

CATEGORY: BEST PRACTICE STATEMENT

# Management of Obesity in Pregnancy

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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 2022

Review due: March 2027

## 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, reviewed in March 2017 and most recently in March 2021.

## Funding:

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

## 1. Plain Language Summary

Achieving and maintaining a woman’s optimal nutritional status, fitness and weight before, during and between pregnancies (including while breastfeeding) has immediate and long-term benefits for the health of both the woman and her child/ children. Women who are above a healthy weight in pregnancy have a higher risk of complications. To help reduce these risks, the Body Mass Index (BMI), which is a ratio of weight to height, is measured at the first antenatal appointment. It is important to acknowledge that BMI is not an accurate predictor of health, especially in racially and ethnically diverse populations. Measurements that are more accurate than BMI at predicting outcomes include blood pressure and waist circumference. However, the World Health Organisation (WHO) classification of BMI is the most commonly used screening tool for health outcomes.

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. Whilst most women who have a BMI over 25 have an uncomplicated healthy pregnancy, there are some extra precautions that should be taken. This College Statement provides recommendations to caregivers to help reduce risks associated with obesity in pregnancy.

Many doctors and midwives feel uncomfortable bringing up the issue of weight. They are concerned that women may feel judged and uncomfortable with them. Women with high BMI report numerous negative interactions with maternity care providers arising from the presence of weight stigma. However, research shows that women want to be fully informed about the risks of high BMI in pregnancy and how to minimise these risks so as to have the best pregnancy outcomes. When discussing body weight, it is important that caregivers do this in a sensitive, non-judgemental manner and provide tailored, specific advice whilst avoiding hyperbole and generalisations.

Weight change in pregnancy is also important to discuss. Some women may put more weight on than is recommended, which can increase the chance of adverse pregnancy outcomes. Caregivers should discuss the recommended amount of weight change in pregnancy, which depends on the BMI in early pregnancy.

## 2. Summary of Recommendations

Recommendation 1	Grade
Primary care and maternity care providers should measure height and weight at pre-conception appointments and discuss optimising a woman’s nutritional status, fitness and weight prior to conception. When obesity is identified, they should discuss the risks of obesity on both fertility and pregnancy outcomes in a sensitive, non-judgmental manner.	Consensus-based recommendation
Recommendation 2	Grade
Women with obesity considering pregnancy should be encouraged to take a supplement containing folate and 150µg iodine pre-conception. High dose folate (5mg) is recommended for women with a BMI >30, due to the increased risk of neural tube defects.	Evidence based recommendation  D

	References 30-31
<b>Recommendation 3</b>	<b>Grade</b>
Women who have undergone weight loss surgery require extra nutritional supplementation pre-conceptually and should avoid conception during times of rapid weight loss.	Evidence based recommendation  B  Reference 32
<b>Recommendation 4</b>	<b>Grade</b>
All pregnant women should have a height, weight and BMI measured and recorded in their antenatal record at their first antenatal appointment, ideally before 10-12 weeks gestation. Weight gain in pregnancy should be monitored by re-checking weight at least once in each trimester.	Consensus-based recommendation
<b>Recommendation 5</b>	
Pregnant women with obesity should be offered specific advice on the increased risks associated with obesity and the plans to mitigate those risks.	Consensus-based recommendation
<b>Recommendation 6</b>	<b>Grade</b>
Health care facilities should have well-defined pathways for the care and management of pregnant women with obesity.	Consensus-based recommendation
<b>Recommendation 7</b>	<b>Grade</b>
Health professionals should routinely provide general nutritional information and advice on recommended weight gain and exercise in pregnancy. Dietitian referral is recommended for women with obesity.	Consensus-based recommendation
<b>Recommendation 8</b>	<b>Grade</b>
Women with obesity should be offered early screening for diabetes and advised of the increased risk of a 'no result' with non-invasive prenatal testing (NIPT).	Consensus-based recommendation
<b>Recommendation 9</b>	<b>Grade</b>
Influenza and COVID19 vaccination are strongly recommended for pregnant women with obesity.	Consensus-based recommendation
<b>Recommendation 10</b>	<b>Grade</b>
Pregnant women with obesity should have an anaesthetic referral antenatally, as per local guidelines, especially for women with BMI > 40	Consensus-based recommendation

Recommendation 11	Grade
Calcium and aspirin supplementation should be considered in early pregnancy and continued through till 36 weeks' gestation based on other risk factors.	Evidence based recommendation' A (calcium) Reference 47  B (aspirin) Reference 48
Recommendation 12	Grade
Pregnant women with obesity should be offered additional serial ultrasounds for fetal growth. The timing and frequency of serial scans should be based on the full clinical picture.	Consensus-based recommendation
Recommendation 13	Grade
Pregnant women with obesity wishing to consider vaginal birth after previous caesarean section (VBAC) should be advised of the lower chance of success and high chance of complications.	Evidence based recommendation  B  Reference 52-53
Recommendation 14	Grade
Women with BMI $\geq$ 50 should be offered delivery prior to their due date.	Consensus-based recommendation
Recommendation 15	Grade
Women with obesity, particularly those with Class III obesity, should be advised of the increased risks of emergency caesarean section.	Consensus-based recommendation
Recommendation 16	Grade
Intrapartum risks associated with obesity should be mitigated by routine precautions including preparation for PPH and shoulder dystocia.	Consensus-based recommendation

### 3. Definitions

Obesity is defined as a Body Mass Index (BMI) of 30 kg/m<sup>2</sup>. In pregnancy, it is calculated using the height and weight measured at the first antenatal consultation. BMI is calculated by dividing the woman's weight in kilograms by the square of her height in metres (kg/m<sup>2</sup>). The BMI is not a good measure of health, given it does not take into account age, ethnicity or body fat percentage and distribution. Measures that are better predictors of health outcomes include BP measurement, waist circumference and blood sugar levels.

However BMI is widely considered a good measure of obesity for the general population.<sup>1</sup> WHO expert consultation recommended lower BMI cut-off for Asians based on increased health risks at lower BMI. These cut-offs are included in the table below.

