Fetal Growth Patterns

Use of Grow Charts

Dr Carmel Cocchiaro

Consultant Obstetrician and Gynaecologist
North Adelaide Obstetrics & Gynaecology
Calvary Hospital North Adelaide

Staff Specialist Obstetrics and Gynaecology
North Adelaide Local Health Network
Lyell McEwin Hospital
What is normal growth?

- Expression of genetic potential to grow in a way that is neither constrained nor promoted by internal or external factors based

- Normal singleton fetal growth (Resnik 2002)
  - 5g/day at 14-15 weeks  \( T_1 = 50\text{g} / \text{week} \)
  - 10g/day at 20w  \( T_2 = 100\text{g} / \text{week} \)
  - 30-35g/day at 32-34 weeks  \( T_3 = 200\text{g} / \text{week} \)
Small for gestational age (SGA) refers to a total weight, estimated by scan or measured at birth, below what is anticipation at that gestation.

Definition RANZCOG / RCOG
- SGA: EFW or AC <10\textsuperscript{th} centile
- Severe SGA: EFW or AC <3\textsuperscript{rd} centile

Historically defined by population centiles but use of customised charts identifies small babies at higher risk of morbidity and mortality than those identified by population. Figueras 2007
Too Small?? SGA

- Challenge to identify small “sick baby” vs the “healthy” small baby
- SGA defined as birth weight $< 10^{th}$ centile, one in ten of the normal population will be included
- Severe SGA $< 3^{rd}$ centile, will also still include normal fetuses
Too Small?? IUGR / FGR

- A fetus that has failed to reach its genetically determined growth potential
  - Expressed as the optimal weight which a baby is expected to reach at the end of a normal pregnancy free from pathology

- IUGR should only be used for fetuses with definite evidence that growth has faltered

- Growth is a dynamic process of change of size over time and can only be assessed by serial observation
NOT ALL SGA FETUSUS ARE IUGR

- NOT all growth restricted fetuses are SGA and 50-70% of SGA fetuses are constitutionally small
  - The lower the limit, the stronger the association with pathological outcome
SGA vs IUGR

- SGA but no evidence of IUGR
  - Growth along centile line at which it commenced
SGA vs IUGR

- Fall from 95th centile at 30 weeks to below 5th centile at 36 weeks
Symmetrical vs Asymmetrical IUGR

- Symmetrical
  - Head size and trunk are reduced in parallel
  - Usually represents lower end of normal range for size
  - May indicate insult that has occurred in the early antenatal period during general organ growth
  - Main associated conditions
    - Chromosomal / Congenital / Inborn errors of metabolism
    - Intrauterine infection
    - Environmental factors – Poor nutrition / BMI <20 or >25 / Age >35 / Daily vigorous activity
Symmetrical vs Asymmetrical IUGR

- **Symmetrical**

- **Asymmetrical**
  - Fetus responds to inadequate nutrition by redistributing blood flow
    - More to brain, heart and adrenal
    - Less to liver and kidney
  - Result in abdominal girth and fat stores reduced more than head: brain sparing
  - Associated with later onset pathology
    - Maternal medical – hypertension, pre-eclampsia / diabetes / anaemia, pulmonary, cardiovascular or renal disease
    - Placental – abruption, infarction, praevia, chorioamnionitis
Too Big?? Macrosomia / LGA

- Interchangeable terms

- Fetal growth beyond a specific weight
  - RCOG: weight over 4000g or above 90\textsuperscript{th} centile of weight for gestation
  - SA PPG: weight over 4000g, over 4500g or above 90\textsuperscript{th} centile for gestation

- Australian, non-indigenous population, 90\textsuperscript{th} centile at 40 weeks
  - Female 4000g
  - Male 4170g
Evidence shows SGA based on customised growth potential, is associated with increased risk of perinatal morbidity and mortality - REGARDLESS OF CAUSE

The duration and severity of growth deficit is linked with perinatal morbidity

- The longer the slow growth, the higher the morbidity
Why do we care?  
Sequale of SGA/IUGR

