



# Management of Obesity in Pregnancy

This statement has been developed and reviewed by the Women's Health Committee and approved by the RANZCOG Board and Council.

A list of Women's Health Committee Members can be found in [Appendix A](#).

Disclosure statements have been received from all members of this committee.

The Committee acknowledges contributing authorship in [Appendix B](#).

**Disclaimer** This information is intended to provide general advice to practitioners. This information should not be relied on as a substitute for proper assessment with respect to the particular circumstances of each case and the needs of any patient. This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The document has been prepared having regard to general circumstances.

**First endorsed by RANZCOG: March 2013**

**Current: March 2017**

**Review due: March 2020**

**Objectives:** To provide advice on the management of obesity in pregnancy.

**Target audience:** Health professionals providing maternity care, and patients.

**Values:** The evidence was reviewed by the Women's Health Committee (RANZCOG), and applied to local factors relating to Australia and New Zealand.

**Background:** This statement was first developed by Women's Health Committee in March 2013 and most recently reviewed in March 2017.

**Funding:** The development and review of this statement was funded by RANZCOG.

## Table of contents

1. Patient summary .....	4
2. Summary of recommendations .....	4
3. Introduction .....	6
Antenatal:.....	6
Intrapartum:.....	6
Anaesthetic risks <sup>1</sup> :.....	6
Post-partum:.....	6
4. Definitions .....	7
5. Recommendations of the management of obesity during pregnancy.....	9
5.1 Pre-conception .....	9
Identification and management of obesity pre-pregnancy: .....	9
Bariatric surgery:.....	9
Pre-pregnancy counselling for women after bariatric surgery:.....	9
Nutritional supplementation:.....	10
Psychosocial concerns:.....	10
5.2 Antenatal care .....	10
Documentation of BMI:.....	10
Antenatal facilities:.....	10
Gestational weight gain (GWG): .....	10
Nutritional supplementation:.....	11
H1N1 Vaccination:.....	11
Glucose tolerance testing for Gestational Diabetes: .....	11
Anaesthetic assessment:.....	11
Pre-eclampsia.....	11
Ultrasound assessments and fetal growth: .....	12
Previous caesarean section:.....	12
Exercise during pregnancy:.....	12
Timing of birth .....	12
5.3 Intrapartum and postpartum care <sup>30 32</sup> .....	12
Vaginal birth : .....	12
Care in theatre: .....	12
Thromboembolism prophylaxis:.....	12

Use of Rh(D) Immunoglobulin in women with a BMI >30:.....	13
Weight management postpartum:.....	13
6. Summary.....	13
7. References.....	14
8. Links to related College statements.....	15
9. Other suggested reading.....	16
10. Patient information.....	16
Appendices.....	17
Appendix A Women’s Health Committee Membership.....	17
Appendix B Overview of the development and review process for this statement.....	17
Appendix C Full Disclaimer.....	19

## 1. Patient summary

“While talking about body weight is a very sensitive issue for many women, there are important benefits to you and your baby of being a healthy weight before you become pregnant, and gaining the appropriate amount of weight once pregnant. By reaching a healthy weight prior to pregnancy, you are protecting your health and your baby’s wellbeing.

Once you are pregnant, your height and weight should be measured at your first antenatal appointment. Your body mass index (BMI) is a comparison of your weight to your height. Your BMI will be calculated at your first antenatal appointment. Many women are unaware of the how much weight they should put on during pregnancy and some gain above what is recommended. You will be given a recommendation regarding weight gain during pregnancy, according to your BMI. A healthy BMI is above 18.5 and below 25. A person is considered overweight if their BMI is between 25 – 29.9 and obese if their BMI is 30 or higher. Women who are overweight or obese have a higher chance of problems in pregnancy, and it is important to plan your pregnancy care accordingly.

You may be surprised that many doctors and midwives feel uncomfortable bringing up the issue of weight. They are concerned you may feel judged and uncomfortable with them. It is important for you to talk with your caregivers about your weight prior to and during pregnancy, to ensure the best possible care for you and your baby.”

