

## OBESITY IN PREGNANCY - ANMC GUIDELINE

**Background**

At present, more than 40-60% of pregnant women in the United States, based on different populations, are classified as overweight or obese, and 8% of gravidas are classified as extremely obese. The following classification system based on body mass index in kg/M<sup>2</sup> is used:

	<u>BMI (kg/M<sup>2</sup>)</u>	<u>Obesity Class</u>
Underweight	<18.5	-
Normal	18.5-24.9	-
Overweight	25.0-29.9	-
Obese	30.0-34.9	I
	35.0-39.9	II
Extremely obese	≥40.0	III

(for a BMI calculator, see [www.nhlbisupport.com/bmi](http://www.nhlbisupport.com/bmi))

**Pregnancy Associated Risks**

The risk (adjusted odds ratios compared to pregnant women of normal weight) of obstetric complications (by BMI) are shown below (all significant p values):

<u>Outcome</u>	<u>Obese vs. Control</u>	<u>Class III Obesity</u>
Gestational diabetes	2.6	4.0
Gestational hypertension	2.5	3.2
Preeclampsia	1.6	3.3
Birth weight >4500g	2.0	2.4
Birth weight >4000 g	1.7	1.9
Shoulder dystocia	2.7	-
Cesarean delivery	1.7	4.0
Congenital anomalies	1.34-1.87 (by type, most common is NTD)	

A meta-analysis including nine controlled studies examined the association between maternal obesity and risk of stillbirth. (4) The analysis found that overweight and obese pregnant women experienced significantly more stillbirths than normal weight women: overweight women unadjusted OR 1.47, 95% CI 1.08-1.94; obese women unadjusted OR 2.07, 95% CI 1.59-2.74.

## **Management**

(The following **Management** section applies to a pre-pregnancy BMI  $\geq 30$  /M<sup>2</sup> or first prenatal BMI  $\geq 30$  /M<sup>2</sup>, unless other BMI specified)

### First trimester:

- Glycosylated hemoglobin and random blood glucose first visit
- If Hbg A1c 5.7 – 6.4% or RBS 140-199 mg/dL, then obtain fasting blood glucose
- Dating ultrasound
- Counseling on limiting weight gain to 11-20 pounds (5-9 kg) (lowest LGA infants if <10 pounds)
- Nutrition consultation should be offered to all obese women, and they should be encouraged to follow an exercise program (Appendix 1).

### Second trimester:

- Fetal anatomic ultrasound examination
- 2-hr glucose challenge, if first trimester screening negative\*

### Labor and Delivery:

- use appropriate sized blood pressure cuff
- anticipate higher dose of oxytocin for induction or augmentation of labor
- consider placement of prophylactic epidural catheter

**if BMI  $\geq 40$  kg/M<sup>2</sup> at any point during pregnancy:**

- Consider early IUPC and FSE

**If BMI  $\geq$  50 kg/M<sup>2</sup> at any point during pregnancy:**

-Anesthesia consult on admission

### Cesarean Delivery:

Bariatric surgery should not be considered an indication for cesarean delivery (8), but if indicated for obstetric reasons there is an increased risk of wound disruption and infection in obese women:

- anticipate greater time from incision to delivery
- Pfannenstiel incision carries less risk of infection and dehiscence than midline incision
- consider retracting panniculus cephalad (or caudad) with tape or large “loban” drape
- consider self-retaining retractor, extra-long instruments
- close subcutaneous layer (34% decrease in wound disruption)
- subcutaneous drains may be associated with a higher risk of infection
- consider closure with polydioxanone (PDS); consider Smead-Jones “mass closure”
- if staples used for skin closure, do not remove until 7-10 days postoperatively for a vertical incision and 5 days for a Pfannenstiel
- increase dose of prophylactic cefazolin to 3g IV before incision if BMI  $>40$  kg/M<sup>2</sup>
- panniculectomy at the time of cesarean delivery increases complications

