


METABOLIC BARIATRIC SURGERY IN WOMEN'S HEALTH

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DISCLOSURES

Intuitive Foundation Inc fellowship grant 2019-2023
Consultant for Intuitive proctoring services



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OBJECTIVES

- Discuss the rising incidence of obesity
- Why discussing obesity is relevant in women and how to overcome barriers in our current environment
- Describe surgical advancement of metabolic surgery
- Describe evidence-based positive outcomes of metabolic surgery on women and fetal health



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What is obesity and why does it matter to women's health?

Obesity is defined by the World Health Organization (WHO) as abnormal or excessive adipose accumulation that puts health at risk

NE J Epidemiology & Clin. Volume 185, Issue 31, Pages 32-45, First published: 12 January 2023, DOI: 10.1093/ije/dyab018

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Global rise of obesity in women

The prevalence of obesity in women of reproductive age (20 to 39) in the US is 39.7%. Prevalence is found to be lowest among non-Hispanic Asian women (17.2%) and higher in non-Hispanic White (39.8%).

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Social and cultural barriers to obesity care

- Weight bias, stigma, discrimination
- Weight-inclusive language and images
- Cultural considerations and sensitivities

Category	Definition
Weight bias	Negative attitudes toward people with obesity
Weight stigma	Stereotypes and labels used for people with obesity
Weight discrimination	Negative actions taken against people with obesity causing social disadvantage

Weight bias and discrimination is rampant in our schools, workplaces, health systems and media. **The problem is widespread.**

- 63% Elementary school kids with obesity face a 63% higher chance of being bullied
- 64% 64% of adults with obesity report being stigmatized by coworkers
- 64% 64% of adults with obesity report experiencing weight bias from a health care professional
- 72% 72% of images and 77% of videos stigmatized persons with obesity according to recent media studies

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Before we talk to women about obesity let's make a pledge

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WHY BARIATRIC SURGERY: SWEDISH OBESE SUBJECTS STUDY

- Followed around 4,000 obese subjects for ten years, 50 % had surgery; and 50% did not
- The surgery group lost 14-25% body weight over ten years, the other maintained +/- 2%.
- Also resulted in improved lifestyle factors such as being more physically active and lower risk factors for hypertriglyceridemia, DM, and hyperuricemia.

Sjöström L, Lindroos AK, Peltonen M, Torgerson J, Bouhard C, Carlsson B, Dahlgrén S, Larsson B, Narbro K, Sjöström CD, Sullivan M, Wedel H. Swedish Obese Subjects Study Scientific Group. Lifestyle, diabetes, and cardiovascular risk factors 10 years after bariatric surgery. *New Engl J Med.* 2004;351:2683-2693. doi: 10.1056/NEJMoa035222

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Bariatric surgery eligibility and utilization

The prevalence of obesity is similar among adult male and female patients (35.5% and 35.8%, respectively).

Significantly higher proportion of eligible women received bariatric surgery compared to eligible men

A higher proportion of female bariatric surgery patients are younger (less than 45 years old)


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Knowledge gap, provider referral, and patient selection patterns

Knowledge gap and increased perceived risk on behalf of providers and patients pose significant barriers between morbidly obese patients and surgical treatments.

Perceptions of weight loss surgery as carrying increased risk further hinder access across genders



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ASMBS /IFMSO 2022 UPDATED INDICATIONS



Original article
 2022 American Society for Metabolic and Bariatric Surgery (ASMBS) and International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO): Indications for Metabolic and Bariatric Surgery

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MAJOR UPDATES TO 1991 NIH GUIDELINES FOR BARIATRIC SURGERY

- Metabolic and bariatric surgery (MBS) is recommended for individuals with a body mass index (BMI) **35 kg/m²**, regardless of presence, absence, or severity of co-morbidities.
- MBS should be considered for individuals with metabolic disease and BMI of **30-34.9 kg/m²**.
- BMI thresholds should be adjusted in the Asian population such that a BMI 25 kg/m² suggests clinical obesity, and individuals with BMI ≥ 27.5 kg/m² should be offered MBS.
- Long-term results of MBS consistently demonstrate safety and efficacy.
- Appropriately selected children and adolescents should be considered for MBS.



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SURGERY: CLASSIFIED BY FUNCTION

Restrictive:

- Laparoscopic Sleeve Gastrectomy (LSG)
- Laparoscopic Gastric Banding

Restrictive and Malabsorptive:

- Roux en Y gastric bypass
- BPD-DS Biliopancreatic Diversion with Duodenal Switch
- SADI (Single Anastomosis Duodenal ileal bypass)

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SLEEVE GASTRECTOMY

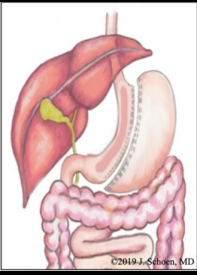
Approximately 70% of the stomach is removed and a staple line is created leaving a much smaller stomach and reducing ghrelin production.


