Bariatric Surgery

Overview of Procedural Options
The Obesity Epidemic

In 1991, NO state had an obesity rate above 20%\(^1\)

As of 2010, more than two-thirds of states (38) now have adult obesity rates above 25%\(^1\)

Eight states have obesity rates above 30%: Alabama, Arkansas, Kentucky, Louisiana, Mississippi, Oklahoma, Tennessee and West Virginia\(^1\)

\(^1\)Source: *F as in Fat: How Obesity Threatens America’s Future 2010*
http://healthyamericans.org/reports/obesity2010/
How is Obesity Calculated?

The standard indicator of level of overweight is the **Body Mass Index (BMI)**, a number calculated from a person’s weight and height.

BMI is expressed metrically as kg/m² and is calculated by:

\[
\text{BMI} = \left( \frac{\text{Weight in Pounds}}{(\text{Height in Inches})^2} \right) \times 703
\]

A BMI of 30 or more is considered to represent obesity. A BMI of 40 or more, or a BMI of 35 or more in the presence of significant obesity related comorbidities is considered to represent morbid obesity.¹

An automatic BMI calculator is also available online at:

http://www.nhlbisupport.com/bmi/

### Table 2. Prevalence of Obesity and Overweight for Adults Aged 20 Years or Older

<table>
<thead>
<tr>
<th>Categories by Age</th>
<th>All(b)</th>
<th>Non-Hispanic White</th>
<th>Non-Hispanic Black</th>
<th>All Hispanics(c)</th>
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<tr>
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<td>All, age, y</td>
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<td>(\geq 20)</td>
<td>33.9 (31.7-36.1)</td>
<td>32.8 (29.4-36.1)</td>
<td>44.1 (39.9-48.3)</td>
<td>37.9 (32.3-43.4)</td>
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<td>32.4 (29.6-35.9)</td>
<td>44.1 (40.0-48.2)</td>
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<td>Men, age, y</td>
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**Among Adults Aged 20 Years or Older…**

- **68.3% BMI \(\geq 25\) (Overweight)**
- **33.9% BMI \(\geq 30\) (Obese)**
Prevalence of Obesity for Adults – BMI > 35

Among Adults Aged 20 Years or Older...

14.3% BMI ≥ 35 (Obese)

5.7% BMI ≥ 40 (Severely Obese)
Obesity-Associated Comorbidities

Research has shown that as weight increases to reach the levels referred to as "overweight" and "obesity," the risks for the following conditions also increases:¹

- Coronary heart disease
- Type 2 diabetes
- Cancers (endometrial, breast, and colon)
- Hypertension (high blood pressure)
- Dyslipidemia (for example, high total cholesterol or high levels of triglycerides)
- Stroke
- Liver and gallbladder disease
- Sleep apnea and respiratory problems
- Osteoarthritis (a degeneration of cartilage and its underlying bone within a joint)
- Gynecological problems (abnormal menses, infertility)

How is Obesity Treated?

Non-Surgical Treatment
• Medication
• Diet and exercise
• Behavior modification

Surgical Treatment
Due to the high failure rate in maintaining weight loss after medically supervised diets, surgery has proven to be the most effective and only durable treatment for morbidly obese patients. It delivers long-term weight loss, with minimal morbidity and mortality, and also improves or achieves complete remission for several of the comorbidities associated with the disease.¹

“Only surgery has proven effective over the long term for most patients with clinically severe obesity.”


Bariatric Surgery Overview

What is Bariatric Surgery?
Bariatric surgery is a medical procedure that produces weight loss by limiting how much the stomach can hold, and by limiting absorption of calories.

What is the Goal of Bariatric Surgery?
The goal of bariatric surgery is for the patient to lose over half his/her excess weight in order to help reduce or prevent obesity-related health problems.