*Table 1 Maternal BMI as categorised by the World Health Organization (WHO)<sup>1</sup>*

CATEGORY	BMI.	ASIAN
Underweight	<18.5kg/m <sup>2</sup> .	<18.5
Normal	18.5-24.99 kg/m <sup>2</sup> .	18.5 -22.9
Overweight/pre-obese	25-29.99kg/m <sup>2</sup>	23-26.9
Obese Class I	30-34.99 kg/m <sup>2</sup> .	27-29.9
Obese Class II	35-39.99 kg/m <sup>2</sup> .	>30
Obese Class III	>40 kg/m <sup>2</sup>	

## 4. Introduction

Excess weight in pregnancy is now one of the most important challenges in obstetric care. Approximately 45 per cent of women who become pregnant are either overweight (BMI>25 – 30) or obese (BMI>30).<sup>2</sup> The serious impact of increasing obesity on a global scale has prompted FIGO to publish international guidelines on its management in and around pregnancy. They encourage the development of country-specific guidelines to help manage this increasing problem.<sup>3</sup>

The adverse impact of obesity on pregnancy begins prior to conception and continues throughout pregnancy and into future generations. 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>4</sup> Once pregnant, almost all complications are more common (Table 2) and the increased likelihood of serious side-effects shows a direct relationship with the class of obesity (Table 1). It is important to recognise that the increased risk of stillbirth is significant even for Class 1 women with obesity.<sup>5</sup> Furthermore, evidence clearly demonstrates prenatal and lactational maternal obesity is associated with cardiometabolic morbidity and neurodevelopmental disorders in offspring<sup>6</sup>. Given the broad ramifications of obesity on the health of women, including the intergenerational effects, it is important to consider this Statement within a wider system’s approach where possible.

Many women are unaware of current recommendations surrounding gestational weight management and the effect of significant antepartum weight gain on the current pregnancy.<sup>7</sup> Women may have difficulty losing the additional weight gained in pregnancy, which increases the risk for future pregnancies.<sup>8</sup>

Many of the recommendations in this Statement are consensus based as randomised controlled trial evidence is lacking.

<i>i. Antenatal:</i>
• Miscarriage <sup>9</sup> and Recurrent miscarriage <sup>10</sup>
• Fetal congenital abnormalities (eg. neural tube defects) <sup>11</sup>
• Diabetes – pre-existing and gestational <sup>12</sup>
• Stillbirth <sup>12</sup>
• Pre-eclampsia <sup>12</sup>
• Thromboembolism <sup>13, 14</sup>
• Obstructive sleep apnoea <sup>15</sup>
• Preterm birth <sup>12</sup>

• Maternal death <sup>16</sup>
• Depression <sup>17</sup>
• Fetal growth restriction
<b>ii. Intrapartum:</b>
• Induction of labour, prolonged labour and failure to progress <sup>18</sup>
• Increased rate of instrumental delivery <sup>19</sup>
• Difficulties with fetal heart rate monitoring <sup>20</sup>
• Shoulder dystocia <sup>12</sup>
• Caesarean section <sup>12</sup>
• Post-partum haemorrhage <sup>12</sup>
• Perinatal death <sup>12</sup>
<b>iii. Anaesthetic risks:</b>
• Difficulties with labour analgesia and need for general anaesthetic <sup>21</sup>
• Difficulty maintaining an adequate airway, failed intubation <sup>22</sup>
• Increased risk of need for ICU care post operatively <sup>23</sup>
<b>iv. Post-partum:</b>
• Delayed wound healing and infection <sup>24</sup>
• Thromboembolic disease <sup>14</sup>
• Greater likelihood of needing support with breastfeeding establishment and continuation <sup>25</sup>
• Postnatal depression <sup>17</sup>
• Long term neonatal consequences: neonatal body composition; infant weight gain; obesity <sup>26</sup>

When providing care for women with obesity, health professionals should be aware that many terms, including “obesity”, have been shown to have negative connotations for patients. 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”) and instead use sensitive, non-judgmental language when broaching the topic of healthy weight and ideal gestational weight gain targets with patients.<sup>27</sup> Healthcare providers should ideally ask for the woman’s permission prior to discussing her weight (“Would it be alright if we discussed your weight?”). Asking for permission demonstrates compassion and empathy and builds trust. It is important to take the woman’s lead on how to discuss weight and what terminology to use in relation to it.

## 5. Recommendations for the pre-conception management of women with obesity

The following key management recommendations address the areas of pre-conception care of women with obesity and women who have had bariatric surgery.

### 5.1 Identification and management of obesity pre-pregnancy and between pregnancies

Recommendation 1	Grade
Primary care and maternity care providers should measure height and weight at pre-conception appointments and discuss optimising a woman’s nutritional status, fitness and weight prior to conception. When obesity is	Consensus-based recommendation

<p>identified, they should discuss the risks of obesity on both fertility and pregnancy outcomes in a sensitive, non-judgmental manner.</p>	
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Becoming pregnant above a healthy weight puts women and their babies at risk of complications that can be reduced by pre-conceptual weight reduction. Pregnant women with obesity are at increased risk of pregnancy-induced hypertension and preeclampsia, gestational diabetes mellitus, thrombosis and wound infection. Women with obesity may have underlying obstructive sleep apnoea that requires assessment with sleep studies and potentially treatment with CPAP, ideally pre-pregnancy. Chronic hypertension should be optimised pre-pregnancy.

Even modest weight gain of 1–2 BMI units (kg/m<sup>2</sup>) between pregnancies may increase the risk of gestational hypertension, macrosomia and gestational diabetes.<sup>28</sup>

Unfortunately, there is a lack of trial evidence that identifies health interventions that are optimal for pre-pregnancy use.<sup>29</sup>

Women should be advised to use contraception whilst reducing weight.

Medications for weight management are not recommended during the time of conception or during pregnancy because of safety concerns and adverse effects.<sup>30</sup>

## 5.2 Nutritional supplementation:

Recommendation 2	Grade
<p>Women with obesity considering pregnancy should be encouraged to take a supplement containing folate and 150µg iodine pre-conception. High dose folate (5mg) is recommended for women with a BMI &gt;30, due to the increased risk of neural tube defects.</p>	<p>Evidence based recommendation  D  References 31-32</p>

Women with obesity considering pregnancy should be encouraged to take a supplement containing folate and 150mcg iodine pre-conception.<sup>31</sup> High dose folate (5mg) is recommended for women with a BMI >30, given the increased risk of neural tube defects<sup>32</sup>

Women with obesity are also likely to be vitamin D and iron deficient and should have their vitamin D and iron levels checked and supplemented as necessary.

