Northwestern Medicine®

Challenges Created by Severe Obesity

Michelle A. Kominiarek, MD MS

Professor, Department of Obstetrics and Gynecology
Northwestern University Feinberg School of Medicine
Maternal Fetal Medicine

September 5, 2025

I have no conflicts of interest to disclose.

Learning Objectives

- Review peripartum risks and interventions in people with a BMI ≥ 40
- Review gestational weight gain less than NAM 2009 guidelines in people with a BMI ≥ 40
- Describe trends in metabolic and bariatric surgery and gestational weight gain outcomes in subsequent pregnancies
- Describe periconception use of GLP-1 agonists

Peripartum Interventions for People with Obesity

Recognizing challenges and providing a safe delivery

Problem	Intervention
↑ Respiratory work and O_2 requirements	Epidural, O_2, left lateral position
Difficult IV access	Central line
Inaccurate BP	Appropriate size BP cuff, A-line
Difficult patient transfer	Bariatric lifts, inflatable mattresses, additional personnel
Shoulder dystocia	EFW near term, caution with operative delivery
Difficult intubation	Anesthesia consult, early epidural
Aspiration	H_2 antagonist, Na citrate w/ citric acid, metoclopramide, NPO in labor

Gunatilake RP, Perlow JH. Obesity and pregnancy: clinical management of the obese gravida. Am J Obstet Gynecol. 2011; 106-119

Peripartum Interventions for People with Obesity

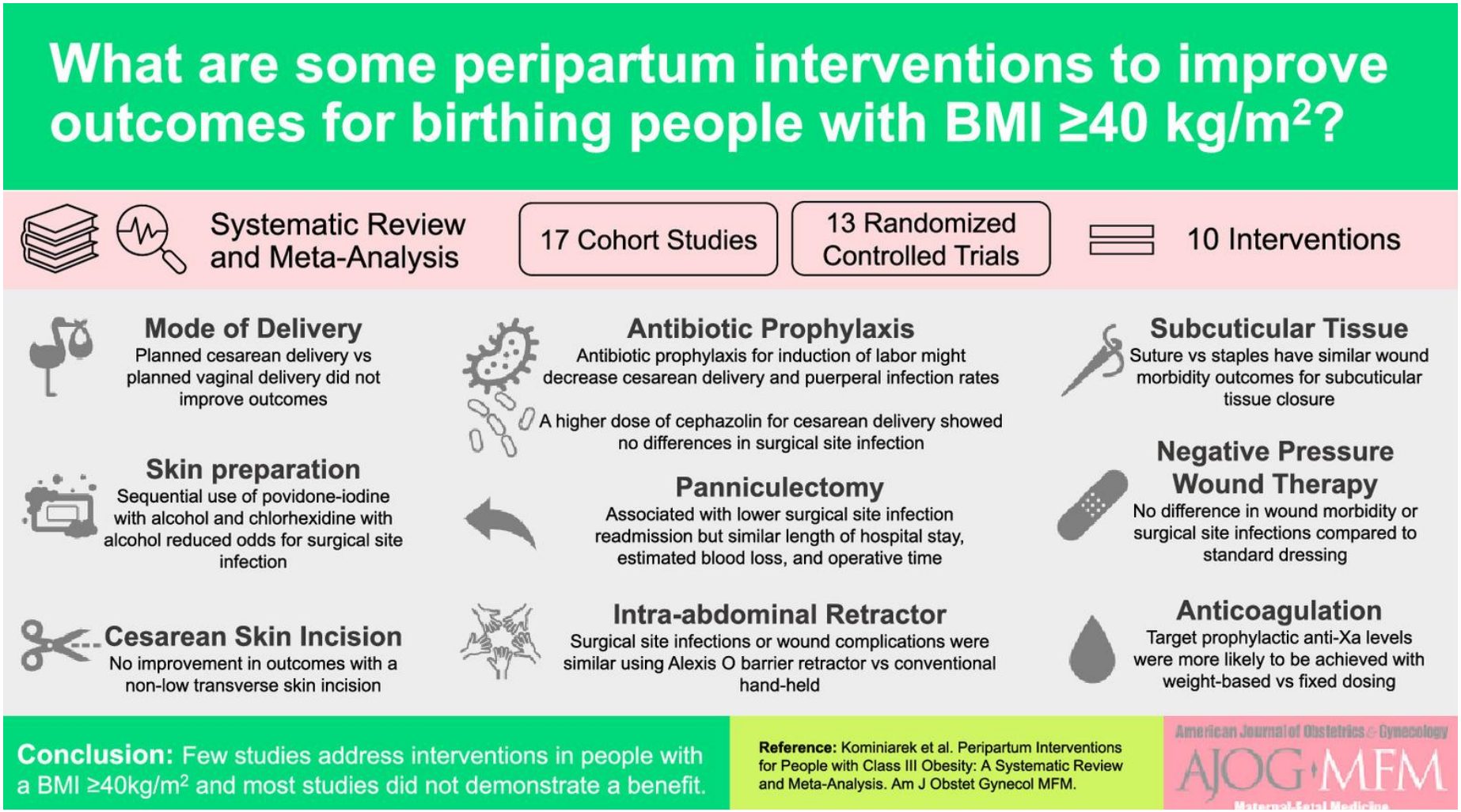
Recognizing challenges and providing a safe delivery

