The outcomes information and comments on this page are based on unselected, consecutive patients from Dr. Callery's bariatric surgery practice.

- Each Green Diamond represents one patient at time of last follow-up.
- The blue triangles show the average at that time.
- Each patient starts at 100% overweight. The "0%" mark indicates ideal weight based on life insurance tables. The "0%" value is thus an approximation.

This graph shows the weight loss results for the patients from Dr. Callery's practice. Each patient starts out at 100% overweight. If everyone were to lose all of her/his excess weight, the green diamonds would all drop to 0% on the Y-axis. If patients had not had surgery they probably would have gained weight and might be at 110% or 120% over time.

This graph shows two important results. First, as a group, patients lose a great deal of weight over time, and tend to keep much of it off. For these patients, average excess weight loss at 2 years is 80%, at 4 years is 64%, and 5 years 65%. We do not have enough data to calculate a meaningful average beyond 5 years. Second, there is a great deal of variation among patients. Some drop to a normal weight while a few will keep off little of their excess weight. A few patients are underweight, but this is usually not a major problem.

While some of this variation of weight loss may be due to the surgery, interviews with patients suggest that much of the variation is due to variations in dietary and exercise patterns. People who do well tend to avoid snacks, eat healthy types of food, and be active. Those patients who tend to regain weight tend to be those who don't change their eating and exercise patterns, or those that return to snacking behaviors. There may be a genetic basis for various patient's
Gastric Bypass Outcomes

response to surgery, but this hasn't been worked out. There is no reliable psychological or medical test that can accurately predict who will do well and who will only lose a small amount of weight.

Most studies in the medical literature suggest that patients lose about 2/3 to 3/4 of their excess weight over the first two years. Longer term studies have shown that on average patients keep off at least 50 to 65% of the excess weight over 5 to 15 years. There is no data available beyond 15 years. Thus there is some weight regain that occurs over time after the first two years, but patients are as a group much better off from a weight and health standpoint even long after surgery.

Related Questions and Answers from Thinner Times Forum

- Alcohol after gastric bypass and vertical sleeve gastrectomy
- SSRIs and RNY gastric bypass
- NSAID and over-the-counter medications after gastric bypass and vertical sleeve
- Doing really well after gastric bypass. How long will it last?
- How much is too much weight to lose?

Related Medical Journals:

Effects of bariatric surgery on mortality in Swedish obese subjects.


Sjöström L, et. al

BACKGROUND: Obesity is associated with increased mortality. Weight loss improves cardiovascular risk factors, but no prospective interventional studies have reported whether weight loss decreases overall mortality. In fact, many observational studies suggest that weight reduction is associated with increased mortality. METHODS: The prospective, controlled Swedish Obese Subjects study involved 4047 obese subjects. Of these subjects, 2010 underwent bariatric surgery (surgery group) and 2037 received conventional treatment (matched control group). We report on overall mortality during an average of 10.9 years of follow-up. At the time of the analysis (November 1, 2005), vital status was known for all but three subjects (follow-up rate, 99.9%). RESULTS: The average weight change in control subjects was less than +/-2% during the period of up to 15 years during which weights were recorded. Maximum weight losses in the surgical subgroups were observed after 1 to 2 years:
gastric bypass, 32%; vertical-banded gastroplasty, 25%; and banding, 20%. After 10 years, the weight losses from baseline were stabilized at 25%, 16%, and 14%, respectively. There were 129 deaths in the control group and 101 deaths in the surgery group. The unadjusted overall hazard ratio was 0.76 in the surgery group (P=0.04), as compared with the control group, and the hazard ratio adjusted for sex, age, and risk factors was 0.71 (P=0.01). The most common causes of death were myocardial infarction (control group, 25 subjects; surgery group, 13 subjects) and cancer (control group, 47; surgery group, 29). CONCLUSIONS: Bariatric surgery for severe obesity is associated with long-term weight loss and decreased overall mortality.

CONCLUSIONS: Bariatric surgery for severe obesity is associated with long-term weight loss and decreased overall mortality.

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Laparoscopic adjustable gastric banding versus Roux-en-Y gastric bypass: 5-year results of a prospective randomized trial.


Angrisani L, Lorenzo M, Borrelli V.

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BACKGROUND: To perform a prospective, randomized comparison of laparoscopic adjustable gastric banding (LAGB) and laparoscopic Roux-en-Y gastric bypass (LRYGB). METHODS: LAGB, using the pars flaccida technique, and standard LRYGB were performed. From January 2000 to November 2000, 51 patients (mean age 34.0 +/- 8.9 years, range 20-49) were randomly allocated to undergo either LAGB (n = 27, 5 men and 22 women, mean age 33.3 years, mean weight 120 kg, mean body mass index [BMI] 43.4 kg/m(2); percentage of excess weight loss 83.8%) or LRYGB (n = 24, 4 men and 20 women, mean age 34.7, mean weight 120 kg, mean BMI 43.8 kg/m(2), percentage of excess weight loss 83.3). Data on the operative time, complications, reoperations with hospital stay, weight, BMI, percentage of excess weight loss, and co-morbidities were collected yearly. Failure was considered a BMI of >35 at 5 years postoperatively. The data were analyzed using Student's t test and Fisher's exact test, with P <.05 considered significant. RESULTS: The mean operative time was 60 +/- 20 minutes for the LAGB group and 220 +/- 100 minutes for the LRYGB group (P <.001). One patient in the LAGB group was lost to follow-up. No patient died. Conversion to laparotomy was performed in 1 (4.2%) of 24 LRYGB patients because of a posterior leak of the gastrojejunal anastomosis. Reoperations were required in 4 (15.2%) of 26 LAGB patients, 2 because of gastric pouch dilation and 2 because of unsatisfactory weight loss. One of these patients required conversion to LRYGB.
Gastric Bypass Outcomes