Women with obesity should be referred to a dietitian and/or metabolic weight loss clinic for weight optimisation prior to pregnancy.

Consideration should be given to discussion and referral for bariatric surgery prior to conception especially in women with Class III obesity.

## 5.3 Bariatric surgery

Recommendation 3	Grade
Women who have undergone weight loss surgery require extra nutritional supplementation pre-conceptually and should avoid conception during times of rapid weight loss.	Evidence based recommendation  B  Reference 33

Recent consensus recommendations have detailed optimal management for women who have undergone weight loss surgery.<sup>33</sup>

- An increasing number of women have undergone bariatric surgery prior to pregnancy. Common types of bariatric surgery are laparoscopic banding, sleeve gastrectomy and gastric bypass. 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 and large for gestational age infants, but with an increase in the risk of fetal growth restriction, shorter gestation and stillbirth. Caesarean section rates, the risk of postpartum haemorrhage and preterm delivery are not significantly different in women who have had bariatric surgery as compared with the pregnant population who are obese.
- The women often need to be on life-long vitamin supplementation and referral to a dietitian should be instituted. The nutritional supplementation required will depend on the type of bariatric surgery.
- 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.
- The oral contraceptive pill may be compromised by unreliable absorption in women who have undergone gastric bypass surgery and a LARC such as an implant or IUD is always first preference.

## 5.4 Psychosocial concerns:

Depression is a well-known key determinant of weight gain and obesity. If depression is identified, psychological support and appropriate referral should be offered pre-pregnancy. This should be supported by appropriate assessment and referral once pregnant.<sup>17</sup>

Studies have demonstrated a link between childhood neglect and adult obesity<sup>34</sup>. In addition to neglect, an association has also been found between childhood sexual abuse and adult obesity<sup>35, 36</sup>. Healthcare providers should be aware of this association when caring for women with obesity.

## 6. Antenatal care

### 6.1 Documentation of BMI:

Recommendation 4	Grade
All pregnant women should have a height, weight and BMI measured and recorded in their antenatal record at their first antenatal appointment,	Consensus-based recommendation

ideally before 10-12 weeks gestation. Weight gain in pregnancy should be monitored by re-checking weight at least once in each trimester.	
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Women should have their BMI measured and recorded at their first antenatal appointment. The calculated BMI should be used to determine the appropriate antenatal pathway.

## 6.2 Counselling about increased pregnancy complications

Recommendation 5	
Pregnant women with obesity should be offered specific advice on the increased risks associated with obesity and the plans to mitigate those risks.	Consensus-based recommendation

The risk mitigation advice related to obesity will involve recommendations for extra investigations, increased surveillance and alterations to care pathways. The reasons for this need to be sensitively explained to support shared decision making throughout pregnancy.

## 6.3 Antenatal facilities and staffing

Recommendation 6	Grade
Health care facilities should have well-defined pathways for the care and management of pregnant women with obesity.	Consensus-based recommendation

Antenatal care generally requires a multidisciplinary team, which may include a specialist obstetrician, midwifery support, physician, dietitian, lactation consultant and anaesthetist.

- The location and referral for care for these women should be according to local hospital guidelines.
  - 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.
  - The principles of shared decision-making should be used in determining a woman’s plan of care.
  - Decisions to transfer should be made as early in pregnancy as possible.
  - Bariatric equipment should be readily available.
  - Both BMI and absolute weight may be relevant in terms of equipment limitations and both should be taken into account when considering an individual woman’s suitability for local care.

## 6.4 Nutritional supplementation:

Recommendation 7	Grade
Health professionals should routinely provide general nutritional information and advice on recommended weight gain and exercise in pregnancy. Dietitian referral is recommended for women with obesity.	Consensus-based recommendation

Women with obesity should be advised to take 5mg folic acid and 150mcg iodine supplementation daily.<sup>37</sup> Women with obesity are also at increased risk of iron and vitamin D deficiency.

They should be referred to a dietitian for more specific and tailored advice on appropriate nutrition and optimal weight gain during pregnancy.

Women who have undergone bariatric surgery may have increased nutritional requirements.

- Nutrient deficiency is minimal after gastric banding, however the band may need to be partially deflated after the first trimester for reasons of patient comfort, to control reflux and in order to allow the patient to eat.
- Sleeve gastrectomy restricts gastric distension, whereas gastric bypass is a combination of restriction and malabsorption to achieve weight loss.
- Women who have undergone gastric bypass surgery may be deficient in macronutrients, vitamin A, D, B12, calcium, iron, selenium, zinc and copper. These women will often need to take a multivitamin as well as micronutrients. Protein intake should be greater than 60g/day to achieve nutritional requirements. Active weight loss and caloric restriction during pregnancy is not advisable. If the woman is iron deficient, consideration should be given to intravenous iron infusion to allow for better absorption.
- Women who have undergone malabsorptive surgery, such as gastric bypass, are at risk of dumping syndromes that can cause symptomatic hypoglycaemia. Dumping can be overcome with small, frequent meals of complex carbohydrates, by delaying liquid intake for 30 minutes after the meal and by lying down for 30 minutes. If postprandial hypoglycaemia becomes an issue, acarbose could be considered. Pectin can also be added to food to increase its viscosity.
- In women who have undergone bariatric surgery presenting with abdominal pain in pregnancy, surgical complications such as small bowel obstruction, hernia, gastric band erosion and cholelithiasis should be considered.

## 6.5 Gestational weight gain (GWG):

Health professionals should be aware of current Institute of Medicine (IOM 2009) guidelines for weight management during pregnancy.<sup>38</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.