## 2. Summary of recommendations

Recommendation 1	Grade
Primary care and maternity care providers should discuss the effect of maternal weight on fertility and pregnancy outcomes during preconception and antenatal consultations.	Consensus-based recommendation
Recommendation 2	Grade
All pregnant women should have a height, weight and BMI measured and recorded in their antenatal record. (at the first antenatal consultation)	Consensus-based recommendation
Recommendation 3	Grade
Health professionals should provide general nutritional information and advise patients of the recommended weight gain according to their BMI.	Consensus-based recommendation
Recommendation 4	Grade
Obese women (BMI > 30) planning pregnancy should be encouraged to take a supplement containing folate and 150ug iodine pre-conception. <sup>22</sup> High dose folate (5mg) is recommended for women with a BMI >30, due to the increased risk of neural tube defects. <sup>1</sup>	Consensus-based recommendation

<b>Recommendation 5</b>	<b>Grade</b>
The mainstay of weight management strategies during pregnancy and the preconception period are dietary modification and exercise.	Consensus-based recommendation
<b>Recommendation 6</b>	<b>Grade</b>
Medications or surgery for weight management are not recommended around the time of conception or during pregnancy because of insufficient safety data.	Consensus-based recommendation
<b>Recommendation 7</b>	<b>Grade</b>
Women who have had bariatric surgery require closer monitoring of their nutritional status and fetal growth.	Consensus-based recommendation
<b>Recommendation 8</b>	<b>Grade</b>
Health care facilities should have well-defined pathways for the care and management of pregnant obese women. Decisions regarding ongoing care of a woman with a very high BMI (eg > 40) should be based on the ability of the health care facility to provide adequate and experienced healthcare clinicians and infrastructure.	Consensus-based recommendation
<b>Recommendation 9</b>	<b>Grade</b>
Health professionals should be aware of the relationship between mental health and obesity and offer psychological support and referral where appropriate.	Consensus-based recommendation

### 3. Introduction

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).<sup>1</sup> Many women are unaware of current recommendations surrounding gestational weight gain and many gain above current gestational weight gain guidelines during pregnancy,<sup>2</sup> and do not lose the additional weight post pregnancy. This increases the risks in the current and future pregnancies.<sup>1 3 4</sup>

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.<sup>3, 4</sup>

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

#### **Antenatal:**

- Miscarriage<sup>1 5</sup>
- Gestational diabetes<sup>1</sup>
- Fetal congenital abnormalities (eg. neural tube defects)<sup>6</sup>
- Antenatal stillbirth<sup>7 8</sup>
- Pre-eclampsia<sup>1 5 9</sup>
- Thromboembolism<sup>1</sup>
- Abnormalities in fetal growth<sup>10</sup>
- Obstructive sleep apnoea<sup>11</sup>
- Preterm birth, mostly associated with co-morbidities (QLD statement)
- Maternal death<sup>1</sup>

#### **Intrapartum:**

- Induction of labour, prolonged labour and failure to progress<sup>12</sup>
- Rate of instrumental delivery
- Failed instrumental delivery
- Shoulder dystocia<sup>13</sup>
- Caesarean section
- Difficulties with fetal heart rate monitoring<sup>14</sup>
- Postpartum haemorrhage<sup>12 15 16</sup>
- Peripartum death

#### **Anaesthetic risks<sup>1</sup>:**

- Difficulties with labour analgesia<sup>1</sup>
- Use of general anaesthesia<sup>1</sup>
- Difficulty maintaining an adequate airway, failed intubation
- Increased risk of need for ICU care post operatively<sup>14</sup>

#### **Post-partum:**

- Delayed wound healing and infection<sup>1 17</sup>
- Thromboembolic disease
- Greater likelihood of needing support with breastfeeding establishment and continuation<sup>18 19</sup>
- Postnatal depression<sup>20</sup>
- Long term neonatal consequences: neonatal body composition, infant weight gain, obesity<sup>20</sup>

In view of the well-recognised risks, maternity care providers should have specific plans for the care of obese pregnant women, taking into account local jurisdictional guidelines.

When providing care for obese women, health professionals should be aware that many terms - including "obesity" - have been shown to have negative connotations for patients.<sup>21</sup> In an American study, the terms "weight", "excess weight" and "BMI" were viewed by patients as preferable to "fatness", "large size", and "heaviness". Practitioners should avoid using negative terms such as "morbid obesity" when broaching the topic of healthy weight and ideal gestational weight gain targets with patients.