to biliopancreatic diversion; the remaining 3 patients were on the waiting list for LRYGB. Reoperations were required in 3 (12.5%) of the 24 LRYGB patients, and each was because of a potentially lethal complication. No LAGB patient required reoperation because of an early complication. Of the 27 LAGB patients, 3 had hypertension and 1 had sleep apnea. Of the 24 LRYGB patients, 2 had hyperlipemia, 1 had hypertension, and 1 had type 2 diabetes. Five years after surgery, the diabetes, sleep apnea, and hyperlipemia had resolved. At the 5-year (range 60-66 months) follow-up visit, the LRYGB patients had significantly lower weight and BMI and a greater percentage of excess weight loss than did the LAGB patients. Weight loss failure (BMI >35 kg/m(2) at 5 yr) was observed in 9 (34.6%) of 26 LAGB patients and in 1 (4.2%) of 24 LRYGB patients (P < .001). Of the 26 patients in the LAGB group and 24 in the LRYGB group, 3 (11.5%) and 15 (62.5%) had a BMI of <30 kg/m(2), respectively (P < .001).

CONCLUSION: The results of our study have shown that LRYGB results in better weight loss and a reduced number of failures compared with LAGB, despite the significantly longer operative time and life-threatening complications.

Surgery decreases long-term mortality, morbidity, and health care use in morbidly obese patients.

Christou NV, Sampalis JS, Liberman M, Look D, Auger S, McLean AP, MacLean LD


Section of Bariatric Surgery, Division of General Surgery, Department of Surgery, McGill University, Montreal, Quebec, Canada. nicolas.christou@MUHC.McGill.ca

OBJECTIVE: This study tested the hypothesis that weight-reduction (bariatric) surgery reduces long-term mortality in morbidly obese patients. BACKGROUND: Obesity is a significant cause of morbidity and mortality. The impact of surgically induced, long-term weight loss on this mortality is unknown. METHODS: We used an observational 2-cohort study. The treatment cohort (n = 1035) included patients having undergone bariatric surgery at the McGill University Health Centre between 1986 and 2002. The control group (n = 5746) included age- and gender-matched severely obese patients who had not undergone weight-reduction surgery identified from the Quebec provincial health insurance database. Subjects with medical conditions (other than morbid obesity) at cohort-inception into the study were excluded. The cohorts were followed for a maximum of 5 years from inception. RESULTS: The cohorts were well matched for age, gender, and duration of follow-up. Bariatric surgery resulted in significant reduction in mean percent excess weight loss (67.1%, P < 0.001). Bariatric surgery patients had significant risk reductions for developing cardiovascular, cancer, endocrine, infectious,
psychiatric, and mental disorders compared with controls, with the exception of hematologic (no difference) and digestive diseases (increased rates in the bariatric cohort). The mortality rate in the bariatric surgery cohort was 0.68% compared with 6.17% in controls (relative risk 0.11, 95% confidence interval 0.04-0.27), which translates to a reduction in the relative risk of death by 89%. **CONCLUSIONS:** This study shows that weight-loss surgery significantly decreases overall mortality as well as the development of new health-related conditions in morbidly obese patients.

**Impact of gastric bypass operation on survival: a population-based analysis.**


Flum DR, Dellinger EP.

Department of Surgery, University of Washington, Seattle, WA 98195-7183, USA.

