Approved by Safety & Quality Committee
July 2022

FETAL GROWTH RESTRICTION AND SMALL FOR GESTATIONAL AGE - SCREENING AND MANAGEMENT FOR SINGLETON PREGNANCIES

This LOP is developed to guide clinical practice at the Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this LOP.

1. AIM

- Appropriate detection, surveillance, and delivery of the fetus with growth restriction

2. PATIENT

- Pregnant woman with a singleton pregnancy
- Pregnant woman with a small for gestational age (SGA) fetus, defined as a fetus with an estimated fetal weight (EFW) less than the 10th centile
- Pregnant woman with a diagnosis of fetal growth restriction (FGR)

3. STAFF

- Medical and midwifery staff

4. EQUIPMENT

- Ultrasound
- Cardiotocograph (CTG)

5. CLINICAL PRACTICE

Antenatal screening:

- Use the NSW Fetal Safety Risk Assessment Pathway - fetal growth restriction (Appendix 1) to guide screening and risk reduction at the booking visit, as follows:
  - assess woman for risk factors for FGR and suitability for symphysial fundal height measurements (SFH)
  - commence low dose aspirin (150mg orally at night) prior to 16 weeks gestation for woman at increased risk of pre-eclampsia and/or FGR. Advise to take until 36 weeks gestation
  - advise cessation of smoking and other drug use in pregnancy (if applicable) [1]
- Measure SFH at each antenatal appointment from 28 weeks gestation and document in eMaternity (this will automatically be plotted on a growth chart in eMaternity)
- Refer for ultrasound assessment of fetal growth when:
  - a SFH measurement is less than the 10th centile
  - there is clinical suspicion of static or slowing growth on plotting of serial SFH measurements
  - ultrasound surveillance of fetal growth is indicated by risk factors as per Appendix 1[1]
- Plot ultrasound measurements on NSW Health recommended ultrasound charts (see appendix 3)

Management for a fetus with suspected FGR or SGA:

- Check gestational age dating is correct
- Review first trimester screening/cell free DNA results (if applicable) and fetal anatomy ultrasounds
- Measure blood pressure at each visit and monitor for signs and symptoms of pre-eclampsia
- Advise woman about importance of monitoring fetal movements and to call if concerned
- Discuss underlying cause/contributing factors (e.g. discuss cessation of smoking)
- Do not recommend bed rest

- Do not arrange CTG monitoring unless otherwise clinically indicated or Absent or Reversed End Diastolic Flow (EDF) in the umbilical artery (see appendix 4)
- Arrange fetal and maternal surveillance according to table 1 and appendix 4

Table 1. Surveillance of FGR or SGA:

	Recommended management
Early onset FGR (< 32 weeks) • Abdominal circumference or EFW < 3rd centile; or • umbilical artery (UA) absent end-diastolic flow; or • Abdominal circumference (AC) or EFW < the 10th centile with uterine artery or UA Pulsatility Index (PI) > the 95th centile.[2]	• Refer woman to the Department of Maternal Fetal Medicine (MFM) • Consider CMV serology (IgG and IgM), and testing for syphilis or malaria if relevant • Schedule ultrasounds based on the severity of FGR and alterations in the umbilical artery doppler: ○ Weekly ultrasound if doppler findings are normal ○ Twice a week ultrasound if umbilical artery PI is greater than the 95th centile ○ Ultrasound every 2-3 days if umbilical artery absent or reversed end-diastolic flow, plus recommend CTG surveillance • Plot fetal growth measurements on charts (appendix 3) when done every 2 weeks • Arrange clinical review weekly • Arrange admission if absent or reversed end diastolic flow in the umbilical artery (AREDF) or if maternal indications
Late onset FGR (> 32 weeks) • AC or EFW < the 3rd centile; or • At least two of: ○ AC or EFW < the 10th centile ○ AC or EFW centile drop of 50 centiles ○ Cerebro-placental ratio (CPR) < the 5th centile or UAPI > the 95th centile (if CPR < 5th percentile measurement should be repeated due to risk of false positive) [2]	• Refer woman to the Department of MFM if there is suspicion of a fetal anomaly or other specific concerns • Schedule ultrasound for fetal wellbeing weekly • Plot fetal growth measurements on charts (appendix 3) when done every 2 weeks • Arrange clinical review weekly • Arrange admission if AREDF in the umbilical artery or maternal indications
SGA • EFW < the 10th centile, but not meeting above criteria for FGR	• Perform serial ultrasound for assessment of growth and wellbeing every 2 weeks, and plot growth measurements on charts (appendix 3) • Arrange clinical review every 2 weeks