- **Stillbirth (7X):** IUGR most common factor identified in IUFD

Why do we care?
Sequale of SGA/IUGR

- Stillbirth

- Pre-term birth and sequale of prematurity
  - NEC, low apgar, HIE, chronic lung dx, retinopathy, mortality
Why do we care?  
Sequale of SGA/IUGR

- Stillbirth
- Pre-term birth and sequale of prematurity
  - NEC, low apgar, HIE, chronic lung dx, retinopathy, mortality
- Neonatal short term
  - Hypoglycaemia, hypocalcaemia, hypothermia, polycythemia, hyperbilirubinaemia, failure to thrive
Why do we care? Sequale of SGA/IUGR

- Stillbirth
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  - Hypoglycaemia, hypocalcaemia, hypothermia, polycythemia, hyperbilirubinaemia, failure to thrive
- Neonatal long term
  - Mortality, learning difficulties, short stature, cerebral palsy, SIDS
Why do we care?
Sequale of SGA/IUGR

- **Stillbirth**
- **Pre-term birth and sequale of prematurity**
  - NEC, low apgar, HIE, chronic lung dx, retinopathy, mortality
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  - Hypoglycaemia, hypocalcaemia, hypothermia, polycythemia, hyperbilirubinaemia, failure to thrive
- **Neonatal long term**
  - Mortality, learning difficulties, short stature, cerebral palsy, SIDS
- **In adult life**
  - Type II DM, hypertension, obesity, mental health problems
Why do we care?
Sequale of Macrosomia

- Maternal
  - Reduction in perception of fetal movements
  - Meconium stained liquor
  - Abnormal heart rate pattern
  - Cephalopelvic disproportion
  - Shoulder dystocia
  - Genital tract laceration
  - Caesarean section
  - Uterine rupture
Why do we care?
Sequale of Macrosomia

- Maternal
- Fetal
  - Birth trauma: Brachial plexus injuries, 10X paralysis, clavicular fracture 20x, asphyxia
  - Low apgar
  - Hypoxic ischemic encphalopatia
  - Perinatal mortality
  - Neonatal hypoglycaemia
Why do we care?
Sequale of Macrosomia

- Maternal
- Fetal
- Long term
  - Metabolic syndrome: impaired glucose tolerance and obesity
Detecting abnormal fetal growth patterns

- Aim of ANC is to identify fetal growth abnormalities in the general obstetric population
Detecting abnormal fetal growth patterns

- Methods of screening for SGA in 1st & 2nd trimester
  - Maternal Medical history
  - Maternal Obstetric history
  - Examination - BMI
  - Placental biochemical markers – PAPP-A
  - Uterine artery dopplers

- Methods of screening for SGA in 2nd and 3rd trimester
  - Abdominal palpation
  - Symphysis fundal height measurement
  - Fetal biometry
  - AFI and Dopplers
Detecting abnormal fetal growth patterns

- Primary surveillance tool = abdominal palpation + SFH
  - Acceptable to women, easy to perform, non-invasive, inexpensive
  - Performs poorly in identifying fetal growth abnormalities, with errors worse at extremes of range when detection most important

- BUT more advanced tests perform less well when used to screen low risk women due to lack of specificity
  - More sensitive and specific in high risk groups
BEFORE ROUTINE AN SCREENING MUST...

1. Identify patients not suitable for low risk screening
2. Decide on optimal method of screening
3. Understand course of action if abnormality identified
BEFORE ROUTINE AN SCREENING MUST...

① Identify patients not suitable for low risk screening
② Decide on optimal method of screening
③ Understand course of action if abnormality identified
Identify patients not suitable for low risk screening
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<tr>
<th>Major Risk Factors for SGA ≥1</th>
<th>Minor Risk Factors SGA ≥3</th>
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<tbody>
<tr>
<td><strong>Maternal characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>• Age &gt; 40</td>
<td></td>
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<tr>
<td>• Smoke &gt; 11/day or Cocaine</td>
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<tr>
<td>• Daily vigorous exercise (x4, &gt;30min/week)</td>
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<tr>
<td><strong>Obstetric History</strong></td>
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<tr>
<td>• Previous SGA or stillbirth</td>
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<tr>
<td><strong>Medical History</strong></td>
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<tr>
<td>• Diabetes with vascular disease</td>
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<td>• Chronic hypertension</td>
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<td>• APL syndrome</td>
<td></td>
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<tr>
<td>• Maternal or paternal SGA</td>
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<tr>
<td><strong>Current Pregnancy</strong></td>
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<td>• PET / Gestational hypertension</td>
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<td>• T1 bleeding / APH / Abruption</td>
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<td>• Fetal Echogenic bowel</td>
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<td>• BMI &gt; 35</td>
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Who is at risk of a big baby?