Problem	Intervention
Cesarean delivery	Informed consent, monitor labor curve
Infection	Skin prep, antimicrobial prophylaxis
Prolonged CD time	Combined spinal-epidural
Poor operative exposure	Panniculus retraction, self-retaining retractor
Hemorrhage	Blood products available, ligate subcutaneous vessels, meticulous technique
Clotting	Early ambulation, SCDs, anticoagulation until ambulatory

Gunatilake RP, Perlow JH. Obesity and pregnancy: clinical management of the obese gravida. Am J Obstet Gynecol. 2011; 106-119

Peripartum Interventions for People with a BMI ≥ 40

Systematic Review and Meta-Analysis



Northwestern Medicine®

Safe Delivery for People with a BMI ≥ 40

Also, for the providers and hospital system

Providers and staff

- May not have adequate training
  - "…all takes more time and thoughtfulness…"
- May have biases
- May have difficulty titrating oxytocin and monitoring fetal heart rate

Clinic or Hospital Systems

- May not have appropriate resources or equipment
  - Transfer mats
  - Surgical instruments
  - Bed weight capacity
- May need to adjust staff levels
- May need to transfer patient late in pregnancy or in labor

Northwestern Medicine®

Kominiarek MA. Lyleroehr MJ, Torres J. A qualitative exploration of the challenges providers experience during peripartum management of patients with a body mass index ≥ 50 kg/m^2 and recommendations for improvement. PloS one. 2024:19:p.e0303497.

Is 20 pounds too much?

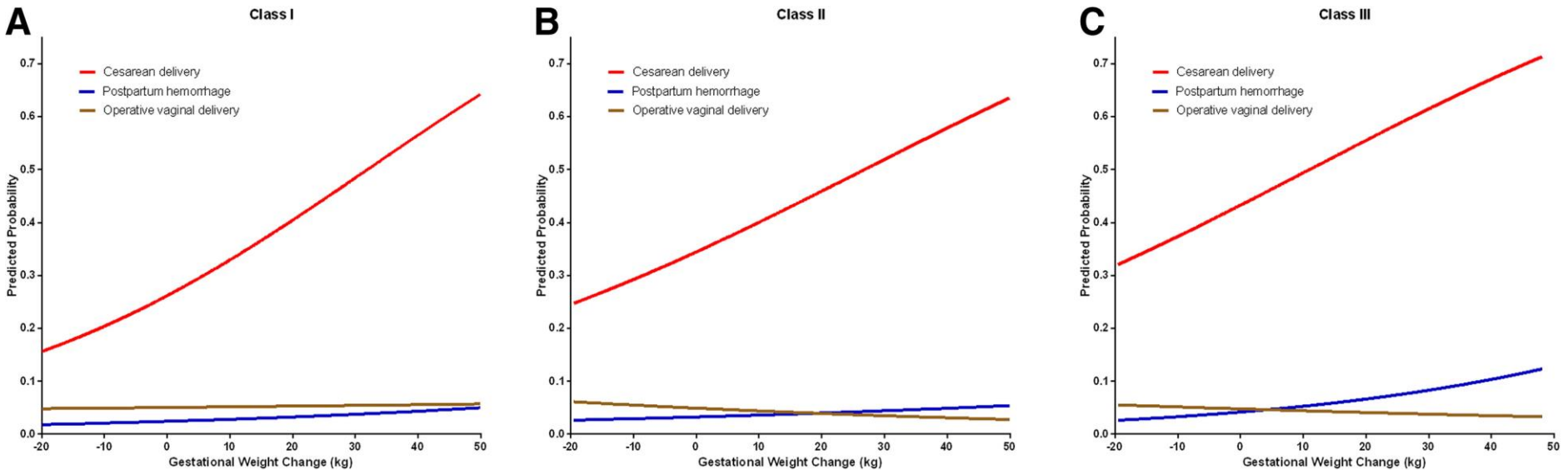
We now have more evidence to review.