## 4. Definitions

**All pregnant women should have a height, weight and BMI measured and recorded in their antenatal record.**

Obesity during pregnancy is defined as a Body Mass Index (BMI) of 30 kg/m<sup>2</sup> or more calculated using the height and weight **measured** at the first antenatal consultation.<sup>1</sup> Ideally a BMI should be calculated using a pre-pregnancy weight; however this is often not available/unknown. If unknown, 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/m<sup>2</sup>). 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.<sup>22</sup>

**Maternal BMI is categorised by the World Health Organization (WHO)<sup>22</sup> as follows:**

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

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.<sup>17</sup>

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



## 5. Recommendations on 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.

### 5.1 Pre-conception

#### **Identification and management of obesity pre-pregnancy:**

- Primary care and maternity care providers should identify obesity at pre-conception appointments.
- Weight management strategies include:
  - Dietary modification: referral to dietician
  - Exercise: refer to RANZCOG Statement *Exercise in Pregnancy (C-Obs 62)*
- A Cochrane review found no pre-conception health interventional trials to improve pregnancy outcomes.<sup>23</sup>
- 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 ( $\text{kg}/\text{m}^2$ ) between pregnancies may increase the risk of gestational hypertension, macrosomia and gestational diabetes.<sup>20</sup>
- Medications for weight management are not recommended during the time of conception or during pregnancy because of safety concerns and adverse effects.<sup>24</sup>

#### **Bariatric surgery:**

- Some women may have undergone bariatric surgery prior to pregnancy. This is an increasing trend.<sup>5</sup> Data regarding the safety and long-term efficacy of this approach continue to evolve.
- Current evidence suggests a positive outcome in reduction of maternal risks during pregnancy such as gestational diabetes, but with an increase in the risk of fetal growth restriction and stillbirth.<sup>25</sup>

#### **Pre-pregnancy counselling for women after bariatric surgery:**

- Advise the woman to be on life-long vitamin supplementation: 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.
- Avoid pregnancy immediately post surgery (to avoid pregnancy during complications e.g. band displacement) and during the initial weight loss phase, usually 12-24 months after surgery.

### **Nutritional supplementation:**

Obese women considering pregnancy should be encouraged to take a supplement containing folate and 150mcg iodine pre-conception.<sup>26</sup> High dose folate (5mg) is recommended for women with a BMI >30, given the increased risk of neural tube defects.<sup>1</sup>

### **Psychosocial concerns:**

Depression is a well-known key determinant of weight gain and obesity.<sup>20</sup> If depression is identified, psychological support and appropriate referral should be offered antenatally.

## **5.2 Antenatal care**

### **Documentation of BMI:**

Women should have their BMI measured and recorded at their first antenatal appointment. Ideally, BMI will be calculated using their pre-pregnancy weight (or earliest pregnancy weight), and height.

### **Antenatal facilities:**

- Maternity care facilities should have well-defined pathways for the care and management of pregnant obese women.
- Antenatal care generally requires a multidisciplinary team, which may include a specialist obstetrician, midwifery support, dietician, lactation consultant and anaesthetist.
- The location and referral for care for these women should be according to local hospital guidelines.
- Availability of appropriate bariatric equipment.
- Decisions regarding ongoing care or the transfer of a woman with a high BMI should be based on the ability of the health care facility to provide adequate and experienced healthcare clinicians and infrastructure to manage these cases.

### **Gestational weight gain (GWG):**

- Health professionals should be aware of current Institute of Medicine (IOM 2009) guidelines for weight management during pregnancy.<sup>20</sup> Health professionals should advise patients of the recommended weight gain (as per the table below).
- Weight gain should be discussed and monitored regularly during antenatal care.

### **Institute of Medicine weight gain during pregnancy suggested guidelines<sup>27</sup>**

<b>BMI (kg/m<sup>2</sup>) (WHO)<sup>19</sup></b>	<b>Classification</b>	<b>Singleton pregnancy total weight gain range</b>	<b>Rates of weight gain in 2<sup>nd</sup> and 3<sup>rd</sup> Trimester (kg/week)</b>
<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	6.8-11.3kg	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	5-9.1kg	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.<sup>2,20</sup> 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](#)"
- Provisional gestational weight guidelines were made for multiple pregnancies of:
  - Normal weight women should gain 17-25 kg at term,
  - Overweight women should gain 14-23 kg at term, and
  - Obese women should gain 11-19 kg at term.

