Reference Number: *UHBOBS163* **Version Number:** 5	**Date of Next Review:** November 2025 **Previous Trust/LHB Reference Number:** **n/***a*

Management of the Small For Gestational Age Fetus

Introduction and Aim

This document is a clinical guideline designed to support safe and effective practice.

To provide support for clinical decision-making.

Objectives

The purpose of this guidance is to aid the investigation and management of the SGA fetus. It is based upon the Royal College of Obstetricians and Gynaecologists' Green-top Guideline No. 31 (2013) of the same title and further references can be obtained from that source.

Detection of the SGA fetus is covered in the Fetal Growth Assessment Guideline 2018.

Scope

This procedure applies to all of our staff in all locations including those with honorary contracts

Equality Health Impact Assessment	*An Equality Health Impact Assessment has not been completed. 'This is because a procedure has been written to support the implementation the. Policy. The Equality Impact Assessment completed for the policy found here to be a negative/positive/no impact.*
Documents to read alongside this Procedure	Fetal Growth Assessment Guideline Electronic Fetal Monitoring Guideline
Approved by	*Maternity Professional Forum*

Summary of reviews/amendments

Version Number	Date of Review Approved	Authors	Summary of Amendments
UHB 2	July 2011	N Thomas / S Jose	
3	July 2014	P. Amin/E. Ferris	
4	March 2019	A.Robb/ /B.Beattie/ M.Latibeaudiere	Inclusion of RCOG SGA guideline 2013 Adapted for implementation of GAP-GROW
5	November 2022	A Burrin A Vanderspear	Updated to include information for management when unable to obtain Ductus venosus doppler. Addition of use of computerised CTG. Included updated SBAR for use of dopplers

1 Table of Contents

2 Introduction

There is strong evidence to suggest that fetal growth restriction (FGR) is the biggest risk factor for stillbirth (SB). This was also the major underlying factor identified in the recent MBBRACE report on stillbirths, which states that 'about one in three term, normally formed, antepartum stillbirths are related to abnormalities of fetal growth'.

The policy applies to all staff working within Maternity service. The guideline should be followed unless there is an overriding clinical reason, or the decision comes from the consultant - this should be documented in the notes.

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2.1 Objectives

The aim of this guideline is to make recommendations regarding the antenatal management of pregnancies where the estimated weight of the fetus is known to be below the tenth customised centile.

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2.2 Policy Scope

This policy addresses women with singleton pregnancies without fetal abnormalities that have been diagnosed as small for gestational age in their current pregnancy.

It is important whenever assessing fetal growth that the pregnancy has been dated correctly. This should be with an early dating scan. *(The early pregnancy scan must be performed between 11 weeks and 2 days (CRL 45.0mm) and 14 weeks and 1 day (CRL 84.0mm) of pregnancy).*

If the dates are uncertain, the woman should be referred to consultant care and an assessment made of gestational age. Where CRL is over 84.0mm, the head circumference (HC) measurement must be used to calculate the gestation.

The recommendations regarding the timing of delivery do not apply in pregnancies where there is co-existing maternal disease (e.g.: pre-eclampsia or lupus) where the maternal health must also be considered. In such cases care and decisions should be individualised.

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3 Definitions

Term	Definition
Small for Gestational Age (SGA)	refers to a fetus that has failed to reach a specific biometric or estimated weight by a specific gestational age.
EFW <10th centile	refers to estimated fetal weight generated by ultrasoundbiometry, plotted below the 10th centile on a customised growth chart for estimated fetal weight. The customised growth chart is generated using the maternal variables of height, weight, parity and ethnic group.
Fetal Growth Restriction	The term used for babies that have slow or no growth. FGR may be defined by the rate of growth according to serial fundal height or ultrasound EFW measurements (regardless of whether theyare already below the tenth centile or not), with or without abnormal umbilicalor fetal Doppler flow measurements.
Preterm	Is defined as babies born alive before 37 weeks of pregnancy are completed.There are sub-categories of preterm birth, based on gestational age: - Extremely preterm (less than 28 weeks) - Very Preterm (28-32 weeks) - Moderate to late preterm (32 to 37 weeks)

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4 Duties and Responsibilities

4.1 Sonographers

If liquor is reduced (Deepest Vertical Pocket, DVP≤3cm up to 36+6 weeks or ≤ 2cm at 37 weeks and over) or umbilical artery Doppler is abnormal, (sample both umbilical arteries and take the lower (*better ratio* – *See SBAR UA PI*), the patient should be discussed with a Midwife or Obstetrician to alert them to the abnormal finding. Out of hours the patient should be sent to Obstetric assessment unit for medical review.

If umbilical artery Doppler is reversed or absent, or MCA or Ductus Venosus Doppler are abnormal:-

Ensure that either the clinic midwife is alerted to the abnormal result, OR that the referring ward (most likely obstetric assessment unit or delivery suite) is telephoned and alerted to the abnormal result.