Timing and planning of birth

- Assess the risk of prematurity against the risk of stillbirth in an FGR fetus and plan timed birth according to fetal and maternal risks
- Recommend delivery at any gestation if repeated unprovoked decelerations on CTG, or maternal indications
- Recommend timing delivery based on the table 2 (derived from flowchart in appendix 2)[2]

Table 2. Criteria for delivery by gestation

Gestation	Criteria for delivery at this gestation	Other considerations
< 26	Personalise timing of delivery based on expected	Steroids, magnesium sulphate, and

weeks	neonatal outcomes and parental wishes for resuscitation	neonatology review are important at this gestation if resuscitation is planned
26 - 28+6 weeks	Recommend birth by caesarean section if abnormal ductus venosus waveform (reversed a wave) and umbilical artery absent or reversed end-diastolic flow, if neonatal resuscitation planned	Steroids, magnesium sulphate, and neonatology review are important at this gestation
29 - 31+6 weeks	Recommend birth by caesarean section if abnormal ductus venosus waveform (absent a wave) and umbilical artery absent or reversed end-diastolic flow	Steroids and neonatology review are important at this gestation. Magnesium sulphate is indicated if birth is planned prior to 30 weeks gestation
32 - 33+6 weeks	Recommend birth by caesarean section if reversed end-diastolic flow (EDF) in the umbilical artery	Steroids are important at this gestation
≥ 34 weeks	Recommend birth by caesarean section if absent end-diastolic flow (EDF) in the umbilical artery	
36 - 37+6 weeks	Recommend birth if EFW is less than the 3rd centile, or abdominal circumference is less than the 3rd centile, or FGR with oligohydramnios, or umbilical artery PI is greater than the 95th centile	
38 - 38+6 weeks	Recommend birth if FGR not meeting criteria for earlier delivery	
39 -39+6 weeks	Recommend birth if SGA	

Birth

- Recommend induction of labour (IOL) for planned vaginal birth for the FGR or SGA fetus with normal umbilical artery Doppler if no other indications for CS
  - Recommend mechanical preparation if IOL planned for the FGR fetus
  - Recommend continuous fetal heart rate monitoring in labour if SGA/FGR
  - Advise woman that fetus with FGR have higher rates of birth by emergency CS due to increased risk of fetal hypoxia in labour
- Recommend CS for the FGR fetus with absent or reversed end diastolic flow in the umbilical artery or if abnormal CTG
- Inform neonatology team and have them present at the birth
- Send placenta for histopathology
- Make individualised maternal postnatal follow up plan if severe, early onset FGR requiring preterm birth < 32 weeks

6. DOCUMENTATION

- Antenatal Yellow Card
- Medical Record

7. EDUCATIONAL NOTES

- FGR does not necessarily produce a SGA fetus. Some growth restricted fetuses are greater than the 10th centile and some SGA fetuses are constitutionally small rather than growth restricted[2,3]
- SGA fetuses/neonates make up 28-45% of non-anomalous stillbirths, and have a higher chance of neurodevelopmental delay, childhood and adult obesity, and metabolic disease[3]

- Short term morbidity is increased in FGR neonates. FGR fetuses/infants have increased risk of stillbirth, birth hypoxia, respiratory distress syndrome, necrotising enterocolitis, retinopathy of prematurity, infection and hypoglycaemia[4]
- Mild COVID19 infection is not a major risk factor for FGR, and ultrasound surveillance should be based on all clinical factors, rather than COVID19[6]

8. RELATED POLICIES / PROCEDURES / CLINICAL PRACTICE LOP

- Estimating Due Date (EDD) Clinical Guideline
- Referral to Department of Maternal Fetal Medicine: Fetal Indications
- Fetal Movements- Identification and management of reduced patterns
- Neonatal Observations Outside of Neonatal Care Centre
- Placental Examination Guideline and indications for referral to pathology
- Hypoglycaemia in a Neonate – Monitoring and Management of at-Risk Neonates
- Magnesium sulphate for women at risk of preterm birth for fetal neuroprotection
- Corticosteroids for women at risk of preterm birth or with a fetus at risk of respiratory distress
- Fetal heart rate Monitoring – Maternity – MoH GL_025