What are the Procedural Options?
Bariatric Procedures can be classified into three main categories:
1) Restrictive
   - Laparoscopic Sleeve Gastrectomy, Laparoscopic Adjustable Gastric Banding
2) Malabsorptive
   - Biliopancreatic Diversion and Duodenal Switch
3) Combination of Restrictive and Malabsorptive
   - Roux-en-Y Gastric Bypass

Is Success Guaranteed?
Bariatric surgery is a tool to help patients lose weight, but must be combined with lifelong commitment to diet, activity, and support to increase the chances of success.
American Society of Metabolic and Bariatric Surgery Statement

Treatment for Metabolic Diseases and Conditions:

“Bariatric surgery is known to be the most effective and long lasting treatment for morbid obesity and many related conditions, but now mounting evidence suggests it may be among the most effective treatments for metabolic diseases and conditions, including type 2 diabetes, hypertension, high cholesterol, non-alcoholic fatty liver disease and obstructive sleep apnea.”

Improved Safety:

“According to a recent study from the Agency for Healthcare Research and Quality (AHRQ), the mortality rate associated with bariatric surgery dropped by a staggering 78.7%, from 0.89% in 1998 to 0.19% in 2004.  Meanwhile, the mortality rate from morbid obesity was reduced by 89% after bariatric or metabolic surgery, according to a study published in the Annals of Surgery in 2004.”

-- ASMBS Statement, August 22, 2007

American Diabetes Association Statement

Surgery for Weight Loss:

“Gastric reduction surgery can be an effective weight loss treatment for obesity and may be considered in people with diabetes who have BMI ≥35 kg/m².”

Surgery for Type 2 Diabetes Resolution:

“A meta-analysis of studies of bariatric surgery reported that 77% of individuals with type 2 diabetes had complete resolution of diabetes (normalization of blood glucose levels in the absence of medications), and diabetes was resolved or improved in 86%.”

-- Nutrition Recommendations and Interventions for Diabetes: A Position Statement of the American Diabetes Association
http://care.diabetesjournals.org/content/31/Supplement_1/S61.full
Review of the Normal Digestive System

Esophagus
The muscular tube that carries solid foods and liquids from the mouth to the stomach

Stomach
The “storage pouch” of the gastro-intestinal tract. After food is swallowed, it arrives in the stomach, where it is processed before passing to the small intestine.

Small Intestine (Duodenum, Jejunum, Ileum)
A 20-30 foot tube where the vast majority of nutrients and calories from food are absorbed.

Large Intestine
The final part of the digestive tract where water is re-absorbed into the body from the leftover liquid from digested food.

Normally, as food moves along the digestive tract, appropriate digestive juices and enzymes arrive at the right place at the right time to digest and absorb calories and nutrients. After chewing and swallowing the food, it moves down the esophagus to the stomach, where a strong acid continues the digestive process.

When the stomach contents move through the pylorus to the duodenum, bile and pancreatic juice speed up the digestion. Most of the calcium and iron in the foods we eat is absorbed in the duodenum. The jejunum and ileum complete the absorption of almost all calories and nutrients. The food particles that cannot be digested in the small intestine are stored in the large intestine and eliminated.
Normal Digestive Process Animation

Animations available on www.bariatrics4diabetes.com:
Three Types of Most Commonly Performed Bariatric Surgery Procedures

Restrictive

- Sleeve Gastrectomy
- Adjustable Gastric Banding

Malabsorptive

- Biliopancreatic Diversion with Duodenal Switch

Combination

- Roux-en-Y Gastric Bypass
Most bariatric surgeries today use laparoscopy, in which a small incision is made in the abdomen and a small camera, or scope, enables the surgeon to view internal organs on a video monitor. Other small incisions are made to insert surgical instruments.

Laparoscopic surgery is less invasive than “open” abdominal procedures, resulting in less postoperative pain, fewer wound complications, shorter hospital stays and quicker returns to work.

Through recent technological advances, some minimally invasive procedures are now being performed through the SILS™ procedure, an advanced technique that requires only one small incision (typically through the belly button), rather than multiple small incisions.
Sleeve Gastrectomy Procedure

This procedure involves surgery only on the stomach and does not involve any surgery on the intestine.

It basically consists of making a stomach that (before surgery) looks like a pouch into a long tube, or “sleeve”.

The sleeve gastrectomy procedure removes approximately 2/3 of the stomach, which provides for quicker satiety (sense of fullness) and decreased appetite.

