



## An AOM Clinical Practice Guideline Summary

# BODY MASS INDEX

This summary provides easy access to some of the most essential content of AOM CPG No. 12: The Management of High or Low Body Mass Index during Pregnancy. It is intended to be used in conjunction with the full-length Clinical Practice Guideline (CPG). For a complete analysis of the research relevant to the management of high or low body mass index, along with citations, refer to the full CPG.

### INTRODUCTION

Body mass index (BMI) is a numerical value that relates weight to height. While BMI is used as an indicator of adiposity, it cannot measure adiposity directly, and it has several important limitations that are discussed in the full CPG.

Currently, BMI is the most widely used variable to examine the health impact associated with very low or very high levels of adiposity. To make recommendations that are consistent with the available evidence base, the CPG and this summary document refer specifically to BMI and the World Health Organization (WHO) BMI categorization (see Table 1).

**Table 1: Institute of Medicine (IOM) Recommendations for Total and Rate of Weight Gain during Pregnancy, by Pre-pregnancy BMI (1)**

| Pre-pregnancy BMI   | BMI (WHO) (kg/m <sup>2</sup> ) | Total Weight Gain Range (lbs) | Rate of Weight Gain* in Second and Third Trimester (Mean Range in lbs/wk) |
|---------------------|--------------------------------|-------------------------------|---|
| Underweight         | < 18.5                         | 28-40                         | 1 (1-1.3)   |
| Recommended weight  | 18.5-24.9                      | 25-35                         | 1 (0.8-1)   |
| Overweight          | 25.0-29.9                      | 15-25                         | 0.6 (0.5-0.7)   |
| Obese (all classes) | ≥ 30.0                         | 11-20                         | 0.5 (0.4-0.6)   |

\* Calculations assume a 1.1-4.4 lb weight gain in the first trimester (Siga-Ritz, 1994 quoted in (1))

## RISK FACTORS

### DISORDERED EATING

Eating disorders such as anorexia nervosa, bulimia and binge eating are often associated with high or low BMI measurements, and they increase the risks of morbidity and mortality. (2)

#### Recommendation

1. Offer referral to the most appropriate and available mental health services for clients who have or are suspected of having an eating disorder. [III-C] [2010]

## PREVENTION OF POOR OUTCOMES

### OPTIMIZING GESTATIONAL WEIGHT GAIN

A 2017 systematic review found that individuals who gain weight within the recommended ranges outlined by the IOM (see Table 1) experience better pregnancy outcomes than those who do not. This suggests that complications related to obesity and underweight can be reduced or prevented through the careful management of gestational weight gain (GWG). (3) However, this research is limited by several factors, and there is insufficient evidence to rely on these results. Until more evidence is available, IOM recommendations should only be used as a general reference, and clients may focus on optimizing weight gain through healthy diet and physical activity.

Midwives can help curb BMI-related health complications by engaging in thoughtful, informative conversations with their clients about the benefits of maintaining a healthy diet and physical activity, and by linking them to appropriate services and resources. However, midwives should remain mindful that the causes of high or low BMI often extend beyond an individual's control.

#### Recommendation

2. Discuss the benefits of optimizing GWG in pregnancy for clients with a BMI < 18.5 kg/m<sup>2</sup> or ≥ 30 kg/m<sup>2</sup>. [II-2-B] [new 2019]

### CHARTING WEIGHT GAIN ON ANTENATAL RECORDS

The IOM recommends that midwives document preconception BMI, as well as subsequent weight gain throughout pregnancy, and regularly share these results with clients to remind them of their progress toward their weight gain goals. (1)

When discussing weight charting and management with high-BMI clients in particular, midwives should avoid potentially offensive terminology, such as “fat,” “fatness,” “large size,” “heaviness” and “obesity.” Midwives should consistently encourage open discussion and questioning with clients, and they should respect the wishes of clients with specific preferences about the language they prefer their provider to use. (4)

Midwives or clients may choose not to routinely measure or document weight gain.