**If BMI  $> 50$  at any point during pregnancy:**

Anesthesia consult on admission

- Increased risk of anesthesia complications in obese women:
- increased risk of gastric aspiration in obese women
  - 30 mL 0.3 mol sodium citrate (Bicitra)
  - consider additional use of IV famotidine and/or metoclopramide
- anticipate higher rate of failed regional anesthesia
- anticipate difficult airway (75% of anesthesia-related maternal deaths are in women  $>40$  kg/M<sup>2</sup>)
  - have videolaryngoscope available

- have laryngeal mask airway available
- have emergency cricothyroidotomy kit available

### **Cesarean Delivery Thromboprophylaxis**

-Increased risk of venous thromboembolism in obese women

(See existing Cesarean Delivery Thromboprophylaxis guideline on ANMC website)

#### **Management**

- Early ambulation
- Intermittent pneumatic compression devices
- Consider using bariatric bed with frame and trapeze for mobility postoperatively

#### **Pharmacologic thromboprophylaxis**

Begin pharmacologic therapy if:

- One major ACCP risk factor for VTE (See Appendix 2)  
or
- Two minor ACCP risk factors for VTE

Treatment will consist of:

BMI < 50 kg/M<sup>2</sup>

Enoxaparin (Lovenox) 40 mg subcutaneous q 12 hrs, starting 12 hrs post op

BMI > 50 kg/M<sup>2</sup>

Enoxaparin (Lovenox) 60 mg subcutaneous q 12 hrs, starting 12 hrs post op

B. High Risk

(multiple episodes of VTE, or anti-thrombin III deficiency)

Individualize care

Weight-based dosing may be superior to fixed dosing, eg, enoxaparin 0.5 mg/kg every 12 hours

### **Postpartum:**

- breastfeeding should be encouraged
- increased incidence of postpartum depression (40% in class III obesity)
- higher failure rate with oral contraceptives, depot medroxyprogesterone, and Nexplanon
- intrauterine levonorgestrel system most suitable long term contraceptive option
- Continuation of nutrition counseling and exercise program after delivery, and consultation with weight loss specialists before attempting another pregnancy

-Preconception counseling prior to next pregnancy: Obese women should be advised that their fetus is at an increased risk of congenital abnormalities, and appropriate screening should be done.

**Women with prior bariatric surgery:**

-laboratory evaluation of serum folate, B-12, ferritin, calcium, Vitamin D

-additional folate (1 mg/d), and iron (325 mg 2x/day) prn

- if history of “dumping syndrome”, then obtain a fasting blood glucose instead of glucose load testing

-reduced pregnancy risks compared to obese women

\*consider fasting glucose at 24-28 wks (instead of 2 hr OGTT), if first trimester GDM screening is negative

**Appendix 1**

**Exercise recommendations in Obese Pregnant Women**

All women should be encouraged to participate in regular physical exercise during their pregnancy. Joint recommendations by the SOGC and the Canadian Society for Exercise Physiology were published in 2003. (10)

It is recommended that women exercise four times weekly at moderate intensity. The actual effect of these recommendations is hard to measure because of the difficulty of behavioral change assessment; however, the rising obesity rate in the pregnant population and the maternal and neonatal sequelae described above are most disturbing.

Heart rate target zones for previously sedentary obese pregnant women have recently been developed.

**Recommend target heart rate zones in obese women (11):**

Age 20 to 29

102 to 124 beats per minute

Age 30 to 39

101 to 120 beats per minute

## Appendix 1

### American College of Chest Physicians (ACCP) risk factors

#### ACCP, major risk factors

- strict bedrest for  $\geq 1$  week antepartum
- bleeding  $\geq 1000$  mL at cesarean
- previous VTE
- preeclampsia with fetal growth restriction
- antithrombin deficiency
- factor V Leiden (homozygous or heterozygous)
- prothrombin G20210A (homozygous or heterozygous)
- blood transfusion
- infection
- Lupus, heart disease
- Sickle cell disease

#### ACCP, minor risk factors

- BMI  $>30$  kg/m<sup>2</sup>
- multiple gestation
- postpartum hemorrhage  $>1000$  mL
- smoking  $>10$  cigarettes/day
- birth weight  $<25$ th centile
- protein C or S deficiency
- preeclampsia

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