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TITLE: Small for Gestational Age and Fetal Growth Restriction

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1. Purpose

To ensure that the Te Whatu Ora Guideline on Small for Gestational Age and Fetal Growth Restriction is followed within Te Whatu Ora Health New Zealand Lakes by means of a planned approach to care.

This guideline describes a clinical pathway based on the Te Whatu Ora Guideline published in July 2023. Responsibility for the content and further review of the national guideline rests with Te Whatu Ora.

All Lead Maternity Carers (LMCs) are encouraged to refer women according to the national guideline. The national guideline is available via Chrome and familiarisation with this document is recommended (https://www.tewhatuora.govt.nz/publications/small-for-gestational-age-fetal-growth-restriction-guidelines/).

This guideline includes the management of SGA once detected. Under Section 88 of the Public Health and Disability Act 2000, when SGA is diagnosed the woman/person must be referred to a specialist Obstetrician.

2. Scope

All Te Whatu Ora Health New Zealand Lakes medical and midwifery staff and LMC's working within the Maternity Service and the women/people they are providing care to.

3. Definitions

AEDF	Absent End Diastolic Flow
AC	Abdominal Circumference
ANC	Antenatal Clinic
ASUM	Australasian Society for Ultrasound Medicine
BMI	Body Mass Index
BP	Blood Pressure
CIS	Clinical Information System
EFW	Estimated Fetal Weight
GP	General Practitioner
GROW	Gestation Related Optimal Weight – Customised antenatal chart for plotting estimated fetal weight
HC	Head Circumference
FGR	Fetal Growth Restriction: Growth which is abnormally reduced, less than expected due to pathology.
LDA	Low dose Aspirin
LMC	Lead Maternity Carer
MOH	Ministry of Health
NZMFMN	New Zealand Maternal Fetal Medicine Network
PET	Pre-eclampsia
REDF	Reduced End Diastolic Flow
SGA	Small for Gestational Age: <10th centile on customised growth chart, or birthweight <10th customised birth weight centile
SMO	Senior Medical Officer
USS	Ultrasound Scan

4. Background

A fetus with SGA/FGR is at increased risk of perinatal morbidity and mortality.
Early identification of risk factors is important so measures can be taken towards prevention and early detection.

Risk Factors

Major Risk Factors:

Each of the major risk factors in the table below more than doubles chance of SGA/FGR occurring in pregnancy.

Major Risk Factors
Pre-existing Risk Factors
• Previous FGR born
• Previous hypertensive disease in pregnancy
• Previous stillbirth
• Chronic hypertension
• Diabetes with vascular disease
• Renal disease
• Antiphospholipid syndrome
• Maternal age ≥40 (nulliparous)
• Drug abuse/use
• Smoker of >10 cigarettes/day continuing after 16 weeks gestation
Pregnancy Related Risk Factors
• Threatened miscarriage - Period like bleeding <20 weeks gestation
• Poor maternal weight gain
• Pre-eclampsia or gestational hypertension - See PET guideline

Table 1. Major Risk Factors for SGA

Minor Risk Factors:

Are associated with a smaller increase in the chance of SGA/FGR. It is likely that multiple minor risk factors increase risk further, but the magnitude of this increase is not known.

Minor Risk Factors
• Nulliparity
• Maternal age ≥ 40 (multiparous)
• Smoking 1-20 cigarettes per day beyond 16 weeks gestation
• Short (<6 months) or long (>5 years) interpregnancy interval
• Conception via assisted reproductive technology
• BMI > 30 kg/m2 or <18.5 kg/m2
• Placenta previa
• Low gestational weight gain

Table 2. Minor Risk Factors for SGA

Risk Factors cont'd

Velamentous or marginal cord insertion, and an isolated finding of a 2 vessel cord may have a higher chance of SGA/FGR, however the findings are not consistent across studies. They are not included as risk factors in this guideline.

This pathway does not include an exhaustive list of all risk factors for abnormal fetal growth. If clinically indicated, ultrasound scan for fetal growth should be requested through the usual process.

Symphysial Fundal Height Measurements

In low risk women/people, ultrasound screening has not been shown to improve the detection of SGA.