#### Recommendation

3. Midwives may consider calculating and documenting pre-pregnancy BMI on the first antenatal record. If pre-pregnancy weight is unknown, midwives may consider documenting BMI at the intake visit. [III-B] [new 2019]

## NUTRITION AND PHYSICAL ACTIVITY DURING PREGNANCY

The ideal format and intensity of methods for managing gestational weight gain has not been established. (5) However, dietary interventions should take the following into account:

- Individual preferences and experiences during pregnancy
- Time and budget constraints
- Cultural food practices
- Food knowledge and preparation skills (6)

According to the Society of Obstetricians and Gynaecologists' 2018 Canadian Guideline for Physical Activity throughout Pregnancy, exercise is associated with improved cardiovascular function and a reduction of excess weight gain. (7) The 2018 SOGC guideline recommends that pregnant people try to do physical activity at least three days a week, and that low-risk, previously active individuals may continue their exercise routines. (7)

Midwives should encourage individualized, multi-faceted weight management strategies with both high- and low-BMI clients, and they should refer clients to appropriate health care providers as needed.

### Recommendations

4. All clients should be counselled about the importance of good nutrition and physical activity during pregnancy. Canada's Food Guide is an example of a nutrition guideline that includes dietary advice for individuals who are pregnant or nursing. [II-2-B] [2010]
5. For clients with a BMI < 18.5 kg/m<sup>2</sup> or ≥ 30 kg/m<sup>2</sup>, midwives should identify and offer referrals to the most appropriate health care providers available in clients' communities to discuss nutrition, healthy eating and other good habits. [II-2-B] [2010]

## ANTENATAL AND INTRAPARTUM COMPLICATIONS: HIGH BMI

### PREECLAMPSIA AND HYPERTENSION

Pregnant individuals with a BMI ≥ 30 kg/m<sup>2</sup> were found to have a moderate risk for preeclampsia during pregnancy compared with recommended-BMI individuals (OR 3.15 95% CI 2.96-3.35). (8) This risk appears to increase as BMI increases. (9)

Appropriately sized blood pressure cuffs should be used with high-BMI clients to avoid inaccurate readings. (10)

The use of low-dose acetylsalicylic acid (ASA) during pregnancy is shown to provide some preventive benefit against the development of preeclampsia and hypertension. (11) However, ASA is only recommended for clients with at least one other moderate risk factor for preeclampsia. (11) To learn more, refer to the AOM's CPG No.15: Hypertensive Disorders of Pregnancy. (12)

### Recommendation

6. Obtain and document a baseline blood pressure, using the appropriate cuff size for clients with a BMI ≥ 30 kg/m<sup>2</sup>.

## GESTATIONAL DIABETES

Pregnant individuals with a BMI  $\geq 30$  kg/m<sup>2</sup> were found to have a moderate risk for gestational diabetes mellitus (GDM) during pregnancy compared with recommended-BMI individuals (OR 3.34-3.76). (13)

There is inconsistent evidence to support the use of GDM screening over universal screening, based on risk factors (such as BMI  $\geq 30$  kg/m<sup>2</sup>). (14) Additionally, adverse outcomes associated with GDM are likely due to hyperglycemia and the pregnant person's co-existing environment rather than high BMI. (14) Midwives may review the AOM's literature review on GDM for more information on this topic.

### Recommendation

7. For clients with a BMI  $\geq 30$  kg/m<sup>2</sup>, midwives should discuss the higher risk of preeclampsia and GDM, along with the risks and benefits of GDM screening. [II-2-A] [new 2019]

## THROMBOEMBOLISM

There is inconsistent research on the risks for antepartum venous thromboembolism in pregnant people with BMI  $\geq 30$  kg/m<sup>2</sup>. (15,16) Despite this variation, several clinical practice guidelines on obesity and pregnancy acknowledge the elevated risk of venous thromboembolism during and after pregnancy. (17) Midwives should account for the following risk factors for venous thromboembolism when considering thromboprophylaxis:

- BMI  $\geq 30$  kg/m<sup>2</sup>
- Delivery via caesarean section
- Age > 35 years
- Medical comorbidities (18)

The Royal College of Obstetricians and Gynecologists (RCOG) also recommends offering postnatal thromboprophylaxis to all pregnant people with a BMI  $\geq 40$  kg/m<sup>2</sup>, regardless of mode of delivery. (19) However, given the paucity of high-quality evidence about when and in what form thromboprophylaxis should be considered with high-BMI clients, the necessity for thromboprophylaxis should be assessed individually.

