

Fetal growth (accelerated)

© Department of Health, Government of South Australia. All rights reserved.

Definitions

Normal fetal growth

- > Defined as the expression of the genetic potential to grow in a way that is neither constrained nor promoted by internal or external factors
- > **(NB:** It is difficult to identify real or true variation from normal growth in an individual fetus)

Macrosomia

- > Is variably defined as a birthweight over 4,000 g, over 4,500 g, or above the 90th centile of weight for gestation
- > For non-indigenous Australians the 90th centile at 40 weeks gestation is 4,000 g for female infants and 4,170 g for male infants¹
- >

Risk factors

Maternal:

- > Race
- > Maternal size
- > Previous history of a large baby
- > Matrilineal tendency to give birth to large babies
- > Maternal diabetes mellitus / glucose intolerance
- > Maternal age \geq 30 years
- > High parity
- > Post-term pregnancy (> twofold risk)
- > Excessive maternal weight gain in pregnancy (> 20 kg)

Fetal:

- > Hydrops fetalis
- > Male infant (as opposed to female)
- > **NB:** Few pregnancies with any or a combination of these risk factors will result in a baby with macrosomia

Pre-pregnancy counselling

- > Encourage women with high body mass index who are planning pregnancy to participate in weight reduction and exercise programs before becoming pregnant
- > Encourage a well balanced diet

Fetal growth (accelerated)

© Department of Health, Government of South Australia. All rights reserved.

Clinical assessment

Abdominal examination

- > The predictive value of abdominal palpation and symphysial-fundal height (SFH) measurements as the primary surveillance method for estimating fetal weight in the third trimester is limited
- > SFH measurement must be taken from the top of the fundus to the fixed point at the upper edge of the pubic symphysis. Measure along the fetal axis, using a non-elastic tape measure²
- > Serial measurement of fundal height and plotting on a growth chart is a useful screening tool and is recommended
- > Pregnancies unsuitable for primary surveillance by SFH include:
 - > Fibroids
 - > High maternal body mass index
 - > High risk pregnancy e.g. previous macrosomia
- > Refer for further assessment if:
 - > The first fundal height measurement is above the 90th centile
 - > Consecutive measurements suggest accelerated growth (do not follow the expected slope of the growth curve)

Customised fundal height charts

- > The routine use of a customised growth chart is still being evaluated
- > Calculation of customised centiles (fundal height and ultrasound growth) requires computer software that can be downloaded free from the Internet (www.gestation.net).
 - > A customised SFH chart is adjusted for sex as well as maternal characteristics such as height, weight, parity and ethnic origin
 - > Pathological factors known to affect birth weight and growth such as smoking, hypertension, diabetes and preterm delivery are excluded

Ultrasound

- > Routine morphology scan at 18-20 weeks
- > Serial measurements of abdominal circumference and estimated fetal weight are useful to identify accelerated fetal growth
- > Ultrasound alone is not an accurate determining factor of the fetal weight in grams. However, ultrasound may provide useful information regarding the relative size of the abdomen, amniotic fluid index and other signs of fetal wellbeing
- > Consider follow up ultrasound if:
 - > Estimated fetal weight at routine ultrasound is > 90th centile and dates are accurate
 - > Symphysial-fundal height is persistently above the 90th centile according to the symphysio-fundal chart located in the South Australian pregnancy record
 - > Symphysial-fundal height is > 40 cm at term

Fetal growth (accelerated)

© Department of Health, Government of South Australia. All rights reserved.

- > Maternal perception suggests fetal weight is significantly greater than in a previous pregnancy

Antenatal care

- > Early confirmation of pregnancy
- > Detailed history to identify risk factors
- > Routine antenatal care / tests in pregnancy
- > Encourage screening for neural tube defects and Down syndrome
- > Consider early oral glucose challenge test (OGCT) if fetal weight > 90th centile on routine ultrasound
- > Appropriate counselling as indicated (e.g. balanced diet, exercise)

Management of birth

- > Careful consideration should be given to the place, mode and timing of birth when fetal macrosomia is suspected
- > Timing of birth should not be based solely on estimated fetal weight

Baby of a woman with diabetes

- > Induction of labour at 38⁺⁰ weeks pregnancy for women with diabetes treated with insulin lowers the chances of delivering a large baby³
- > If large for gestational age is detected and macrosomia is predicted at term in the fetus of a diabetic woman, consider induction of labour at 37 – 38 weeks³
- > One cohort study found that the use of a fetal weight threshold of $\geq 4,250$ g in diabetic women for elective caesarean reduced the incidence of shoulder dystocia in this population⁵

Baby of a non-diabetic woman

- > Induction of labour for suspected fetal macrosomia in non-diabetic women does not alter the risk of maternal or neonatal morbidity^{7,8}
- > A systematic review of three trials found induction of labour for women with suspected fetal macrosomia provided no benefit in terms of rates of caesarean section, instrumental or spontaneous birth⁷
- > If fetal macrosomia is suspected, induction at term may be reasonable⁹

Associated outcomes

- > Reduction in maternal perception of fetal movements
- > Meconium stained liquor and aspiration
- > Abnormal heart rate patterns
- > Cephalopelvic disproportion
- > Shoulder dystocia
- > Clavicular fracture
- > Brachial plexus injuries and paralysis
- > Low Apgar score



Fetal growth (accelerated)

© Department of Health, Government of South Australia. All rights reserved.