- Gain *less* than guidelines
  - Bianco 1998
  - Bayerlein 2009
  - Blomberg 2011
  - Cedergan 2006
  - Zilko 2010
  - Kominiarek 2013
  - Kiel 2007
  - Flick 2010
  - Petersen 2023
- *Lose weight*
  - Kiel 2007
  - Flick 2010
  - Lifecycle Project 2019
  - Oken 2009
  - Blomberg 2011
  - Johansson 2024
  - Bayerlein 2009
  - Bodnar 2016

- *One recommendation*:
  - Maintain weight during pregnancy for class I/II obesity
  - A small amount of weight loss may improve outcomes in class III obesity

Consortium on Safe Labor

What About Weight Loss?

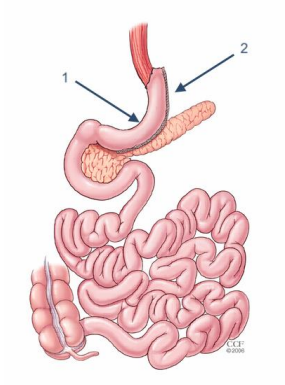


Northwestern Medicine®

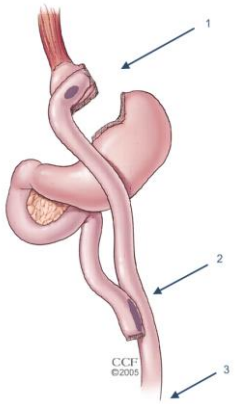
Kominiarek MA, Seligman N, Dolan C, Gao W, Berghella V, Hoffman M, Hibbard J. Gestational weight gain and obesity: Is 20 pounds too much? Am J Obstet Gynecol. 2013;209: 214.e1-214.e11.

Pregnancy after Metabolic and Bariatric Surgery

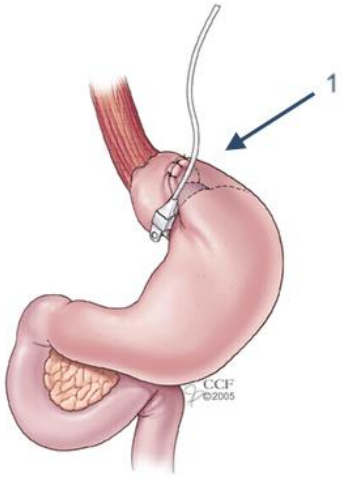
- Fertility improves!
  - Decreased menstrual irregularities
  - Improved hirsutism
  - Decreased PCOS
- Recommendation to wait up to 2 years prior to conception
  - Allow for weight loss plateau



