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# Efficacy of Bariatric Surgery Compared to Non-Surgical Treatments for Morbid Obesity

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# Efficacy of Bariatric Surgery Compared to Non-Surgical Treatments for Morbid Obesity

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## Abstract

The purpose of this research is to show the efficacy of Roux-en-Y gastric bypass and sleeve gastrectomy as compared to traditional diet and exercise models. Finding ways to combat morbid obesity has resulted in invasive surgical techniques because traditional diets and exercise work infrequently and often fail. Systematic reviews, meta-analysis, randomized controlled trials and retrospective studies were found using the data base of CINAHL, SportsDiscus, PsycInfo, Embase, and PubMed. All of the studies were published no later than 2014 and used human adult subjects ages 19-65. The studies reviewed show that bariatric surgery is a safe and effective obesity treatment with low risk of post-operative complications and mortality related to surgery. The reviewed studies find that patients who undergo the Roux-en-Y gastric bypass can lose 80% or more of excess weight and those who undergo sleeve gastrectomy can lose 60% or more of excess weight. The data supports that the bariatric surgeries discussed here help people maintain weight loss for up to ten years.

• **Key Words**: *bariatric surgery, Roux-en-Y gastric bypass, sleeve gastrectomy, morbid obesity, weight reduction*, and *long term*.

## Introduction

- The World Health Organization (WHO) estimated in 2016 that 1.9 billion adults were overweight, and 650 million people worldwide are considered obese.
- Bariatric surgery recommendations (DynaMed 2017):
  - BMI ≥ 40 kg/m$^2$ with no comorbidities OR BMI ≥ 35 kg/m$^2$ with on comorbidity: Grade A, BEL 1 recommendation
  - BMI 30 kg/m$^2$ to 34.9 kg/m$^2$ : Grade B, BEL 2 recommendation
  - BMI ≤ 30 kg/m$^2$ with diabetes mellitus type II: Grade C, BEL 3 recommendation.

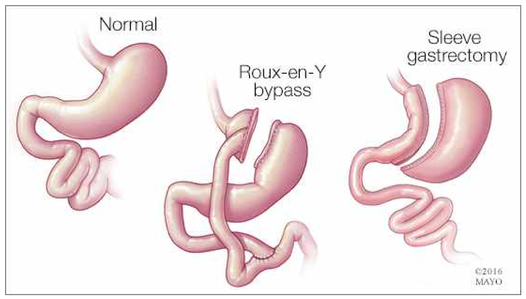



*Figure 1.* Illustration of normal stomach, Roux-en-Y gastric bypass and sleeve gastrectomy. Used with permission of Mayo Foundation for Medical Education and Research, all rights reserved.

## Statement of the Problem

Weight loss is an essential part of reducing the risk of cardiovascular disease, resolving and controlling diabetes, reducing the risk for experiencing certain types of cancers, and reducing musculoskeletal problems (WHO, 2018). When encountering patients classified as morbidly obese, providers need to be able to discuss the risks and benefits of both invasive and non-invasive weight reduction options.

## Research Question

In morbidly obese patients, does the Roux-en-Y gastric bypass or sleeve gastrectomy provide a more significant weight loss over a more extended period when compared to more traditional non-invasive weight reduction programs?

