



Pregnancy and Birth in the Patient with High BMI

Anne Biringer
Milena Forte
Family Medicine Forum
Vancouver, November 2, 2019

Bridgeway
Active Healthcare

Circle of Care

Lunenfeld-Tanenbaum
Research Institute

Mount Sinai Hospital
Joseph & Wolf Labovitz Health Complex

1

Faculty/Presenter Disclosure

- Faculty: Anne Biringer and Milena Forte
- Relationships with financial sponsors: Nil
- This program has received in-kind support from:
 - Anne Biringer's directorship in FM maternity care is supported by the Ada and Slight Family Foundation
- Potential for conflict(s) of interest: Nil



2

Isobel Franklin

- 29 year G0P0
- Long standing patient of yours
- Periodic health exam and remove IUD
- Generally healthy but has always struggled with her weight
 - Some successes but always regains
- BP 120/75
- BMI 36
- Has been amenorrheic since had Mirena inserted - previously slightly irregular
- Very excited to be planning family - but anxious - knows that her weight confers some risk



3

The Stigma of Obesity

- Providers may be biased
- Shaming, stigma and bias have been linked to poorer health outcomes
- "Fat shaming" — discrimination, poor service, harassment and negative attitudes toward people with larger bodies
 - Linked to higher rates of metabolic syndrome and high triglycerides



4

Definitions

Weight bias Refers to negative attitudes towards others because of their weight

Weight stigma Refers to stereotypes and labels we assign to people who have obesity

Weight discrimination Refers to actions against people who have obesity that can cause social exclusion and inequities



5

Overcoming Stigma

- Creating weight-inclusive welcoming atmospheres.
 - Focuses on well-being rather than weight loss
 - Emphasizes healthy behaviors
- Empathy, respect, and humanity will foster better healthcare.



6

Make the office a welcoming space



7

Language Matters – Use people first language

If a person is “an **obese person**”, they are held responsible for that.

Their person is indistinguishable from their disease.

“**A person with obesity**” separates the **person** from their **disease**.

“**Overweight**” vs “**obese**” or “**fat**” in patient’s perception



8

Risks of High BMI in Pregnancy and Birth

For the mother

- OSA
- GDM
- PET
- Dysfunctional labour
- Shoulder dystocia
- Higher CS rate (more comps)
- Anaesthesia difficulties (epidural, intubation)
- VTE
- PPH
- Wound infection
- Lower breast feeding rates
- Maternal death

For the baby

- Miscarriage
- Congenital anomalies
- Macrosomia
- SGA
- Stillbirth
- Neonatal death
- Childhood and adolescent obesity



9

Discussing Risk

- Give the **actual numerical risk** of a complication

"Your risk of gestational diabetes is around 10-15%" vs

"You are 3-5x more likely to get gestational diabetes than a woman with N BMI"

- Use **positive framing** as well as negative

"You have 85-90% chance of NOT having gestation DM"

You have the power to reduce your risk.



10

Definition of Obesity in Pregnancy

- WHO defines obesity in pregnancy as BMI >30
 - Maternal weight and height pre-pregnancy (or first visit if not known)
- Prevalence
 - Range from 10-50% (including overweight?)
 - ↑ across all populations
- **At least 1 in 10 women** identified with obesity as risk factor in pregnancy



11

Isobel Franklin

- What would you recommend in your preconception discussion?
- Are there any concerns about fertility with her BMI?



12

Preconception

- Identification of obesity prior to conception
 - **Role for family doctor!**
- Encouragement and support of sustainable lifestyle changes
 - Combination of diet and physical activity
- **Weight loss prior to pregnancy most effective** intervention
 - Improves medical comorbidities
- Solution requires **community empowerment** – create demand for obesity prevention policies and better access to good food for women of childbearing age.