Sleeve gastrectomy



Roux-en-Y gastric bypass

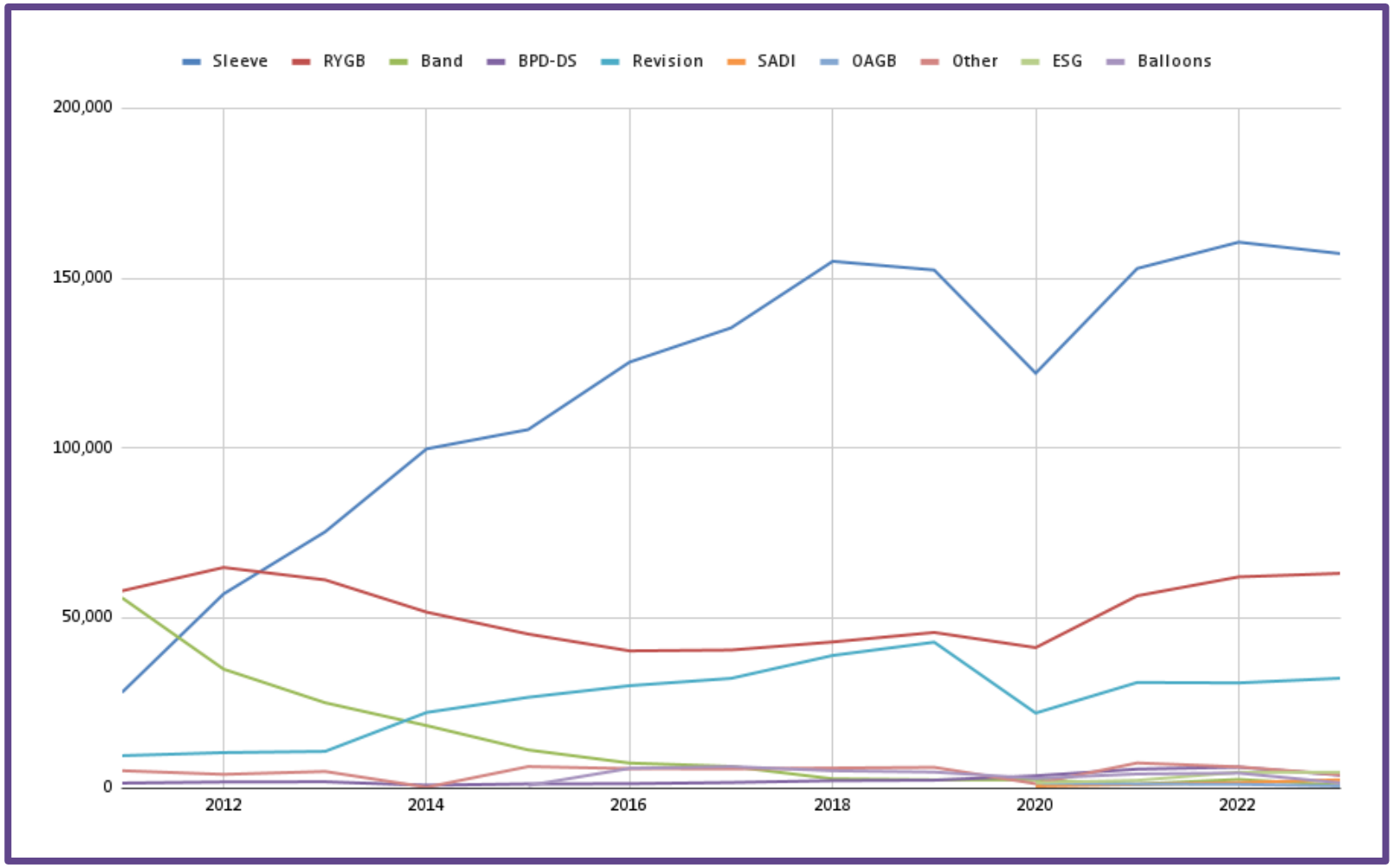


Adjustable gastric banding

Northwestern Medicine®

American Society for Metabolic and Bariatric Surgery position statement on the impact of obesity and obesity treatment on fertility and fertility therapy 2017; American College of Obstetricians and Gynecologists Practice Bulletin #105 Bariatric Surgery and Pregnancy

Estimate of Bariatric Surgery Numbers, 2011-2023



Northwestern Medicine®

https://asmbs.org/resources/estimate-of-bariatric-surgery-numbers

Summary and Translation for Our Practices

- Obesity prevalence
  - Increasing among adults
  - Increasing severity
  - Increasing among reproductive age persons
    - 26.1% in 2016 to 29.0% in 2019
- Bariatric surgeries
  - Increasing

NCHS Data Brief No. 392 November 2020 Increases in Prepregannncy Obesity: United States, 2016-2019

Summary and Translation for Our Practices

- Obesity prevalence
  - Increasing among adults
  - Increasing severity
  - Increasing among reproductive age persons