- **Maternal factors**
  - Race / Maternal size / Age >30 years / Multiparty
  - Previous history of large baby
  - Diabetes mellitus / glucose intolerance
  - Post-term pregnancy: > two fold risk
  - Excessive maternal weight gain; > 20 kg

- **Fetal factors**
  - Male infant
  - Hydrops fetalis
BEFORE ROUTINE AN SCREENING MUST...

① Identify patients not suitable for low risk screening

② Decide on optimal method of screening

③ Understand course of action if abnormality identified
2 Decide on Optimal screening

- Screening methods available to predict SGA fetus
  - Placental biochemical markers – PAPP-A
  - Uterine artery dopplers
  - Abdominal palpation
  - Symphysis-fundal height measurement
  - Fetal biometry
  - AFI and Dopplers
2. Decide on Optimal screening

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  - AFI and Dopplers
Screening: Placental biochemical markers

- Low PAPP-A
  - Inversely associated with risk of SGA
  - Using a cut off of 5th centile: 0.415 MoM
    - SGA < 10th centile: OR 2.7
    - Severe SGA < 3rd centile: OR 3.66
  - Predictive value may be improved by addition of uterine artery dopplers at morphology

- No evidence for other placental markers: AFP, hcg, inhibin or estriol
Screening methods available to predict SGA fetus

- Placental biochemical markers – PAPP-A
- Uterine artery dopplers
- Abdominal palpation
- Symphysis-fundal height measurement
- Fetal biometry
- AFI and Dopplers
Screening: Uterine artery dopplers

- Moderate predictive value for severe SGA <3rd centile

- BUT predictive value insufficient to negate the risk associated with a major risk factor

- IUGR is characterised by failure of trophoblast invasion of myometrial uterine spiral arteries and reduced utero-placental flood flow
  - Evident by low end-diastolic velocities + early diastolic notch
  - Normalisation of flow indices still associated with risk of SGA: do not repeat
Screening: Uterine artery dopplers

- Who should have uterine artery dopplers
  - ≥1 major risk factor
  - ≥3 minor risk factors
  - Low PAPP-A

- If normal ➔ NO need for serial US, only single ax in T3
  - UNLESS major risk factor: need screening REGARDLESS
2 Decide on Optimal screening

- Screening methods available to predict SGA fetus
  - Placental biochemical markers – PAPP-A
  - Uterine artery dopplers
  - **Abdominal palpation**
  - Symphysis-fundal height measurement
  - Fetal biometry
  - AFI and Dopplers
Screening: Abdominal palpation

- **Leopolds Maneuvers**

1. **Fundal grip**
   Superior surface of fundus palpated for consistency, shape & mobility

2. **Lateral Grip**
   Palpate both sides of uterus to determine direction of fetal back

3. **Pawlicks grip**
   Grasp lower portion of abdomen with thumb and finger to assess presenting part & mobility

4. **Pelvic grip**
   Move fingers down both side of the uterus to assess degree of extension of presenting part into pelvis
Screening: Abdominal palpation

- Performs very poorly in identifying SGA: 30-50%
- Errors worse at extremes of range: detection more important
- Factors affecting predictive value
  - Obesity
  - Uterine fibroids
  - Increased or decreased AFI
  - Fetal lie
Screening methods available to predict SGA fetus

- Placental biochemical markers – PAPP-A
- Uterine artery dopplers
- Abdominal palpation
- **Symphysis-fundal height measurement**
- Fetal biometry
- AFI and Dopplers
Screening: SFH measurement

- Measured from 27 weeks
- Start at fundus, more variable than symphysis
- Tape facing down to reduce error
- Record to nearest 0.5cm
- Technique same regardless of fetal position