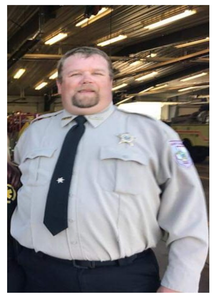
## Literature Review

- Short Term (≤ 5 yr) Outcomes of Surgery
  - Peterli et al. (2018) found excess BMI loss of 68.3% with Roux-en-Y gastric bypass (RYGB) and 61.1% with sleeve gastrectomy (SG) after five years. Authors found no significant different between procedures.
  - Puzziferri et al. (2014) conducted systematic review using 29 studies that showed 65.7% excess weight loss (EWL) for RYGB and 64.5% for SG after one year.
  - Arterburn et al. (2018) conducted a retrospective cohort study. Showed at five years RYGB had total weight loss of 25.5% while SG has 18.8%, p-value < 0.001. Also shows proportionally, after five years 35% of RYGB group and 20% of SG group maintained a >30% TWL.
- Long Term (≥ 5 yr) Outcomes of Surgery
  - Golzarand et al. (2017) conducted a meta-analysis showing RYGBP has EWL of 62.85% after 5 years and 63.52% EWL after 10 years. SG showed 53.25% EWL after 5 years.
  - Maciejewski et al. (2016) conducts a retrospective cohort study through the VA. At 10 years RYGB had 56.4% EWL. No data was presented for SG as this procedure has only been around since 2010.
- Outcomes of Non-Surgical Obesity Treatment
  - Burguera et al. (2015) compared Intensive Lifestyle Intervention (ILI) to Conventional Obesity Therapy (COT). The COT group had 3.3% weight loss and BMI reduction to 46.2 kg/m$^2$ and the ILI group has 11.3% weight loss and BMI reduction to 40.6 kg/m$^2$.
  - Shadid, Jakob, &Jensen (2018) compared ILI to a control group. The starting average BMI in the ILI group was 44.2 kg/m$^2$ with 76% excess weight while the control was 43.1 kg/m$^2$ with 72% excess weight. After two years the ILI group, BMI decreased to 37.4 kg/m$^2$ and excess weight decreased to 50% and the control had BMI of 43.2 kg/m$^2$ and excess weight of 73%.
- Comparison of Surgery to Non-Surgical Treatment


  - Beaulac & Sandre (2017) show a comparison of RYBG, SG, and VLCD.
  - Reges et al (2018) compared surgical patients to non-surgical matched controls. In RYGB vs. control, there was an 8-point BMI loss difference in favor of RYGB. In the SG vs. the control, there was a 9.3-point BMI loss difference in favor the SG.
- Morbidity and Mortality of Surgery
  - Bhatti et al. (2016) conducted a self-matched longitudinal cohort study that shows a 17% increase of ER visits after surgery.
  - Brushi Kelles et al. (2014) found 0.55% (24) death rate due to surgery with in 30 days post-op. Within 10 years of surgery, 1.9% (82) had died. Of the 82 people who died 54% was surgery related. Sepsis accounted for 42.7%, thromboembolism for 24.3%, and suicide for 9.8%.
  - Sanni A. et al. (2014) found 5.1% post-op complication rate in RYGB with a 0.2% mortality rate and 1.4% complication rate in SG with a 0.1% mortality rate.
  - Nocca et al. (2017) reports SG as having 15-35% complication of GERD within 3-5 years.

## Discussion

- All studies show both RYGB and SG are more effective for the treatment of morbid obesity than non-invasive treatments.
- Studies show that patients who had bariatric surgery lost weight rapidly in the first year, then slowly regain some weight. Patients will lose some muscle mass during the first year.
- With a randomized controlled trial there was no significance between RYGB and SG in the first five years, however past five years RYGB shows more retained weight loss than SG. This may speak for the importance of choosing the mort appropriate procedure for each patient.
- A small proportion of people who participated in non-surgical treatments for obesity succeeded and the excess weight loss experienced was far less than that of surgical treatments.
- RYGB has higher post-op complication rate and slightly higher mortality rate than SG; however, mortality is less than 0.5% in both groups.
- Many studies were retrospective studies, that lacked follow-up data for longer study periods. More studies need to be done regarding participant loss in the studies.



***Picture 1.*** Shawn Donovan 1 year prior to Roux-en-Y gastric bypass surgery.
Pre-surgery weight: 350 lbs
BMI: 44.93 kg/m$^2$

***Picture 2.*** Shawn on 3/1/2020
Surgery date: 9/17/2019
Current Weight: 198 lbs
BMI: 25.42 kg/m$^2$

## Applicability to Clinical Practice

As health care providers we are constantly talking to patients about how to prevent lifelong, potentially debilitating diseases like hypertension, diabetes or hyperlipidemia. Obesity has become a more prevalent problem with many comorbid conditions mentioned earlier that health care providers will have to treat. When patients struggle with weight loss and ask for help, it is important as health care providers that we are able to discuss all the possible weight loss treatments and efficacy of those options to do what is best for that specific patient.

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