+

- Bariatric surgeries
  - Increasing

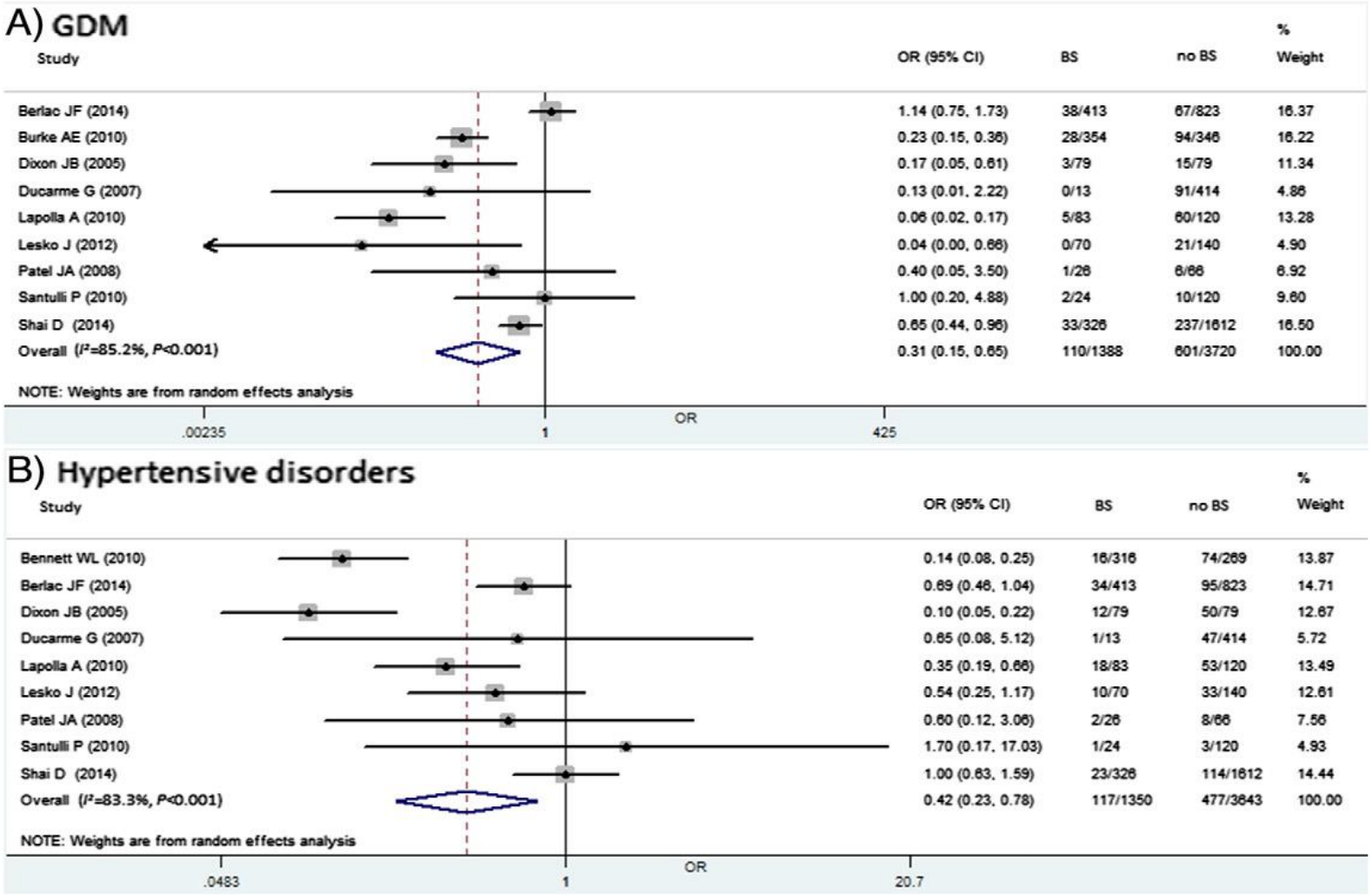
- Increasing number of people with bariatric surgery
  - Preparing for a pregnancy
  - Pregnant

Perinatal Outcomes after Metabolic and Bariatric Surgery

- Small retrospective reviews
- Selection and recall bias from self-reported outcomes
- Types of bariatric surgery not always specified
- Control groups vary

Perinatal Outcomes after Metabolic and Bariatric Surgery

Systematic Reviews and Meta-Analyses



Northwestern Medicine®

Yi X, Li Q, Zhang J, et al. A meta-analysis of maternal and fetal outcomes of pregnancy after bariatric surgery. Int J Gynecol Obstet. 2015;130:3-9.