**BACKGROUND:** Bariatric procedures are increasingly performed but their impact on survival is unknown. **STUDY DESIGN:** We evaluated short- and long-term mortality rates of patients undergoing gastric bypass on a population level compared with a nonoperated cohort of patients with morbid obesity in a retrospective study, using the Washington State Comprehensive Hospital Abstract Reporting System database and the Vital Statistics database. The study included all patients (age 18 to 65 years) from 1987 to 2001 who underwent gastric bypass with ICD-9 diagnostic codes for obesity. The comparator group included patients of similar age with a diagnosis of obesity or morbid obesity who did not have a bariatric procedure. Survival analysis was used to determine the association of surgeon experience on 30-day mortality and of the procedure on survival while controlling for age, gender, and comorbidity index. **RESULTS:** Of the 66,109 obese patients we evaluated, 3,328 had a bariatric procedure. Incidence of the procedure increased from 0.7 to 10.6 per 100,000 from 1987 to 2001, with a 2.5-fold increase in incidence rate of the procedure in the years after 1996 (incidence rate ratio, 2.5; 95% CI, 2.4 to 2.7). Thirty-day mortality was 1.9% and was associated with surgical inexperience. Within the surgeon's first 19 procedures the odds of death within 30 days were 4.7 times higher (95% CI, 1.2 to 18.2) than at later points in a surgeon's case order. At 15 years followup, 16.3% of nonoperated patients had died as compared with 11.8% of patients who had the bariatric procedure. *When survival was compared beginning 1 year after the procedure, the adjusted hazard for death was 33% lower than that of nonoperated patients* (hazard ratio 0.67; 95% CI, 0.54 to 0.85).
CONCLUSIONS:
Thirty-day mortality after gastric bypass is higher than previously reported and closely linked to surgeon inexperience. A modest overall survival benefit was associated with the procedure but a marked survival advantage was noted for patients who survive to the first postoperative year.

Bariatric surgery: a systematic review and meta-analysis


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CONTEXT: About 5% of the US population is morbidly obese. This disease remains largely refractory to diet and drug therapy, but generally responds well to bariatric surgery.
OBJECTIVE: To determine the impact of bariatric surgery on weight loss, operative mortality outcome, and 4 obesity comorbidities (diabetes, hyperlipidemia, hypertension, and obstructive sleep apnea).
DATA SOURCES AND STUDY SELECTION: Electronic literature search of MEDLINE, Current Contents, and the Cochrane Library databases plus manual reference checks of all articles on bariatric surgery published in the English language between 1990 and 2003. Two levels of screening were used on 2738 citations.
DATA EXTRACTION: A total of 136 fully extracted studies, which included 91 overlapping patient populations (kin studies), were included for a total of 22,094 patients. Nineteen percent of the patients were men and 72.6% were women, with a mean age of 39 years (range, 16-64 years). Sex was not reported for 1537 patients (8%). The baseline mean body mass index for 16 944 patients was 46.9 (range, 32.3-68.8).
DATA SYNTHESIS: A random effects model was used in the meta-analysis. The mean (95% confidence interval) percentage of excess weight loss was 61.2% (58.1%-64.4%) for all patients; 47.5% (40.7%-54.2%) for patients who underwent gastric banding; 61.6% (56.7%-66.5%), gastric bypass; 68.2% (61.5%-74.8%), gastroplasty; and 70.1% (66.3%-73.9%), biliopancreatic diversion or duodenal switch. Operative mortality (< or =30 days) in the extracted studies was 0.1% for the purely restrictive procedures, 0.5% for gastric bypass, and 1.1% for biliopancreatic diversion or duodenal switch. Diabetes was completely resolved in 76.8% of patients and resolved or improved in 86.0%. Hyperlipidemia improved in 70% or more of patients. Hypertension was resolved in 61.7% of patients and resolved or improved in 78.5%. Obstructive sleep apnea was resolved in 85.7% of patients and was resolved or improved in
83.6% of patients. **CONCLUSIONS**: Effective weight loss was achieved in morbidly obese patients after undergoing bariatric surgery. A substantial majority of patients with diabetes, hyperlipidemia, hypertension, and obstructive sleep apnea experienced complete resolution or improvement.

**Obesity, Pharmacological and Surgical Treatment**

Agency for Healthcare Research and Quality

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**Related Medical Journals & Articles**

The following abstracts are offered from recent medical journals. To search: [PubMed](http://www.ncbi.nlm.nih.gov/pubmed).

**The Gastric Bypass Operation Reduces the Progression and Mortality of Non-Insulin-Dependent Diabetes Mellitus.**


Departments of Surgery and Biochemistry, East Carolina University School of Medicine, Greenville, N.C.

Of 232 morbidly obese patients with non-insulin-dependent diabetes mellitus referred to East Carolina University between March 5, 1979, and January 1, 1994, 154 had a Roux-en-Y gastric bypass operation and 78 did not undergo surgery because of personal preference or their insurance company’s refusal to pay for the procedure. The surgical and the nonoperative (control) groups were comparable in terms of age, weight, body mass index, sex, and
percentage with hypertension. The two groups were compared retrospectively to determine differences in survival and the need for medical management of their diabetes. Mean length of follow-up was 9 years in the surgical group and 6.2 years in the control group. The mean glucose levels in the surgical group fell from 187 mg/dl preoperatively and remained less than 140 mg/dl for up to 10 years of follow-up. The percentage of control subjects being treated with oral hypoglycemics or insulin increased from 56.4% at initial contact to 87.5% at last contact (P = 0.0003), whereas the percentage of surgical patients requiring medical management fell from 31.8% preoperatively to 8.6% at last contact (P = 0.0001). The mortality rate in the control group was 28% compared to 9% in the surgical group (including perioperative deaths). For every year of follow-up, patients in the control group had a 4.5% chance of dying vs. a 1.0% chance for those in the surgical group. The improvement in the mortality rate in the surgical group was primarily due to a decrease in the number of cardiovascular deaths.