Evidence for the benefit of adhering to these recommendations identifies the potential to reduce the risk of important complications.<sup>39</sup>

While specific dietary advice is best provided by a qualified dietician, all clinicians should discuss basic dietary recommendations including the additional daily caloric needs in pregnancy (approximately 300 calories per

day, equivalent to half a sandwich or a glass of skim milk), avoiding processed foods and basing main meals around vegetables and salads with sides of carbohydrates (pasta, rice, noodles or bread) and lean proteins.<sup>40</sup>

*Table 2 Institute of Medicine weight gain during pregnancy suggested guidelines*

BMI (kg/m <sup>2</sup> ) (WHO) <sup>41</sup>	Classification	Singleton pregnancy total weight gain range	Rates of weight gain in 2 <sup>nd</sup> and 3 <sup>rd</sup> Trimester (kg/week)
<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 (All classes)	5-9 kg	0.22 (0.17-0.27)

\* 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 by her health care provider regarding diet and exercise.<sup>38, 42</sup> The BMI figures in the above table are derived from the World Health Organization the International Classification of adult underweight, overweight and obesity according to BMI<sup>41</sup>. 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.

## 6.6 Exercise during pregnancy:

Women should start or continue exercise programs during pregnancy in line with RANZCOG statement ‘[Exercise during Pregnancy](#)’ (C-Obs 62).

## 6.7 Antenatal screening tests

Recommendation 8	Grade
Women with obesity should be offered early screening for diabetes and advised of the increased risk of a ‘no result’ with non-invasive prenatal testing (NIPT).	Consensus-based recommendation

## 6.8 Glucose tolerance testing for Gestational Diabetes:

- Women with obesity should be offered early glucose tolerance testing (GTT), with a repeat at 28 weeks if the early test was normal.<sup>43</sup>
- Women who have undergone gastric bypass surgery will not tolerate the glucose tolerance test due to “dumping syndrome” as the glucose load can stimulate increased insulin secretion and lead to hypoglycaemia. It may be preferable to undertake BSLs monitoring for 4-7 days preferably including a weekend to account for alterations in regular eating habits between 24 to 28 weeks of gestation in this population of women.

## 6.9 Non-Invasive prenatal testing:

- Obesity increases the risk of not obtaining a result due to low fetal fraction; approximately 5% in class I obesity rising to 10% in Class II and even higher in Class III in some studies.<sup>44</sup> It is important to advise of this likelihood when counselling on this test.
- The issue with NIPT testing is compounded by the greater difficulty in performing ultrasound to achieve accurate neural tube measurements for combined first trimester screening, as well as performing invasive tests (CVS & amnio)

## 6.10 Vaccinations

Recommendation 9	Grade
Influenza and COVID19 vaccination are strongly recommended for pregnant women with obesity.	Consensus-based recommendation

Routine pregnancy vaccinations for influenza and pertussis should be recommended to all pregnant women. 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 women with obesity.

Pregnant women with COVID 19, particularly those with comorbidities, have increased risks of complications.<sup>45, 46</sup> Obesity is a risk factors for increased COVID-19 prevalence and severity in the general population<sup>47</sup>. Hence vaccination against Covid 19 is strongly recommended for pregnant women, if they have not been vaccinated prior to pregnancy. See [Joint statement between RANZCOG and ATAGI about COVID-19 vaccination for pregnant women.](#)

## 6.11 Anaesthetic assessment:

Recommendation 10	Grade
Pregnant women with obesity should have an anaesthetic referral antenatally, as per local guidelines, especially for women with BMI > 40	Consensus-based recommendation

Antenatal anaesthetic consultation provides an opportunity for the anaesthetic team to screen for co-morbidities and perform a comprehensive physical examination. Women can discuss anaesthetic options for labour analgesia, as well as caesarean birth. They can be counseled that neuraxial analgesia may be challenging and hence, they should plan to request this early in labour. The specific risks of general anaesthesia in pregnant women with obesity should also be discussed.

## 6.12 Pre-eclampsia:

Recommendation 11	Grade
Calcium and aspirin supplementation should be considered in early pregnancy and continued through till 36 weeks' gestation based on other risk factors.	Evidence based recommendation' A (calcium) Reference 48  B (aspirin) Reference 49

There is strong evidence that calcium supplementation is of benefit for women at risk of pre-eclampsia.<sup>48</sup> This should be given as 1500 – 2000 mg of elemental calcium per day. Most available formulations of calcium contain 600 mg of elemental calcium requiring two or three tablets daily.

Low-dose aspirin (**100-150 mg**) per day reduces the risk of pre-term pre-eclampsia.<sup>49</sup> Some evidence suggests that this is more effective if taken at night. This should be commenced between 12- and 16-weeks' gestation and stopped at around 36 weeks.

## 6.13 Ultrasound assessments and fetal growth:

Recommendation 12	Grade
Pregnant women with obesity should be offered additional serial ultrasounds for fetal growth. The timing and frequency of serial scans should be based on the full clinical picture.	Consensus-based recommendation

Women with obesity have increased risks of congenital abnormalities, fetal growth restriction and macrosomia. However, ultrasound assessment of anatomy is less accurate in women with obesity with a reduced detection rate of structural conditions at the routine second trimester morphology scan.<sup>50</sup>

Despite its limitations, ultrasound may provide a more accurate assessment of fetal growth than clinical assessment.<sup>51</sup> Third trimester serial fetal growth ultrasound should be offered to women with obesity. There is increasing evidence to suggest that single, or even serial scans, have a low sensitivity for detecting growth restriction in women with obesity.<sup>52</sup> It is important to have a high degree of clinical suspicion for aberrant growth and ultrasound findings should be interpreted, and management planned, in the context of this poor sensitivity.

## 6.14 Previous caesarean section:

Recommendation 13	Grade
Pregnant women with obesity wishing to consider vaginal birth after previous caesarean section (VBAC) should be advised of the lower chance of success and high chance of complications.	Evidence based recommendation

	<p>B</p> <p>Reference 53-54</p>
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Women with obesity 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.<sup>53 54</sup> 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 using the principles of shared decision making.