13

Preconception Weight Loss

- Medical interventions
 - Orlistat or Liraglutide
- Surgical interventions
 - Bariatric surgery – ↓ risk of PET, LGA baby
 - ↑ risk IUGR
 - Time to conception
 - Evaluate need for vitamin supplementation – malabsorption
 - B12, folate, iron, vitamin D, calcium



14

Preconception

- Screen for comorbidities
- Sleep study for OSA?
 - Compliance with CPAP if already diagnosed



15

Preconception

- Folic acid supplementation
 - 2X ↑ NTD
 - Need more than 0.4mg/day?
 - RANZOG and RCOG recommend 5 mg for women with obesity
 - SOGC and ACOG do not as unclear whether higher dosage reduces risk ("merits further consideration")



16

Conception

- High BMI associated with menstrual irregularities and anovulation
- Even with regular cycle, lower probability spont conception
 - Relative hyperandrogenism
 - Hyperinsulinemia and insulin resistance
 - ↑ in Leptin (secreted by adiposites) - inhibits folliculogenesis
- Weight loss
 - ↑ chance of spont conception and ART success – **but delaying fertility treatment likely not warranted**
- Bariatric surgery
 - Bypass (not banding) may improve ovulation and fertility
 - Counseled to avoid conception in first 24 months post op (severe weight loss period)



17

Artificial Reproductive Technologies

- Live pregnancy rate ↓ with ↑ BMI
- 31% with normal BMI to 21% with BMI>50
- Multifactorial



18

Isobel Franklin – 6 months later

- She presents with 6 weeks amenorrhea and positive home pregnancy test
- She and her partner are ecstatic
- You provide your usual screening and counseling for a first prenatal visit.
 - How do you determine and discuss her ideal gestational weight gain?
 - Are there any other recommendations specific to her BMI?



19

Prenatal Considerations for Women with High BMI



20

No. 391, November 2019 (Replaces No. 239, February 2010)

Guideline No. 391-Pregnancy and Maternal Obesity Part 1: Pre-conception and Prenatal Care

This Clinical Practice Guideline has been prepared by the authors and reviewed by the Society of Obstetricians and Gynaecologists of Canada (SOGC), Maternal-Fetal Medicine Committee*, Family Physician Advisory Committee, and Subspecialty Management and Oversight Committee, and approved by the Board of the SOGC. Parts 1 and 2 of this Clinical Practice Guideline represent the original version (R229) that was published in February 2010.

Note: Team Planning for Delivery and Postpartum Care is covered in Part 2.

Cynthia Maxwell, MD, Toronto, ON
Leland Sessler, MD, Ottawa, ON
Gabrielle Casson, MD, Beaufortville, QC
Christine Skusek, MD, Vancouver, BC
N. Lynne McLeod, MD, Halifax, NS
Christie Foster Jarvis, MD, Montreal, QC
Mark Walker, MD, Ottawa, ON

Maternal-Fetal Medicine Committee: Huiyao Bao, MD, Victoria, BC (co-chair); Richard Brown, MD, Beaufortville, QC; Sheryl Chou, MD, London, ON; Hans-John MD, Edmonton, AB; Lisa Kwiatkowski, PhD, Victoria, BC; Heather Markes, BSc, Edmonton, AB; N. Lynne McLeod, MD, Halifax, NS; William Murdoch, MD, Windsor, ON; Jonathan Pridgen Hines, MD, Toronto, ON; Frank Sanderson, MD, Saint John, NB; Jennifer French, MD, Calgary, AB

Disclosure statements have been received from all authors.

Key Words: Pregnancy, maternal obesity, labour and delivery, vaginal birth, Caesarean birth, vacuum distraction, venous thromboembolism, maternal mortality, foetal/maternal morbidity, fetal ultrasound, weight loss surgery, gestational weight gain, diet/fit, vaginal birth after Caesarean

Corresponding author: Dr. Cynthia Maxwell

CHANGES IN PRACTICE

1. Update terminology.
2. Increased surveillance following bariatric surgery.
3. Delivery by birth.

KEY MESSAGES

1. Pregnancy care requires maternal medical assessment.
2. Team planning enhances care and reduces risks for patients and caregivers.
3. Increased surveillance is needed for weight loss obstetrics.

J Obstet Gynaecol Can 2019;41(11):1623-1640
https://doi.org/10.1016/j.jogc.2019.03.006
© 2019 The Society of Obstetricians and Gynaecologists of Canada / Société des obstétriciens et gynécologues du Canada. Published by Elsevier Inc.