A. Mother semi-recumbent, with bladder empty.
B. Palpate to determine fundus with two hands.
C. Secure tape with hand at top of fundus.
D. Measure to top of symphysis pubis.
Screening: SFH measurement

RULE OF THUMB

SFH = gestation in weeks +/- 2 cm

- Better than abdominal palpation alone
- Initially studies reporting up to 86% detection
- More recent evidence showing 25-30% predictor of SGA
- No evidence that improves perinatal outcomes
Screening: SFH measurement

- Can improve predictive value and accuracy by:
  - Single care provider: intra & inter observer variation
  - Serial measurements: 2-3 weeks apart
  - Empty bladder: full add 2cm
  - Tape measure: not elastic
  - Customised charts
    - Evidence to show improved prediction of SGA + reduction in risk of stillbirth [Gardosi 2011]
    - RCOG and RANZCOG recommends use
Decide on Optimal screening

- Screening methods available to predict SGA fetus
  - Placental biochemical markers – PAPP-A
  - Uterine artery dopplers
  - Abdominal palpation
  - Symphysis-fundal height measurement
  - Fetal biometry
  - AFI and Dopplers
Screening: fetal biometry

- Allow diagnosis of SGA: AC or EFW or <10th centile
  - Customised fetal weight references may improve prediction of SGA with adverse outcomes *Mikolajczyk Lancet 2011*

- Serial measurement allow diagnosis of IUGR
  - 2-3 weeks apart to minimise false positive

- Routine AC or EFW in T3 in low risk population DOES NOT reduce incidence of SGA or improve perinatal outcomes *McKenna 2003*

**REMEMBER ULTRASOUND IS NOT PERFECT**

**ERROR +/- 15%**
② Decide on Optimal screening

- Screening methods available to predict SGA fetus
  - Placental biochemical markers – PAPP-A
  - Uterine artery dopplers
  - Abdominal palpation
  - Symphysis-fundal height measurement
  - Fetal biometry
  - AFI and Dopplers
Amniotic fluid volume

- Reduced in IUGR
  - Fetal hypoxia with redistribution of fetal blood away from kidneys to vital structures with reduced renal perfusion
- Should NOT be used in isolation
  - Both AFI & SDP correlate poorly with **actual** fluid volume
  - No increased risk perinatal M&M with isolated low AFI in low risk population *Zhang et al BJOG 2004*
- Oligohydramnios defined
  - Amniotic Fluid index $\leq 5$cm or Single deepest pool $\leq 2$cm
Screening: AFI and dopplers

- Umbilical artery dopplers
  - Primary surveillance tool in SGA fetus *Cochrane 2013*
    - Reduced perinatal deaths
    - Reduced IOL / LSCS
    - No difference in operative vaginal delivery or Apgars
  - Aim to identify placental insufficiency
    - Assessing feto-placental blood flow & placental resistance
  - Placental resistance usually falls throughout gestation
    - Increased resistance ➞ Poor perfusion of placenta
    - Absent or reversed EDF ➞ Strong association with fetal compromise & IUFD
  - Absolute figures gestation specific
Screening: AFI and dopplers

- Umbilical artery dopplers
  - If normal
    - Repeat surveillance every 14 days
    - BUT more frequent will be required in severely SGA
  - If abnormal: (PI or RI > +2SD) & delivery not indicated
    - Twice weekly surveillance reasonable
    - More frequent in severely SGA
Screening: AFI and dopplers

- Fetal dopplers: Is fetus acutely compromised? When to deliver?
  - Middle cerebral artery dopplers: brain sparing
    - In preterm: limited accuracy for acidaemia & adverse outcomes ➔ *should not* be used to time delivery
    - In term: moderate predictive value for acidaemia and adverse outcomes ➔ *should* be used to time delivery
  - Ductus venosus dopplers: increased cardiac workload
    - Moderate predictive value for acidemia and adverse outcomes
    - Preterm + IUGR + AREDV + Abnormal DV: deliver
Decide on optimal screening method