J Gastrointest Surg 1997 May;1(3):213-220

Significant changes in blood pressure, glucose, and lipids with gastric bypass surgery.

Cowan GS Jr, Buffington CK

Department of Surgery, University of Tennessee, Memphis 38163, USA.

The morbidly obese have a disproportionately greater risk of hypertension, diabetes, and coronary artery disease than their lean or less seriously obese counterparts. Roux-en-Y gastric bypass surgery has been found to be highly effective in inducing, and sustaining, weight loss in individuals with morbid obesity. The purpose of the present study was to examine the effects of weight loss with Roux-en-Y gastric bypass surgery (GBP) on blood pressure, fasting blood glucose, and the lipid/lipoprotein status of 61 morbidly obese women and 21 men. Anthropometric and blood pressure assessments and blood samples for glucose and lipid/lipoprotein analyses were obtained before surgery and at 6 to 12 months postoperatively. By this time, morbidly obese (MO) males and females had lost 33% and 30% of their initial body weight, respectively, along with significant reductions in fasting blood glucose (p < 0.01) and systemic blood pressure (p < 0.05). Weight loss with GBP was also associated with significant reductions in the apoprotein B-containing lipoproteins and the triglyceride and cholesterol composition of these particles. There was a trend (p < 0.10) toward increased serum levels of high density lipoprotein (HDL)-cholesterol following GBP, and significant (p < 0.05) improvement in HDL subfraction distribution and composition. These findings demonstrate the effectiveness of GBP in inducing metabolic changes in the MO population, which may reduce the risk of coronary artery disease, diabetes, and hypertension.
Who would have thought it? An operation proves to be the most effective therapy for adult-onset diabetes mellitus.


Department of Surgery, School of Medicine, East Carolina University, Greenville, North Carolina, USA.

OBJECTIVE: This report documents that the gastric bypass operation provides long-term control for obesity and diabetes. SUMMARY BACKGROUND DATA: Obesity and diabetes, both notoriously resistant to medical therapy, continue to be two of our most common and serious diseases. METHODS: Over the last 14 years, 608 morbidly obese patients underwent gastric bypass, an operation that restricts caloric intake by (1) reducing the functional stomach to approximately 30 mL, (2) delaying gastric emptying with a c. 0.8 to 1.0 cm gastric outlet, and (3) excluding foregut with a 40 to 60 cm Roux-en-Y gastrojejunostomy. Even though many of the patients were seriously ill, the operation was performed with a perioperative mortality and complication rate of 1.5% and 8.5%, respectively. Seventeen of the 608 patients (< 3%) were lost to follow-up. RESULTS: Gastric bypass provides durable weight control. Weights fell from a preoperative mean of 304.4 lb (range, 198 to 615 lb) to 192.2 lb (range, 104 to 466) by 1 year and were maintained at 205.4 lb (range, 107 to 512 lb) at 5 years, 206.5 lb (130 to 388 lb) at 10 years, and 204.7 lb (158 to 270 lb) at 14 years. The operation provides long-term control of non-insulin-dependent diabetes mellitus (NIDDM). In those patients with adequate follow-up, 121 of 146 patients (82.9%) with NIDDM and 150 of 152 patients (98.7%) with glucose impairment maintained normal levels of plasma glucose, glycosylated hemoglobin, and insulin. These antidiabetic effects appear to be due primarily to a reduction in caloric intake, suggesting that insulin resistance is a secondary protective effect rather than the initial lesion. In addition to the control of weight and NIDDM, gastric bypass also corrected or alleviated a number of other comorbidities of obesity, including hypertension, sleep apnea, cardiopulmonary failure, arthritis, and infertility. Gastric bypass is now established as an effective and safe therapy for morbid obesity and its associated morbidities. No other therapy has produced such durable and complete control of diabetes mellitus.
GERD is the abbreviation for Gastroesophageal Reflux Disease.

Symptoms of GERD include:

1. Heartburn
2. Water brash (reflex salivary hypersecretion in response to peptic esophagitis),
3. Laryngitis
4. Aspiration (passage of gastric fluid up the esophagus and down into the lungs)
5. Wheezing
6. Night time awakening with choking

As many as 55% of morbidly obese patients coming to surgery have symptoms of GERD.

GERD is more of a problem for obese people than those with normal weight because:

1. Obese people are more sensitive to the presence of acid in the esophagus.
2. Hiatal hernia, capable of promoting GERD by several mechanisms, is more common among the obese.
3. Obese people have increased intra-abdominal pressure that displaces the lower esophageal sphincter and increases the gastro-esophageal gradient (pressure difference).
4. Vagal nerve function abnormalities associated with obesity may cause a higher output of bile and pancreatic enzymes, which makes the refluxed gastric juices more toxic to the
esophageal mucosa.

Adapted from Barak N Obes Rev 2002 Feb;3(1):9-15

The following abstracts from the medical literature about Gastroesophageal Reflux Disease were obtained through the National Library of Medicine.

