



C-Obs 49

Management of Obesity in Pregnancy

Background

Obesity in pregnancy is now one of the most important challenges in obstetric care. Approximately 50 per cent of women who become pregnant are either overweight (BMI >25 – 30) or obese (BMI >30).¹ Many women are unaware of current recommendations surrounding gestational weight gain and many gain above current gestational weight gain guidelines during pregnancy,² and do not lose the additional weight post pregnancy. This increases the risks in the current and future pregnancies.^{1, 3, 4}

The adverse impact of obesity on pregnancy begins prior to conception. Obesity reduces fertility and has been shown to affect the health of the human oocyte and the quality and development of the embryo early in gestation.^{3, 4}

The incidence of the following outcomes is increased for obese women during pregnancy:

Antenatal:

- Impaired fasting glucose and impaired glucose tolerance; and gestational diabetes¹
- Miscarriage^{1, 5}
- Stillbirth^{6, 7}
- Pre-eclampsia^{1, 5}
- Thromboembolism¹
- Obstructive Sleep apnoea⁸
- Maternal death¹
- Abnormalities in fetal growth and development⁹

Intrapartum:

- Induction of labour, prolonged labour and failure to progress¹⁰
- Rate of instrumental delivery, caesarean section and postpartum haemorrhage¹⁰⁻¹²
- Shoulder dystocia¹³
- Difficulties with fetal heart rate monitoring¹⁴
- Difficulties with labour analgesia¹
- Use of general anaesthesia¹

Anaesthetic risks¹:

- Difficulty with positioning
- Difficulty with correct catheter siting within the epidural space, difficulty with spinal anaesthetic and increased risk of dislodgement
- Difficulty maintaining an adequate airway
- Increased risk of need for ICU care post operatively¹⁴

Post-partum:

- Delayed wound healing^{1, 5}
- Increased rates of wound infection^{1, 15}
- Greater likelihood of needing support with breastfeeding establishment and continuation^{16, 17}
- Postnatal depression¹⁸
- Long term neonatal consequences: neonatal body composition, infant weight gain, obesity¹⁸

In view of the recognised risks, consideration needs to be made regarding plans for perinatal care and delivery, taking into account local jurisdictional guidelines.

Definitions

Obesity during pregnancy is defined as a Body Mass Index (BMI) of 30 kg/m² or more calculated using the height and weight **measured** at the first antenatal consultation.¹ Ideally a BMI should be calculated using a pre-pregnancy weight; however this is often not available/unknown. In which case, the weight at the first antenatal consultation should be used. BMI is calculated by dividing the woman's weight in kilograms by the square of their height in metres (kg/m²). The BMI is not a perfect measure given it does not take into account age or ethnicity; however, it is widely considered a good measure of obesity for the general population.¹⁹

Maternal BMI is categorized by the World Health Organization (WHO)¹⁹ as follows:

- Underweight (BMI <18.5kg/m²)
- Normal (BMI 18.5-24.99 kg/m²)
- Overweight/pre-obese (BMI 25-29.99kg/m²)
- Obese class 1 (BMI 30-34.99 kg/m²)
- Obese class 2 (BMI 35-39.99 kg/m²)
- Obese class 3 (BMI ≥40 kg/m²)

The following table comes from a retrospective cohort of over 72,000 Australian women delivered in a tertiary centre and allows some quantification of the obstetric risks by BMI strata. These data may be useful when evaluating risks according to BMI strata, and assist in planning of obstetric care.¹²

Variable	BMI <18.5	BMI 18.5-25	BMI 25-30	BMI 30-35	BMI 35-40	BMI >40
Hypertension in pregnancy	1%	2%	3%	5%	7%	10%
Gestational diabetes	1%	1%	2%	3%	6%	7%
Type 1 or 2 diabetes	0.2%	0.5%	0.3%	2%	3%	4%
Spontaneous vaginal birth	61%	55%	50%	47%	47%	44%
Assisted birth	13%	13%	10%	8%	6%	5%
Caesarean birth	26%	33%	40%	45%	47%	52%
Perinatal death	0.5%	0.7%	1%	1%	1.5%	2%
Neonatal Mechanical Ventilation	6%	5%	6%	7%	9%	10%
Preterm birth (<37 weeks)	9%	7%	8%	9%	10%	11%
Macrosomia	5%	11%	16%	19%	20%	21%
SGA (customised)	12%	11%	12%	13%	16%	19%
LGA (customised)	11%	11%	13%	13%	14%	16%