Pros:

1. Less post operative complications (Marginal Ulcers, internal hernia and GU stricture)
2. Shorter operation time
3. Success in same day surgery

Cons:

1. Increased post-op Nausea and vomiting
2. Concern for Barrett's esophagus




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LAPAROSCOPIC ROUX EN Y GASTRIC BYPASS

- lesser curve 15 cc pouch
- complete gastric division
- antecolic or retrocolic Roux limb: 60-150 cm
- 0.8 cm – 2.0 cm gastrojejunostomy



Laparoscopic Roux-en-Y Bypass

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BPD-DS BILIOPANCREATIC DIVERSION WITH DUODENAL SWITCH

FIGURE 4
BILIOPANCREATIC DIVERSION (BPD) (SCORNIANO)

Biliopancreatic Diversion (BPD) with Duodenal Switch

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SADI (SINGLE ANASTOMOSIS DUODENAL ILEAL BYPASS)

- Simplified version of the BPD-DS
- Revisional option for patients who have failed previous bariatric sleeve surgeries

Single Anastomosis Duodenal-Ileal Bypass with sleeve gastrectomy (SADI-S)

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SADI-S


<p>Pros</p> <ul style="list-style-type: none"> ▪ Excellent weight loss results and long-term success ▪ Ideal for poorly controlled Diabetes or dyslipidemia (high cholesterol). SADI and BPD are the most effective treatments for patients with Type II DM on insulin ▪ No Dumping Syndrome ▪ Low risk of marginal ulcers (which can occur with Gastric Bypass) 	<p>Cons</p> <ul style="list-style-type: none"> ▪ Moderate risk of long-term nutritional deficiencies; patients will need special vitamin and nutritional supplements ▪ Frequent blood tests the first 1-2 years ▪ Can have loose and/or more frequent bowel movements, particularly after rich or oily food.
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Weight Loss Comparison

	Adjustable Gastric Band	Sleeve Gastrectomy	Gastric Bypass	Bilopancreatic Diversion (BPD), SADI-S
Time course (time to goal)	2-3 years	1 year	1-2 years	1-2 years
Success Rate	50%	70-80%	80-90%	>90%
Excess Weight Loss	40%	60-70%	70-80%	80-90%

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Does Bariatric Surgery Improve Pregnancy Outcomes?


BACKGROUND AND PURPOSE:

- Bariatric surgery for obesity usually results in long-term weight control and improved health outcomes
 - Data on pregnancy outcomes after bariatric surgery are limited
- Getahun et al. (AJOG, 2021) examined the association between bariatric surgery and adverse perinatal outcomes in pregnant women

METHODS:

- Retrospective cohort study
- Population
 - Women eligible for bariatric surgery: (1) BMI ≥ 40 kg/m² with no comorbidities or (2) a BMI between 35 and 40 kg/m² in the presence of certain obesity-related comorbidities (eg, diabetes mellitus and severe sleep apnea)
 - Delivered ≥ 20 weeks
- Exposures
 - Bariatric surgery
 - All surgeries included
- Primary outcomes
 - Perinatal outcomes

Getahun et al. Perinatal outcomes after Bariatric Surgery. Am J Obstet Gynecol 2022;226:121-41-16.

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RESULTS:

- 20,213 women eligible for surgery
 - Received bariatric surgery: 9.3%
 - Most common surgeries were Roux-en-Y gastric bypass and vertical sleeve gastrectomy
- Bariatric surgery was associated with a reduction in the risks for
 - Gestational diabetes (aOR 0.60; 95% CI, 0.53-0.69); P<.001)
 - Preeclampsia (aOR 0.53 (95% CI, 0.46 to 0.61); P<0.001)
 - Chorioamnionitis (aOR 0.45 (95% CI, 0.32 to 0.63); P<0.001)
 - Cesarean delivery (aOR 0.65 (95% CI, 0.59 to 0.72); P<0.001)
 - Large for gestational age neonate (aOR 0.23 (95% CI, 0.19 to 0.29); P<0.001)
 - Macrosomia (aOR 0.24 (95% CI, 0.19 to 0.30); P<0.001)
 - Neonatal intensive care unit admission (aOR 0.70 (95% CI, 0.61 to 0.81); P<0.001)
- Bariatric surgery was also associated with a significantly increased risk for
 - Small for gestational age (SGA) neonates (aOR 2.46 (95% CI, 2.16 to 2.79); P<0.001)
 - Postpartum hemorrhage (PPH); aOR, 1.79 (95% CI, 1.30 to 2.46); P<.001

CONCLUSION:

- Bariatric surgery was associated with improved pregnancy outcomes such as reduced risk of preeclampsia or cesarean delivery, but risk was increased for SGA neonates

Getahun et al. Perinatal outcomes after Bariatric Surgery. Am J Obstet Gynecol 2022;226:121-41-16.