***Nutritional supplementation:***

Obese women should be advised to take 5mg folic acid and 150mcg iodine supplementation daily.<sup>26</sup> Obese women are also at increased risk of iron and vitamin D deficiency.

***H1N1 Vaccination:***

Vaccinations should be recommended to obese pregnant women as per standard antenatal care. It is particularly important that women are aware of the significant increased risks of major maternal morbidity associated with infection with influenza strain H1N1 during pregnancy, particularly among obese women. Influenza vaccination is strongly recommended for obese women during pregnancy.<sup>23</sup>

***Glucose tolerance testing for Gestational Diabetes:***

Obese women should be offered early glucose tolerance testing (GTT) testing, with a repeat at 28 weeks,<sup>1</sup> if the early test was normal.

***Anaesthetic assessment:***

Obese women should be referred for anaesthetic assessment prior to delivery, in line with local guidelines.

***Pre-eclampsia***

Given the increased risk of pre-eclampsia, obese women should have appropriate surveillance for pre-eclampsia. Consideration should be given to aspirin for prophylaxis.

### **Ultrasound assessments and fetal growth:**

Obese women have increased risks of congenital abnormalities, fetal growth restriction and macrosomia. However, ultrasound assessment of anatomy is less accurate in obese women with a reduced detection rate of structural conditions at the routine second trimester morphology scan.<sup>28</sup>

Despite its limitations, ultrasound may provide a more accurate assessment of fetal growth than clinical assessment.<sup>29</sup> Third trimester fetal growth ultrasound should be offered to 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.<sup>30</sup>

### **Exercise during pregnancy:**

Women may start or continue exercise programs during pregnancy in line with RANZCOG statement *Exercise in Pregnancy (C-Obs 62)*.

### **Timing of birth**

There is no universal consensus on the optimum timing of birth for obese women in the absence of comorbidities. Awaiting spontaneous labour after the due date may increase the risk of macrosomia and term stillbirth in obese women, however, induction of labour carries the risks of failed induction of labour, including emergency Caesarean section. Recent observational data on 5000 women comparing outcomes before and after a protocol of delivery by 40 weeks gestation found a significant reduction in the risk of Caesarean section for obese women.<sup>31</sup> Health care facilities should consider their own local resources and patient population when developing protocols in this area.

## **5.3 Intrapartum and postpartum care <sup>30 32</sup>**

### **Vaginal birth :**

- Women with a BMI  $>40\text{kg/m}^2$  should have intravenous access on admission to labour ward.
- Fetal presentation may need to be confirmed with ultrasound if clinical assessment in early labour is difficult.
- At the time of delivery, awareness should be maintained of the increased risk of shoulder dystocia and postpartum haemorrhage.

### **Care in theatre:**

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

### **Thromboembolism prophylaxis:**

Women who are obese are at an increased risk of thromboembolism. Local guidelines for thromboembolism prophylaxis should be followed.<sup>30</sup>

### ***Use of Rh(D) Immunoglobulin in women with a BMI >30:***

Whilst there is some evidence to suggest that intramuscular administration of Rh(D) immunoglobulin may be associated with an increased risk of lack of effect in patients with a BMI >30, there is currently insufficient evidence to support a change to clinical and laboratory practice at the present time.

No specific additional testing is required because of a BMI >30, unless there has been a large fetomaternal haemorrhage, in which case testing should be in accordance with local guidelines. For women with a BMI >30 who experience a fetomaternal haemorrhage of greater than 6ml, consideration may be given to administering any required additional doses of Rh(D) immunoglobulin via the intravenous route to increase bioavailability and facilitate the more rapid clearance of fetal cells.

When administering Rh(D) Immunoglobulin, particular consideration should be given to factors which may impact on the injection, including the site of administration and length of the needle used.<sup>33</sup>

### ***Breastfeeding:***

Given obesity is associated with lower rates of breastfeeding uptake and continuation,<sup>16</sup> women who are obese should be offered support to assist with the initiation and maintenance of breastfeeding.

### ***Weight management postpartum:***

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 encouraging weight reduction.<sup>32</sup>

## **6. Summary**

Maternal obesity is a major issue in obstetric practice in Australia and New Zealand.<sup>16</sup> 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.