- > Hypoxic ischaemic encephalopathy
- > Perinatal mortality

Also

- > Increased childhood and adult morbidity^{11,12}
- >

References

1. Roberts CL, Lancaster PAL. Australian national birthweight percentiles by gestational age. *Med J Aust* 1999; 170:114-18.
2. Figueras F, Gardosi J. Intrauterine growth restriction: new concepts in antenatal surveillance, diagnosis and management. *AJOG* 2011; 204: 288-300.
3. Boulvain M, Stan CM, Irion O. Elective delivery in diabetic pregnant women. *Cochrane Database of Systematic Reviews* 2001, Issue 2. Art. No.: CD001997. DOI: 10.1002/14651858.CD001997
4. Boulet SL, Alexander GR, Hamisu MS, Pass M. Macrosomic births in the United States: Determinants, outcomes, and proposed grades of risk. *Am J Obstet Gynecol* 2003; 188 (5):1372-78 (Level III-2).
5. Conway DL, Langer O. Elective delivery of infants with macrosomia in diabetic women: Reduced shoulder dystocia versus increased caesarean deliveries. *Am J Obstet Gynecol* 1998; 178:922-25 (Level III-2).
6. Conway, D. Delivery of the macrosomic infant: cesarean section versus vaginal delivery. *Sem Perinatol* 2002; 26 (3):225-31.
7. Irion O, Boulvain M. Induction of labour for suspected fetal macrosomia. *Cochrane Database of Systematic Reviews* 1998, Issue 2. Art. No.: CD000938. DOI: 10.1002/14651858.CD000938. (Level I). Available from URL: http://onlinelibrary.wiley.com/o/cochrane/clsysrev/articles/CD000938/pdf_standard_fs.html
8. Sanchez-Ramos L, Bernstein S, Kaunitz AM. Expectant management versus labor induction for suspected fetal macrosomia: A systematic review. *Obstet Gynecol* 2002; 100 (5): 997-1002 (Level I).
9. Nocon JJ. Shoulder dystocia and macrosomia. In: Kean LH, Baker PN, Edelstone DI, editors. *Best Practice in Labour Ward Management*. 1st ed. Edinburgh: W. B. Saunders; 2000. p. 82-106.
10. National Collaborating Centre for Women's and Children's Health. Antenatal care, routine care for the healthy pregnant woman. Commissioned by National Institute for Clinical Excellence, London: RCOG Press; 2003: 47-48.
11. Neilson JP. Symphysis-fundal height measurement in pregnancy. *Cochrane Database of Systematic Reviews* 1998, Issue 1. Art. No.: CD000944. DOI: 10.1002/14651858.CD000944. (Level I). Available from URL: http://onlinelibrary.wiley.com/o/cochrane/clsysrev/articles/CD000944/pdf_standard_fs.html
12. Orskou J, Henriksen TB, Kesmodel U, Secher NJ. Maternal characteristics and lifestyle factors and the risk of delivering high birth weight infants, *Obstet Gynecol* 2003;102 (1):115-20 (Level III-2).

Fetal growth (accelerated)

© Department of Health, Government of South Australia. All rights reserved.

Useful web sites

Gestation Network: Available from URL:

http://www.gestation.net/birthweight_centiles/birthweight_centiles.htm

Abbreviations

ACOG	American College of Obstetricians and Gynecologists
cm	Centimetre(s)
CTG	Cardiotocograph
e.g.	For example
et al.	And others
g	Gram(s)
kg	Kilogram(s)
LGA	Large for gestational age
LSCS	Lower segment caesarean section
mg	Milligram(s)
mL	Millilitre(s)
mm Hg	Millimetres of mercury
N.B.	Note
OGCT	Oral glucose challenge test
%	Percentage
RCOG	Royal College of Obstetricians and Gynaecologists
SFH	Symphysial-fundal height

Version control and change history

PDS reference: OCE use only

Version	Date from	Date to	Amendment
1.0	08 Dec 03	05 Nov 12	Original version
2.0	05 Nov 12	Current	