

# Diagnostic Imaging Pathways - Intrauterine Growth Restriction (Suspected)

## Population Covered By The Guidance

This pathway provides guidance on the imaging investigation of a fetus with suspected intra-uterine growth restriction (IUGR), and the role of imaging in the management of confirmed IUGR.

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## Quick User Guide

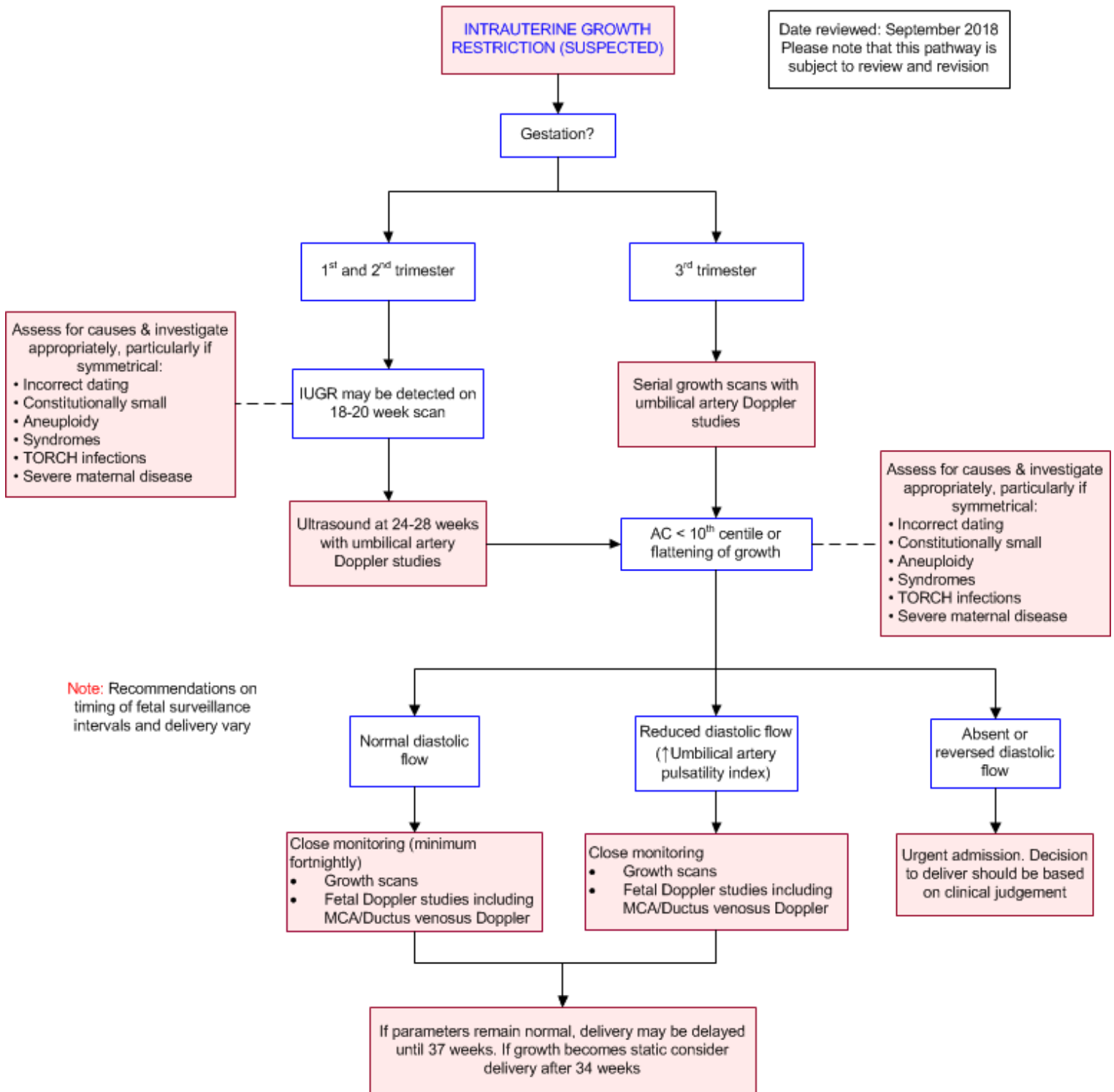
Move the mouse cursor over the **PINK** text boxes inside the flow chart to bring up a pop up box with salient points.

Clicking on the **PINK** text box will bring up the full text.

The relative radiation level (RRL) of each imaging investigation is displayed in the pop up box.

SYMBOL	RRL	EFFECTIVE DOSE RANGE
	None	0
	Minimal	< 1 millisieverts
	Low	1-5 mSv
	Medium	5-10 mSv
	High	>10 mSv

## Pathway Diagram



## Image Gallery

*Note: These images open in a new page*

1a



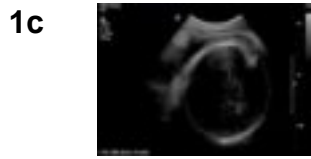
### Intrauterine Growth Restriction

Image 1a,b,c (Ultrasound, 33 weeks gestation): The fetus is in a cephalic presentation. The placenta is situated on the posterior uterine wall, clear of



the cervix.