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4.2 Midwives

Follow plan of care as per guidelines and medical review.
Ensure the woman understands the importance of attending hospital in the presence of diminished fetal movements.

If

- Growth velocity has tailed off
- Or EFW < 10th customised centile
- Or liquor is reduced (maximum pool depth ≤3cm up to 36+6 weeks or ≤2cm at 37 weeks and over)
- Or umbilical artery Doppler is abnormal

The patient should be discussed with discussed with an Obstetrician. Out of hours the patient should be sent to Obstetric assessment unit for medical review. Their case should be discussed with the senior SpR (ST 6- 7) or consultant.

Ensure urgent senior (ST6/7/Consultant) medical review if umbilicalartery Doppler is reversed or absent.

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4.3 Medical Staff

Following detection of EFW<10th centile or tail off in growth, ensure this is clearly documented in the “hand held” notes and neonatal section. Ensure appropriate follow up as per guidelines and that the woman understands the plan of care and is clear as to when and how she should be reviewed. Liaise

with the neonatal team where appropriate, see guidance below.

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5 Initial Management of a fetus <10th centile or a tail off ingrowth

Following the diagnosis of a fetus <10th centile or a tail off in growth the plan for initial management will include:

5.1 ALWAYS:

1) Discuss and refer for smoking cessation if appropriate

2) Assess liquor volume, reduced defined as (maximum pool depth ≤3cm up to 36+6 weeks or ≤2cm at 37 weeks and over)
Studies have indicated a reduced LV is associated with an increased perinatal mortality compared with controls.

3) Umbilical artery Doppler is the primary surveillance tool. In high risk pregnancy the use of this reduces perinatal morbidity and mortality, reduces antenatal admissions and inductions of labour.

Where this is found to be raised, it should be repeated and both umbilical arteries should be assessed. The lower (best) value should be used.

4) Current blood pressure reading and review of booking blood pressure

5) Assessment for proteinuria via point of care dipstick testing, or if >1+, quantification by protein: creatinine ratio (PCR).

6) The importance of monitoring pattern of fetal movements should be discussed

7) Women should be informed of and allowed easy access to day assessment unit and the Obstetric assessment unit

8) Reduced fetal movements should be managed as per guideline for investigation of women with reduced fetal movements.

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5.2 SOMETIMES:

Middle cerebral artery doppler pulsatility index (MCA PI) following discussion with fetal medicine or antenatal lead may be appropriate in some women at 37 weeks if delivery is declined. The finding of a MCA PI < 5th centile should prompt further discussion re delivery.

Referral to fetal medicine should be considered for further detailed fetal anatomical survey and other investigations such as karyotyping, antiphospholipid antibody screen and serological screening for congenital cytomegalovirus (CMV) and toxoplasmosis (occasionally syphilis and malaria) infection if

- **SGA is identified at the 18–20-week scan**
- **SGA fetuses with structural anomalies and in those detected before 23 weeks of gestation**
- **Severely SGA fetuses at any gestation EFW <5th customised centile AND AC<5th centile on population cha**rt.

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6 Management of Small for Gestational Age Fetus

6.1 Small for Gestational Age with Normal Liquor and Normal UA Doppler (RI/PI)

- After the first EFW < 10th centile, the woman should be reviewed 2 weekly with a growth scan, LV and umbilical artery Doppler. If the subsequent growth scan shows sequential growth, 2 weekly growth scan, LV and umbilical artery Doppler surveillance should continue.

- Maternal blood pressure and urinalysis should also be performed at a minimum every 2 weeks as these women are at potentially increased risk of preeclampsia, which is also related to placental insufficiency.

- Even if the growth velocity is normal, advise delivery from 37 weeks as those fetuses that are <10th customised centile have a stronger association with adverse perinatal outcome than those that are appropriately grown for gestation. Women who decline should be discussed with a Consultant the same day.

- If the growth is static for more than 3 weeks consider delivery if >34 weeks. If < 34 weeks increase surveillance to three times weekly Doppler and liquor assessment.

- Aim for vaginal delivery (unless other obstetric indications for caesarean section)

- If there is an abnormal UA Doppler, reduced liquor or severe SGA then induction of labour should take place on delivery suite, with continuous monitoring, which should be commenced when contractions start. Ensure this is detailed on the intrapartum care plan

- If Doppler and liquor are normal then induction of labour may take place on first floor, with continuous monitoring with continuous monitoring which should be commenced when contractions start. Ensure this is detailed on the intrapartum care plan

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6.2 Small for Gestational Age with Decreased Liquor ** and Normal UA Doppler (RI/PI)

****(maximum pool depth ≤3cm up to 36+6 weeks or ≤2cm at 37 weeks andover)**

As above but with weekly LV and Doppler measurements.

- Consider delivery after 34 weeks if static growth over 3 weeks
- Advise delivery at 37 weeks
- IOL can be considered but must take place on delivery suite, with continuous monitoring, which should be commenced when contractions

start.