Perinatal Outcomes after Bariatric Surgery

Kaiser Southern California 2007-2018
N=1886 after BS vs. n=18,327 without BS

Improved

- GDM
- Preeclampsia
- Chorioamnionitis
- Cesarean delivery
- LGA, macrosomia
- NICU admission

Worse

- **SGA**
- PPH

Same

- Abruption
- PROM
- PTD <37 weeks
- Surgical site infection
- Stillbirth
- Apgar <7 at 5 min
- RDS

Getahun D, Fassett MJ, Jacobsen SJ, et al. Perinatal outcomes after bariatric surgery. Am J Obstet Gynecol. 2022;226:121e.1-121e.16

Perinatal Outcomes after Bariatric Surgery

Kaiser Southern California 2007-2018
N=1886 after BS vs. n=18,327 without BS

Improved

- GDM
- Preeclampsia
- Chorioamnionitis
- Cesarean delivery
- LGA, macrosomia
- NICU admission

Worse

- SGA
- PPH

Same

- Abruption
- PROM
- PTD <37 weeks
- Surgical site infection
- Stillbirth
- Apgar <7 at 5 min
- RDS

- Independent of time interval since surgery
  - <1 year, 1-1.5 years, 1.5-2 years, >2 years
- For either Roux-en-Y or vertical sleeve gastrectomy

Getahun D, Fassett MJ, Jacobsen SJ, et al. Perinatal outcomes after bariatric surgery. Am J Obstet Gynecol. 2022;226:121e.1-121e.16

Birth Weight after Metabolic and Bariatric Surgery

Too Small

- ↑↑ SGA*
  - Richards 1987
  - Marceau 2004
  - Patel 2008
  - Santulli 2010
  - Lesko 2012
  - Rottenstreich 2018
  - Akhter 2019
  - Getahun 2022

Northwestern Medicine®

Birth Weight after Metabolic and Bariatric Surgery

Too Small

- ↑↑ SGA
  - Richards 1987
  - Marceau 2004
  - Patel 2008
  - Santulli 2010
  - Lesko 2012
  - Rottenstreich 2018
  - Akhter 2019
  - Getahun 2022

Not Too Big

- ↓↓ LGA
  - Richards 1987
  - Marceau 2004
  - Patel 2008
  - Santulli 2010
  - Ibiebele 2020

- ↓↓ Macrosomia
  - Richards 1988
  - Wittgrove 1998
  - Marceau 2004
  - Dixon 2005
  - Ducarme 2007
  - Weintraub 2007
  - Wax 2008
  - Patel 2008
  - Sheiner 2013

GWG after Metabolic and Bariatric Surgery

A Scoping Review of 13 studies (sample size range 23-670 pregnancies after BS)

- Compared to no surgery
  - Still have obesity
  - Excessive GWG based on 2009 guidelines more common
- Sleeve gastrectomy vs. RYGB
  - Mean GWG similar
- Surgery to conception interval
  - Inadequate GWG based on 2009 guidelines more common with short interval
- Birthweight

Deleus E, Lannoo M, Ceulemans D, et al. Gestational weight gain following metabolic bariatric surgery: A scoping review. Nutrients. 2024;16:2516.