- Low risk
  - Serial abdominal + SFH from 27/40 using customised growth charts

- One major risk factor
  - Serial ultrasound 28, 32 & 36 weeks

- Three or more minor risk factors
  - Uterine artery Doppler's at morphology
  - If normal, ultrasound for fetal size & umbilical dopplers in T3
  - If abnormal, serial ultrasound screening 28, 32 & 36 weeks

- Abdominal and SFH not possible/unreliable
  - Serial ultrasound 28, 32, 36 weeks
APPENDIX II: Screening for Small-for-Gestational-Age (SGA) Fetus

Booking assessment (first trimester)

**Minor risk factors**
- Maternal age ≥35 years
- IVF singleton pregnancy
- Nulliparity
- BMI <20
- BMI 25–34.9
- Smoker 1–10 cigarettes per day
- Low fruit intake pre-pregnancy
- Previous pre-eclampsia
- Pregnancy interval <6 months
- Pregnancy interval ≥60 months

**Major risk factors**
- Maternal age >40 years
- Smoker >11 cigarettes per day
- Paternal SGA
- Cocaine
- Daily vigorous exercise
- Previous SGA baby
- Previous stillbirth
- Maternal SGA
- Chronic hypertension
- Diabetes with vascular disease
- Renal impairment
- Antiphospholipid syndrome
- Heavy bleeding similar to menses
- PAPP-A <0.4 MoM

Women unsuitable for monitoring of growth by SFH measurement e.g. Large fibroids, BMI >35

- 3 or more
- Reassess at 20 weeks
- PAPP-A <0.4 MOM (major)
- Fetal echogenic bowel (major)

- One risk factor

- Consider aspirin at <16 weeks if risk factors for pre-eclampsia

- Uterine artery Doppler at 20–24 weeks
- 3 or more

- Normal
- Abnormal

- Assessment of fetal size and umbilical artery Doppler in third trimester

- Reassess during third trimester
- Institute serial assessment of fetal size and umbilical artery Doppler if develop:
  - Severe pregnancy induced hypertension
  - Pre-eclampsia
  - Unexplained APH abruption

Risk assessment must always be individualised (taking into account previous medical and obstetric history and current pregnancy history). Disease progression or institution of medical therapies may increase an individual’s risk.
BEFORE ROUTINE AN SCREENING MUST...

① Identify patients not suitable for low risk screening

② Decide on optimal method of screening

③ Understand course of action if abnormality identified
Case – Mrs Average

- 26 year old, Caucasian woman, G1P0, with a BMI of 24 at booking, currently 14 weeks gestation.

- Her dates have been confirmed by a 12 week US and MSS is low risk with normal PAPP-A
Case – Mrs Average

- 26 year old, Caucasian woman, G1P0, with a BMI of 24 at booking, currently 14 weeks gestation.

- Her dates have been confirmed by a 12 week US and MSS is low risk with normal PAPP-A

Is she suitable for low risk screening?
Case – Mrs Average

- 26 year old, Caucasian woman, G1P0, with a BMI of 24 at booking, currently 14 weeks gestation.

- Her dates have been confirmed by a 12 week US and MSS is low risk with normal PAPP-A

Is she suitable for low risk screening?

What next??
Generate a customised chart
app.growservice.ort/uk

Enter:
Mothers details – height, weight, ethnicity

Ensure estimated due date is accurate by generating chart following the T1 ultrasound
Print chart and secure in HHR
Left hand axis
SFH in cm

Right hand axis
EFW in grams

Y axis
Gestation in weeks

Standardised referral criteria
Case – Mrs Average

- Same, 26 year old, Caucasian woman, G1P0, with a BMI of 24 at booking.
- Now 32 weeks gestation
- On examination
  - Fetus – longitudinal lie, cephalic presentation
  - FHR – 150bpm
  - SFH 31cm

What next??
Plot the SFH

Fundal height plotted with a ×
First measurement at 26-28 weeks to establish a correct baseline
Normal growth ➔ Continue SFH

Fundal height plotted with a ×
First measurement at 26-28 weeks to establish a correct baseline

Normal growth pattern with sequential measurements following same slope of cure
Case – Mrs Average

- Same, 26 year old, Caucasian woman, G1P0, with a BMI of 24 at booking.