## 7. References

1. National Institute of Health and Clinical Excellence. Weight management before, during and after pregnancy, 2010.
2. de Jersey SJ. Are we missing opportunities? Understanding health behaviours associated with overweight in pregnancy. . Queensland University of Technology, 2013.
3. Robker RL. Evidence that obesity alters the quality of oocytes and embryos. *Pathophysiology : the official journal of the International Society for Pathophysiology / ISP* 2008;**15**(2):115-21.
4. Wu LL, Norman RJ, Robker RL. The impact of obesity on oocytes: evidence for lipotoxicity mechanisms. *Reproduction, fertility, and development* 2011;**24**(1):29-34.
5. American College of Obstetricians and Gynecologists (ACOG). Obesity in pregnancy: Committee opinion no. 549. *Obstetrics and gynecology* 2013;**121**(1):213-7.
6. Gynecologists. TACoOa. Obesity in Pregnancy. *Practice Bulletin* 2015;**156**.
7. Crane JM, Murphy P, Burrage L, et al. Maternal and perinatal outcomes of extreme obesity in pregnancy. *Journal of obstetrics and gynaecology Canada : JOGC = Journal d'obstetrique et gynecologie du Canada : JOGC* 2013;**35**(7):606-11.
8. Salihu HM. Maternal obesity and stillbirth. *Seminars in perinatology* 2011;**35**(6):340-4.
9. American College of Obstetricians and Gynecologists (ACOG). ACOG Committee opinion no. 549: obesity in pregnancy. *Obstetrics and gynecology* 2013;**121**(1):213-7.
10. Leddy MA, Power ML, Schulkin J. The impact of maternal obesity on maternal and fetal health. *Reviews in obstetrics and gynecology* 2008;**1**(4):170-8.
11. Maasilta P, Bachour A, Teramo K, et al. Sleep-related disordered breathing during pregnancy in obese women. *Chest* 2001;**120**(5):1448-54.
12. Yu CK, Teoh TG, Robinson S. Obesity in pregnancy. *BJOG : an international journal of obstetrics and gynaecology* 2006;**113**(10):1117-25.
13. Politi SDE, L. Giorlandino, M. Giolandino, C. Shoulder Dystocia: an evidence-based approach. *Journal of Prenatal Medicine* 2010;**4**(3):35-42.
14. Fraser R. CK. Problems of obesity in obstetric care. *Current Obstetrics and Gynaecology* 2003;**13**(4):239-43.
15. Chu SY, Kim SY, Schmid CH, et al. Maternal obesity and risk of cesarean delivery: a meta-analysis. *Obesity reviews : an official journal of the International Association for the Study of Obesity* 2007;**8**(5):385-94.
16. McIntyre HD, Gibbons KS, Flenady VJ, et al. Overweight and obesity in Australian mothers: epidemic or endemic? *The Medical journal of Australia* 2012;**196**(3):184-8.
17. Myles TD, Gooch J, Santolaya J. Obesity as an independent risk factor for infectious morbidity in patients who undergo cesarean delivery. *Obstetrics and gynecology* 2002;**100**(5 Pt 1):959-64.
18. Amir LH, Donath S. A systematic review of maternal obesity and breastfeeding intention, initiation and duration. *BMC pregnancy and childbirth* 2007;**7**:9.
19. Heslehurst N, Lang R, Rankin J, et al. Obesity in pregnancy: a study of the impact of maternal obesity on NHS maternity services. *BJOG : an international journal of obstetrics and gynaecology* 2007;**114**(3):334-42.
20. Institute of Medicine (US) and National Research Council (US) Committee to Reexamine IOM Pregnancy Weight Guidelines. *Weight Gain During Pregnancy: Reexamining the Guidelines*. Washington DC: National Academy of Sciences, 2009.
21. Volger S VM, Dougherty M,. Patients' Preferred Terms for Describing their Excess Weight: Discussing Obesity in Clinical Practice. *Obesity (Silver Spring)* 2012;**20**(1):147-50.
22. World Health Organization. Global database on body mass index: BMI classification 2006 [Available from: [http://apps.who.int/bmi/index.jsp?introPage=intro\\_3.html](http://apps.who.int/bmi/index.jsp?introPage=intro_3.html)].
23. Opray NG, R. Deussen, A, Dodd, J. Directed preconception health programs and interventions for improving pregnancy outcomes for women who are overweight or obese. *Cochrane Database of Systematic Reviews* 2015.