9. RISK RATING

- Medium

10. National Standard

- Standard 5 Comprehensive Care
- Standard 2 Partnering with Consumers
- Standard 8 Recognising and Responding to Clinical deterioration

11. REFERENCES

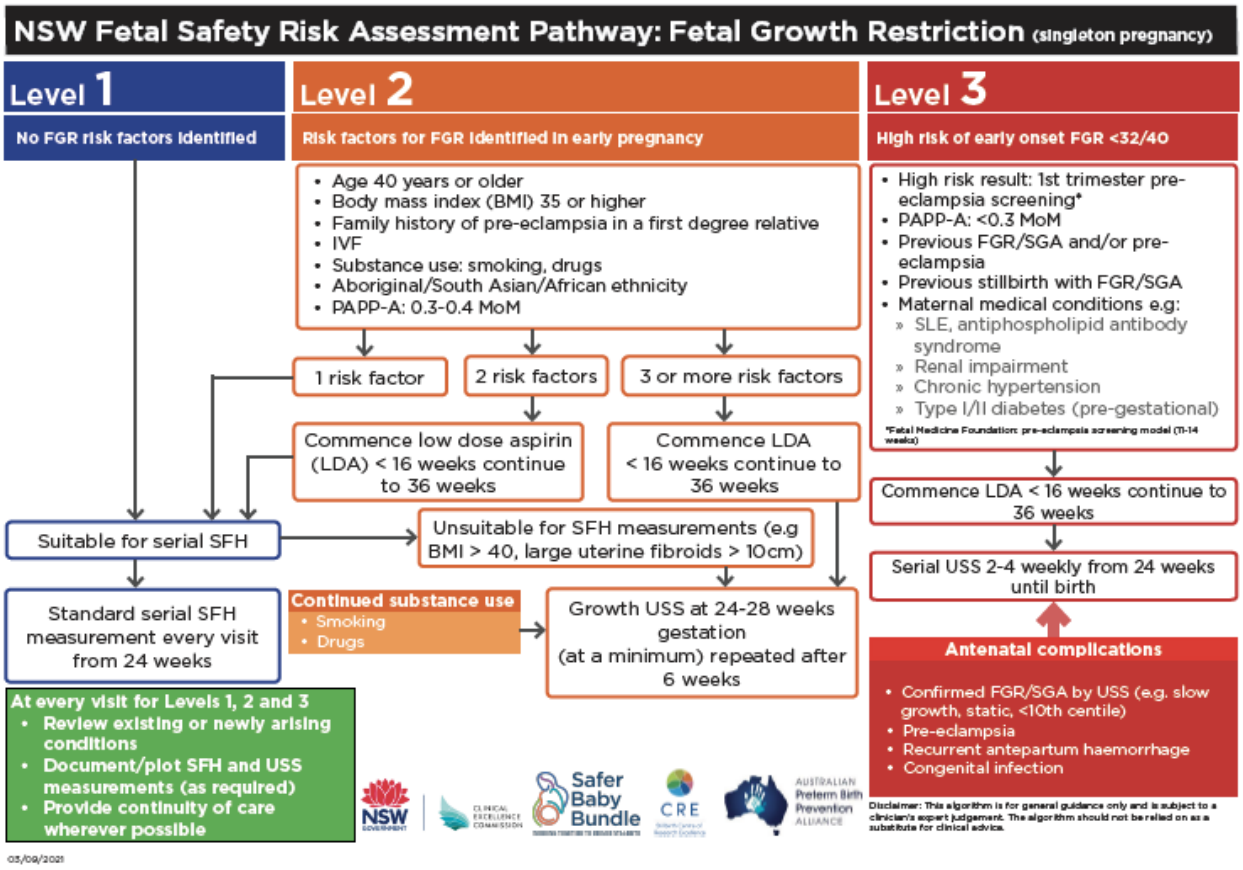
1. Clinical Excellence Comission. 2021. NSW Fetal Safety Risk assessment pathway- fetal growth restriction https://www.cec.health.nsw.gov.au/__data/assets/pdf_file/0004/674419/NSW-Fetal-Safety-Risk-Assessment-Pathway.pdf.
2. Lees CC, Stampalija T, Baschat A, da Silva Costa F, Ferrazzi E, Figueras F, Hecher K, Kingdom J, Poon LC, Salomon LJ, Unterscheider J. 2020. ISUOG Practice Guidelines: diagnosis and management of small-for-gestational-age fetus and fetal growth restriction. *Ultrasound Obstet Gynecol,* 56: 298-312.
3. McCowan LM, Figueras F, Anderson NH. 2018. Evidence-based national guidelines for the management of suspected fetal growth restriction: comparison, consensus, and controversy. Am J Obstet Gynecol 218:S855-s868.
4. Lees CC, Marlow N, van Wassenaer-Leemhuis A, Arabin B, Bilardo CM, Brezinka C, Calvert S, Derks JB, Diemert A, Duvekot JJ, Ferrazzi E, Frusca T, Ganzevoort W, Hecher K, Martinelli P, Ostermayer E, Papageorghiou AT, Schlembach D, Schneider KT, Thilaganathan B, Todros T, Valcamonico A, Visser GH, Wolf H. 2015. 2 year neurodevelopmental and intermediate perinatal outcomes in infants with very preterm fetal growth restriction (TRUFFLE): a randomised trial. Lancet 385:2162-72.
5. Centre of Research Excellence Stillbirth. 2019. Safer Baby Bundle Handbook and Resource Guide: Working together to reduce stillbirth. Centre of Research Excellence Stillbirth, Australia.