The smaller stomach sleeve restricts food intake by allowing only a small amount of food to be eaten at one time.
Sleeve Gastrectomy Procedure

1. A small sleeve (or narrow tube) is created with a surgical stapler along the inside curve of the stomach, from the pylorus of the stomach up to the esophagus.

2. After the separation of the stomach into a smaller tube is completed, the remainder of the stomach is removed.

3. The valve at the outlet of the stomach remains, which provides for the normal process of stomach-emptying to continue, which allows for the feeling of fullness.

4. The muscle defects underneath the skin are often closed with suture that is absorbable. The skin incisions are then closed with suture, steri-strips or staples, depending on the surgeon’s preference.
Sleeve Gastrectomy Animation

Laparoscopic Sleeve Gastrectomy (LSG)

**PATIENT Benefits**
- More effective EWL and T2D resolution than LAGB\(^1\)
- No need for additional visits for band fills (as with adjustable gastric banding)
- No foreign body
- Less or absent nutritional deficiencies than LRYGB\(^2\)
- Greater appetite suppression than LRYGB\(^3\)
- Can be performed laparoscopically on high BMI patients\(^3\)

**HOSPITAL Benefits**
- Less resource allocation (potentially shorter LOS than LRYGB)
- Increased opportunity for SILS™ technique when compared to LRYGB
- When combined with LRYGB and LAGB more comprehensive/competitive patient offering

**SURGEON Benefits**
- Minimal follow-up required when compared to LRYGB and LAGB\(^3\) (resource strain)
- Can be performed laparoscopically on high BMI patients\(^3\)
- Technically simpler\(^3\) and increased opportunity for SILS™ technique when compared to LRYGB
- No re-routing of anatomy; no anastomosis
- Relatively new procedure – marketing cache/image/buzz

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\(^1\) Birkmeyer et al. “Hospital Complication Rates with Bariatric Surgery in Michigan”
\(^2\) Gehrer et al. “Fewer Nutrient Deficiencies After LSG than After LRYGB – A Prospective Study”
\(^3\) Abu-Jaish et al. “Sleeve Gastrectomy: a New Surgical Approach for Morbid Obesity”
Roux-en-Y Gastric Bypass Procedure

This procedure involves surgery on both the stomach and the intestine.

As “gastric bypass” implies, following this surgical procedure, food is now routed past most of the stomach and the first part of the small intestine.

In addition to restricting food intake, a Roux-en-Y Gastric Bypass reduces nutrient absorption.
Roux-en-Y Gastric Bypass Procedure

1. A small stomach pouch is (about the size of your thumb) is created using a surgical stapler.
   a. The small stomach pouch restricts food intake.

2. The small bowel is divided, using a surgical stapler, about two feet from the stomach.

3. One end of the small intestine is brought up and attached to the stomach pouch (gastrojejunostomy).

4. The other end of the small intestine, still connected to the non-functional stomach remnant, is reconnected to the intestinal tract (jejunojejunostomy).

5. The surgeon usually places a plastic drainage tube near the gastro-jejunal anastomosis to serve as a “sentinel” for a leak in this area.

6. The muscle defects underneath the skin are often closed with suture that is absorbable. The skin incisions are then closed with suture, steri-strips or staples, depending on the surgeon’s preference.
Roux-en-Y Gastric Bypass Animation

Animations available on www.bariatrics4diabetes.com:
Laparoscopic Roux-en-Y Gastric Bypass (LRYGB)

**PATIENT Benefits**

- Robust long-term data available
- No need for additional visits for band fills (as with adjustable gastric banding)
- More effective EWL and T2D resolution than LAGB and LSG\(^1,2\)
- No foreign body

**HOSPITAL Benefits**

- Widely accepted by insurance
- Established care pathways – known body of evidence on what to do

**SURGEON Benefits**

- Less resource strain than LAGB (no routine maintenance/fills required)
- Widely accepted by insurance
- More effective EWL and T2D resolution than LAGB and LSG\(^1,2\)

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1. Birkmeyer et al. “Hospital Complication Rates with Bariatric Surgery in Michigan”
2. Lee et al. “Gastric Bypass vs Sleeve Gastrectomy for Type 2 Diabetes Mellitus”
Adjustable Gastric Banding Procedure

This procedure utilizes an adjustable band that restricts the opening to the remainder of the stomach, attempting to create anatomy that provides a sensation of satiety after a very small meal.