- Ensure this is detailed on the intrapartum care plan
- Rates of emergency caesarean section are increased.
- Recommend steroids if delivery is by elective caesarean section before 39 weeks

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6.3 Small for Gestational Age with Absent or Reversed End Diastolic Flow

Once the Doppler has become absent the management is largely gestationrelated. The consultant should be informed and generate the management plan (or on-call consultant if out of hours).

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6.3.1 32-37 weeks (Moderate-late preterm):

Admit and advise delivery by caesarean section.

REDF: The presence of reversed end diastolic flow at this gestation should prompt delivery as soon as safely possible. Delivery should be immediate in the presence of CTG abnormalities. It may be appropriate to consider steroids and the need to transfer as an IUT if no neonatal cots are available but this decision should be made on a case-by-case basis at consultant level.

AEDF: Absent end diastolic flow should usually be an indication for delivery but consider steroids, if time and fetal condition allow (see section below regarding steroid administration).
Additional fetal monitoring should consist of twice-daily computerised CTG until delivery withabnormal computerised CTG prompting delivery.

Offer discussion with neonatal team about the prognosis of the baby and if appropriate a tour of the neonatal unit

BP and urinalysis should also be performed to exclude maternal disease (e.g.: pre-eclampsia)

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6.3.2 28 - 32 weeks (very pre-term birth):

Admit.
A discussion about timing of delivery together with appropriately timed steroids should be made with consultation with Neonatology.
Twice daily computerised CTG
Ductus venosus (DV) Doppler should be used to time delivery. Where possible, daily Doppler surveillance should be performed (UA and DV dopplers) following discussion with a Consultant Obstetrician.

Either DV or c CTG should be used to time delivery. If DV unavailable or difficult to obtain, use cCTG.

Patient to discuss with neonatal team the prognosis of the baby and if appropriate a tour of the neonatal unit.
BP and urinalysis should also be performed daily to exclude maternal disease (e.g.: pre-eclampsia)

Triggers for delivery (if fetus > 500g):

- **Reversed end diastolic flow**
- **Abnormal venous Dopplers**
- **Pathological CTG**

These fetuses would usually require delivery by caesarean section and discussion with the neonatal unit before delivery.

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6.3.3 Under 28 weeks only:

Estimated fetal weight should be performed.

If the EFW is < 500g, the woman should be informed of the poor prognosis (mortality and morbidity) of the baby and that delivery of the baby is not usually indicated. Conservative management is advised though the risks of stillbirth need to be discussed. If time permits, referral to fetal medicine / consultant antenatal lead may be appropriate. Urgent telephone consultation would also be appropriate for advice if required.

Conversation should take place between the lead consultant and the consultant neonatologist regarding whether delivery is appropriate and when.

At the extremes of viability (based upon gestation, EFW or fetal condition), frank sensitive discussions should be had with parents.

Expectant management and subsequent intrauterine death may be more appropriate than inevitable early neonatal death after classical Caesarean Section.

A Consultant Obstetrician should assess the woman and her fetus – formulation of an on-going plan of care is required. Ductus venosus (DV) Doppler should be used to time delivery. Where possible daily Dopplersurveillance should be performed (UA and DV dopplers). If DV unavailable, use cCTG.

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7 Corticosteroids for Fetal Lung Maturity

Betamethasone 12mg, two doses 24 hours apart should be given prior to delivery. The exact timing of these should be discussed with the lead consultant, as their most beneficial effects are seen when delivery is within the following 7 days. BP and urinalysis should also be performed daily to exclude maternal disease (e.g.: preeclampsia)

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8 Future Pregnancies: Prevention

8.1 Smoking Cessation

Smoking cessation support should be offered to all women who are pregnant and who smoke. Women who stop smoking by 15 weeks can reduce their risk of a SGA baby back to non-smokers.

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8.2 Low dose Aspirin

There is some evidence that antiplatelet therapy (low-dose aspirin PO daily at night) from 12 weeks to 37 weeks may prevent subsequent SGA birth.

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8.3 Antiphospholipid Antibody Screen

For baby under 5th centile, consider maternal antiphospholipid antibodyscreen

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9 References:

O'Connor D. Saving Babies' Lives; A care bundle for reducing stillbirth. Maternity and Women's Health, NHS England. 2013; updated 2017.

MBRRACE-UK: Term, singleton, normally formed, antepartum stillbirth 2015 Perinatal Confidential Enquiry.

RCOG Green-Top Guideline 31: The Investigation and Management of the Small-for-Gestational- Age Fetus. Royal College of Obstetricians and Gynaecologists, 2013.

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10 Appendices

10.1 Appendix 1: Timing of Delivery in SGA with normal UAPI

Timing of delivery in normal UA PI, Small for Gestational Age

RCOG guidance that women with an SGA fetus with normal UA shouldbe offered delivery at 37 weeks has not been altered in the UHW guideline but discussion should take place with an appreciation of thesupporting reference:

(DIGITAT: Induction versus expectant monitoring for intrauterine growth restriction at term: randomised equivalence trial), a study that used 38 weeks as the gestation for the induction arm.