Surg Endosc 2002 Jul;16(7):1027-31

Symptomatic improvement in gastroesophageal reflux disease (GERD) following laparoscopic Roux-en-Y gastric bypass.

Frezza EE, Ikramuddin S, Gourash W, Rakitt T, Kingston A, Luketich J, Schauer P.

Department of Surgery, Presbyterian University Hospital, University of Pittsburgh, 200 Lothrop Street, Pittsburgh, PA 15213-2582, USA.

BACKGROUND: The purpose of this study was to determine the effect of laparoscopic Roux-en-Y gastric bypass (LRYGBP) on symptomatic control of gastroesophageal reflux disease (GERD). METHODS: Morbidly obese patients (n = 435) who underwent LRYGBP for morbid obesity were assessed for changes in GERD symptoms, quality of life, and patient satisfaction after surgery. RESULTS: A total of 238 patients (55%) had evidence of chronic GERD, and 152 patients (64%) voluntarily participated in the study. The mean body mass index (BMI) was 48 kg/m2. The mean excess weight loss was 68.8% at 12 months. There was a significant decrease in GERD-related symptoms, including heartburn (from 87% to 22%, p<0.001); water brash (from 18% to 7%, p<0.05); wheezing (from 40% to 5%, p<0.001) laryngitis (from 17% to 7%, p<0.05); and aspiration (from 14% to 2%, p<0.01) following LRYGBP. Postoperatively, the use of medication decreased significantly both for proton pump inhibitors (from 44% to 9%, p<0.001) and for the H2 blockers (from 60% to 10%, p<0.01). SF-36 physical function scores and the mental component summary scores improved after the operation (87 vs 71; p<0.05 and 83 vs 66; p<0.05, respectively). Overall patient satisfaction was 97%. CONCLUSION: LRYGBP results in very good control of GERD in morbidly obese patients with follow-up as late as 3 years. Morbidly obese patients who require surgery for GERD may be better served by LRYGBP than fundoplication because of the additional benefit of significant
weight loss.

Obes Surg 1998 Feb;8(1):35-8

Roux-en-Y gastric bypass: an effective antireflux procedure in the less than morbidly obese.

Jones KB Jr.

LSU Medical Center, Shreveport, Louisiana, USA.

BACKGROUND: Since Roux-en-Y gastric bypass (RYGBP) is an excellent antireflux procedure, why is it necessary to do it only for those who are morbidly obese: why not anyone who has had a longstanding severe weight problem with chronic disabling reflux esophagitis? METHODS: RYGBP was done primarily as an antireflux procedure in 332 patients late from 1987 through October 1996. Eighty-nine were less than 100 lb (45 kg) overweight. Forty-five were lost to follow-up. All but one had Visick ratings from 2 to 4 preoperatively. Thirty-one were primary RYGBP and 13 were conversions from previous gastroplasties. The diagnosis in each case was made by esophagogastrscopy with esophageal biopsy with or without the Bernstein test when indicated. RESULTS: Postoperatively, only one patient was symptomatic. The remaining had Visick ratings of 1. The average preoperative weight of 192 lb (87 kg) dropped to 145 lb (66 kg) postoperatively, or 67% of excess weight loss at a mean of 56 months. Compared to the morbidly obese group, there was no significant difference in 1-year postoperative laboratory values. CONCLUSION: This study supports the efficacy and safety of RYGBP for reflux esophagitis in the less than morbidly obese patient. Esophagitis is truly a comorbid condition of severe obesity, and it should be accepted as such. The arbitrary elimination from the consideration of candidacy for this procedure by those with a body mass index of less than 35 kg/m2 and unproven comorbidity appears unjustified.

Obes Surg 1997 Dec;7(6):479-84

Symptomatic and clinical improvement in morbidly obese patients with gastroesophageal reflux disease following Roux-en-Y gastric bypass.

Smith SC, Edwards CB, Goodman GN.
BACKGROUND: Patients who suffer with gastroesophageal reflux Disease (GERD) endure a worsening of symptoms as their weight increases. When medical treatment of this condition in the morbidly obese patients fails, surgical intervention may be indicated. Choosing a procedure which not only helps achieve weight control but which also relieves symptoms and complications of GERD is the goal. We present a review of patients who have undergone Roux-en-Y Gastric Bypass (RYGBP) and related procedures for this disease. METHODS: One hundred eighty-eight patients undergoing surgery for morbid obesity and for GERD in 1992-1996 were contacted by mail or phone. All of these patients had undergone preoperative esophagogastroduodenoscopy to grade the severity of their disease. Their preoperative symptoms were compared to those experienced postoperatively. RESULTS: One hundred thirty patients underwent a RYGBP with modified Hill fundopexy, 22 patients underwent a distal gastrectomy with modified Hill fundopexy, 8 patients underwent distal gastrectomy alone and 28 patients underwent RYGBP alone. There have been no deaths. There were nine surgical complications, eight early and one at 2.5 years postoperation. Follow-up is 4-48 months. The average BMI dropped from 43 to 30.2 kg/m2. Whereas all patients were on some form of medical therapy before surgery, only 14 reported the need for medication postoperatively. CONCLUSIONS: Surgical intervention for weight control and treatment of GERD has been highly successful in our experience both with respect to weight control and to the reduction of reflux symptoms. Depending upon endoscopic and operative findings a RYGBP with or without an antireflux procedure can provide dramatic improvement. Gastrectomy with antireflux modifications is appropriate in selected cases.