### 6.15 Timing of birth

Recommendation 14	Grade
Women with BMI $\geq$ 50 should be offered delivery prior to their due date.	Consensus-based recommendation

There is no universal consensus on the optimum timing of birth for women with obesity in the absence of comorbidities. Awaiting spontaneous labour after the due date may increase the risk of macrosomia and term stillbirth in women with obesity. Induction of labour does not appear to increase the risk of caesarean birth.<sup>55</sup> 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 women with obesity.<sup>56</sup>

The benefit of induction is likely to be more significant with higher BMI. Given the extremely high rates of stillbirth from 39 weeks' gestation in women with a BMI > 50,<sup>5</sup> consideration should be given to offering delivery by 39 weeks for this group.

The optimal timing of delivery for women with obesity with lower BMI is unclear.

### 6.16 Mode of birth

Recommendation 15	Grade
Women with obesity, particularly those with Class III obesity, should be advised of the increased risks of emergency caesarean section.	Consensus-based recommendation

Emergency caesarean section rates are strongly linked to BMI. Women with class III obesity have, approximately, a 40% chance of an emergency caesarean following spontaneous onset of labour<sup>57, 58</sup>. This information should inform discussions around mode of delivery and for some women, there may be benefits to elective caesarean section. The principles of shared decision making should be used to guide discussions regarding mode of birth.

## 6.17 Medication dosing during pregnancy, peripartum, and postpartum

Although data are sparse and mostly drawn from studies of non-pregnant adults with obesity, consideration should be given to appropriate medication dosage and whether an increased dosage is required for women with obesity in pregnancy. In particular:

- Recommended folic acid supplementation dose (for prevention of neural tube defects) is 5mg rather than the standard 0.4-0.5mg<sup>59</sup>.
- Venous thromboembolism prophylaxis dose increase is recommended with increasing maternal weight (e.g. standard dose enoxaparin 40mg daily 50-90kg, 60mg daily 90-130kg, 80mg daily >130kg)<sup>60</sup>.
- There is *in vitro* evidence that very low-dose aspirin (60mg) for preeclampsia prophylaxis is ineffective in women with obesity in pregnancy<sup>61</sup>, so these women should receive at least 100mg or 150mg daily dose.
- Consider increased prophylactic antibiotic dose at caesarean section e.g. if cephazolin used, 1g for maternal weight <80kg, 2g if 80kg or more and 3g if 120kg or more. (It should be noted that this evidence is mostly based on data from non-pregnant adults with obesity and specific Caesarean Section data is sparse and inconclusive)<sup>62</sup>.

## 7. Intrapartum and postpartum care

Recommendation 16	Grade
Intrapartum risks associated with obesity should be mitigated by routine precautions including preparation for PPH and shoulder dystocia.	Consensus-based recommendation

### 7.1 Vaginal birth:

The progress of labour and time taken to achieve full dilatation is prolonged for women with obesity. [18](#), [63](#) Most of this extra time is in the latent phase with active first and second stage being similar. There is also a greater chance of failed induction, which may be as high as 37.5% for Class III obesity, with Bishop score reliably indicating success rates.<sup>64</sup> Higher doses and longer exposure to oxytocin is also needed to achieve vaginal delivery.<sup>65</sup> The potential for a more prolonged labour to achieve vaginal delivery should be explained to women antenatally.

Intrapartum management may be complicated by difficulty confirming fetal presentation and a higher requirement for internal fetal and uterine pressure monitoring.<sup>20</sup> Continuous electronic fetal monitoring in labour is recommended for women with BMI  $\geq 40$  as per [RANZCOG Intrapartum Fetal Surveillance Clinical Guideline](#). Women with BMI 30-40 may need continuous electronic fetal monitoring in the presence of additional risk factors in accordance with the RANZCOG guideline<sup>66</sup>.

At the time of delivery, awareness should be maintained of the increased risk of shoulder dystocia.

With the increased risk of PPH, women with a BMI  $>40\text{kg/m}^2$  should have intravenous access on admission to labour ward and advised of the benefits of active management of the **third** stage of labour.

### 7.2 Care in theatre:

Operating theatre staff should be alerted regarding any woman whose weight exceeds 120kg to ensure adequate staffing and equipment are available. Clinicians should appreciate that obesity adds complexity and experienced surgical staff should be involved. Consideration should be given to the use of specific devices such as panniculus retractors.

### 7.3 Thromboembolism prophylaxis:

Women who are obese are at increased risk of thromboembolism. Local guidelines for thromboembolism prophylaxis should be followed but standard doses for DVT prophylaxis are likely to be insufficient. Therefore, doses should be calculated on the basis of weight.<sup>67</sup>

### 7.4 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 not be as effective 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>68</sup>

### 7.5 Breastfeeding:

Given obesity is associated with lower rates of breastfeeding uptake and continuation,<sup>25</sup> women who are obese should be offered support antenatally and immediately following birth to assist with the initiation and maintenance of breastfeeding.

### 7.6 Weight management postpartum:

Women with obesity should continue to receive nutritional and exercise advice following delivery from an appropriately trained professional, with a view to encouraging appropriate weight reduction. It may be an opportunity to evaluate for underlying causes of obesity (for example with thyroid function or cortisol) and to explore previous interventions tried. Women can also be screened for complications of obesity.

Advice should be provided that weight loss or limiting further weight gain will reduce risks in future pregnancies.<sup>8</sup>

Consideration should be given to referral for bariatric surgery following birth especially in women with Class III obesity.

Women should be offered appropriate advice on postpartum contraception, taking into consideration the individual needs of the woman and presence of additional risk factors.

## 8. Summary

Obesity is prevalent in obstetrics and presents increased risks of complication. Extra advice, investigations and surveillance may help reduce these risks. Clinicians should routinely engage in counselling about risks and ensure women are able to engage with the recommendations.