### Recommendation

8. Midwives should individually evaluate each client's need for thromboprophylaxis. They may consider suggesting an antepartum consultation with a physician for clients with a BMI  $\geq 40$  kg/m<sup>2</sup>, or for clients with a BMI  $\geq 30$  kg/m<sup>2</sup> and other known risk factors for thromboembolism. [III-C] [new 2019]

## FETAL MONITORING

Excessive abdominal adiposity may affect midwives' ability to monitor fetal development during pregnancy through ultrasound and abdominal palpation. (20) Growth charts may not be accurate for high-BMI clients. (21)

There is no evidence to support the necessity of continuous FHR monitoring during labour on the basis of high BMI alone. (22) Electronic fetal monitoring may be used when fetal heart rate is difficult to detect. (23)

### Recommendations

9. For second-trimester ultrasounds indicating suboptimal visualization, discuss limitations of ultrasound with client and consider offering repeat ultrasound if needed. [III-B] [2019]
10. When abdominal palpation proves challenging and/or symphysis-fundal measurements are unreliable, midwives should discuss the risks and benefits of a third-trimester ultrasound and offer as necessary to address any information gaps. [II-2-B] [2019]

## ANESTHESIA

Although epidural or spinal catheter needle placement may be more difficult with high-BMI clients, BMI is a poor predictor of distance to the epidural space, and standard epidural needles can generally be used. (24–26)

### Recommendation

11. Midwives should consider offering an antepartum anesthesiology consultation for clients who plan to have an epidural, or for those who wish to have a more detailed discussion about potential anesthesia complications related to BMI  $\geq 30$  kg/m<sup>2</sup>. [III-C] [2019]

## POSTPARTUM CONSIDERATIONS: HIGH BMI

## LACTATION

Individuals with a BMI  $\geq 30$  kg/m<sup>2</sup> are less likely to initiate human milk feeding, and they have been shown to have a shorter duration of nursing (both exclusive and any), regardless of GWG. (13,27–30)

Midwives can play a vital role in encouraging chest/breastfeeding by discussing the numerous benefits and providing lactation support.

### Recommendation

12. Midwives are well suited to help clients with a BMI  $\geq 30$  kg/m<sup>2</sup> who may experience difficulties with nursing to establish good positioning, latch and milk supply. When appropriate, midwives should refer clients to a lactation consultant or other specialist for lactation support. [III-B] [2019]

## FETAL AND NEONATAL COMPLICATIONS: HIGH BMI

## NEURAL TUBE DEFECTS AND FOLATE INTAKE

Individuals with a high BMI have a greater risk for neural tube defects (NTDs) during pregnancy. (31) Although the reasons for this association are unclear, pharmacokinetic research suggests that some of the risk may be explained by a lower concentration of serum folate in the blood. (32,33) High-BMI individuals may require a higher dosage of supplemental or dietary folate to achieve a serum folate concentration that could prevent NTDs. (34) Indeed, a case-control study from 2013 suggests that the risk of NTD may be attenuated with a folate-rich diet. (35)

There is no clear consensus about the recommended folate dosage for pregnant clients with a BMI  $\geq 30$  kg/m<sup>2</sup>. However, guideline development groups have suggested 0.4 mg to 5 mg of folic acid. (34,36)

### Recommendation

13. For clients with a BMI  $\geq 30$  kg/m<sup>2</sup>, midwives should discuss the benefits of a diet high in nutrient-dense, folate-containing foods before and during pregnancy to reduce the risk of NTDs. For clients who cannot maintain a high-folate diet, midwives may also discuss the risks and benefits of administering a supplement with 0.4 mg to 5 mg of folic acid. [II-2-B] [new 2019]

### ESTABLISHING IV ACCESS

Visualization and palpation of a suitable vein for IV cannulation may be more challenging in clients with a BMI  $\geq 30$  kg/m<sup>2</sup>. (37) Midwives may consider placing an IV during labour, particularly for a planned home birth.