- Now 35 weeks gestation

- On examination
  - Fetus – longitudinal lie, cephalic presentation
  - FHR – 150bpm
  - SFH 31cm

What next??
Plot the SFH
Static growth ➔ Refer for Ultrasound

NO incremental increase in fundal height ➔ REFER FOR U/S
Case – Mrs Average

- Ultrasound findings
  - EFW: 2658g
  - Symmetrical growth
  - AFI 11.2 – Normal
  - PI 0.8 - Normal

What next??
Plot the Estimated Fetal Weight

EFW plotted with a ○
Can be plotted from 24 weeks
Normal growth ➔ Continue SFH

U/S shows normal growth just below 50th centile customised ➔ Resume routine SFH

EFW plotted with a ○
Can be plotted from 24 weeks
Normal growth ➔ Continue SFH

Resume SFH with next plot as new baseline
Case – Mrs Small

- 25 year old, G2P1. You are seeing her for the first time at 26 weeks gestation
- Her dates have been confirmed by a 12 week US and MSS is low risk with normal PAPP-A
- She is a smoker, reducing to about 5/day during pregnancy
- On examination
  - Fetus – longitudinal lie, cephalic presentation, 5/5
  - FHR – 150bpm
  - SFH 24cm
Case – Mrs Small

- 25 year old, G2P1. You are seeing her for the first time at 26 weeks gestation
- Her dates have been confirmed by a 12 week US and MSS is low risk with normal PAPP-A
- She is a smoker, reducing to about 5 a day during pregnancy
- On examination
  - Fetus – longitudinal lie, cephalic presentation, 5/5
  - FHR – 150bpm
  - SFH 24cm

What next??
Plot the SFH
SFH is an assessment of the uterus & its contents. Need US to calculate EFW

1st SFH <10th customised ➔ REFER for U/S

1st plot below 10th ➔ Refer for US
1st plot below 10th \(\rightarrow\) Refer for US

Look at previous baby:
- SGA customised
- X1 MAJOR risk factor
- Ultrasound surveillance
  - 28 weeks
  - 32 weeks
  - 36 weeks
- REGARDLESS of SFH

1st SFH <10th customised \(\rightarrow\) REFER for U/S
Case – Mrs Big

- 33 year old, G1P0, BMI 24. Uncomplicated antenatal to date. Currently 32 weeks gestation.

- On examination
  - Fetus – longitudinal lie, cephalic presentation, 5/5
  - FHR – 150bpm
  - SFH 35cm
Case – Mrs Big

- 33 year old, G1P0, BMI 24. Uncomplicated antenatal to date. Currently 32 weeks gestation.

- On examination
  - Fetus – longitudinal lie, cephalic presentation, 5/5
  - FHR – 150bpm
  - SFH 35cm

What next??
Plot the SFH
>90th customised ➞ Normal growth

All plots are following same slope demonstrating a normal pattern of growth

1st fundal height >90th centile customised does NOT need referral for scan UNLESS other concerns such as polyhydramnios
Case – Mrs Big

- Same 33 year old, G1P0, BMI 24. Now 34 weeks gestation

- On examination
  - Fetus – longitudinal lie, cephalic presentation, 5/5
  - FHR – 150bpm
  - SFH 39cm
Case – Mrs Big

- Same 33 year old, G1P0, BMI 24. Now 34 weeks gestation

- On examination
  - Fetus – longitudinal lie, cephalic presentation, 5/5
  - FHR – 150bpm
  - SFH 39cm

What next??
Plot the SFH

Antenatal GROW Chart
Anna Sample (Ref: 123456, DOB: 31/01/1990)

Mother details:
Para 1, British European
Maternal height (cm): 163
Booking weight (kg): 64
Body Mass Index: 24.1

Centile lines:
- 90th
- 50th
- 10th

X = Fundal height  O = Estimated weight by scan

Weeks

Gestation (wks)

EDD
Accelerated growth ➔ Refer for US

The plots are not following the slope on the curve, has accelerated ➔ Refer for US ➔ Repeat GTT
Now what?
Large for gestational age

- In the presence of diabetes
  - IOL at 37-38 weeks to reduce fetal size *SA PPG*
  - LSCS if EFW projected ≥4250g: reduced incidence of shoulder dystocia *SA PPG / Conway 1998*