The following are journal articles that describe the outcomes for sleep apnea:

Sleep disturbance and obesity: changes following surgically induced weight loss.

Dixon JB, Schachter LM, O'Brien PE.

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BACKGROUND: Obesity causes sleep disturbance and is the most significant risk factor for
sleep apnea. Only surgical methods provide substantial sustained weight loss for most severely obese subjects. OBJECTIVE: To study sleep disturbance in patients undergoing laparoscopic adjustable gastric banding with a commercially available product (Lap-Band). METHODS: In this study, 313 consecutive patients with severe obesity (body mass index [calculated as weight in kilograms divided by the square of height in meters] >35) completed a preoperative sleep questionnaire and clinical assessment. One hundred twenty-three patients completed the same assessment 12 months after surgery. The characteristics of sleep disturbance and changes in responses to weight loss have been assessed. RESULTS: There was a high prevalence of significantly disturbed sleep in men (59%) and women (45%), with women less likely to have had their sleep disturbance investigated. Observed sleep apnea was more common in men, but daytime sleepiness was not affected by sex. Waist circumference was the best clinical measure predicting observed sleep apnea (R = 0.36; P<.001). The group lost an average of 48% (SD, 16%) of excess weight by 12 months. There was a significant improvement in the responses to all questions at follow-up, with habitual snoring reduced to 14% (preoperative value, 82%), observed sleep apnea to 2% (preoperative value, 33%), abnormal daytime sleepiness to 4% (preoperative value, 39%), and poor sleep quality to 2% (preoperative value, 39%) (P<.001 for all). CONCLUSIONS: Obesity-related sleep disorders improve markedly with weight loss. Sustainable weight loss should be a primary aim in the management of severely obese patients with significant sleep disturbance, including sleep apnea. Low-risk laparoscopic obesity surgery should be considered for selected patients with this important comorbidity.

Arch Intern Med 2001 Jan 8;161(1):102-6

Longitudinal study of moderate weight change and sleep-disordered breathing.

Peppard PE, Young T, Palta M, Dempsey J, Skatrud J.

University of Wisconsin School of Medicine, Department of Preventive Medicine, 502 N Walnut St, Madison, WI 53705, USA. ppeppard@facstaff.wisc.edu

CONTEXT: Excess body weight is positively associated with sleep-disordered breathing (SDB), a prevalent condition in the US general population. No large study has been conducted of the longitudinal association between SDB and change in weight. OBJECTIVE: To measure the independent longitudinal association between weight change and change in SDB severity. DESIGN: Population-based, prospective cohort study conducted from July 1989 to January 2000. SETTING AND PARTICIPANTS: Six hundred ninety randomly selected employed Wisconsin residents (mean age at baseline, 46 years; 56% male) who were evaluated twice at 4-year intervals for SDB. MAIN OUTCOME MEASURES: Percentage change in the apnea-hypopnea index (AHI; apnea events + hypopnea events per hour of sleep) and odds of developing moderate-to-severe SDB (defined by an AHI > or =15 events per hour of sleep), with
respect to change in weight. RESULTS: Relative to stable weight, a 10% weight gain predicted an approximate 32% (95% confidence interval [CI], 20%-45%) increase in the AHI. A 10% weight loss predicted a 26% (95% CI, 18%-34%) decrease in the AHI. A 10% increase in weight predicted a 6-fold (95% CI, 2.2-17.0) increase in the odds of developing moderate-to-severe SDB. CONCLUSIONS: Our data indicate that clinical and public health programs that result in even modest weight control are likely to be effective in managing SDB and reducing new occurrence of SDB.

JAMA 2000 Dec 20;284(23):3015-21

Long-term effects of gastric surgery for treating respiratory insufficiency of obesity.

Sugerman HJ, Fairman RP, Sood RK, Engle K, Wolfe L, Kellum JM

Department of Surgery, Medical College of Virginia, Richmond 23298.

The Pickwickian syndrome can be divided into two primary breathing disorders, which can affect patients alone or in combination: sleep apnea syndrome (SAS) and obesity hypoventilation syndrome (OHS). Between 1980 and 1990, 126 patients with respiratory insufficiency underwent gastric surgery for morbid obesity, 12.5% of the entire series. These patients weighed more (164 +/- 36 vs 135 +/- 25 kg, P less than 0.0001) and were more often men (62% vs 14%, P less than 0.001) than those without pulmonary dysfunction. Sixteen had OHS alone, 65 had SAS alone, and 45 had both. Of those with OHS, 38 have been followed for 5.8 +/- 2.4 y since surgery and 29 are currently asymptomatic. In the 12 patients in whom arterial blood gases were available greater than 5 y since surgery, the PaO2 increased from 54 +/- 10 to 68 +/- 20 mm Hg (P less than 0.0001) and PaCO2 fell from 53 +/- 9 to 47 +/- 11 mm Hg (P = 0.05). Of the 110 patients with SAS, 57 were available for follow-up an average of 4.5 +/- 2.3 y since surgery and 38 were completely asymptomatic. In 40 patients with pre- and post-weight reduction sleep polysomnograms, the sleep apnea index fell from 64 +/- 39 to 26 +/- 26 (P less than 0.0001). Although respiratory insufficiency of obesity patients had a higher operative mortality than did patients without pulmonary dysfunction (2.4% vs 0.2% after gastric bypass), weight loss was associated with significant improvements in sleep apnea, arterial blood gases, pulmonary hypertension, left ventricular dysfunction, lung volumes, and polycythemia.