#### Recommendation

14. Midwives should ensure that they feel competent to perform venipuncture and gain IV access in clients with a BMI  $\geq 30$  kg/m<sup>2</sup>, and they may consider establishing IV access during labour in clients who choose home birth. [III-C] [2010]

### CHOICE OF BIRTHPLACE

Two cohort studies examined the risks for adverse intrapartum and neonatal complications among individuals with a BMI  $> 35$  kg/m<sup>2</sup> who planned to give birth at home, in a Freestanding Midwifery Unit (FMU) or in an Alongside Midwifery Unit (AMU). (38,39) In both studies, a selected subset of “otherwise healthy” participants were included in the analysis, i.e., before the onset of labour, these participants were not known to have any medical or obstetric history risk factors, according to the National Institute for Health and Care Excellence (NICE) intrapartum care guideline, other than BMI  $> 35$  kg/m<sup>2</sup>. (40)

In one study, no significant differences in risk were found between high-BMI and recommended-BMI participants who opted to give birth at home, in an FMU or in an AMU. (38)

In the second study, 88.3% of participants with a BMI of 35.1-40 kg/m<sup>2</sup> who gave birth in an AMU had uncomplicated vaginal births. This is comparable with the proportion of recommended-BMI participants in this sample who had similar birth experiences at an AMU (82.7%). However, those with a BMI of 35.1-40 kg/m<sup>2</sup> had a slightly higher risk of caesarean section, and nulliparous participants in particular had a higher risk of postpartum hemorrhage. (39)

This evidence suggests that high BMI alone is not an indicator for hospital birth. Furthermore, adverse intrapartum and neonatal risks are low for individuals with a high BMI who are “otherwise healthy,” and particularly for those who have given birth before.

#### Recommendation

15. BMI  $\geq 30$  kg/m<sup>2</sup> alone is not an indicator for hospital birth. Midwives should support choice of birthplace for clients with a BMI  $\geq 30$  kg/m<sup>2</sup>. [II-2-B] [new 2019]

## LOW-BMI PREGNANCY

### MALNUTRITION AND OTHER COMORBIDITIES

Individuals with a low BMI are more likely to suffer from poor nutrition or malnourishment, which may explain the association between low BMI and low birth weight (LBW), small for gestational age (SGA), preterm birth and intrauterine growth restriction (IUGR). (41–43) Midwives may support low-BMI clients who lack knowledge of their nutritional needs through education and/or by referring them to a nutritionist when necessary or requested.

While the independent impact of low BMI on the risks of health complications is rather mild, the presence of other comorbid conditions, such as anorexia or prolonged nicotine use, severely raises the risks for serious health consequences. (44)

#### Recommendation

16. Clients with a BMI  $< 18.5$  kg/m<sup>2</sup> are at higher risk of IUGR, SGA and LBW. If poor fetal growth is suspected, offer third-trimester ultrasound or serial growth studies as necessary to rule out IUGR. [II-2-B] [2019]

## FERTILITY

Low BMI may also contribute to menstrual irregularities and infertility problems, which increases the difficulty of estimating a due date by menstrual history alone. (45)

### Recommendation

17. Midwives should perform a thorough menstrual history with every client. For those who report menstrual irregularities, discuss the risks and benefits of a dating ultrasound, preferably prior to 14 weeks' gestation. [I-A] [2019]

## CONCLUSION

It is important to note that not all individuals within a particular BMI category have equal likelihoods of complications. High or low BMI alone, without complications, is not sufficient cause to categorize a client as high risk.

Midwives should take particular care in discussions with high-BMI clients, as qualitative research has demonstrated that they often experience labelling, stereotyping and discrimination from health care professionals during their pregnancies. (46) The perception of high-BMI clients as high risk for medical intervention is disempowering, and it may result in poor care, over-treatment or over-diagnosis within this population.

Every client deserves to be given an individualized care plan that takes into account their own clinical picture, which may or may not be affected by factors related to BMI.

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