- In the absence of diabetes
  - No evidence that IOL improves outcomes *Sanchez-Ramos 2002*
    - No difference in LSCS / instrumental/ NVD / brachial plexus injury/ clavicular fracture
  - IOL at term may be reasonable *SA PPG*
  - Consider LSCS if EFW projected ≥ 5kg
Flow chart GROW guideline
Northern Adelaide Local Health Network*

Triage visit~midwife

- Produce, print and attach
  Customised GROW-Chart
  to SA hand-held record

  >20wks
  AN visit~doctor

Antenatal visit after 27 wks:

- Plot FH measurement in chart: X
- First FH plot < P10?
- Slope of FH graph less than expected?

  Request USS ‘Fetal Growth’ ≤2 days

Based on the:
- GROW guideline of the
  Institute, Birmingham, the UK
  https://www.pernatal.org.uk/fetalgrowth/
  fetalgrowth.aspx
  https://www.rcog.org.uk/globalassets/
  documents/guidelines/gto_31.pdf, London, UK
  Dr Alphonse Roex NALHN Feb 2016

USS: EFW >P10, AFI ✓ UA Doppler ✓

Back to FH measurement and plotting

USS: EFW ≤P10

URGENT REFERRAL OBSTETRICAL REVIEW
Assessing fetal growth patterns
All you need to know...

- Assess who is NOT suitable for routine surveillance
  - ≥ 1 major risk factors
  - ≥ 3 minor risk factors
  - SFH not possible: fibroids / multiple preg / BMI >35
  - Increased uterine artery dopplers at morphology

- On the rest: SFH from 27 weeks plotted on customised chart
  - Refer for ultrasound (within 72h) if
    - 1st plot <10th centile OR Static OR Slow OR Accelerated growth
  - Plot EFW on customised chart
    - If normal ➔ Continue serial fundal height measurements
    - If sub-optimal ➔ AFI + Dopplers + Serial growth ultrasound ➔ REFER
    - If accelerated ➔ Exclude diabetes + consider delivery mode
# Video-lectures essential learning for all practicing NALHN related antenatal care midwives and (shared care) doctors

DAROGA YouTube channel link:  [https://www.youtube.com/channel/UCwzPm_ji91MQRziM-fumvug](https://www.youtube.com/channel/UCwzPm_ji91MQRziM-fumvug)

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<td>1 Pregnancy. Essential clinical skills:</td>
<td>19</td>
<td><a href="https://www.youtube.com/watch?v=KEWHedvLEY4">https://www.youtube.com/watch?v=KEWHedvLEY4</a></td>
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<tr>
<td>+ Measuring the blood pressure</td>
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<td>+ The obstetric examination abdomen:</td>
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<td>o Leopold maneuvers</td>
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<td>o Measuring the Fundal Height</td>
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<td>o Listening to fetal heart rate</td>
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<td>2 Methods to detect the SGA: sensitivity and their impact on Intra uterine fetal death.</td>
<td>20</td>
<td><a href="https://www.youtube.com/watch?v=LnYZAF0z4FA">https://www.youtube.com/watch?v=LnYZAF0z4FA</a></td>
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<tr>
<td>Customised FH/EFW chart is at present the clinical method of choice to detect SGA</td>
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<td>3 Pregnancy. The Antenatal detection and management of the (suspected) SGA fetus.</td>
<td>20</td>
<td><a href="https://www.youtube.com/watch?v=DoiOGHYgQII&amp;feature=em-subs_digest">https://www.youtube.com/watch?v=DoiOGHYgQII&amp;feature=em-subs_digest</a></td>
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<td>The NALHN GROW Guideline</td>
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<td>4 DAROGA Antenatal Care. Customised GROW charts: cases to manage.</td>
<td>24</td>
<td><a href="https://www.youtube.com/watch?v=l5r98H8LHAw">https://www.youtube.com/watch?v=l5r98H8LHAw</a></td>
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<td>Practicing what you have learned in 1-3</td>
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Well trained clinicians adhering to the GROW guideline contribute to a reduction of Intra Uterine Fetal Death due to missed IUGR