21

Recommended Gestational Weight Gain (IOM)

	BMI (kg/m ²)	Suggested weight gain (kg)	Suggested rate of weight gain in T2 and T3 (kg)
Underweight	<18.5	12.5-18	0.5
Normal weight	18.5-24.9	11.5-16	0.4
Overweight	25-29.9	7-11.5	0.3
Obese class I	30-34.9	5-9	0.2
Obese class II	35-39.9	5-9	0.2
Obese class III	>40	5-9	0.2



22

Gestational Weight Gain (GWG)

- Weight gain affects **maternal outcomes**
 - If excessive, ↑ in Pre-eclampsia, CS, GDM
- Weight gain affects **fetal outcomes**
 - Excess GWG associated with LGA fetus
 - Inadequate GWG associated with SGA fetus in all BMI categories



23

Gestational Weight Gain – Our role

- Counsel as to appropriate GWG
- Advise re behaviours that may interfere
 - Eating in front of a screen
 - “Eating for 2” – i.e. planning to gain too much
 - Believing that GWG is out of their control



24

GWG – What helps?

- Deliberately planning meals and snacks
- ↓ sedentary behavior
- Self-weighing
- Adequate sleep
- Supervised physical activity

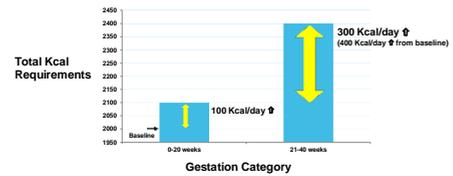
- Setting a **clear goal** for GWG



25

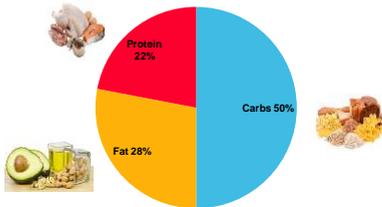
Nutrition: Caloric needs

- +100 Kcal/d in the first half of pregnancy (2100 Kcal/d)
- +300 Kcal/d after 20 weeks (2400 Kcal/d)



26

Macronutrient Breakdown:



27



28

Nutrients and Supplements

- **Folic acid** (0.4- 5mg)
- **Vit D** 400 IU/d during pregnancy and breastfeeding
- ? Ca, Fe
- Probiotics – insufficient evidence
- Omega 3 FA – insufficient evidence



29

Impact of Physical Activity on High BMI



30

2019 Canadian guideline for physical activity throughout pregnancy

2019 CANADIAN GUIDELINE FOR PHYSICAL ACTIVITY THROUGHOUT PREGNANCY

NO. 367-2019 CANADIAN GUIDELINE FOR PHYSICAL ACTIVITY THROUGHOUT PREGNANCY

KEY MESSAGES

1. Physical activity is safe and beneficial for most pregnant women.
2. Physical activity is recommended for all pregnant women, unless contraindicated.
3. Physical activity is recommended for all pregnant women, unless contraindicated.
4. Physical activity is recommended for all pregnant women, unless contraindicated.
5. Physical activity is recommended for all pregnant women, unless contraindicated.

CONTRAINDICATIONS

Physical activity is contraindicated in pregnant women with the following conditions:

- Placenta previa or low-lying placenta
- Preterm labor or history of preterm labor
- Cervical insufficiency
- Vaginal bleeding
- Multiple gestation
- Hypertension
- Heart disease
- Diabetes
- Asthma
- Seizures
- Blood clotting disorders
- Anemia
- Infection
- Uncontrolled chronic conditions



31

Exercise Decreases the Risk of:

- Excessive gestational wt gain (32% RRR, 95% CI 0.57-0.80)
- Gest HTN (39% RRR 95% CI 0.43 - 0.85)
- Preeclampsia (41% RRR 95% CI 0.37-0.9)
- GDM (38% RRR, 95% CI 0.52 - 0.75)
- LGA babies (39% RRR 95% CI)
- Urinary incontinence (50% RRR, 95% CI 0.37 - 0.68)
- Depression (depressive Sx) (67% RRR 95% CI 0.21-0.53)
- Lumbopelvic pain severity (SMD -1.03, 95% CI -1.58, -0.48)
- *Instrumental delivery (24% RRR, 95% CI 0.63-0.92)