A band is placed at the top of the stomach, creating a pouch. The opening to the rest of the digestive tract is adjustable through an epidermal port.

Appropriate aftercare and routine band adjustments are critical to the long-term success of this procedure.
1. A band is placed around the top of the stomach, creating a small pouch that limits food intake.

2. A small port is affixed inside the body that allows the band to be adjusted later to make the pouch smaller or larger.

3. The muscle defects underneath the skin are often closed with suture that is absorbable. The skin incisions are then closed with suture, steri-strips or staples, depending on the surgeon’s preference.
Adjustable Gastric Banding Animation

Animations available on www.bariatrics4diabetes.com:
Laparoscopic Adjustable Gastric Banding (LAGB)

**PATIENT Benefits**
- Lowest rate of complications when compared to LRYGB and LSG
- No re-routing of the anatomy; no stapling of stomach; no anastomosis

**HOSPITAL Benefits**
- Lowest rate of readmission and emergency department visits when compared to LRYGB and LSG
- Shorter Length of Stay than LRYGB and LSG
- Potential opportunity for increased cash pay patients
- Increased opportunity for SILS™ technique when compared to LRYGB

**SURGEON Benefits**
- On average, less operative time required – can stack more cases each day
- Increased opportunity for SILS™ technique when compared to LRYGB

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1 Birkmeyer et al. “Hospital Complication Rates with Bariatric Surgery in Michigan”
2 Abu-Jaish et al. “Sleeve Gastrectomy: a New Surgical Approach for Morbid Obesity”
Who is Eligible for Bariatric Surgery?

Through its Obesity Education Initiative, the National Institutes of Health issued the following recommendation:

*Surgical intervention is an option for carefully selected obesity (a BMI > 40 or > 35 with comorbid conditions) when less invasive methods of weight loss have failed and the patient is at high risk for obesity-associated morbidity and mortality.*

For patients interested in learning more about their surgical options, a Surgery Eligibility Tool is available at Bariatrics4Diabetes.com.


Who is NOT Eligible for Bariatric Surgery?

Bariatric Surgery is NOT recommended for patients with*:

- Untreated major depression or psychosis
- Binge eating disorders
- Current drug or alcohol abuse
- Severe heart disease that makes anesthesia prohibitively risky
- Severe inability of blood to clot normally
- Patients unable or unwilling to quit smoking
- BMI < 35
- Currently pregnant
- Some previous surgery and chronic condition restrictions may prevent eligibility

* Note: additional restrictions may apply; please consult your physician for additional information
Possible Side Effects and Complications

Potential side effects of bariatric surgery include, but are not limited to:

- Nausea and vomiting
- Gas and bloating
- Lactose intolerance
- Temporary hair thinning
- Depression and psychological distress
- Changes in bowel habits

Potential complications of bariatric surgery include, but are not limited to:

- Infection, bleeding or leakage at suture/staple lines
- Blockage of intestines or stomach pouch
- Dehydration
- Blood clots in legs or lungs
- Vitamin and/or mineral deficiency
- Protein malnutrition
- Incisional hernia
- Irreversibility, or difficulty reversing some procedures
- Revision procedure(s) sometimes needed
- Death
Typical Patient Care Pathway

1. Initial Contact
2. Informational Seminar
3. Pre-Op Information Exchange
4. Preoperative Evaluation
5. Surgery
6. Post-Op Follow-Up and Support
7. Success!
What Patients Can Expect After Surgery

In the Weeks Following the Procedure
• No strenuous activities for three weeks after surgery
  • Patients may walk and perform light household duties as tolerated

  • Most patient return to work 2-4 weeks after surgery
    • Individual circumstances may vary

Patient’s Lifetime Commitment is Critical to Success
• Eat healthy foods

  • Take vitamins, minerals and protein supplements

  • Maintain an active lifestyle

  • Attend support group meetings

  • Follow-up with surgical team

  • Avoid alcohol for at least one year post-surgery

  • Avoid tobacco products
Questions?