It states that:
'In conclusion, we found equivalent fetal and maternal outcomes for induction (at 38 weeks) and expectant monitoring in women with suspected intrauterine growth restriction at term, indicating that both approaches are acceptable. In practice, however, obstetricians and patients will let factors other than growth restriction guide decision-making at delivery.

It is reasonable for patients who are keen on non-intervention to choose expectant management with intensive maternal and fetal monitoring because, as far as we can tell, this approach is safe for the baby. However, it is more rational to choose induction to prevent possible neonatal morbidity and stillbirth on the grounds that we showed no increase in operative and instrumental delivery rates. However, our study was underpowered to show differences in late pregnancy losses.

Observational data has identified a reduction in stillbirth rates in regions of the UK that have adopted the GAP programme run by the Perinatal Institute. This recommends a policy of delivery after 37 weeks when customised EFW is below 10th centile in the absence of any other ultrasound markers of FGR.

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10.2 Appendix 2: Patient Information

PATIENT INFORMATION

The following information may be shared with women to assist in theirdecision-making:

Ultrasound scan measurements of your baby suggest that his or her size is in the lowest 10% of expected size for this stage of pregnancy.

In other words, one out of every ten babies is similar (or smaller) in size to yours and nine out of ten babies are larger. This finding is not a cause for alarm because the ultrasound scan shows that the placenta (afterbirth) is working normally and that the baby is healthy.

This suggests that your baby is 'normal small', growing completely normally according to the genetics that he or she inherited at the very start of the pregnancy. These babies usually cope with labour as well as larger babies.

We recommend that the baby's growth and function of the placenta be checked by scan every two weeks. If any scan shows a problem, your baby may need to be scanned more frequently or birth may be recommended. If each scan demonstrates that your baby is well, we will scan you until you approach 37 weeks.

The Royal College of Obstetricians and Gynaecologists (RCOG, the national organisation that advises doctors who specialise in pregnancycare) recommends that inducing labour after 37 weeks of pregnancy should be offered.

A recent large research study from Holland compared induction of labour (at 38 weeks) with waiting for natural labour for these small babies and showed no difference in the outcome for the babies; they were equally healthy whether labour was induced or not.

So why do RCOG suggest that induction should be offered?
Stillbirth after 37 weeks is thankfully very rare but in the group of babies where no cause is found for their death (all tests including checks on the placenta arenormal), a greater number than expected by chance alone are small (bottom10% of the baby population).

This suggests that any small baby has a VERY SMALL increase in risk at the end of pregnancy. This sad outcome is too rare for the study from Holland to have shown a benefit from inducing labour.

Although inducing labour in this situation is a medical intervention, it is straightforward in most cases and it does not appear to increase the risk of problems in labour.

The chance of needing a Caesarean Section or a forceps/ ventouse delivery is not increased by the induction.

You need to weigh up the possible small safety benefit for your baby of induction of labour against a desire to 'wait for nature' in your otherwise normal pregnancy.

The doctor and midwife will discuss these issues with you and help you come to a decision that is right for you and your baby.

There is no hurry to make a decision; your baby is perfectly healthy by all the tests that we have available to us.

If you choose to wait for natural labour, we will recommend additional weekly scans after 37 weeks to keep a close eye on your baby, ensuring that he or she remains well.

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Fetal Biometry
Single AC or EFW<10th customised centile
Serial measurements indicative of FGR

UA Doppler

Normal

Repeat Ultrasound (Fortnightly)
AC & EFW**, UA Doppler

Delivery

Offer delivery by 37 weeks with the involvement of a senior clinician.

If delivery at 37weeks is declined, consider use of MCADoppler.

Consider delivery > 34 weeks if static growth over 3weeks

Recommend steroids if delivery is by CS

PI/RI>2Sds, EDF present

Repeat ultrasound
Weekly AC & EFW**
Twice-weekly UA Doppler

Delivery

Recommend delivery by 37 weeks.

Consider delivery > 34 weeks if static growth over 3 weeks.

Recommend steroids if delivery is by CS

AREDF

Repeat ultrasound
Weekly* AC & EFW
Daily UA Doppler, DV Doppler, CTG***

Delivery

Recommend delivery before 32 weeks after steroids if: – abnormal DV Doppler and/or cCTG provided ≥ 24 weeks & EFW > 500 g.