Bariatric surgery in morbidly obese sleep-apnea patients: short- and long-term follow-up.

Charuzi I, Lavie P, Peiser J, Peled R

Department of Surgery C, Soroka Medical Center, Beer-Sheva, Israel.

The following links are questions Dr. Callery has answered on Thinner Times Forum - Forums for gastric bypass, Lap Band, and Vertical Sleeve Gastrectomy:

- Pregnancy and hunger after laparoscopic rny gastric bypass
- How long to wait to have gastric bypass after having a baby
- 5 months post-op gastric bypass and pregnant
- How long to wait after gastric bypass before becoming pregnant

The following abstracts are offered from the recent medical literature. To search: PubMe d.

Pregnancy following gastric bypass surgery for morbid obesity.

Gurewitsch ED, Smith-Levitin M, Mack J

Department of Obstetrics and Gynecology, New York Hospital-Cornell Medical Center, New York, USA.

BACKGROUND: Surgical treatment for severe obesity is sometimes recommended. Many long-term risks, particularly to adolescents and to subsequent pregnancies, are still being determined. CASE: A 23-year-old woman, gravida 6, para 2, treated for morbid obesity during adolescence with gastric bypass surgery, presented at 6 weeks' gestation with severe microcytic anemia. Significant iron and cobalamin deficiencies were found. Although the vitamin B12 deficiency responded to parenteral treatment, the iron deficiency was refractory to oral supplementation because of malabsorption. By 30 weeks' gestation, the patient required blood
transfusions to correct the progressive anemia. Subsequently, she delivered a healthy male infant at term. CONCLUSION: Severe iron deficiency anemia resulting from malabsorption can complicate pregnancy following gastric bypass surgery for morbid obesity. For women of childbearing age, this potential adverse effect must be considered.


Pregnancy following gastric bypass for morbid obesity.

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BACKGROUND: Women who suffer from morbid obesity are often infertile. If these women are able to become pregnant, they are considered high risk because of the hypertension, diabetes and other associated risk factors. Following the pregnancy is difficult due to limitations of the physical examinations. More costly ultrasound examinations are needed at a higher frequency. Bariatric surgery reduces the woman's weight and the incidence of obesity related co-morbidities. The number of pregnancies and rate of complications during those pregnancies in our post-bariatric surgical patients were evaluated. METHOD: Our group has been doing bariatric surgery since the early 1980s. We have over 2000 active patients on our current newsletter mailing list. The patients also have a series of networks through support groups. The patients are informed to contact us when they become pregnant so we may assist the obstetrician with their care. Through these various means, we have been able to identify 41 women in our patient population who have become pregnant. Using personal interview, questionnaire, and review of perinatal records, pregnancy-related risks and complications were studied. RESULTS: With over a 95% follow-up rate on the patients identified as having been pregnant following surgery, we found less risk of gestational diabetes, macrosomia, and cesarean section than associated with obesity. There were no patients with clinically significant anemia. CONCLUSION: Since the patients had an operation that restricts their food intake, some basic precautions should be taken when they become pregnant. With this in mind, our patients have done well with their pregnancies. The post-surgical group had fewer pregnancy-related complications than did an internally controlled group that were morbidly obese during their previous pregnancies.

Pregnancy after gastric bypass for morbid obesity.

Richards DS, Miller DK, Goodman GN

There has been only one previous report on pregnancies following gastric bypass for the treatment of morbid obesity. In this study 57 such pregnancies were compared to a group of control pregnancies occurring in morbidly obese women before their bypass surgery. There was a significantly lower incidence of hypertension and large-for-gestational-age infants in the postoperative pregnancies. There was no significant difference in a number of other pregnancy complications studied.


Pregnancy following gastric bypass for the treatment of morbid obesity.