- Low risk women/people should have serial symphysial fundal height measurements plotted on a customised growth chart.
- If fundal height measurements are not normal (i.e. if the plotted fundal height is < 10th centile or if fundal height declines > 30 centiles), SGA/FGR should be confirmed on serial ultrasounds.

  (N.B.: If fundal height measurement is not normal, and an USS appointment cannot be arranged for within 1 week, refer to ANC for advice.)

- Symphysial fundal heights are not reliable in women/people with;
  - a BMI of greater than 35
  - polyhydramnios
  - multiple gestations
  - multiple/large fibroids

  These women/people should have ultrasound screening for fetal growth, even when low risk.

5. Understanding the SGA Pathways

There are two components to SGA, each presented in separate pathways;

1. **Screening** – for the prevention and detection of SGA – see Appendix 1
2. **Management** – to optimise care for mothers and babies once SGA is detected – see Appendix 2

6. Screening

The SGA Prevention and Detection Pathway aims to stratify a woman/person's risk for SGA and it recommends an appropriate care bundle/schedule.

Entry onto the SGA Prevention and Detection Pathway

A pregnant woman/person may be placed on the SGA Prevention and Detection Pathway (Appendix 1.) at any time in pregnancy. This may be initiated by medical staff, midwives, GPs, or LMCs.

How to Use the SGA Prevention and Detection Pathway

- Read DOWN the list of risk factors.
- Read ACROSS the page to the appropriate care bundle/schedule.
- Major risk factors are not cumulative. The FIRST RELEVANT FACTOR identified on the list determines the level of care.
- The responsible clinician must arrange, and follow up on, ultrasound scan results

N.B.: Smoking cessation: if women/people become smoke-free prior to 16 weeks' gestation the risk of SGA due to smoking returns to the baseline.

Exiting the SGA Prevention and Detection Pathway

The woman/person may exit the SGA Prevention and Detection Pathway when they have birthed their infant, or when SGA is detected. When SGA is detected it is strongly recommended that they are transferred to the SGA Management Pathway (Appendix 2.)

7. Prevention

Low Dose Aspirin

There is clear evidence of benefit for the prophylactic use of Low Dose Aspirin (LDA) in the prevention of small for gestational age babies, and pre-eclampsia. The experience of low dose aspirin in pregnancy is adequate to demonstrate that the embryo-fetal risk is very low, or non-existent (NZ Formulary).

- Contraindications

These are rare in women of reproductive age, but include:

- Previous peptic ulcer
- Asthma induced by Non-Steroidal Anti Inflammatory Drugs
- Allergy to aspirin

The patient information leaflet 'Taking Aspirin in Pregnancy' has been developed to facilitate the consent process (EDMS 2480090)

- Prescribing

When taken from prior to 16 weeks' gestation until term, low dose aspirin (100mg EC, nocte) reduces the risk of SGA in high risk women.

The prescription of aspirin is within a midwifery scope of practice. Medical staff, midwives, GPs, and LMCs can prescribe aspirin for high risk women/people. When uncertain about the indication, or contraindications midwives and GPs are encouraged to consult with a specialist Obstetrician prior to 16 weeks' gestation.

- Vaginal Bleeding

Approximately 20% of women/people who have ongoing pregnancies will experience vaginal bleeding before 20 weeks. Aspirin has anti-platelet effects by inhibiting the production of thromboxane, which binds platelets together to create a patch over damaged walls of blood vessels

Women/people taking LDA who experience bleeding should be advised to contact their midwife or maternity care provider**.** LDA can be continued if spotting or light vaginal bleeding occurs in early pregnancy, however specialist advice is recommended for all women with moderate to heavy bleeding (bleeding like a period or with blood clots). If moderate to heavy bleeding occurs discontinue aspirin and arrange specialist consultation.

8. Detection

- If SGA/FGR is suspected on SFH measurements a growth scan is recommended.

  (N.B.: If SFH measurement is not normal, and an USS appointment cannot be arranged for within 1 week, refer to ANC for advice.)

- The detection of SGA/ FGR requires all ultrasound scans (USS) to be plotted on a customised growth chart (customising expected size for maternal characteristics), and on an ASUM population growth chart.