6. Royal College of Obstetricians & Gynaecologists. 2022. Coronavirus (COVID-19) Infection in Pregnacy. Information for healthcare professionals. Version 15

REVISION & APPROVAL HISTORY
May 2022 Primary Document Approved Maternity LOPs Committee

FOR REVIEW: 2025

Appendix 1: Surveillance recommended for fetal growth restriction



Appendix 2: Definitions of early and late onset fetal growth restriction[2]

Table 2 Definitions for early- and late-onset fetal growth restriction (FGR) in absence of congenital anomalies, based on international Delphi consensus

Early FGR: *GA < 32 weeks, in absence of congenital anomalies*	*Late FGR:* *GA ≥ 32 weeks, in absence of congenital anomalies*
AC/EFW < 3rd centile *or* UA-AEDF *Or* 1. AC/EFW < 10th centile *combined with* 2. UtA-PI > 95th centile *and/or* 3. UA-PI > 95th centile	AC/EFW < 3rd centile *Or at least two out of three of the following* 1. AC/EFW < 10th centile 2. AC/EFW crossing centiles > 2 quartiles on growth centiles* 3. CPR < 5th centile *or* UA-PI > 95th centile

*Growth centiles are non-customized centiles. AC, fetal abdominal circumference; AEDF, absent end-diastolic flow; CPR, cerebroplacental ratio; EFW, estimated fetal weight; GA, gestational age; PI, pulsatility index; UA, umbilical artery; UtA, uterine artery. Reproduced from Gordijn *et al.*[16].