Printen KJ, Scott D

Of the patients undergoing gastric bypass for treatment of morbid obesity, 75 per cent are female. A common question both pre-and postoperatively concerns the advisability of a pregnancy following surgically-induced weight loss. Of all patients, 45 became pregnant on 54 occasions following gastric bypass and 46 infants were delivered. There were two spontaneous abortions (4.0%) and six early terminations of an undesired pregnancy. Seven infants were delivered prematurely. One child was born microcephalic and has developed severe retardation in both growth and development. In contrast to reports of infants born to mothers with jejunoileal bypass, 12 of the babies that were born to mothers after gastric bypass were heavier at birth than older siblings. An additional ten infants were the first born to women who had lost more than 100 pounds following gastric bypass. All but one of the women became pregnant more than six months following surgery. This corresponds to the period of maximum weight loss and reversal of menstrual abnormalities associated with massive obesity. Pregnancies were well tolerated by the mothers, with no excessive increase in weight loss or development of metabolic deficiencies. Since the gastric bypass is modeled on the Billroth II gastrectomy, additional iron
supplementation was recommended during the pregnancy. While we cannot recommend pregnancy during the period of rapid weight loss in the initial postoperative period, our data indicate that neither the mother nor the developing fetus is unduly endangered by a pregnancy which develops after the period of rapid postoperative weight loss.


Pregnancy outcome and weight gain recommendations for the morbidly obese woman.

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**OBJECTIVE:** To compare pregnancy outcomes between morbidly obese and nonobese women and to determine the effect of gestational weight gain on pregnancy outcome in morbidly obese women. **METHODS:** A retrospective cohort study was conducted comparing 613 morbidly obese and 11,313 nonobese women who were delivered of a singleton live birth. Morbid obesity was defined as a body mass index greater than 35. The incidence of selected perinatal and neonatal outcomes was assessed for the two groups. Multiple logistic regression analysis was used to evaluate the association between morbid obesity and various measures of outcome while controlling for potential confounders. A subanalysis of the morbidly obese patients was performed to assess the effect of gestational weight gain on pregnancy outcome. **RESULTS:** Morbidly obese patients were more likely to experience pregnancy complications including diabetes, hypertension, preeclampsia, and arrest-of-labor disorders; however, these were not affected by gestational weight gain. Morbidly obese patients were more likely to experience fetal distress and meconium and to undergo cesarean delivery than their nonobese counterparts (P < .05). Weight gains of more than 25 lb were associated strongly with birth of a large for gestational age (LGA) neonate (P < .01); however, poor weight gain did not appear to increase the risk of delivery of a low birth weight neonate. **CONCLUSION:** Gestational weight gain was not associated with adverse perinatal outcome, but it did influence neonatal outcome. To reduce the risk of delivery of an LGA newborn, the optimal gestational weight gain for morbidly obese women should not exceed 25 lb.

Perinatal outcome in pregnancy complicated by massive obesity.

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OBJECTIVE: Our objective was to determine the impact of massive obesity during pregnancy, defined as maternal weight > 300 pounds, on perinatal outcome. STUDY DESIGN: A case-controlled study was conducted. Between Jan. 1, 1986, and Dec. 31, 1990, 111 pregnant women weighing > 300 pounds who were delivered at Long Beach Memorial Women's Hospital were identified with a perinatal data base search. A control group matched for maternal age and parity was selected, and perinatal variables were compared between groups. To control for potential confounding medical complications, massively obese patients with diabetes and/or chronic hypertension antedating the index pregnancy were excluded from the obese group, and the data were reanalyzed. The Student t test chi 2, and Fisher's exact statistical analysis were used where appropriate. RESULTS: Massively obese pregnant women are significantly more likely to have a multitude of adverse perinatal outcomes, including primary cesarean section (32.4% vs 14.3%, p = 0.002), macrosomia (30.2% vs 11.6%, p = 0.0001), intrauterine growth retardation (8.1% vs 0.9%, p = 0.03), and neonatal admission to the intensive care unit (15.6% vs 4.5%, p = 0.01). They also are significantly more likely to have chronic hypertension (27.0% vs 0.9%, p < 0.0001) and insulin-dependent diabetes mellitus (19.8% vs 2.7%, p = 0.0001). However, when those massively obese pregnant women with diabetes and/or hypertension antedating pregnancy are excluded from analysis, no statistically significant differences in perinatal outcome persisted. CONCLUSION: Massively obese pregnant women are at high risk for adverse perinatal outcome; however, this risk appears to be related to medical complications of obesity.


Pregnancy outcomes after gastric-bypass surgery.

Dao T, Kuhn J, Ehmer D, Fisher T, McCarty T.
BACKGROUND: The purpose of this study is to compare outcomes of patients who become pregnant within the first year after surgery and those who delayed pregnancy until after 1 year after surgery. METHODS: A retrospective review was performed to identify patients who became pregnant after their gastric-bypass surgery from 2001 to 2004. Endpoints included pregnancy complications, fetal birth weight and outcome, delivery method, weight change during pregnancy, and nutrition. RESULTS: Of 2,423 patients who had undergone bariatric surgery from 2001 to 2004, 21 patients became pregnant within the first year after surgery and 13 became pregnant after 1 year. Similar outcomes were seen between the 2 groups regarding fetal weight, term pregnancy, and complications. CONCLUSIONS: Pregnancy outcomes within the first year after weight-loss surgery revealed no significant episodes of malnutrition, adverse fetal outcomes, or pregnancy complications. Anxiety over poor outcomes of pregnancy during the first year after bariatric surgery can be allayed.