicine guidelines advise IUT this is designated 'consider IUT'. This is because it is recognised that within the Thames Valley area many units have fetal medicine expertise. However, IUT may be discussed with any pregnancies at any stage on this guideline according to individual units' or consultants' preference. Non urgent IUT to the OUH for IUGR is normally arranged by calling fetal medicine office (01865 221716) or the fetal medicine consultant (07810 376679)
11. CTG: computerised cardiotocograph. Evidence based tool in severe IUGR
12. STV: short term variability on computerised cardiotocograph
13. DV: ductus venosus
14. 14: Absent/ reversed a wave of ductus venosus. From 26+0w, computerised CTG as effective
15. 15: Note this threshold is <28+0 if DC twin pregnancy

This document takes account of national neonatal guidelines and national fetal medicine guidelines (RCOG Greentop and Specialised Commissioning CRG service Specifications)

Oxford AHSN Maternity Network Guideline
Management of preterm singleton/ DC twin Intrauterine Growth restriction (IUGR), v1, 24/04/2015

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Appendix 5: Referral for Growth and Doppler Assessment in Fetal Medicine

Referral For Growth And Doppler Assessment In Fetal Medicine

Gestation: .....

EDD:.....

Date:.....

Sticky label

Contact Telephone number……...

Is the EFW below the 3rd centile (see SGA guideline)? ☐

Is the Umbilical PI above the 95th centile? ☐

Absent or reversed umbilical EDF? ☐

Is the fetus below the 10th centile AND ≥ 36+0 weeks? ☐

Referring clinician (name): .....

Referring clinician (signature): .....

Request ordered electronically ☐

Appointment date time and location……

If no box can be ticked do not refer to Fetal Medicine but see SGA guideline for management