KEY MANAGEMENT RECOMMENDATIONS OF THE MANAGEMENT OF OBESITY DURING PREGNANCY

The following key management recommendations address the areas of pre-conception, antenatal care, intrapartum and post-partum management of obese women during pregnancy.

1.1 Pre-conception

Identification and management of obesity pre-pregnancy:

- Primary care and maternity care providers should identify obesity at pre-conception appointments, monitor weight and encourage women in making lifelong sustainable lifestyle (nutrition and exercise) changes that support ongoing health and weight management pre-conception. If obesity is identified, appropriate referral to a dietitian/exercise specialist should be offered prenatally.
- Primary care and maternity care providers should discuss the risks of obesity on both fertility and pregnancy outcomes.
- Women should be made aware that even a modest gain of 1–2 BMI units (kg/m^2) between pregnancies may increase the risk of gestational hypertension, macrosomia and gestational diabetes.²⁰

Exercise recommendations:

- According to the Australian Bureau of Statistics, a majority of Australians do not exercise regularly.²¹ Internationally this is a consistent pattern.¹⁸ Pre-conception advice should include encouraging women to engage in daily exercise as per national guidelines.

Bariatric surgery:

- Some women may have undergone bariatric surgery prior to pregnancy. This is an increasing trend.⁵ Data regarding the safety and long-term efficacy of this approach continue to evolve so specialised advice may need to be sought. Current evidence suggests a positive outcome in reduction of maternal risks during pregnancy, albeit with a possible increase in the risk of Intrauterine Growth Restriction (IUGR).⁵ If a woman has had bariatric surgery pre-pregnancy, referral to a dietitian should be instituted, particularly if the woman has had malabsorptive surgery, since she may require additional supplementation during pregnancy including: vitamin B12, iron, folate, vitamin D and calcium.⁵

Nutritional supplementation:

- Women considering pregnancy should be encouraged to take a supplement containing folate and $150\mu\text{g}$ iodine pre-conception).²² High dose folate (5mg) is recommended for women with a BMI >30 , given the increased risk of neural tube defects.¹

Psychosocial concerns:

- Depression is a well-known key determinant of weight gain and obesity.¹⁸ If depression is identified, psychological support and appropriate referral should be offered prenatally.

H1N1 Vaccination:

- Vaccinations as per standard antenatal care should be checked to be up to date. It is particularly important that women are aware of the significant increased risks of major maternal morbidity associated with H1N1 in pregnancy, particularly among obese women, and the imperative for vaccination during pregnancy.²³

1.2 Antenatal care

Antenatal facilities:

- Antenatal clinics need to be equipped and able to offer adequate care for obese women. This includes calibrated scales, which go up to 200kg, large blood pressure cuffs, and appropriate sitting room chairs in waiting areas and information available for women for services available to support them during pregnancy, such as dietetics.

Documentation of BMI:

- Women should have their BMI documented at their first antenatal appointment. Ideally BMI will be calculated using their pre-pregnancy weight (or else first trimester/early pregnancy weight), and height. Those in high BMI categories should be offered referral to available support services (e.g. dietitian, exercise physiologist etc.), and advise of the increased risks associated with obesity in pregnancy, including intrapartum.

Gestational weight gain (GWG):

- Health professionals should be aware of current Institute of Medicine (IOM 2009) guidelines (which are based on observational studies of American women) for weight management during pregnancy.¹⁸ The IOM guidelines adopted the World Health Organisation (WHO 1995) BMI cut offs.^{18, 24, 25} The IOM guidelines are widely used throughout Australian and New Zealand. At the time of this publication, no specific Australian/New Zealand guidelines are available on gestational weight gain (with the exception that IOM guidelines have been incorporated into recent [Healthy Eating When You're Pregnant or Breastfeeding](#) guidelines which are based on the 2013 NHMRC Australian Dietary Guidelines 'Eat for Health').²⁶
- Health professionals should advise patients of the recommended weight gain (as per the table below) according to their prenatally calculated BMI documented at their first antenatal appointment.
- Weight gain should be discussed and monitored regularly during antenatal care.

