Surgical Options for Weight Loss

Jordan Garrison Jr. MD, FACS, FASMBS
A life-long progressive, life-threatening, genetically-related, costly, multifactorial disease of excess fat storage with multiple co-morbidities
OBESITY
A World-Wide Epidemic

~ 25% industrialized world
Obesity Trends* Among U.S. Adults
BRFSS, 1985

(*BMI ≥ 30, or ~ 30 lbs overweight for 5’4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1986

(*BMI ≥30, or ~30 lbs overweight for 5’4” woman)
Obesity Trends* Among U.S. Adults
BRFSS, 1987

(*BMI ≥30, or ~ 30 lbs overweight for 5’4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1988

(*BMI ≥30, or ~ 30 lbs overweight for 5’4” woman)
Obesity Trends* Among U.S. Adults
BRFSS, 1989

(*BMI ≥30, or ~30 lbs overweight for 5’4” woman)
Obesity Trends Among U.S. Adults
BRFSS, 1990

(*BMI ≥ 30, or ~ 30 lbs overweight for 5’4” woman)

[Map of the United States with states shaded in varying colors to represent obesity trends.]

- No Data
- <10%
- 10%-14%
Obesity Trends* Among U.S. Adults
BRFSS, 1991

(*BMI ≥30, or ~30 lbs overweight for 5′4″ woman)
Obesity Trends Among U.S. Adults

BRFSS, 1992

(*BMI ≥30, or ~30 lbs overweight for 5’4” woman)
Obesity Trends* Among U.S. Adults
BRFSS, 1993

(*BMI ≥30, or ~ 30 lbs overweight for 5’4” woman)
Obesity Trends* Among U.S. Adults
BRFSS, 1994

(*BMI ≥30, or ~ 30 lbs overweight for 5’4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1996

(*BMI ≥30, or ~ 30 lbs overweight for 5’4” woman)
Obesity Trends* Among U.S. Adults

BRFSS, 1997

(*BMI ≥30, or ~ 30 lbs overweight for 5’4” woman)
Obesity Trends Among U.S. Adults

BRFSS, 1998

(*BMI ≥30, or ~30 lbs overweight for 5’4” woman)
Obesity Trends* Among U.S. Adults
BRFSS, 1999

(*BMI ≥30, or ~ 30 lbs overweight for 5’4” woman)
Obesity Trends Among U.S. Adults
BRFSS, 2000

(*BMI ≥30, or ~ 30 lbs overweight for 5’4” woman)
Obesity Trends* Among U.S. Adults
BRFSS, 2001

(*BMI ≥30, or ~30 lbs overweight for 5’4” woman)

What is Happening?
Monster Portions

Growth of serving sizes of three products since 1955, by calories. For children aged 7 to 10, nutritionists recommend a daily diet of 1,600 to 2,400 calories.

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**McDonald's Fries**
- 210 CALORIES, 2.3 oz (ONLY SIZE AVAILABLE)
- 610 CALORIES, 6.9 oz (SUPER SIZE)

**Coca-Cola**
- 80 CALORIES, 6.5 oz (ONLY SIZE AVAILABLE)
- 250 CALORIES, 20 oz (BOTTLE)

**Snickers Bar**
- 150 CALORIES, 1.1 oz (ONLY SIZE AVAILABLE)
- 510 CALORIES, 3.7 oz ("THE BIG ONE")

1995 PORTION | 2001 OPTIONS
What Should I Do?
"Thelma is trying that new Duct Tape Diet."
YOUR INCREDIBLE SHRINKING DAY
(PART 1)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOURS IN A DAY</td>
<td>24</td>
</tr>
<tr>
<td>PREP FOR THE DAY</td>
<td>1</td>
</tr>
<tr>
<td>COMMUTE/PARK</td>
<td>2</td>
</tr>
<tr>
<td>WORK (8-10)</td>
<td>9</td>
</tr>
<tr>
<td>SLEEP</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

This leaves 4 hours to do everything else!
YOUR INCREDIBLE SHRINKING DAY (PART 2)

What is everything else?