## 9. References

1. Organisation WH. Global database on body mass index: BMI classification 2006 2006 [cited 2013 6 September ]. Available from: <http://www.assessmentpsychology.com/icbmi.htm>.
2. Australian Institute of Health and Welfare. Australia's mothers and babies 2017—in brief. Perinatal statistics series no. 35. Cat. no. PER 100. Canberra AIHW, 2019.
3. McAuliffe FM, Killeen SL, Jacob CM, Hanson MA, Hadar E, McIntyre HD, et al. Management of prepregnancy, pregnancy, and postpartum obesity from the FIGO Pregnancy and Non-Communicable Diseases Committee: A FIGO (International Federation of Gynecology and Obstetrics) guideline. *International Journal of Gynecology & Obstetrics*. 2020;151(S1):16-36.
4. Snider AP, Wood JR. Obesity induces ovarian inflammation and reduces oocyte quality. *Reproduction*. 2019;158(3):R79-R90.
5. Yao R, Ananth CV, Park BY, Pereira L, Plante LA, Perinatal Research C. Obesity and the risk of stillbirth: a population-based cohort study. *American journal of obstetrics and gynecology*. 2014;210(5):457 e1-9.
6. Kislal S, Shook LL, Edlow AG. Perinatal exposure to maternal obesity: Lasting cardiometabolic impact on offspring. *Prenat Diagn*. 2020;40(9):1109-25.
7. de Jersey S. ARE WE MISSING OPPORTUNITIES? UNDERSTANDING HEALTH BEHAVIOURS ASSOCIATED WITH OVERWEIGHT IN PREGNANCY. Queensland University of Technology. 2013.
8. Knight-Agarwal CR, Williams LT, Davis D, Davey R, Cochrane T, Zhang H, et al. Association of BMI and interpregnancy BMI change with birth outcomes in an Australian obstetric population: a retrospective cohort study. *BMJ Open*. 2016;6(5):e010667.
9. Lashen H, Fear K, Sturdee DW. Obesity is associated with increased risk of first trimester and recurrent miscarriage: matched case-control study. *Hum Reprod*. 2004;19(7):1644-6.
10. Cavalcante MB, Sarno M, Peixoto AB, Araujo Junior E, Barini R. Obesity and recurrent miscarriage: A systematic review and meta-analysis. *J Obstet Gynaecol Res*. 2019;45(1):30-8.
11. Rasmussen SA, Chu SY, Kim SY, Schmid CH, Lau J. Maternal obesity and risk of neural tube defects: a metaanalysis. *American journal of obstetrics and gynecology*. 2008;198(6):611-9.
12. D'Souza R, Horyn I, Pavalagantharajah S, Zaffar N, Jacob C-E. Maternal body mass index and pregnancy outcomes: a systematic review and metaanalysis. *American Journal of Obstetrics & Gynecology MFM*. 2019;1(4):100041.
13. Jacobsen AF, Skjeldestad FE, Sandset PM. Ante- and postnatal risk factors of venous thrombosis: a hospital-based case-control study. *J Thromb Haemost*. 2008;6(6):905-12.
14. Butwick AJ, Bentley J, Leonard SA, Carmichael SL, El-Sayed YY, Stephansson O, et al. Prepregnancy maternal body mass index and venous thromboembolism: a population-based cohort study. *BJOG : an international journal of obstetrics and gynaecology*. 2019;126(5):581-8.
15. Dominguez JE, Grotegut CA, Cooter M, Krystal AD, Habib AS. Screening extremely obese pregnant women for obstructive sleep apnea. *American journal of obstetrics and gynecology*. 2018;219(6):613 e1- e10.
16. Nelson DB, Moniz MH, Davis MM. Population-level factors associated with maternal mortality in the United States, 1997-2012. *BMC Public Health*. 2018;18(1):1007.
17. Ruhstaller KE, Elovitz MA, Stringer M, Epperson CN, Durnwald CP. Obesity and the association with maternal mental health symptoms. *J Matern Fetal Neonatal Med*. 2017;30(16):1897-901.
18. Polónia Valente R, Santos P, Ferraz T, Montenegro N, Rodrigues T. Effect of obesity on labor duration among nulliparous women with epidural analgesia. *J Matern Fetal Neonatal Med*. 2020;33(13):2195-201.

19. Morken NH, Klungsoyr K, Magnus P, Skjaerven R. Pre-pregnant body mass index, gestational weight gain and the risk of operative delivery. *Acta Obstet Gynecol Scand.* 2013;92(7):809-15.
20. Brocato B, Lewis D, Mulekar M, Baker S. Obesity's impact on intrapartum electronic fetal monitoring. *J Matern Fetal Neonatal Med.* 2019;32(1):92-4.
21. Kula AO, Riess ML, Ellinas EH. Increasing body mass index predicts increasing difficulty, failure rate, and time to discovery of failure of epidural anesthesia in laboring patients. *J Clin Anesth.* 2017;37:154-8.
22. Taylor CR, Dominguez JE, Habib AS. Obesity And Obstetric Anesthesia: Current Insights. *Local Reg Anesth.* 2019;12:111-24.
23. Sullivan EA, Dickinson JE, Vaughan GA, Peek MJ, Ellwood D, Homer CS, et al. Maternal super-obesity and perinatal outcomes in Australia: a national population-based cohort study. *BMC Pregnancy and Childbirth.* 2015;15(1).
24. Conner SN, Verticchio JC, Tuuli MG, Odibo AO, Macones GA, Cahill AG. Maternal obesity and risk of postcesarean wound complications. *Am J Perinatol.* 2014;31(4):299-304.
25. Ramji N, Challa S, Murphy PA, Quinlan J, Crane JMG. A comparison of breastfeeding rates by obesity class. *J Matern Fetal Neonatal Med.* 2018;31(22):3021-6.
26. Josefson JL, Catalano PM, Lowe WL, Scholtens DM, Kuang A, Dyer AR, et al. The Joint Associations of Maternal BMI and Glycemia with Childhood Adiposity. *J Clin Endocrinol Metab.* 2020;105(7).
27. 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.
28. Oteng-Ntim E, Mononen S, Sawicki O, Seed PT, Bick D, Poston L. Interpregnancy weight change and adverse pregnancy outcomes: a systematic review and meta-analysis. *BMJ Open.* 2018;8(6):e018778.
29. 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.
30. 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.
31. NHMRC. NHMRC Public Statement: Iodine supplementation for pregnant and breastfeeding women 2010 [cited 2021]. Available from: <https://www.nhmrc.gov.au/about-us/publications/iodine-supplementation-pregnant-and-breastfeeding-women>.
32. NICE. Weight management before, during and after pregnancy: National Institute of Health and Care Excellence; 2010 [cited 2021]. Available from: <https://www.nice.org.uk/guidance/ph27/resources/weight-management-before-during-and-after-pregnancy-pdf-1996242046405>.
33. Shawe J, Ceulemans D, Akhter Z, Neff K, Hart K, Heslehurst N, et al. Pregnancy after bariatric surgery: Consensus recommendations for periconception, antenatal and postnatal care. *Obes Rev.* 2019;20(11):1507-22.
34. Lissau I, Sørensen TI. Parental neglect during childhood and increased risk of obesity in young adulthood. *Lancet.* 1994;343(8893):324-7.
35. Gustafson TB, Sarwer DB. Childhood sexual abuse and obesity. *Obes Rev.* 2004;5(3):129-35.
36. Hollingsworth K, Callaway L, Duhig M, Matheson S, Scott J. The association between maltreatment in childhood and pre-pregnancy obesity in women attending an antenatal clinic in Australia. *PLoS One.* 2012;7(12):e51868-e.
37. National Health and Medical Research Council. Iodine supplementation for Pregnant and Breastfeeding Women: Public statement. 2010.
38. 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.
39. Goldstein RF, Abell SK, Ranasinha S, Misso M, Boyle JA, Black MH, et al. Association of Gestational Weight Gain With Maternal and Infant Outcomes: A Systematic Review and Meta-analysis. *JAMA.* 2017;317(21):2207-25.
40. NHMRC. Australian Dietary Guidelines Canberra: National Health and Medical Research Council; 2013 [cited 2021]. Available from: [https://www.eatforhealth.gov.au/sites/default/files/content/The%20Guidelines/n55a\\_australian\\_dietary\\_guidelines\\_summary\\_131014\\_1.pdf](https://www.eatforhealth.gov.au/sites/default/files/content/The%20Guidelines/n55a_australian_dietary_guidelines_summary_131014_1.pdf).