Institute of Medicine weight gain during pregnancy suggested guidelines¹⁸

BMI (kg/m ²) (WHO) ¹⁹	Classification	Singleton pregnancy total weight gain range	Rates of weight gain in 2 nd and 3 rd Trimester
<18.5	Underweight	12.5-18kg	0.51 (0.44- 0.58)
18.5-24.9	Normal	11.5-16kg	0.42 (0.35- 0.50)
25-29.9	Overweight	7-11.5kg	0.28 (0.23-0.33)
≥30	Obese (includes all Obesity classes 1, 2 and 3); Obesity Class 1: BMI 30-34.9 Obesity Class 2: BMI 35-39.9 Obesity Class 3: BMI >40	5-9kg	0.22 (0.17-0.27)

Footnote to table:

- The above calculations for rates of weight gain assume a 0.5-2kg weight gain only during the first trimester, and presume a linear gestational weight gain throughout the 2nd and 3rd trimesters.
- The above-recommended ranges are suggested to be used in combination with 'good clinical judgment' and a discussion with each woman and her health care provider regarding diet and exercise.^{18, 27}
- The BMI figures in the above table are derived from the World Health Organizations "[The International Classification of adult underweight, overweight and obesity according to BMI](#)"

Multiple pregnancy and factors to note if considering lower GWG for women in higher obesity classes, or potential weight loss during pregnancy:

- The 2009 IOM guidelines acknowledged that at the time of review, there was insufficient evidence to support guidelines for stratified obesity class 2 and 3 including weight loss guidelines published by Kiel²⁴ and insufficient literature to support the previous 1990 IOM weight guidelines for multiple pregnancies, hence provisional guidelines were made for multiple pregnancies of:

- Normal weight women should gain 17-25 kg (37-54 pounds) at term,
- Overweight women should gain 14-23 kg (31-50 pounds) at term, and
- Obese women should gain 11-19 kg (25-42 pounds) at term.
- Despite there being insufficient literature to make specific guidelines for obesity classes 2 and 3, the 2009 IOM review acknowledged that minimal weight gain may still be safe and be associated with improved outcomes for obesity classes 2 and 3, if women are closely monitored by their care providers to ensure nutritional adequacy and safety. This is consistent with 1) emerging research that a range of gestational weight gain which balance risks according to obesity may be beneficial²⁸; and 2) expert opinion in Australia sought at the time of this publication which takes into account that minimal weight gain may occur in women in obesity classes 2 and 3 where expert guided safe lifestyle changes to diet and exercise occur during pregnancy.²⁹
- At the time of this publication, consistent with the IOM publication, there still remains some uncertainty regarding safety of weight loss during pregnancy, particularly on neonatal outcomes. Given there is currently inadequate literature reviewing long-term neonatal outcomes, no weight loss guidelines have been included above.
- Thus, when considering tailored and individualised recommendations for appropriate GWG (which consider lower than IOM guideline GWG amounts), 'a balance between maternal and infant outcomes needs to be achieved, and the severity and long term consequences of these outcomes considered.'²⁷

Nutritional supplementation:

- Obese women should be recommended to take 5mg/day folate supplement, 150µg iodine supplementation²² and will need vitamin D supplementation if confirmed by testing to be vitamin D deficient.

Glucose tolerance testing for Gestational Diabetes:

- Overweight and obese women who have a raised BMI should be offered early glucose tolerance testing (GTT) testing, with a repeat at 28 weeks.¹

Anaesthetic assessment:

- Women who are identified as obese should be referred for anaesthetic assessment prior to delivery, in line with local guidelines.

Pre-eclampsia surveillance:

- Given the increased risk of pre-eclampsia, obese women should have appropriate surveillance for pre-eclampsia.