24. Furber CM, L. Bower, P. Kontopantelis, E. Quenby, S. Lavender, T. Antenatal interventions for reducing weight in obese women for improving pregnancy outcome. Cochrane Database of Systematic Reviews 2013.
25. Johansson K CS, Näslund I, Roos N, Trolle Lagerros Y, Granath F, Stephansson O, Neovius M. N Outcomes of pregnancy after bariatric surgery. The New England journal of medicine 2015;**372**(9):814-24.
26. National Health and Medical Research Council. Iodine supplementation for Pregnant and Breastfeeding Women: Public statement, 2010.
27. Gynaecologists ACoOa. Weight gain during pregnancy. Committee Opinion 548. Obstetrics and gynecology 2013;**121**:210-12.
28. Dashe JM, D. Twickler, D. . Effect of Maternal Obesity on the Ultrasound Detection of Anomalous Fetuses. . Obstetrics and gynecology 2009;**113**(5):1001-7.
29. Sovio UW, I. Dacey, A. Pasupathy, D. Smith, G. Screening for fetal growth restriction with universal third trimester ultrasonography in nulliparous women in the Pregnancy Outcome Prediction (POP) study: a prospective cohort study. Lancet 2015;**386**:2089-97.
30. CMAACE/RCOG Joint Guideline. Management of women with obesity in pregnancy. 2010.
31. Schuster M M-LO, Mackeen AD, Feng W, Paglia MJ. The effect of the MFM obesity protocol on cesarean delivery rates. American journal of obstetrics and gynecology 2016;**215**(4):492-6.
32. Davies GA, Maxwell C, McLeod L, et al. SOGC Clinical Practice Guidelines: Obesity in pregnancy. No. 239, February 2010. International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics 2010;**110**(2):167-73.
33. Australian Red Cross Blood Service & National Blood Authority. Expert Panel Consensus Position Statement regarding the Use of Rh(D) Immunoglobulin in Patients with a Body Mass Index >30 2015.

## 8. Links to related College statements

RANZCOG Standards of Maternity Care in Australia and New Zealand

[https://www.ranzcog.edu.au/RANZCOG\\_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Standards-in-Maternity-Care-\(C-Obs-41\)-Review-March-2016.pdf?ext=.pdf](https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Standards-in-Maternity-Care-(C-Obs-41)-Review-March-2016.pdf?ext=.pdf)

Diagnosis of Gestational Diabetes Mellitus (C-Obs 7)

[https://www.ranzcog.edu.au/RANZCOG\\_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Diagnosis-of-GDM-\(C-Obs-7\)-Review-July-2014.pdf?ext=.pdf](https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Diagnosis-of-GDM-(C-Obs-7)-Review-July-2014.pdf?ext=.pdf)

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

[https://www.ranzcog.edu.au/RANZCOG\\_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Vitamin-and-mineral-supplementation-in-pregnancy-\(C-Obs-25\)-Review-Nov-2014,-Amended-May-2015.pdf?ext=.pdf](https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Vitamin-and-mineral-supplementation-in-pregnancy-(C-Obs-25)-Review-Nov-2014,-Amended-May-2015.pdf?ext=.pdf)

Pre-pregnancy Counselling (C-Obs 3a)

[https://www.ranzcog.edu.au/RANZCOG\\_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Pre-pregnancy-Counselling-\(C-Obs-3a\)-Amended-April-2015.pdf?ext=.pdf](https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Pre-pregnancy-Counselling-(C-Obs-3a)-Amended-April-2015.pdf?ext=.pdf)

Exercise in Pregnancy (C-Obs 62)

[https://www.ranzcog.edu.au/RANZCOG\\_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Exercise-during-pregnancy-\(C-Obs-62\)-New-July-2016.pdf?ext=.pdf](https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Exercise-during-pregnancy-(C-Obs-62)-New-July-2016.pdf?ext=.pdf)

## 9. 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>

NHMRC Australia's Physical Activity and Sedentary Behaviour Guidelines 2014

Brown WJ, Bauman AE, Bull FC, Burton NW. Development of Evidence-based Physical Activity Recommendations for Adults (18-64 years). Report prepared for the Australian Government Department of Health, August 2012. <http://www.health.gov.au/internet/main/publishing.nsf/content/health-pubhlth-strateg-phys-act-guidelines#apaadult>