32

BOGC CLINICAL PRACTICE GUIDELINE

Table 2. Maternal risks associated with obesity as compared with normal weight

	Odds ratio/adjusted odds ratio compared to women with normal weight BMI <25 kg/m ²		
	Overweight BMI 25–29.9 kg/m ²	Obese I-II BMI 30–39.9 kg/m ²	Obese III BMI ≥40 kg/m ²
Gestational diabetes	1.85–4.25 ^{***}	2.80–6.25 ^{***}	7.44 ^{***}
Hypertension	1.79–2.15 ^{***}	2.65–6.24 ^{***}	4.85 ^{***}
Preeclampsia	1.44 [*]	2.14–3.81 ^{***}	4.82 ^{***}
Placental abruption	1.44–1.91 ^{**}		
Venous thromboembolism in pregnancy	1.80 ^{**}	0.30 [†]	
Spontaneous miscarriage	1.62 ^{†,11}	1.20 [†]	
Recurrent miscarriage		3.30 [†]	
Haemorrhage/bleeds >500 ml	1.16 [†]	1.39–1.92 ^{†,14}	
Gest. tract infection	1.24 [†]	1.30 [†]	
Urinary tract infection	1.17 [†]	1.39–1.92 ^{†,14}	
Wound infection	1.22 [†]	2.24 [†]	
Induction of labour	1.27 [†]	1.60–1.70 ^{†,11}	
Failure to progress in labour		2.80 [†]	
Cesarean birth	1.60 [†]	1.69–2.02 ^{†,11}	2.54 [†]
Emergency Cesarean birth	1.30–1.62 [†]	2.02 [†]	2.54 [†]
		1.81 [†]	
		2.02 [†]	
Instrumental delivery		1.83–2.02 ^{†,11}	1.34 [†]
		1.18 [†]	
Failed instrumental delivery		1.67 [†]	
		1.75 [†]	
Breastfeeding issues	0.86 [†]	0.58 [†]	



Table 3. Neonatal risks associated with maternal obesity

	Odds ratio/adjusted odds ratio (95% confidence interval)		
	Overweight BMI 25–29.9 kg/m ²	Obese BMI 30–49.9 kg/m ²	Obese BMI ≥40 kg/m ²
Stillbirth	1.40–3.10 ^{***}	2.79 [†]	
Shoulder dystocia	2.14–3.10 ^{***}	3.14 [†]	
Macrosomia/operation	1.64–2.67 ^{***}	2.80 [†]	
Fetal distress	1.61–2.12 ^{***}	2.52 [†]	
Large for gestational age/macrosomia	1.20 [†]	1.37–2.20 ^{***}	2.66–3.41 ^{***}
	1.57 [†]	2.20 [†]	
	1.69 [†]	2.57 [†]	
		2.30 [†]	
		3.61 [†]	
		3.10 [†]	
		2.15–3.04 ^{***}	
Major congenital anomalies/both sides	1.59 [†]	1.12–1.58 ^{†,14}	1.37–3.41 ^{***}
Neonatal tube defects	1.20 [†]		
Spina/birth		1.80–2.80 ^{***}	
Congenital cardiac anomalies	1.05–1.12 ^{†,14}	1.15–1.30 ^{†,14,16}	1.44 [†]
Neurologic system defects	1.13 [†]	1.44–1.86 [†]	1.84 [†]
Chromosomes		3.30 [†]	
Anomorphology		1.39 [†]	
Clit. pudor.		1.20 [†]	
Labia born birth (<41 weeks)		1.40 [†]	
Postern birth		1.50 [†]	2.13 [†]
NICU admission		1.20–1.30 ^{†,14}	2.77 [†]
Hypoglycemia		2.87 [†]	7.14 [†]
Jaundice		2.87 [†]	2.13 [†]
Low Apgar scores	1.16 [†]	1.40 [†]	
Glucose lab.		1.50 [†]	
Neonatal trauma		1.50 [†]	



Conclusion:

Exercise reduces the risk of many complications that women with high BMI and their babies are already at risk for



In **previously sedentary** women, exercise has an even **bigger effect** on reduction of GDM, Gest HTN, macrosomia, Depression and risk of C/S



Exercise is *Not* Ass with:

- M/C (T2)
- Stillbirth or neonatal death
- PTB or PROM/ PPROM
- LBW
- Neonatal hypoglycemia
- Induction of labour
- Birth defects
- Birth complications



37

Not engaging in physical activity **↑** the **odds of pregnancy complications:**
GDM, HTN disorders, excessive weight gain, and severity of depression