Fetal growth:

- Maternal obesity can make clinical assessment of fetal growth difficult and at risk of missing IUGR. Ultrasound assessments of fetal growth, despite its limitations, can provide a more accurate assessment.

Ultrasound assessments:

- Obesity will make ultrasound assessment of anatomy, fetal size and fetal wellbeing more difficult,³⁰ and some women may require referral to a specialist centre for ultrasound assessment with experience scanning obese women.

Previous caesarean section:

- Obese women are less likely to have a successful vaginal birth after caesarean section, and the operative and anaesthetic risks of emergency caesarean section will be higher for these women. Accordingly, it is recommended that an informed discussion is held with the woman during the antenatal period and an individualised decision made regarding mode of delivery after consideration of all relevant clinical factors.³¹

Exercise during pregnancy:

- Women may start or continue exercise programs during pregnancy in line with national guidelines.

1.3 Intrapartum care of obese women³¹**Vaginal delivery:**

- Women with a BMI $>40\text{kg/m}^2$ should have an intravenous line placed on admission to labour ward.
- At the time of delivery, awareness should be maintained of the increased risk of shoulder dystocia and postpartum haemorrhage.

Caesarean Section:

- Operating theatre staff should be alerted regarding any woman whose weight exceeds 120kg to ensure adequate staffing and equipment are available.

1.4 Post-partum**Thromboembolism prophylaxis:**

- Women who are obese are at increased risk of thromboembolism. Local guidelines for thromboembolism prophylaxis should be followed.³⁰

Breastfeeding:

- Given obesity is associated with lower rates of breastfeeding uptake and continuation,¹⁶ women who are obese should be offered support during the antenatal and post natal care to assist with the initiation and maintenance of breastfeeding. Referral to hospital lactation consultants, or support from external organisations may be beneficial.

Weight management post-partum:

- Obese women should continue to receive nutritional and exercise advice following delivery from an appropriately trained professional, with a view to minimising postpartum weight retention and weight reduction where appropriate.³¹

Summary

Maternal obesity is a major issue in obstetric practice in Australia and New Zealand.¹² It is important that women with an elevated BMI are offered nutritional and exercise information pre-conception, during pregnancy and post pregnancy from appropriate specialists. This ensures that women are supported appropriately in safe weight loss pre-conception, appropriate weight gain during pregnancy and appropriate weight management after pregnancy to minimise postpartum weight retention. Given the higher risk of maternal and neonatal complications associated with obesity, the above statement provides advice on pre-conception, antenatal, intrapartum and post-partum management to minimise these risks.

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Links to related College statements

RANZCOG Standards of Maternity Care in Australia and New Zealand

http://www.ranzcog.edu.au/component/docman/doc_view/974-c-obs-41-standards-of-maternity-care-in-australia-and-new-zealand.html?Itemid=341

Diagnosis of Gestational Diabetes Mellitus (C-Obs 7)

http://www.ranzcog.edu.au/component/docman/doc_view/941-c-obs-07-diagnosis-of-gestational-diabetes-mellitus.html?Itemid=341

Vitamin and Mineral Supplementation and Pregnancy (C-Obs 25)

http://www.ranzcog.edu.au/documents/doc_view/958-c-obs-25-vitamin-and-mineral-supplementation-in-pregnancy.html

Pre-pregnancy Counselling (C-Obs 3a)

http://www.ranzcog.edu.au/component/docman/doc_download/1170-c-obs-03a-pre-pregnancy-counselling.html?Itemid=341

Other suggested reading

The Royal Women's Hospital. Obesity and Pregnancy Fact Sheet. Victoria 2008. Available at: <http://www.thewomens.org.au/Obesityandpregnancy>

CMACE/RCOG Joint Guideline. Management of Women with Obesity in Pregnancy. March 2010. Available at: <http://www.rcog.org.uk/files/rcog-corp/CMACERCOGJointGuidelineManagementWomenObesityPregnancya.pdf>

National Institute for Health and Clinical Excellence. Weight management before, during and after pregnancy. NICE public health guidance 27. July 2010. Available at: <http://guidance.nice.org.uk/PH27>

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