41. World Health Organization. Global database on body mass index: BMI classification 2006 [cited 2013 6 September 2013]. Available from: [http://apps.who.int/bmi/index.jsp?introPage=intro\\_3.html](http://apps.who.int/bmi/index.jsp?introPage=intro_3.html).
42. de Jersey SJ. Are we missing opportunities? Understanding health behaviours associated with overweight in pregnancy. : Queensland University of Technology; 2013.
43. Nankervis A MH, Moses R, Ross GP, Callaway L, Porter C, Jeffries W, Boorman C, De Vries B ADIPS Consensus Guidelines for the Testing and Diagnosis of Hyperglycaemia in Pregnancy in Australia and New Zealand: Australasian Diabetes in Pregnancy Society; 2014 [cited 2021 3 November]. Available from: [https://www.adips.org/downloads/2014ADIPSGDMGuidelinesV18.11.2014\\_000.pdf](https://www.adips.org/downloads/2014ADIPSGDMGuidelinesV18.11.2014_000.pdf).
44. Juul LA, Hartwig TS, Ambye L, Sorensen S, Jorgensen FS. Noninvasive prenatal testing and maternal obesity: A review. *Acta Obstet Gynecol Scand*. 2020;99(6):744-50.
45. Knight M, Bunch K, Vousden N, Morris E, Simpson N, Gale C, et al. Characteristics and outcomes of pregnant women admitted to hospital with confirmed SARS-CoV-2 infection in UK: national population based cohort study. *BMJ*. 2020;369:m2107.
46. Kayem G, Lecarpentier E, Deruelle P, Bretelle F, Azria E, Blanc J, et al. A snapshot of the Covid-19 pandemic among pregnant women in France. *J Gynecol Obstet Hum Reprod*. 2020;49(7):101826.
47. Petrakis D, Margină D, Tsarouhas K, Tekos F, Stan M, Nikitovic D, et al. Obesity - a risk factor for increased COVID-19 prevalence, severity and lethality (Review). *Mol Med Rep*. 2020;22(1):9-19.
48. Hofmeyr GJ, Belizan JM, von Dadelszen P, Calcium, Pre-eclampsia Study G. Low-dose calcium supplementation for preventing pre-eclampsia: a systematic review and commentary. *BJOG : an international journal of obstetrics and gynaecology*. 2014;121(8):951-7.
49. Roberge S, Bujold E, Nicolaides KH. Aspirin for the prevention of preterm and term preeclampsia: systematic review and metaanalysis. *American journal of obstetrics and gynecology*. 2018;218(3):287-93 e1.
50. Dashe JM, D. Twickler, D. . Effect of Maternal Obesity on the Ultrasound Detection of Anomalous Fetuses. . *Obstet Gynecol* 2009;113(5):1001-7.
51. Sovio U, White IR, Dacey A, Pasupathy D, Smith GCS. 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(10008):2089-97.
52. Dude AM, Davis B, Delaney K, Yee LM. Identifying fetal growth disorders using ultrasound in obese nulliparous women. *J Matern Fetal Neonatal Med*. 2019:1-6.
53. Yao R, Crimmins SD, Contag SA, Kopelman JN, Goetzinger KR. Adverse perinatal outcomes associated with trial of labor after cesarean section at term in pregnancies complicated by maternal obesity. *J Matern Fetal Neonatal Med*. 2019;32(8):1256-61.
54. Wilson E, Sivanesan K, Veerasingham M. Rates of vaginal birth after caesarean section: What chance do obese women have? *Aust N Z J Obstet Gynaecol*. 2020;60(1):88-92.
55. Grobman WA, Rice MM, Reddy UM, Tita ATN, Silver RM, Mallett G, et al. Labor Induction versus Expectant Management in Low-Risk Nulliparous Women. *N Engl J Med*. 2018;379(6):513-23.
56. Schuster M, Madueke-Laveaux OS, 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 e1-6.
57. Paidas Teefey C, Reforma L, Koelper NC, Sammel MD, Srinivas SK, Levine LD, et al. Risk Factors Associated With Cesarean Delivery After Induction of Labor in Women With Class III Obesity. *Obstetrics and gynecology*. 2020;135(3):542-9.
58. (AIHW) AloHaW. Australia's mothers and babies. Australian Government, 2019.
59. Denison FC, Aedla NR, Keag O, Hor K, Reynolds RM, Milne A, et al. Care of Women with Obesity in Pregnancy: Green-top Guideline No. 72. *BJOG : an international journal of obstetrics and gynaecology*. 2019;126(3):e62-e106.
60. Nelson-Piercy C MP, Mackillop L. Reducing the risk of venous thromboembolism during pregnancy and the puerperium. Green-top Guideline RCOG. 2015;No. 37a (3rd Edition).
61. Finneran MM, Gonzalez-Brown VM, Smith DD, Landon MB, Rood KM. Obesity and laboratory aspirin resistance in high-risk pregnant women treated with low-dose aspirin. *American journal of obstetrics and gynecology*. 2019;220(4):385.e1-.e6.
62. ACOG Practice Bulletin No. 199: Use of Prophylactic Antibiotics in Labor and Delivery. *Obstetrics and gynecology*. 2018;132(3):e103-e19.