38

Summary of Recommendations:

Aerobic Activity

- 150 mins/wk
- Accumulated over a min of 3d/wk
- 30-60mins most days/wk
- Minimum of 15m at a time
- Moderate intensity



Strong recommendation, moderate quality evidence



39

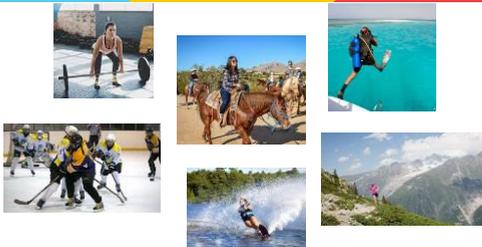
Absolute Contra-indications

- PTL/ROM
- PIH/ Hypertensive disorders of pregnancy
- Unexplained persistent vaginal bleeding
- Incompetent Cervix
- IUGR
- Placenta previa after 28 weeks
- Higher order multiples
- Uncontrolled DM/ HTN / thyroid disease
- Severe illness



40

***Caveats**



41

Summary

- Exercise reduces the risk of excessive gestational weight gain
- Exercise reduces the risk of complications that women with high BMI are already at risk for
-Especially in prev inactive/ sedentary women (not related to weight loss)



42

What about ASA?



43

Prenatal Recommendations

Table 8. Clinical risk assessment for preeclampsia and recommendations for prophylactic acetylsalicylic acid (ASA)

Risk level	Risk factors	Recommendation
High	<ul style="list-style-type: none"> • History of preeclampsia, especially when accompanied by an adverse outcome • Multifetal gestation • Chronic hypertension • Type 1 or 2 diabetes • Renal disease • Autoimmune disease (e.g., systemic lupus erythematosus, antiphospholipid syndrome) 	Recommend low-dose aspirin if the patient has 2 or more high-risk factors.
Moderate	<ul style="list-style-type: none"> • Nulliparity • Obesity (BMI >30 kg/m²) • Family history of preeclampsia (mother or sister) • Sociodemographic characteristics (e.g., African-American race, low socioeconomic status) • Age >35 years • Perinatal history factors (e.g., low birth weight or small for gestational age, previous adverse pregnancy outcome, >10-year pregnancy interval) 	Consider low-dose aspirin if the patient has more than 2 risk factors.
Low	BMI <30 kg/m ² , no other risk factors	Do not recommend low-dose aspirin.



44

What about ASA?

consider **162mg/d** <16wks

Q HS



45

Fetal Surveillance Considerations: T1

- US imaging less accurate
- Establishing Gestational Age
- Prenatal genetic screening (FTS vs NIPT), ?AFP
- Hand-held doppler for FHR
(may not be audible until 16-20wks)



46

Fetal Surveillance Considerations: T2

- **Anatomic US** :
- 20-24 weeks (vs 18-20) +/- one 13-16 weeks as an adjunct given higher risk of anomalies
- **GDM**: screening earlier and repeat 24-28 weeks if neg
- **SFH** not recommended for growth assessment



47

Imaging Recommendations

US indication	GA (wks)
Dating	7-11
NT	11-13+
Adjunct early anatomy	13-16
Anatomy	20-24
Fetal growth & well-being	28
	32
	36
	37, 38... - delivery



48

Isobel Franklin – 37 weeks

- Presents with ↓ FM
- Weight gain has been optimal
- No GDM, no HTN
- Fetal growth by US on 80%ile

What is your management ?



49

Fetal Surveillance Considerations: T3

↓ fetal movement- take note!



50

Guideline No. 392-Pregnancy and Maternal Obesity Part 2: Team Planning for Delivery and Postpartum Care

This Clinical Practice Guideline has been prepared by the authors and reviewed by the Society of Obstetricians and Gynaecologists of Canada (SOCO) Maternal-Fetal Medicine Committee, Family Physician Advisory Committee, and Quality Management and Oversight Committee, and approved by the Board of the SOGC. Parts 1 and 2 of this Clinical Practice Guideline supersede the original version (03/01) that was published in February 2013.

Topic: Preconception and Prenatal Care are covered in Part 1.