- Where slowing of growth is suspected, however not confirmed, a repeat scan is recommended 2-3 weeks later. Repeating the scan at 3 weekly intervals reduces the false positive diagnosis, however timing should be individualised based on clinical scenario.

- When SGA/FGR is diagnosed or suspected fetal-maternal Dopplers are performed:
  - UtA Doppler at diagnosis
  - Umbilical artery in all cases
  - MCA Doppler with CPR is calculated after 32+0/40. (CPR is to be reported, PI is not)

The definitions of SGA, Suspected FGR, slowing of growth, and FGR are found in Table 3. below

Term	Definition
• **SGA**	EFW or birthweight <10th customized centile
• **Suspected Fetal Growth Restriction (FGR)**	EFW customised or AC <10th centile **OR** Slowing of fetal growth
• **Slowing of Growth**	Decline in EFW or AC of >30 centile points after 28 weeks gestation
• **FGR - Early Onset**	< 32 weeks **AND** - EFW customised or AC <3rd centile **OR** - UA with AEDF or REDF **OR** - EFW <10th centile customised or AC < 10th centile AND LEAST ONE OF; ▪ UA Doppler PI >95th centile ▪ UtA Doppler mean PI 95th centile ▪ UtA bilateral notching
• **FGR - Late Onset**	≥ 32 weeks **AND** - EFW customized or AC <3rd centile **OR** - TWO OR MORE OF ▪ EFW customized or AC <10th centile ▪ Slowing of fetal growth ▪ Any of: UA Doppler PI >95th centile UtA Doppler mean PI 95th centile UtA bilateral notching CPR <5th centile

Table 3. Definition of Terms

9. Management

When SGA or FGR is early-onset or severe;

- Consider screening for congenital infection e.g. Toxoplasmosis, CMV, Syphilis, and if clinically appropriate Rubella, Varicella, Zika, or Malaria.
- Review in the Rotorua Obstetric-Ultrasound Clinic
- Maternal Fetal Medicine (MFM) referral if < 28 /40, other fetal anomalies, or polyhydramnios

Placental insufficiency is the most common cause of FGR and as such the pathway is specific to those instances. Management from fetal causes should be individualised in consultation with MFM and the parents.

Entry onto the SGA Management Pathway

Once SGA is detected women/people should be placed on the SGA Management Pathway (see Appendix 2.).

- Responsibility for Care

  Depending on severity, SGA requires either a consultation or transfer of clinical responsibility under the Maternity Referral Guidelines (MOH, 2023).

  Referral to the antenatal clinic is strongly recommended if the woman/person is not already under the supervision of a consultant obstetrician/SMO.

  Communication regarding responsibility for care is to be conducted separately, and deliberately, in accordance with the Maternity Referral Guidelines (MOH, 2023).

  These guidelines recommend transfer of clinical responsibility if there is;

  1. EFW <3rd centile
  2. Risk of birth <28 weeks' gestation
  3. Risk of birthweight <1000g

  Where there are abnormal Dopplers, abnormal fetal movements, or hypertension, an urgent SBARR referral to the on-call Obstetrician is recommended.

  It is recommended that all other women/people with a suspected SGA/FGR fetus must be referred to a specialist Obstetrician for individualised care in line with the Maternity Referral Guidelines (MOH, 2023).

Exiting the SGA Management Pathway

A woman/person may exit the SGA Management Pathway when they have birthed their infant, or if the fetus is found to be of normal growth.

Women/people may move between the monitoring groups as their risk factors develop (e.g., if Dopplers' become abnormal, they may move from the 'frequent monitoring group' to the 'intensive monitoring group').

De-escalation is possible but requires input from the responsible Consultant Obstetrician/SMO.

10. Care for the Pregnant Woman/Persons' Life Course

Future pregnancy planning

Placental histology can help determine the need for further investigations and preventative strategies. Interpretation and management recommendations are in Appendix 3.
While it is recommended for all cases where babies where FGR or SGA, it is particularly the case where;

- There is no identifiable cause/antecedent
  - There is severe FGR (<3rd centile), early onset, and/or preterm birth.

Cardiovascular health

Those who give birth to a baby with FGR have a personal increased chance of cardiovascular disease. Referral to primary care services for a risk assessment and advice is recommended.