63. Norman SM, Tuuli MG, Odibo AO, Caughey AB, Roehl KA, Cahill AG. The effects of obesity on the first stage of labor. *Obstetrics and gynecology*. 2012;120(1):130-5.
64. Kerbage Y, Senat MV, Drumez E, Subtil D, Vayssiere C, Deruelle P. Risk factors for failed induction of labor among pregnant women with Class III obesity. *Acta Obstet Gynecol Scand*. 2020;99(5):637-43.
65. Adams AD, Coviello EM, Drassinower D. The Effect of Maternal Obesity on Oxytocin Requirements to Achieve Vaginal Delivery. *Am J Perinatol*. 2020;37(4):349-56.
66. Gynaecologists RAaNZCoOa. Intrapartum Fetal Surveillance. Clinical Guideline – Fourth Edition 2019/2019.
67. Royal College of Obstetricians and Gynaecologists. Reducing the Risk of Venous Thromboembolism during Pregnancy and the Puerperium. London: RCOG; 2015 [Green-top Guideline No. 37a]. Available from: <https://www.rcog.org.uk/globalassets/documents/guidelines/gtg-37a.pdf>.
68. 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.
67. Paidas Teefey C, Reforma L, Koelper NC, Sammel MD, Srinivas SK, Levine LD, Durnwald CP. Risk Factors Associated With Cesarean Delivery After Induction of Labor in Women With Class III Obesity. *Obstet Gynecol*. 2020 Mar;135(3):542-549. doi: 10.1097/AOG.0000000000003703. PMID: 32028494.

## 10. Links to related College statements

Diagnosis of Gestational Diabetes Mellitus (C-Obs 7)

[https://ranzcoг.edu.au/RANZCOG\\_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Diagnosis-of-GDM-\(C-Obs-7\)-review-July-2017.pdf?ext=.pdf](https://ranzcoг.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Diagnosis-of-GDM-(C-Obs-7)-review-July-2017.pdf?ext=.pdf)

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

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

Pre-pregnancy Counselling (C-Obs 3a)

[https://ranzcoг.edu.au/RANZCOG\\_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Pre-pregnancy-Counselling-\(C-Obs-3a\)-review-July-2017\\_1.pdf?ext=.pdf](https://ranzcoг.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Pre-pregnancy-Counselling-(C-Obs-3a)-review-July-2017_1.pdf?ext=.pdf)

Exercise in Pregnancy (C-Obs 62)

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

## 11. Other suggested reading

Denison FC, Aedla NR, Keag O, Hor K, Reynolds RM, Milne A, Diamond A, on behalf of the Royal College of Obstetricians and Gynaecologists. Care of Women with Obesity in Pregnancy. Green-top Guideline No. 72. *BJOG* 2018

[RANZCOG Intrapartum Fetal Surveillance Clinical Guideline](#)

## 12. Patient information

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

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

## Appendices

### Appendix A Women's Health Committee Membership

Name	Position on Committee
Dr Scott White	Chair
Dr Gillian Gibson	Deputy Chair, Gynaecology
Dr Anna Clare	Deputy Chair, Obstetrics
Associate Professor Amanda Henry	Member and Councillor
Dr Samantha Scherman	Member and Councillor
Dr Marilla Druitt	Member and Councillor
Dr Frank O'Keefe	Member and Councillor
Dr Kasia Siwicki	Member and Councillor
Dr Jessica Caudwell-Hall	Member and Councillor
Dr Sue Belgrave	Member and Councillor
Dr Marilyn Clarke	Aboriginal and Torres Strait Islander Representative
Professor Kirsten Black	SRHSIG Chair
Dr Nisha Khot	Member and SIMG Representative
Dr Judith Gardiner	Diplomate Representative
Dr Angela Brown	Midwifery Representative, Australia
Ms Adrienne Priday	Midwifery Representative, New Zealand
Ms Leigh Toomey	Community Representative
Dr Rania Abdou	Trainee Representative
Dr Philip Suisted	Māori Representative
Prof Caroline De Costa	Co-opted member (ANZJOG member)
Dr Steve Resnick	Co-opted member

### Appendix B: Contributing authors

RANZCOG Women's Health Committee would like to acknowledge the significant contribution of Dr Christine Sammartino to the 2022 update of this statement.

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

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

This statement was developed in March 2013. 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 March 2022 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 C 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. 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

### Purpose

This Statement has been developed to provide general advice to practitioners about women's health issues concerning Management of Obesity in pregnancy 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 person. 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 person with obesity in pregnancy and the particular circumstances of each case.

### Quality of information

The information available in Management of Obesity in Pregnancy (C-Obs 49) is intended as a guide and provided for information purposes only. The information is based on the Australian/New Zealand context using the best available evidence and information at the time of preparation. While the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) had endeavoured 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. The use of this information is entirely at your own risk and responsibility.

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These terms and conditions will be constructed according to and are governed by the laws of Victoria, Australia.

Version	Date of Version	Pages revised / Brief Explanation of Revision
v1.1	Mar/2013	WHC
v2.1	Mar/2017	WHC

Policy Version:	Version 3.1
Policy Owner:	Women's Health Committee
Policy Approved by:	RANZCOG Council/Board
Review of Policy:	Mar / 2026