

## 2 COMPLICATIONS OF PREGNANCY

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2.20 Intrauterine Growth Restriction  
Section B  
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### 2.20 INTRAUTERINE GROWTH RESTRICTION

#### BACKGROUND INFORMATION

50-70% of the Small-for-Gestation Age (SGA) foetuses are constitutionally small but healthy<sup>1</sup>. Approximately 10-15% of SGA foetuses are classified to be 'true' IUGR cases, and another 5-10% are associated with chromosomal/structural anomalies, or chronic intrauterine infection.<sup>2</sup>

A fetus is considered have intrauterine growth restriction (IUGR) when the ultrasound fetal measurements, particularly the abdominal circumference or serial weight measurements are below what is considered normal for that age and gestation.<sup>3</sup> This is usually below the 5<sup>th</sup> or 10<sup>th</sup> centile when compared to the normal growth and gestational for age by ultrasound measurements.<sup>4</sup> The IUGR infant has not reached their genetic growth potential due to a pathological reason or event in utero causing placental dysfunction.<sup>5</sup> The IUGR fetus is associated with increased risk of perinatal mortality and morbidity and long term health consequences for survivors<sup>2,6,7</sup>. Current evidence suggests long term consequences for IUGR infants are that they are prone to heart disease, type 2 diabetes, strokes, hypertension and even osteoporosis later in life.<sup>4</sup>

The Growth Restriction Intervention Trial (GRIT) concluded that generally if the fetus is less than 31 weeks gestation it is best to delay delivery if there is uncertainty about need for intervention, rather than immediate delivery. Evidence to date indicates that by delivering the fetus early to pre-empt severe hypoxia and acidosis does not reduce adverse outcomes.<sup>2,8</sup>

Umbilical artery (UA) Doppler measurement is a tool used to identify if the SGA fetus is affected by placental dysfunction which occurs with the IUGR fetus. With worsening severity of placental insufficiency there is higher placental resistance which can lead to absent or reversed end-diastolic flow velocities. This is associated with a worst perinatal outcomes and mortality.<sup>1,7</sup> Fetal circulatory redistribution due to placental insufficiency leads to abnormal Doppler indices in the cerebral and umbilical arteries<sup>9</sup> providing valuable information to assist decision making regarding timing of birth. Doppler abnormalities have been shown to deteriorate before biophysical profile scores (BPS) in the preterm fetus with IUGR prior to 32 weeks gestation.<sup>9</sup>

#### CAUSES AND RISK FACTORS FOR IUGR<sup>3</sup>

Maternal	Fetal	Placental
Hypertensive disorders	Aneuploidy	Anatomical conditions
Autoimmune disease	Malformations	Vascular conditions
Certain medications	Abnormal genetic imprinting syndromes	Chromosomal conditions
Severe malnutrition	Viral or protozoan infections	Morphological abnormalities
Maternal lifestyle e.g. smoking	Preterm birth	
alcohol abuse, substance abuse	Multiple gestation	

## KEY POINTS

1. An accurate expected delivery date (EDD) is a critical component to allow monitoring, assessment and optimal timing of delivery.
2. Management of the IUGR fetus must include a balance of the risks of intra-uterine chronic hypoxia with preterm delivery and its associated risks.
3. Fetal Doppler studies provide the most accurate non-invasive assessment for placental function. Absent or reversed UA Doppler's are associated with poor perinatal outcome and high perinatal mortality.<sup>10</sup>

## SCREENING AND DIAGNOSIS

Screening and diagnosis for IUGR includes<sup>11</sup>:

1. Accurate determination of the gestational age.
2. Abdominal palpitation to determine fundal height during each antenatal visit.
3. Symphysis-fundal height measurements.
4. Ultrasound examination of a suspected SGA fetus.
5. Assessment of fetal well-being when an SGA fetus or IUGR fetus is diagnosed. This includes biophysical profile (BPP), Doppler studies, and cardiotocography monitoring (CTG) depending on gestation

## DETERMINATION OF GESTATIONAL AGE

A dating ultrasound in the first trimester provides the most accurate method to determine gestational age.<sup>11</sup>

## ABDOMINAL PALPATATION

- The ability to detect fetal weight by palpation is limited. If there is suspicion of SGA or IUGR management should be discussed with the obstetric team. A follow up ultrasound examination may be required.<sup>11, 12</sup>
- Document a management plan on the MR 004 'Obstetric Special Instruction Sheet' after consultation with the Obstetric team if a SGA or IUGR fetus is suspected from palpation.