11. Related Documentation

- SGA Prevention and Detection Pathway
- SGA Management Pathway
- GROW Charts
- ASUM Charts
- New Zealand Maternal Fetal Medicine Network (NZMFMN) Guideline for the Management of Suspected Small for Gestational Age Singleton Pregnancies after 34 weeks. September 2014. (EDMS 1015628)
- Taking Aspirin in Pregnancy – Patient Information (EDMS 2480090)
- Why is My Baby Small – Patient Information (EDMS 993995)

12. References

- Ministry of Health (MOH) (2023). Guidelines for Consultation with Obstetric and Related Medical Services (Referral Guidelines). Wellington: Ministry of Health.
- NZ Formulary: https://nzf.org.nz/nzf_1529 (accessed 20/04/2022)
- New Zealand Maternal Fetal Medicine Network (NZMFMN) Guideline for the Management of Suspected Small for Gestational Age Singleton Pregnancies after 34 weeks. September 2014
- Te Whatu Ora (2023) Guideline on Small for Gestational Age and Fetal Growth Restriction. https://www.tewhatuora.govt.nz/publications/small-for-gestational-age-fetal-growth-restriction-guidelines/

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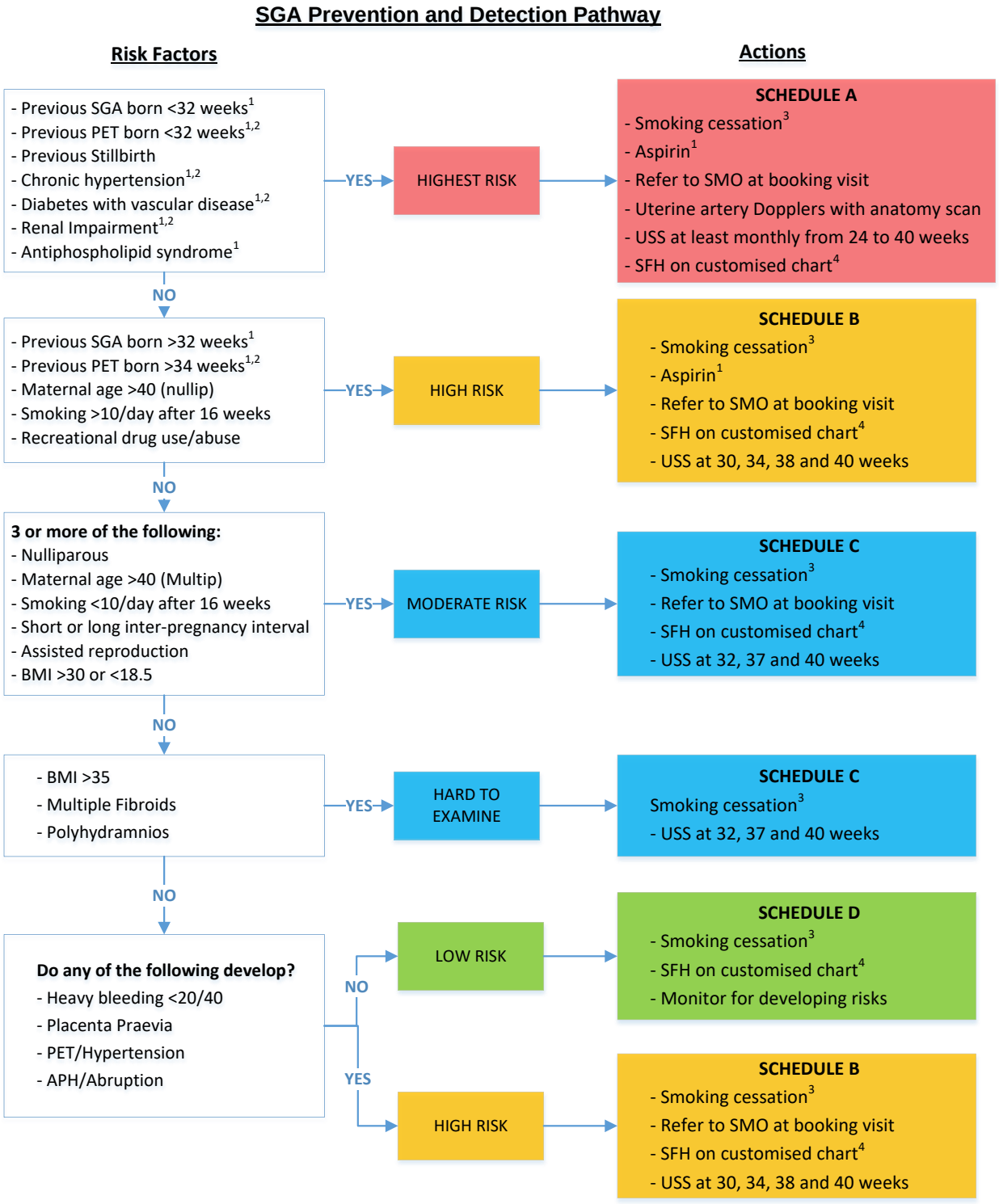
Authorised by: **Maternity Clinical Quality Improvement (CQI) Meeting**