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Does Bariatric Surgery Decrease Cancer Risk?

BACKGROUND AND PURPOSE:

- In the US, over a third of adults meet the threshold for obesity (BMI ≥ 30 kg/m²)
- Obesity is related to a higher risk for multiple cancers
 - Esophageal adenocarcinoma, postmenopausal (≥ 55 years) breast cancer, cancers of the kidney, colon, rectum, gastric cardia, liver, gallbladder, pancreas, ovary, uterus, thyroid, multiple myeloma and meningioma
- Schauer et al. (Annals of Surgery, 2017) sought to determine whether bariatric surgery is correlated with a lower risk of cancer


METHODS:

- Multisite retrospective observational cohort study of patients undergoing bariatric surgery (2004 – 2014)
- Subjects undergoing surgery were compared to nonsurgical (control) patients that matched by age, sex, study site, body mass index
- Models were used to assess cancer risk up to 10 years post-bariatric surgery

RESULTS:

- 22,198 surgery subjects and 66,427 no surgery subjects participated in the study
- After an average 3.5 year follow-up, 2543 incident cancer were detected
- Patients who had bariatric surgery had a lower risk of cancer development (hazard ratio [HR] 0.67; 95% CI 0.60-0.74, P<0.001)

Bariatric Surgery and the Risk of Cancer in a Large Multisite Cohort
Ann Surg. 2019 Jan;249(1):95-101




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- In women who had bariatric surgery, there were fewer
 - Incident cancers (HR 0.64; 95% CI 0.57 – 0.72, P < 0.001)
 - Obesity-associated cancers (HR 0.58; 95% CI 0.49 – 0.67, P < 0.001)
 - Not Obesity-associate cancers (HR 0.74; 95% CI 0.62 – 0.89, P = 0.001)
- Bariatric patients had a lower risk for the following obesity-associated cancers
 - Postmenopausal breast cancer (HR 0.58; 95% CI 0.44 – 0.77, P < 0.001)
 - Colon cancer (HR 0.59; 95% CI 0.36 – 0.97, P = 0.04)
 - Endometrial cancer (HR 0.50; 95% CI 0.37 – 0.67, P < 0.001)
 - Pancreatic cancer (HR 0.46; 95% CI 0.22 – 0.97, P = 0.04)

CONCLUSION:

- Bariatric surgery was associated with a lower risk of cancer, especially obesity-related cancers

Bariatric Surgery and the Risk of Cancer in a Large Multisite Cohort
Ann Surg. 2019 Jan;249(1):95-101



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Is Bariatric Surgery Associated with a Decreased Risk for Breast Cancer?


BACKGROUND AND PURPOSE:

- Obesity is associated with an increased risk of breast cancer
- Feigelson et al. (Annals of Surgery, 2019) assessed whether bariatric surgery in pre- and postmenopausal women is associated with reduced risk of breast cancer

METHODS:

- Retrospective cohort study
- Participants
 - Obese female patients enrolled in an integrated health care delivery system
 - Ages 18-79 years
 - Obesity: Defined as BMI greater than or equal to 35 kg/m²
- Exposure: Bariatric surgery
 - Roux-en-Y gastric bypass (RYGB), laparoscopic adjustable gastric banding, and sleeve gastrectomy)
- Matching to adjust for biases when comparing exposed to unexposed patients, including
 - BMI, age, study site, and comorbidities
- Analysis
 - Statistical models used to examine breast cancer incidence up to 10 years after bariatric surgery

Bariatric Surgery Is Associated With Reduced Risk of Breast Cancer in Both Premenopausal and Postmenopausal Women.
Feigelson et al. Annals of Surgery, 2019
Annals of Surgery, 276(10):1951-1958, December 2020



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RESULTS:

- 17,998 women with bariatric surgery | 53,889 without bariatric surgery
 - 301 premenopausal breast cancer cases
 - 399 postmenopausal breast cancer cases
- Bariatric surgery was associated with a lower risk of breast cancer overall (P < 0.001)
 - Hazard ratio (HR) 0.63 (95% CI, 0.52-0.76)
- Bariatric surgery was associated with a reduced risk of both premenopausal and postmenopausal breast cancer
 - Premenopausal: Hazard ratio (HR) 0.72 (95% CI, 0.54-0.94)
 - Postmenopausal: HR 0.55 (95% CI, 0.42-0.72)
- In premenopausal women, the effect of surgery was more pronounced among ER-negative cases
 - HR 0.36 (95% CI, 0.16-0.79)
- In postmenopausal women, the effect of surgery was more pronounced among ER-positive cases
 - HR 0.52 (95% CI, 0.39-0.70)

CONCLUSION:

- Bariatric surgery was associated with an **37% lower risk of breast cancer** overall compared to severely obese women
- This effect was significant in both pre and postmenopausal women

Bariatric Surgery Is Associated With Reduced Risk of Breast Cancer in Both Premenopausal and Postmenopausal Women
Friedman, Heiner, Gartner, PWS et al
Annals of Surgery, 272(10):1053-1059, December 2020



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Maternal Overweight, Obesity and Congenital Malformations – How Strong is the Link?