## 10. Patient information

A range of RANZCOG Patient Information Pamphlets can be ordered via:

<https://www.ranzcog.edu.au/Womens-Health/Patient-Information-Guides/Patient-Information-Pamphlets>



## Appendices

### Appendix A Women's Health Committee Membership

Name	Position on Committee
Professor Yee Leung	Chair
Dr Joseph Sgroi	Deputy Chair, Gynaecology
Associate Professor Janet Vaughan	Deputy Chair, Obstetrics
Professor Susan Walker	Member
Associate Professor Ian Pettigrew	Member
Dr Tal Jacobson	Member
Dr Ian Page	Member
Dr John Regan	Member
Dr Craig Skidmore	Member
Dr Lisa Hui	Member
Dr Bernadette White	Member
Dr Scott White	Member
Associate Professor Kirsten Black	Member
Dr Greg Fox	College Medical Officer
Dr Marilyn Clarke	Chair of the A&TSI WHC
Dr Martin Byrne	GPOAC Representative
Ms Catherine Whitby	Community Representative
Ms Sherryn Elworthy	Midwifery Representative
Dr Amelia Ryan	Trainee Representative

### Appendix B Overview of the development and review process for this statement

#### *i. Steps in developing and updating this statement*

This statement was originally developed in March 2013 and was most recently reviewed in November 2016. The Women's Health Committee carried out the following steps in reviewing this statement:

- Declarations of interest were sought from all members prior to reviewing this statement.
- Structured clinical questions were developed and agreed upon.
- An updated literature search to answer the clinical questions was undertaken.
- At the November 2016 face-to-face committee meeting, the existing consensus-based recommendations were reviewed and updated (where appropriate) based on the available body of evidence and clinical expertise. Recommendations were graded as set out below in Appendix B part iii)

*ii. Declaration of interest process and management*

Declaring interests is essential in order to prevent any potential conflict between the private interests of members, and their duties as part of the Women's Health Committee.

A declaration of interest form specific to guidelines and statements was developed by RANZCOG and approved by the RANZCOG Board in September 2012. The Women's Health Committee members were required to declare their relevant interests in writing on this form prior to participating in the review of this statement.

Members were required to update their information as soon as they become aware of any changes to their interests and there was also a standing agenda item at each meeting where declarations of interest were called for and recorded as part of the meeting minutes.

There were no significant real or perceived conflicts of interest that required management during the process of updating this statement.

*iii. Grading of recommendations*

Each recommendation in this College statement is given an overall grade as per the table below, based on the National Health and Medical Research Council (NHMRC) Levels of Evidence and Grades of Recommendations for Developers of Guidelines.<sup>17</sup> Where no robust evidence was available but there was sufficient consensus within the Women's Health Committee, consensus-based recommendations were developed or existing ones updated and are identifiable as such. Consensus-based recommendations were agreed to by the entire committee. Good Practice Notes are highlighted throughout and provide practical guidance to facilitate implementation. These were also developed through consensus of the entire committee.

Recommendation category		Description
Evidence-based	A	Body of evidence can be trusted to guide practice
	B	Body of evidence can be trusted to guide practice in most situations
	C	Body of evidence provides some support for recommendation(s) but care should be taken in its application
	D	The body of evidence is weak and the recommendation must be applied with caution
Consensus-based		Recommendation based on clinical opinion and expertise as insufficient evidence available

Good Practice Note	Practical advice and information based on clinical opinion and expertise
--------------------	--

### **Appendix C Full Disclaimer**

This information is intended to provide general advice to practitioners, and should not be relied on as a substitute for proper assessment with respect to the particular circumstances of each case and the needs of any patient.

This information has been prepared having regard to general circumstances. It is the responsibility of each practitioner to have regard to the particular circumstances of each case. Clinical management should be responsive to the needs of the individual patient and the particular circumstances of each case.

This information has been prepared having regard to the information available at the time of its preparation, and each practitioner should have regard to relevant information, research or material which may have been published or become available subsequently.

Whilst the College endeavours to ensure that information is accurate and current at the time of preparation, it takes no responsibility for matters arising from changed circumstances or information or material that may have become subsequently available.