## SYMPHYSIS-FUNDAL MEASUREMENTS

- See [Clinical Guideline, Section B 1.6.3 Measuring Fundal Height with a Tape Measure.](#)
- If SGA or IUGR is suspected by abnormal fundal-symphysis measurements ultrasound examination may be required after obstetric team consultation.

## ULTRASOUND EXAMINATION

If there is suspicion of SGA or IUGR ultrasound examination should be performed to assess:

- Biometry – assessment of growth requires at least 2 measurements two weeks apart.<sup>1</sup>
- Doppler studies – Doppler studies are a valuable tool to differentiate the SGA fetus that is healthy, and the true IUGR fetus.<sup>1</sup>
- Amniotic Fluid Volume (AFI)
- Fetal well-being – BPP
- Anatomy examination - if an anatomy scan has not been done or is unavailable, this scan is required to exclude fetal anomalies, and fetal aneuploidy.<sup>13</sup>

## MANAGEMENT

1. Frequency of fetal surveillance is assessed at each visit, and the management plan is adjusted by the Obstetric team according to the fetal and maternal clinical condition.
2. Antenatal surveillance may be conducted with antenatal clinic visits and by outpatient review in the Maternal Fetal Unit (MFAU). If the maternal or fetal clinical condition requires more intensive surveillance in-patient hospitalisation should be considered in consultation with the team Obstetrician.
3. All Ultrasound examinations, CTGs, and BPP must be reviewed and documented by the registrar or Consultant prior to discharge of a woman.
4. Document the assessment and test results at each visit to MFAU on the MR 226 Multiple Visit Record Sheet.

## ASSESS FOR CAUSES OF IUGR

1. Review the medical and pregnancy history to determine cause of IUGR e.g. accurate delivery date, normal anatomy scan, and if any history of infection<sup>13</sup>.
2. Ensure 'hard copy' of antenatal testing and results are available in the medical records.

## ULTRASOUND SURVEILLANCE

1. ***AFV and Doppler studies***
  - **If normal at the initial visit:** continue weekly assessment of AFV and Doppler studies in MFAU.
  - **If abnormal at the initial visit:** arrange bi-weekly assessment of AFV and Doppler studies, or more frequent surveillance if the clinical condition requires closer monitoring.
2. ***Fetal Biometry***  
Arrange fetal biometry fortnightly<sup>13</sup>

## CTG MONITORING

If gestation more than 32 weeks:

- Arrange a weekly CTG in MFAU on the woman's Obstetric Team day on duty in the antenatal clinic.
- If abnormal AFI or Doppler's arrange bi-weekly CTG monitoring in MFAU.

If gestation is less than 32 weeks gestation discuss with the Registrar and Consultant if CTG monitoring is required.

## ANTICIPATED PRETERM BIRTH

- Consider a course of [corticosteroids](#) if pre-term birth less than 34 weeks gestation is anticipated.<sup>1</sup>
- Arrange Paediatric consultation if the gestation is less than 32 weeks.
- Organise a tour of the Neonatal Intensive Care unit if preterm birth is anticipated.

## TIMING OF DELIVERY

Delivery is indicated when risk of fetal death or morbidity is greater than the risk of prematurity.

### ***IUGR with end diastolic flow***

If other surveillance findings and maternal condition are normal delivery may be delayed until at least 37 weeks.<sup>12</sup>

### ***IUGR associated with absent or reversed flow***

- Admit for close surveillance.<sup>12</sup>
- Administration of steroids may be required if the clinical condition allows time<sup>12</sup>
- If other surveillance results are **abnormal** delivery is indicated<sup>12</sup>

### **INTRAPARTUM MANAGEMENT**

Apply continuous CTG monitoring.

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