13. Appendices

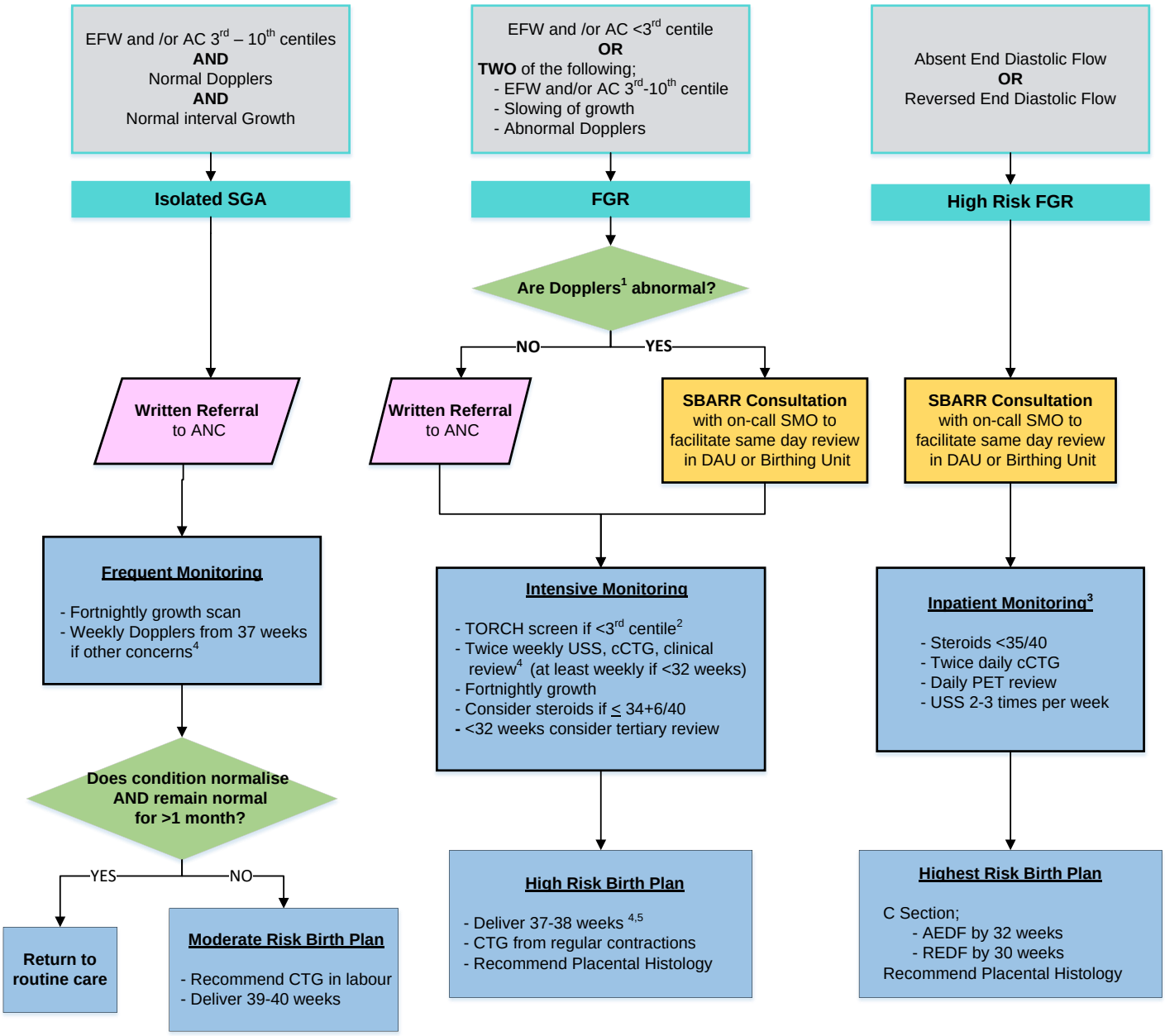
Appendix 1. SGA Prevention and Detection Pathway