Authors:
Cynthia Maxwell, MD, Toronto, ON
Loren Gosselin, MD, Ottawa, ON
Gabrielle Casati, MD, Beaconsfield, QC
Christina Neukirch, MD, Vancouver, BC
Al Lynne McLeod, MD, Halifax, NS
Christie Emile Jacob, MD, Montreal, QC
Mark Walker, MD, Ottawa, ON

Maternal-Fetal Medicine Coauthor: Hayley Ross, MD, Victoria, BC (Coauthor: Michael Brown, MD, Beaconsfield, QC)

J Obstet Gynaecol Can 2019;41(11):1680-1676
https://doi.org/10.1016/j.jogc.2019.03.007
© 2019 The Society of Obstetricians and Gynaecologists of Canada. Published by Société des obstétriciens et gynécologues du Canada. Published by

No. 392, November 2019 (Replaces No. 259, February 2010)

Panel of Experts: MD, London, ON; Yana-Jane MD, Edmonton, AB; Lisa Franklin, RN, Victoria, BC; Heather Martin, RM, Edmonton, AB; Al Lynne McLeod, MD, Halifax, NS; Willem Marcell, MD, Windsor, ON (Coauthor: Kristen Miles, MD, Toronto, ON; Fiane Sanderson, MD, Saint John, NB; Jennifer Heise, MD, Calgary, AB). Disclosure statements have been received from all authors and no conflicts of interest were declared.

Key Words: Pregnancy, maternal obesity, labour and delivery, adiposity, Cesarean birth, neonatal morbidity, neonatal respiratory, maternal morbidity, fetal/maternal mortality, fetal distress, weight loss surgery, gestational weight gain, sGPT®, vaginal birth after Cesarean.

Corresponding author: Dr. Cynthia Maxwell

CHANGES IN PRACTICE

1. Asymptomatic
2. Increased surveillance following bariatric surgery
3. Delivery by term

KEY MESSAGES

1. Pregnancy care requires maternal medical assessment
2. Team planning enhances care and reduces risks for patients and caregivers
3. Increased assessment is needed for weight loss in obstetrics

Labour Management: Induction

- Consider IOL at 39-40 wks for women with BMI ≥ 40 due to ↑ risk of stillbirth (SOGC)
 - Cohort studies suggest elective induction at term may decrease CS rates, macrosomia and neonatal morbidity.
 - ACOG and RCOG do not recommend IOL based on obesity alone
- ↑ obesity ↑ risk of failed induction



52

51

Labour Management

- Anticipate longer latent and first stages of labour – **PATIENCE!**
- Oxytocin – higher dose protocol evidence
- Monitoring labour
 - CEFM if BMI >35
 - Consider FSE
 - Consider IUPC



Sinai Health System

53

Labour Management: Shoulder dystocia and birth trauma

- Anticipate and prepare for shoulder dystocia and PPH
 - RR of shoulder dystocia ↑ with BMI (2.7 with class III obesity)
- Role for planned CS?
 - EFW >4500g in Diabetics
 - EFW>5000g in non Diabetics



Sinai Health System

54

Labour Management

- **Anaesthesia**
 - Early consultation
 - ?Ultrasound guided epidural placement
 - ?Early insertion of epidural
 - ?Higher placement – higher risk of CS
- **TOLAC**
 - Less likely to be successful
- **CS**

Sinai Health System

55

Isobel Franklin – 4 hours postpartum

- Induced labour at 39+4 weeks – foley catheter followed by ARM and oxytocin
- SVD 8lb12oz baby girl who is doing well
- What considerations would you include in Isobel's postpartum care?

Sinai Health System

56

Postpartum

- Skin to skin with baby
- Support lactation – LC consult for positioning
- Encourage early ambulation
- VTE prophylaxis
 - Individualized assessment
 - Consider pneumatic compression devices and thromboprophylaxis
- Screen for PPD and anxiety (higher risk)
- Appropriate metabolic FU (for GDM, HTN etc)
- Contraception



57

Pregnancy and Birth in the Patient with High BMI: Conclusions

- Manage our own biases and combat weight stigma
- Our opportunity is pre-pregnancy!
- Folate supplementation is critical
- Consider ASA
- Discuss both benefits of exercise and risks of inactivity
- ↑ imaging for growth and fetal wellbeing
- Consider induction by term
- Special considerations in labour and PP
- Attention to breastfeeding and perinatal mental health



58

Questions?



59