Appendix 3: NSW Health Growth Charts

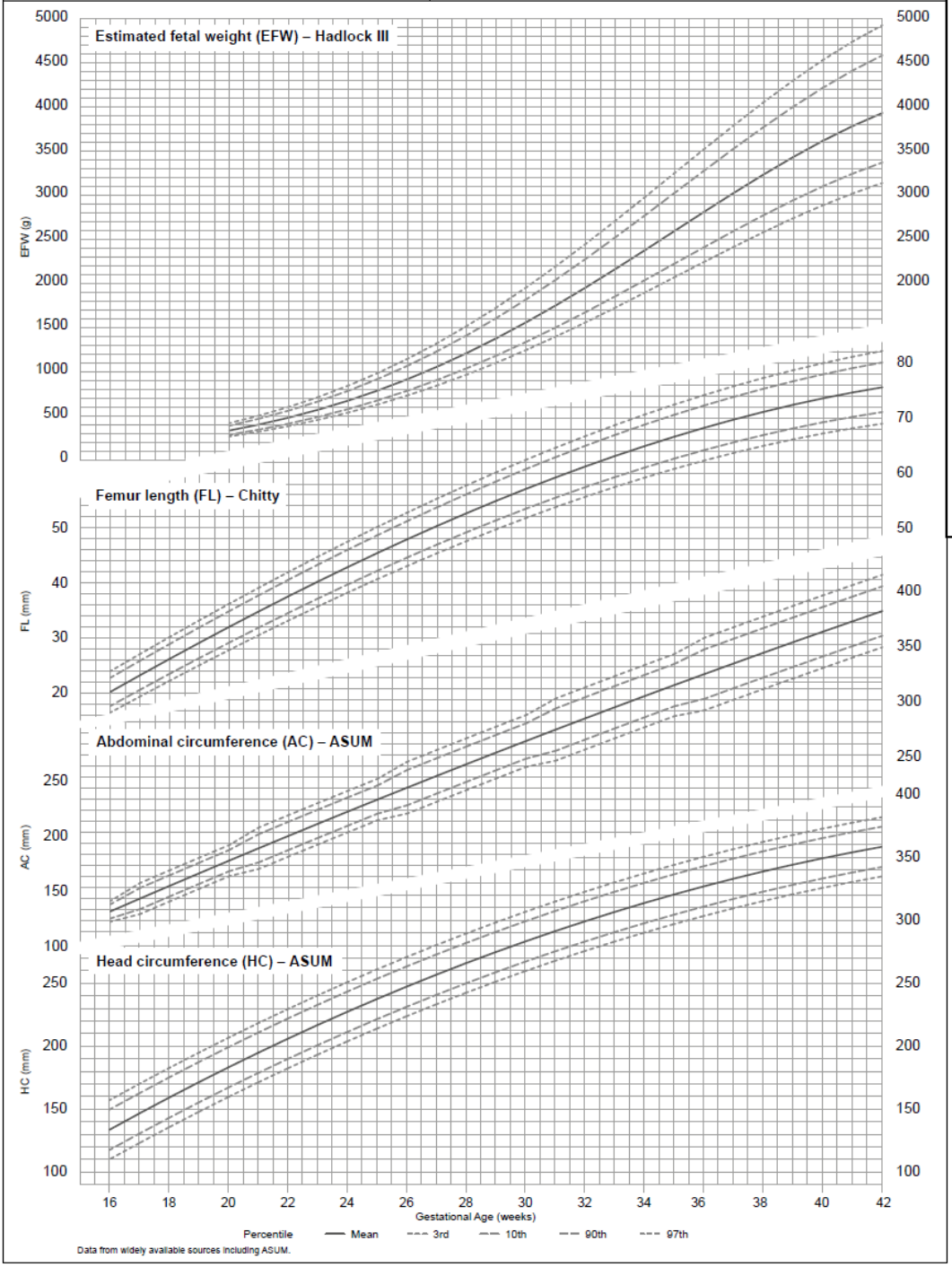
NSW GOVERNMENT Health

Facility:

Maternity - Fetal Biometry

Ultrasound Growth Scan Charts

FAMILY NAME	MRN
GIVEN NAME	☐ MALE ☐ FEMALE
D.O.B. _____/_____/_____	M.O.
ADDRESS	
LOCATION / WARD	
COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE	