Measurements: Biparietal diameter 78mm, Head circumference 283mm, Abdominal circumference 266mm, Femur length 58mm. Estimated fetal weight 1625g +/- 237g. Amniotic fluid volume is normal (Amniotic Fluid Index = 12cm).



On Doppler imaging, there is reverse end diastolic flow in all sections of the umbilical artery evaluated.

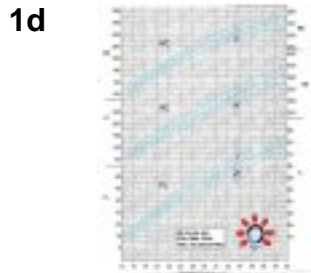


Image 1d (Fetal Biometry Chart, 33 weeks gestation): The above measurements are all below the 3rd percentile.

## Teaching Points

- Small for gestational age (SGA) is defined as an estimated fetal weight (EFW) on a customised growth chart less than the 10th centile for gestation. Most SGA fetuses are small but healthy, however a proportion will be considered to have intrauterine growth restriction (IUGR). IUGR occurs when the fetus fails to reach its genetic growth potential due to a pathological reason or an event in utero causing placental dysfunction
  - The abdominal circumference is usually the first measurement to become reduced. A growth restricted fetus may have a discrepancy between head and abdominal circumference but may not meet the criteria for SGA
- Several risk factors for IUGR have been identified, and screening with growth scans at 24-28 weeks may be considered in high-risk pregnancies
- Fundal symphysis height (FSH) should be measured and plotted regularly in all pregnancies from 24 weeks. Ultrasound examination is required to confirm SGA/IUGR suspected from abnormal measurements. If FSH is unreliable, e.g. due to obesity or large fibroids, then serial growth ultrasounds are recommended for monitoring
- Conventional and Doppler ultrasonography are used to assess fetal wellbeing in conjunction with clinical examination. Depending on gestation cardiotocography (CTG) monitoring may also be used
- Recommendations on timing of fetal surveillance intervals and delivery vary
- Delivery is indicated when risk of fetal death or morbidity is greater than the risk of prematurity

## Intrauterine Growth Restriction (IUGR)

- A small for gestational age (SGA) fetus refers to a fetus with an estimated fetal weight or abdominal circumference below the 10th percentile. [1](#) 50-70% of SGA fetuses are constitutionally small but healthy, with fetal growth appropriate for maternal size and ethnicity. [2](#) A proportion of SGA fetuses will have IUGR, although these may be difficult to differentiate. IUGR occurs where a pathological process has inhibited pre-programmed genetic growth potential, however this can be more difficult to define in practice and many different definitions exist in the literature [3](#)
  - The use of customised growth charts to define SGA have shown promise in better

prediction of perinatal outcomes, [4,5](#) however there is a lack of direct comparative evidence [6](#)

- SGA and IUGR are associated with adverse fetal outcomes including acidosis, stillbirth, oligohydramnios, low birth weight, and adverse events during labour including fetal distress [7-9](#)
- IUGR is often suspected by poor maternal weight gain or when fundal height is less than expected for gestational age. Very early IUGR may also be detected during a routine 18-20 week anatomical ultrasound scan
- Confirmation of accurate gestational age is the first step when IUGR is suspected. A dating ultrasound in the first trimester is the most accurate way to determine gestational age. [10](#) However, if the earliest ultrasound was between 13 and 24 weeks, the ultrasound EDD should be used instead of the last menstrual period (LMP) if LMP is irregular or uncertain [11](#)
- Current evidence has not demonstrated benefit from routine ultrasound screening for IUGR, [12,13](#) however women with strong risk factors for IUGR may warrant increased surveillance with serial growth ultrasounds and Doppler studies [14-16](#)
- Risk factors for IUGR include:
  - Maternal factors and medical history:
    - Maternal age >40 [17](#)
    - Constitutionally small mother
    - Maternal [18](#) or paternal SGA [19,20](#)
    - Smoking >11/day [21](#)
    - Cocaine use [22](#)
    - Maternal disease including: diabetes, [23](#) vascular disease, [23](#) chronic hypertension, [24](#) renal disease [25](#)
    - Antiphospholipid syndrome [26](#)
  - Previous pregnancy history
    - Previous stillbirth [27](#)
    - Previous birth of SGA baby [27](#)
  - Current pregnancy complications
    - Pre-eclampsia [27](#)
    - Severe pregnancy induced hypertension [24](#)
    - Low maternal weight gain [28](#)
    - Heavy bleeding (threatened miscarriage), [29](#) unexplained antepartum haemorrhage
    - Echogenic fetal bowel [30](#)
- IUGR may also be caused by fetal conditions. Further investigation should be considered, especially in the absence of another identifiable cause in the history and in very early onset SGA

## References

**Date of literature search: August-September 2018**

The search methodology is available on request. [Email](#)

References are graded from Level I to V according to the Oxford Centre for Evidence-Based Medicine, Levels of Evidence. [Download the document](#)

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