Recommend delivery by 32 weeks after steroids

Consider delivery at 30–32 weeks even when DV Doppler is normal

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10.3 Use of Dopplers in Obstetrics, Cardiff & Vale UHB: Appendix 3 to SGA guideline

10.3.1 SITUATION

Umbilical artery resistance index (RI) and pulsatility index (PI) are both well-known indices to describe arterial flow velocity waveforms. They are highly correlated. The current charts are outdated and based on a small historical data set. The proposal is to update our charts for Umbilical artery (PI and RI), Middle cerebral artery (PI and Vmax/PS) and Uterine artery PI

10.3.2 BACKGROUND

Umbilical artery Doppler is performed routinely in women having growths scans and for assessment of fetal well-being. Middle cerebral artery PI is used for fetal surveillance in late FGR and hopefully will be implemented in new SGA guidance and antenatal growth clinic. Middle cerebral artery Vmax/PS is used for monitoring of possible fetal anaemia. Uterine artery PI can be used in prediction models for pre-eclampsia and SGA and is currently used in Rainbow and OBS55 clinic.
If PI is in the normal range (<95th centile), only sample one of the umbilical arteries.
If the PI is abnormal (≥95th centile), sample both umbilical arteries and report the lower value
Please report PI if there is absent or reversed EDF so trend is observed.
Raised Doppler indices in normal growth is of significance as risk of missed SGA (1,2) and admission to NICU is increased with at least weekly follow up advised. Raised Doppler with normal growth is especially of concern if there are certain coexisting morbidities (e.g. diabetes, fetal anomalies, previous IUD/abruption, …). In these circumstances, a full clinical assessment that may include cCTG should be considered.

10.3.3 ASSESSMENT

The current charts for umbilical artery PI and RI are out of date as more than 30 years old and the 95th centile is too high which leads to a high false negative rate. This has been associated with adverse outcomes. Change to a newer chart with a lower 95th centile will improve our detection rate of Fetuses who are at risk of hypoxia. For the other charts it is the hope to standardise the reporting and interpreting of these more specialised and rarer Doppler indices.
Online calculators for the exact centile will be provided.

- Umbilical artery PI and RI: intergrowth 21 (charts see appendix)

Calculator: https://intergrowth21.tghn.org/fetal-doppler/ or https://www.perinatology.com/calculators/Fetal%20Biometry%203.0.html

- Uterine artery PI: Gomez et al. 2008 (chart see appendix)

Calculator: https://www.perinatology.com/calculators/Fetal%20Biometry%203.0.html

- MCA artery PI: Bahlmann et al. 2002 (chart see appendix)

Calculator: https://www.perinatology.com/calculators/Fetal%20Biometry%203.0.html

10.3.4 RECOMMENDATION

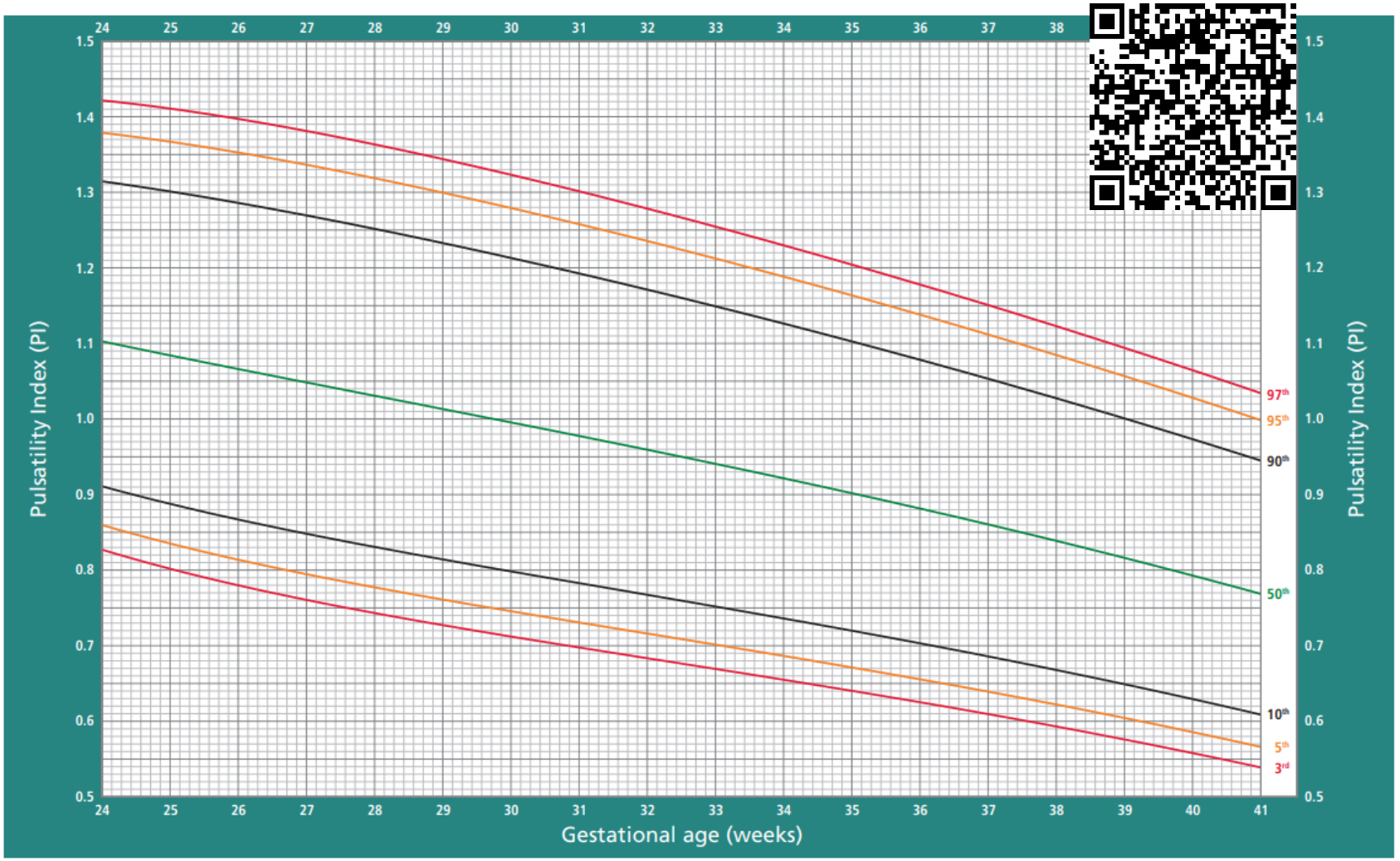
New RI and PI Charts for umbilical artery (with a link for online calculator) will be throughout the department, placed in the antenatal clinic rooms, in UHL and UHW scan rooms, day assessment unit, labour ward and the obstetric assessment unit. Middle cerebral artery PI charts will also be made available to seniors overseeing specific growth clinics. The agreed charts for the Doppler measurements will also be implemented into the scan machines of O+G and radiology across the 2 sites