1. Aspirin 100mg EC nocte starting between 12-16 weeks gestation can reduce change of SGA/FGR and PET. Stop Aspirin at 36 weeks gestation
2. 1.25grams Calcium Carbonate OD from booking until birth can reduce the risk of pre-eclampsia (PET)
3. Smoking cessation by 16 weeks returns risks to baseline (Contact Manaaki Ora, Ph. 0800 348 2400)
4. If SFH under 10th centile, or falls by 30 centile points, consider referral/earlier scan
5. If SGA is diagnosed, consultation is recommended as per the maternity Referral Guidelines

Appendix 2. FGR Management Pathway

FGR Management Pathway



1. Dopplers include: Uterine artery PI at diagnosis, CPR once >32 weeks, Umbilical artery PI
2. CMV, Toxoplasmosis, Syphilis +/- Rubella, Varicella, Zika, Malaria
3. Consider transfer to tertiary unit if <32 weeks (singleton), <34 weeks (twins), or weight <1500g
4. Increase surveillance/consider admission if oligohydramnios, static interval growth, or suspected PET
5. Consider mechanical induction (i.e. balloon)

Absolute Indications for Birth

- Grossly abnormal CTG or cCTG abnormality in babies intended for NICU admission
  26+0 to 28+6 weeks; STV <2.6msec
  29+0 to 31+6 weeks; STV <3.0msec
- Severe maternal concerns (e.g. HELLP, severe PET with uncontrolled hypertension/end organ damage)

Appendix 3. Management of Placental Findings

Placental Pathology	Common Placental Findings	Phenotype	Risk of Recurrence	Recommendations for Investigation and Prevention in the Next Pregnancy
Maternal vascular malperfusion (MVM)	Decidual arteriopathy, agglutinated villi, increased syncytial knots, intervillous fibrin deposition, villous infarcts.	Early-onset or late-onset fetal growth restriction (FGR), pre-eclampsia, placental abruption.	10 – 25%	Screening for antiphospholipid antibodies may be considered in selected cases of severe early-onset FGR, when placental examination shows especially central or multiple areas of villous infarction Consider aspirin in subsequent pregnancy,
Fetal vascular malperfusion	Avascular villi, chorionic plate or stem villous thrombi, obstructive lesions of umbilical cord.	FGR, fetal central nervous system injury, stillbirth.	Low	Consider screening of the infant or the mother/person for hereditary thrombophilia. Family history of bleeding disorder or thrombophilia may help to identify those at greatest risk.
Chronic Inflammation				
Villitis of unknown aetiology	Chronic T-cell mediated inflammation of villous stroma.	Late-onset FGR, abnormal neurodevelopmental outcome, stillbirth.	10 – 50%	None
Chronic histiocytic intervillositis	Maternal histiocytic infiltrate in the intervillous space	Recurrent miscarriages, recurrent severe early-onset FGR, stillbirth	70 – 100%	Suggested interventions include prednisone, hydroxychloroquine, aspirin, low-molecular-weight heparin
Massive perivillous fibrinoid deposition (maternal floor infarction)	Large amounts of fibrinoid matrix surrounding villi	Recurrent miscarriages, recurrent severe early-onset FGR, stillbirth	10 – 60%	Consider screening for antiphospholipid antibodies, hereditary thrombophilia. Anecdotal reports of treatment with aspirin, heparin and intravenous immune globulin.