Prenatal Care after Metabolic and Bariatric Surgery

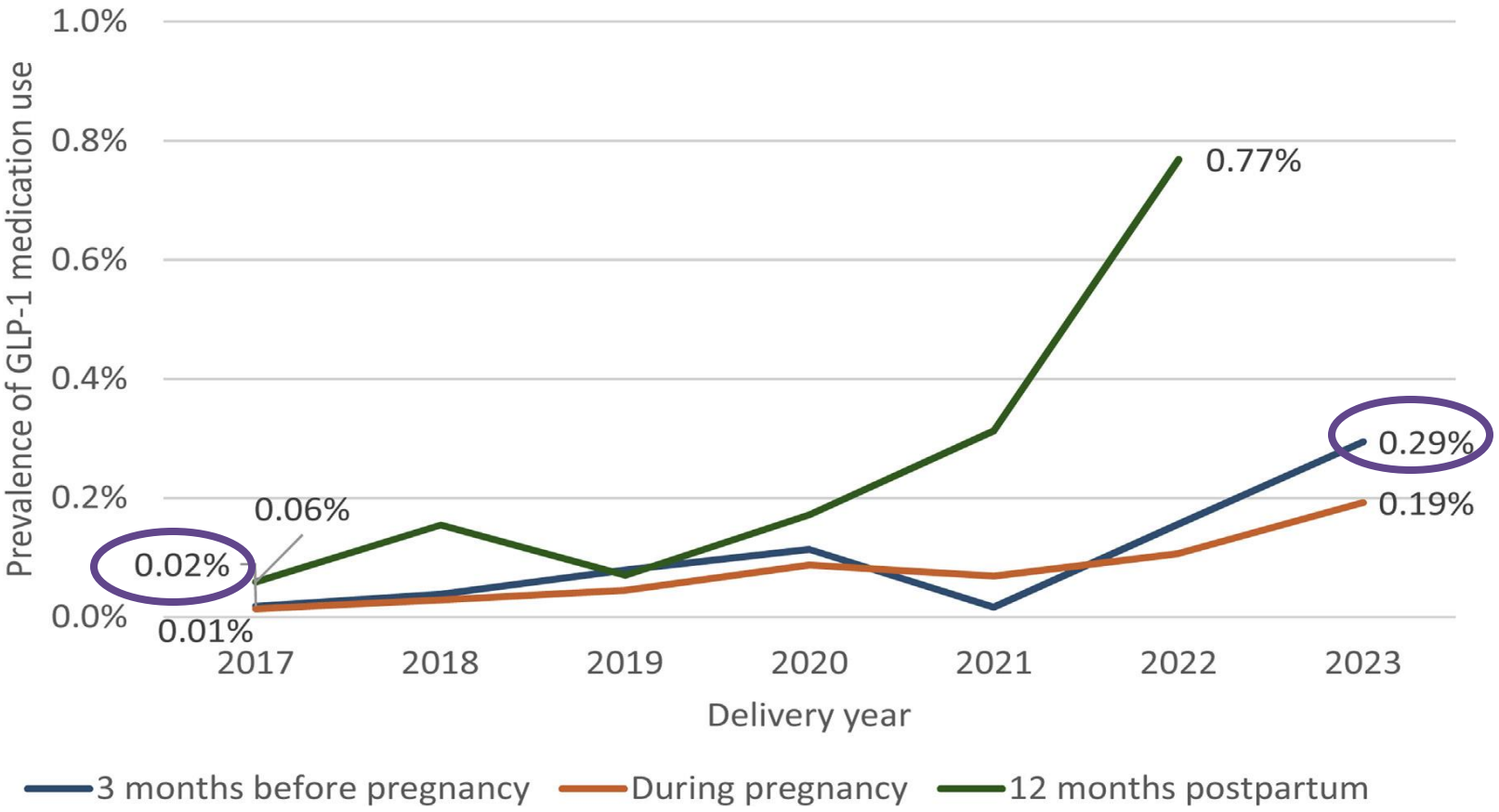
Adaptations required

- Still high prevalence of obesity
- Metabolic changes
  - GDM screening method of questionable use
- Increased risk for SGA
- Close monitoring of weight changes
  - Emotional concerns of weighing and weight gain
  - Still high prevalence of excessive GWG
  - GWG may depend on surgery type and interval until pregnancy

  - Do 2009 GWG guidelines apply?
  - GWG more of a screening measure than a goal?

Any Prescription Filled for GLP-1RA

3 months prior to pregnancy (2017-2023 deliveries)
During pregnancy (2017-2023 deliveries)
First 12 months postpartum (2017-2022 deliveries)



Northwestern Medicine®

Ahrens KA, Lipkind HS, et al.Prevalence of GLP-1 medication exposure prior to, during, and after pregnancy using state-wide data from 2017 to 2023. Am J Obstet Gynecol MFM. 2025;7:101596..