(1) Beriwal, S., et al (2020), OC07.09: Abnormal umbilical artery Doppler in apparently normal growth: what does it mean?. Ultrasound Obstet Gynecol, 56: 20-20. https://doi.org/10.1002/uog.22250.

(2) Al Hamayel, N.A., Baghlaf, H., Blakemore, K. *et al.* Significance of abnormal umbilical artery Doppler studies in normally grown fetuses. *matern health, neonatol and perinatol* **6**, 1 (2020). https://doi.org/10.1186/s40748-020-0115-7

Umbilical Artery Pulsatility Index (PI)
International Reference Values

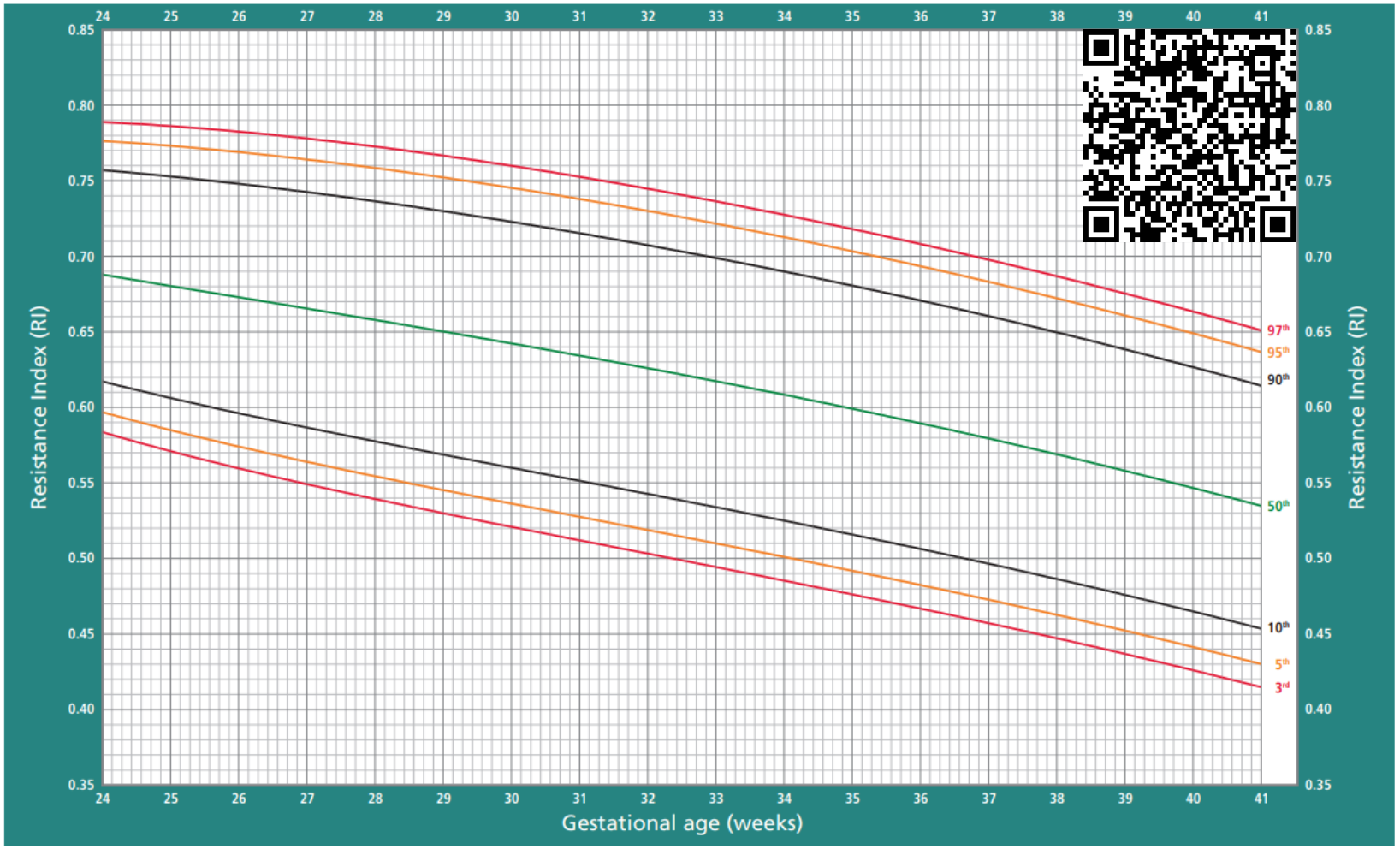
INTERGROWTH-21st



Drukker et al. Am J Obstet Gynecol. 2020;222:602.e1-15

Calculator: https://intergrowth21.tghn.org/fetal-doppler/

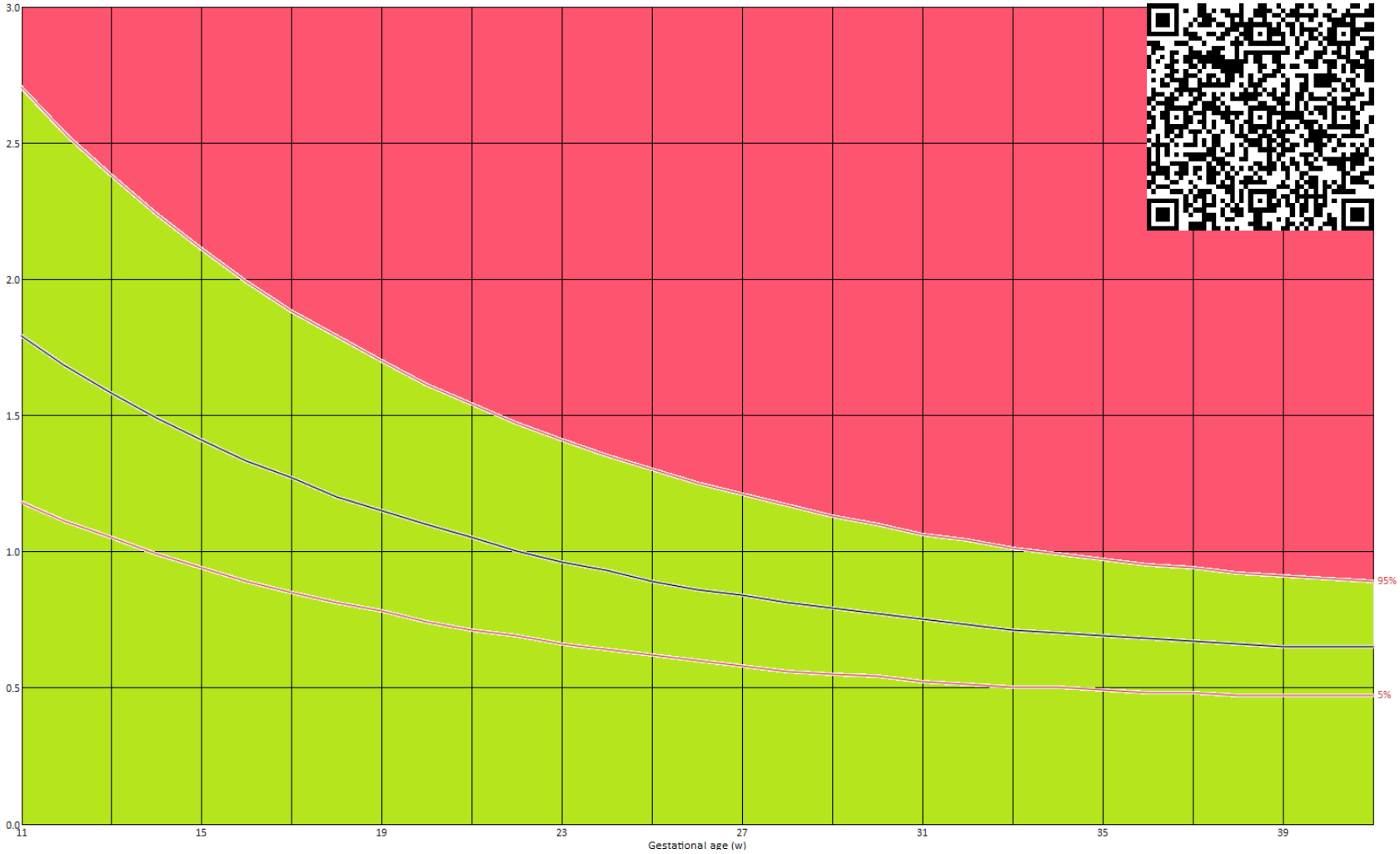
Umbilical Artery Resistance Index (RI) International Reference Values