SAMPLE123

Holes Punched as per AS2828.1: 2019

BINDING MARGIN - NO WRITING

COLOUR TBA

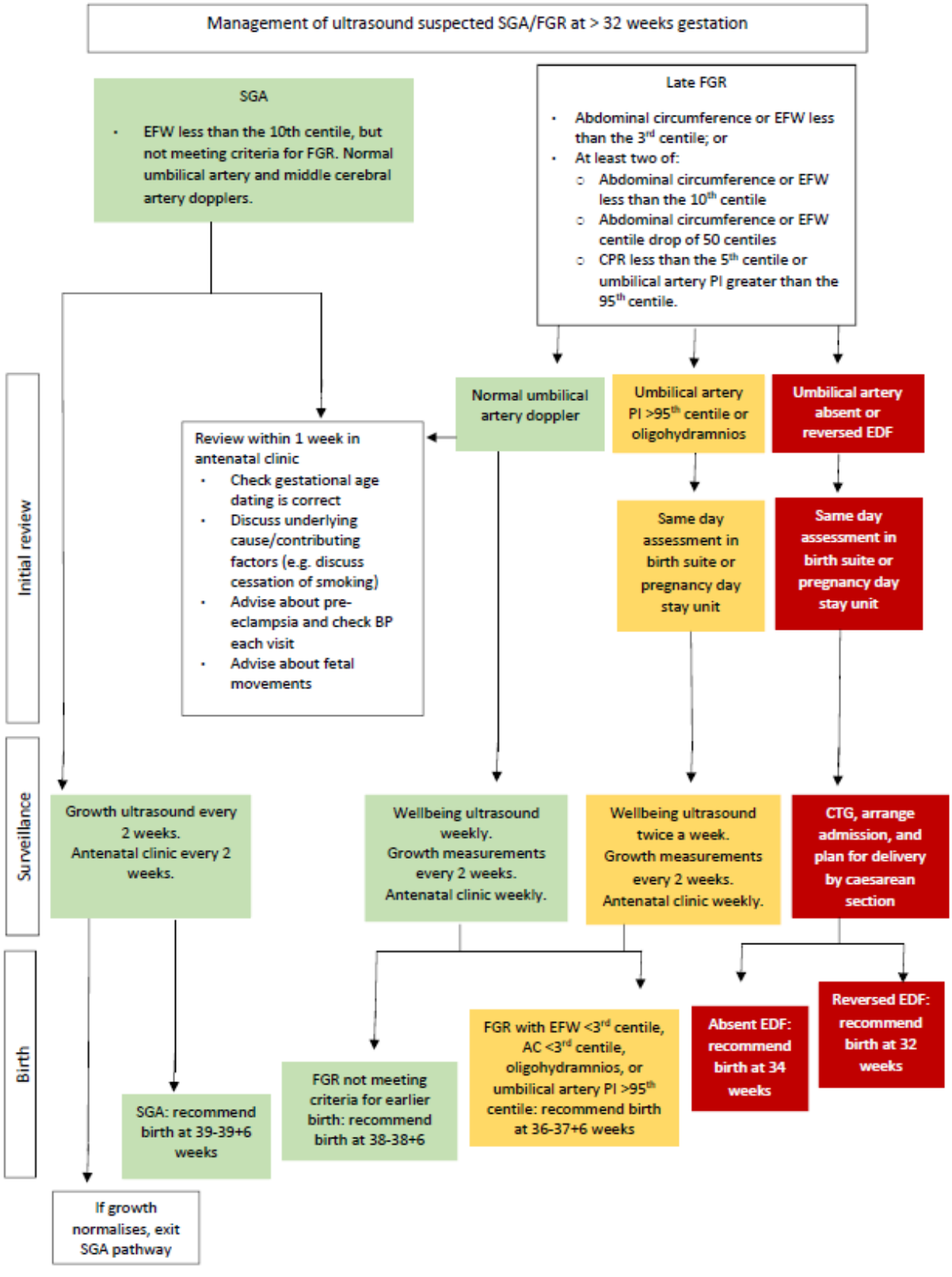
FETAL GROWTH CHARTS

XXX000.000

xxxxxx 000000

NO WRITING

Appendix 4: Management of Small for gestational age (SGA)/ Fetal growth restriction (FGR) from 32 weeks


Management of ultrasound suspected SGA/FGR at > 32 weeks gestation
SGA
EFW less than the 10th centile, but not meeting criteria for FGR. Normal umbilical artery and middle cerebral artery dopplers.
Late FGR
Abdominal circumference or EFW less than the 3rd centile; or
At least two of:
Abdominal circumference or EFW less than the 10th centile
Abdominal circumference or EFW centile drop of 50 centiles
CPR less than the 5th centile or umbilical artery PI greater than the 95th centile.
Normal umbilical artery doppler
Umbilical artery PI >95th centile or oligohydramnios
Umbilical artery absent or reversed EDF
Initial review
Review within 1 week in antenatal clinic
Check gestational age dating is correct
Discuss underlying cause/contributing factors (e.g. discuss cessation of smoking)
Advise about pre-eclampsia and check BP each visit
Advise about fetal movements
Same day assessment in birth suite or pregnancy day stay unit
Same day assessment in birth suite or pregnancy day stay unit
Surveillance
Growth ultrasound every 2 weeks.
Antenatal clinic every 2 weeks.
Wellbeing ultrasound weekly.
Growth measurements every 2 weeks.
Antenatal clinic weekly.
Wellbeing ultrasound twice a week.
Growth measurements every 2 weeks.
Antenatal clinic weekly.
CTG, arrange admission, and plan for delivery by caesarean section
Birth
SGA: recommend birth at 39-39+6 weeks
FGR not meeting criteria for earlier birth: recommend birth at 38-38+6
FGR with EFW <3rd centile, AC <3rd centile, oligohydramnios, or umbilical artery PI >95th centile: recommend birth at 36-37+6 weeks
Absent EDF: recommend birth at 34 weeks
Reversed EDF: recommend birth at 32 weeks
If growth normalises, exit SGA pathway