BACKGROUND AND PURPOSE:

- Previous studies have established an association between maternal obesity and congenital anomalies
- Limited data on the relationship with the overweight category and if there is a relationship between the increasing severity of obesity and birth defects
- Persson et al. (BMJ, 2017) sought to estimate the associations between early pregnancy BMI, including overweight and obese, and congenital anomalies

METHODS:

- Population based cohort study of 1,243,957 live born singleton infants
 - Study used the Swedish birth register which includes information on almost 100% of deliveries
 - Prenatal care is publicly funded and standardized
 - Live singleton births (from 22 completed weeks gestation)
 - Excluded infants with chromosomal aberrations, genetic syndromes, malformation syndromes with known causes, and related viral infections
- Primary outcome measure
 - Offspring with any major congenital malformation
- Additional outcomes
 - Analysis of congenital malformation subgroups with a prevalence of ≥ 1/1000

Persson et al. Risk of major congenital malformations in relation to maternal overweight and obesity: Swedish cohort study of 1.2 million singleton births
BMJ 2017;357:2063 doi:10.1136/bmj.j563



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RESULTS:

- Offspring of obese mothers had a higher risk ratio for congenital malformations with increasing weight
 - Overweight: risk ratio 1.05 (95% CI 1.02 to 1.07)
 - Obesity class I: risk ratio 1.12 (95% CI 1.08 to 1.15)
 - Obesity class II: risk ratio 1.23 (95% CI 1.17 to 1.30)
 - Obesity class III: ratio 1.37 (95% CI 1.26 to 1.49)
- The most common malformation was cardiac, but malformations of the nervous system were especially sensitive to increasing weight with the highest risk ratios
 - Compared to normal weight women, obesity class III women had almost double the risk of a major nervous system anomaly
- Genital and digestive system malformations were increased in offspring of obese mothers

CONCLUSION:

- Risks of any major congenital malformation and several subgroups of organ specific malformations progressively increased with maternal overweight and increasing severity of obesity
- Unclear as to mechanism, as even when excluding diabetes, risk remains
 - Adipose tissue is an active endocrine organ and there may be related inflammation/vascular dysfunction and dysregulation of placental metabolism
 - Folic acid deficiency is common in obesity

Persson et al. Risk of major congenital malformations in relation to maternal overweight and obesity: Swedish cohort study of 1.2 million singleton births
BMJ 2017;357:2063 doi:10.1136/bmj.j563



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Is Bariatric Surgery Associated with Decreased Risks for Severe Birth Defects?

BACKGROUND AND PURPOSE:

- BMI and hyperglycemia are associated with poor perinatal outcomes including birth defects
- Neovius et al. (JAMA, 2019) sought to determine if gastric bypass surgery is associated with reduced risk for major birth defects

METHODS:

- Nationwide matched cohort study
- Participant groups
 - Live-born singleton infants born to women who underwent
 - Roux-en-Y gastric bypass surgery **vs**
 - Women who did not undergo bariatric surgery


RESULTS:

- 2,998 infants born post-bariatric surgery | 97.4% were matched with 30,573 controls
- Major birth defects were less frequent in women who had bariatric surgery
 - Bariatric surgery group: 3.4%
 - Controls: 4.9%
 - Risk ratio 0.67 (95% CI, 0.52 to 0.87)
 - Risk difference, -1.6% (95% CI, -2.7% to -0.6%)

***NTDs**

- **Bariatric surgery group: 0 cases**
- **Controls: 20 cases**


Association of Metabolic Gastric Bypass Surgery with Offspring Birth Defects
Neovius et al. JAMA. 2019;321(12):1187-1195. doi:10.1001/jama.2019.12205

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Summary and Conclusions

- Increasing Obesity in North America especially in women
- Women are subject to obesity related bias and discrimination which has significant effect on their ability to seek medical or surgical treatment
- Women fare much better in surgical outcomes
- Tremendous benefit from metabolic surgery towards resolution of several obesity related conditions and increasing longevity
- Establishing a dialogue between Primary care/GI/OBGYN about pros and cons will help bridge the gap which currently exists in access to Metabolic Surgery

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THANK YOU FOR YOUR TIME AND QUESTIONS

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