Drukker et al. Am J Obstet Gynecol. 2020;222:602.e1-15

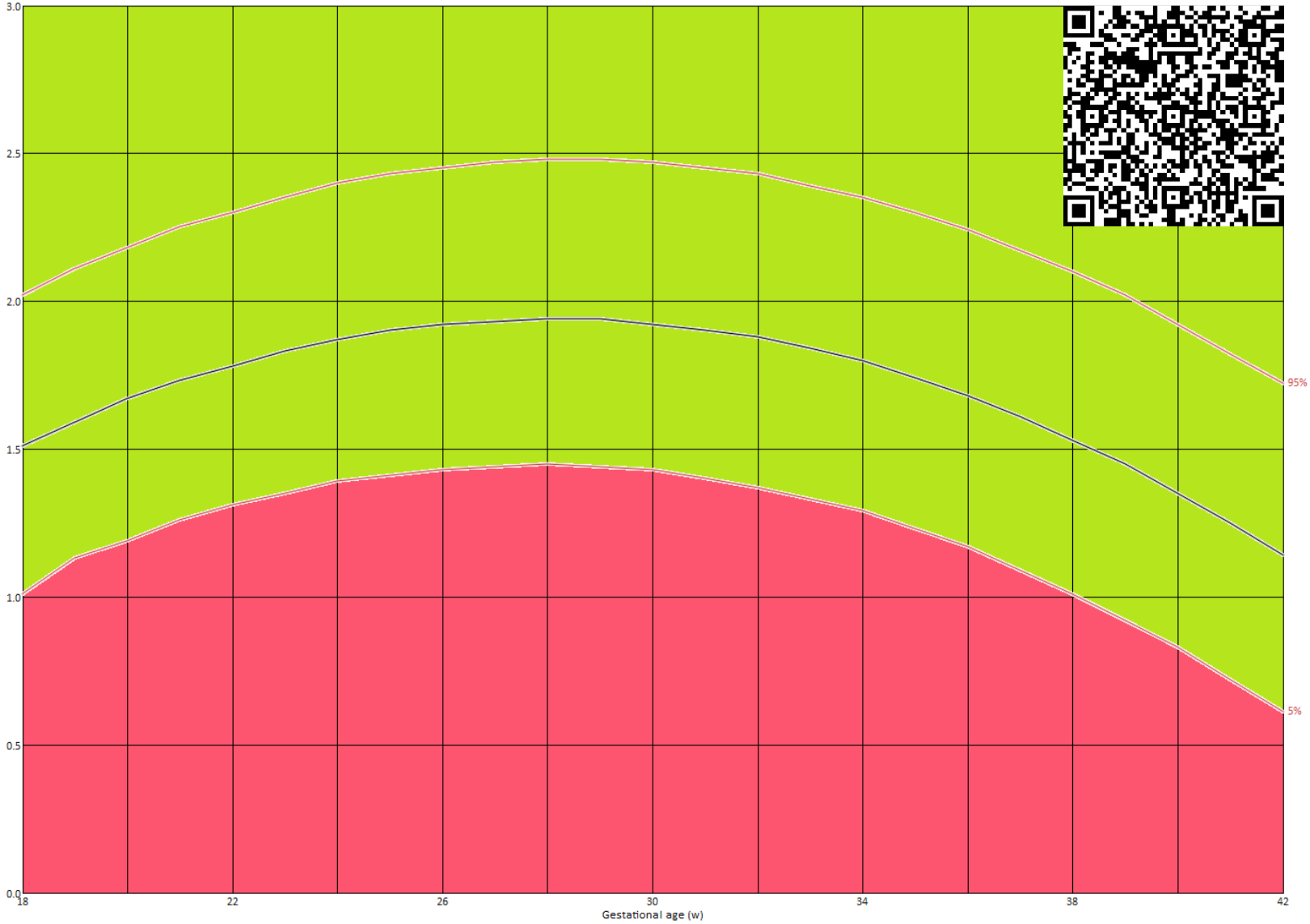
Calculator: https://intergrowth21.tghn.org/fetal-doppler/

Uterine artery PI



Calculator: https://www.perinatology.com/calculators/Fetal%20Biometry%203.0.html

Middle Cerebral Artery PI



Calculator: https://www.perinatology.com/calculators/Fetal%20Biometry%203.0.html