Anti-Obesity Medications and Pregnancy

Glucagon like peptide-1 receptor agonists
GLP-1

- Fertility improves!
- "Ozempic Baby Boom"
- Animal studies: early pregnancy loss, SGA, skeletal anomalies
- GLP-1 agonist exposure periconception (within 90 days of conception until 1st trimester)
  - No increased risk for congenital malformations in people with T2 DM treated with insulin
    - aRR 0.95 (95% CI 0.72-1.26)

https://www.washingtonpost.com/wellness/2024/04/05/ozempic-babies-weight-loss-fertility/

Cesta CE, Rotem R, Bateman BT, et al. Safety of GLP-1 Receptor Agonists and Other Second-Line Antidiabetics in Early Pregnancy. JAMA Intern Med. 2024;184(2):144–152.

Muller DRP Stenvers DJ, Malekczadeh A, et alEffects of GLP-1 agonists and SGLT2 inhinitors during pregnancy and lactation on offspring outcomes: a systematic review of the evidence. Front Endocrinol. 2023;14:1215356.

Case Reports/Series of Pregnancy and GLP-1 Agonists

TABLE 3
Case reports/series of pregnancy and GLP-1RAs[71–75,44,45]

Author (yr)	Drug name	Maternal medical comorbidities	Trimester exposure	Presence of birth defects	Pregnancy complications
Williams et al (2009)	Exenatide	T2DM Morbid obesity Oligomenorrhea	Preconception to end of first trimester	None	None
Greco (2015)	Liraglutide	T2DM PCOS	Preconception to end of first trimester	None	Brief neonatal hypoglycemia
Ivanišević et al (2018)	Liraglutide	T2DM	Preconception to end of pregnancy	None	None
Skov et al (2023)	Semaglutide	PCOS	Preconception to 4 wk gestation	None	- Maternal weight gain of 35 kg - Macrosomia - Shoulder dystocia - Brief neonatal hypoglycemia
Doğan et al (2023)	Exenatide	Obesity PCOS	13–17 wk gestation; preconception to 13 wk gestation	Atrial septal defect; none	None; none
Burlina et al (2023)	Dulaglutide	T2DM	Preconception to 15 wk gestation	None	None

GLP-1RA, glucagon-like peptide-1 receptor agonist; *PCOS*, polycystic ovarian syndrome; *T2DM*, type 2 diabetes mellitus.

Drummond RF, Seif K, Reece A. Glucagon-like peptide-1 receptor agonist use in pregnancy: a review. Am J Obstet Gynecol. 2025; 17-25

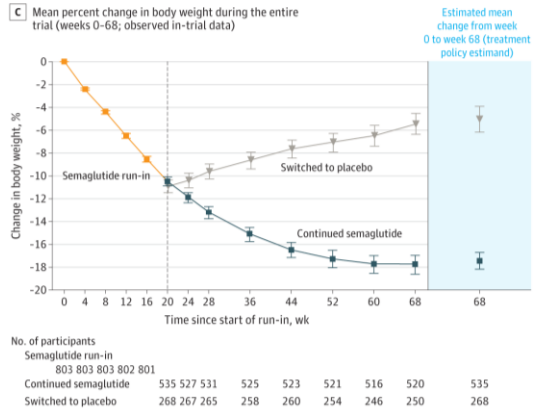
Anti-Obesity Medications and Pregnancy

Pregnancy ≠ Weight Loss

——— USE IN SPECIFIC POPULATIONS ———

Females and Males of Reproductive Potential: Discontinue OZEMPIC® in women at least 2 months before a planned pregnancy due to the long washout period for semaglutide (8.3).

- No data regarding
  - GLP-1 agonist 'withdrawal' in early pregnancy for perinatal outcomes?
  - Subsequent gestational weight gain?
    - Significant weight regain occurs after cessation of GLP-1 agonists



Northwestern Medicine®

Wilding JPH, Batterham RL, Davies M, et al. Weight regain and cardiometabolic effects after withdrawal of semaglutide: The STEP 1 trial extension. Diabetes Obes Metab. 2022; 24:1553-1564.

Summary

Research Gaps

- Evaluate GWG and perinatal outcomes for people with a BMI ≥ 40
  - Should GWG goals differ?
- Evaluate GWG and perinatal outcomes for people after bariatric surgery
  - Should GWG goals differ?
- Evaluate GWG and perinatal outcomes for people exposed to GLP-1 agonists
  - What is their GWG or loss trajectory?
  - What are their perinatal outcomes?