- Laundry
- Homework
- Housework
  - Dishes
- Novellas/Scandal
- Watching the Game
- Kids’ Activities
  - PTA
- Walking the Dog
- Down Time/ Hanging Out
  - Phone Time
  - Exercise
  - Intimacy

What Have We Forgotten?
Incidence of Overweight & Obesity (BMI > 25) in the US

- ≥ 55% Males
- ≥ 55% Females
- ≥ 60% Mexican/African Americans
- ≥ 60% Ages 50–59 M & F

and INCREASING!!
(BMI) Body Mass Index

\[
\text{BMI} = \frac{\text{Wt}(\text{kg})}{\text{Ht}(\text{m}^2)}
\]

= \left[ \frac{\text{lbs}}{\text{in}^2} \right] \times 705

An objective measure of obesity
| Height (ft\:'in") | 5'0" | 5'2" | 5'4" | 5'6" | 5'8" | 5'10" | 6'0" | 6'2" | 6'4" | 6'6"
|------------------|------|------|------|------|------|-------|------|------|------|------
<p>| Height (in)      | 60   | 62   | 64   | 66   | 68   | 70    | 72   | 74   | 76   | 78   |
| BMI  (kg/m²)     |      |      |      |      |      |       |      |      |      |      |
| 150              | 29.4 | 27.5 | 25.8 | 24.3 | 22.9 | 21.6  | 20.4 | 19.3 | 18.3 | 17.4 |
| 160              | 31.3 | 29.3 | 27.5 | 25.9 | 24.4 | 23.0  | 21.7 | 20.6 | 19.5 | 18.5 |
| 170              | 33.3 | 31.2 | 29.2 | 27.5 | 25.9 | 24.4  | 23.1 | 21.9 | 20.7 | 19.7 |
| 180              | 35.2 | 33.0 | 31.0 | 29.1 | 27.4 | 25.9  | 24.5 | 23.2 | 22.0 | 20.8 |
| 190              | 37.2 | 34.8 | 32.7 | 30.7 | 28.9 | 27.3  | 25.8 | 24.4 | 23.2 | 22.0 |
| 200              | 39.1 | 36.7 | 34.4 | 32.3 | 30.5 | 28.8  | 27.2 | 25.7 | 24.4 | 23.2 |
| 210              | 41.1 | 38.5 | 36.1 | 34.0 | 32.0 | 30.2  | 28.5 | 27.0 | 25.6 | 24.3 |
| 220              | 43.1 | 40.3 | 37.8 | 35.6 | 33.5 | 31.6  | 29.9 | 28.3 | 26.8 | 25.5 |
| 230              | 45.0 | 42.2 | 39.6 | 37.2 | 35.0 | 33.1  | 31.3 | 29.6 | 28.1 | 26.6 |
| 240              | 47.0 | 44.0 | 41.3 | 38.8 | 36.6 | 34.5  | 32.6 | 30.9 | 29.3 | 27.8 |
| 250              | 48.9 | 45.8 | 43.0 | 40.4 | 38.1 | 35.9  | 34.0 | 32.2 | 30.5 | 29.0 |
| 260              | 50.9 | 47.7 | 44.7 | 42.1 | 39.6 | 37.4  | 35.3 | 33.5 | 31.7 | 30.1 |
| 270              | 52.8 | 49.5 | 46.4 | 43.7 | 41.1 | 38.8  | 36.7 | 34.7 | 32.9 | 31.3 |
| 280              | 54.8 | 51.3 | 48.2 | 45.3 | 42.7 | 40.3  | 38.1 | 36.0 | 34.2 | 32.4 |
| 290              | 56.8 | 53.2 | 49.9 | 46.9 | 44.2 | 41.7  | 39.4 | 37.3 | 35.4 | 33.6 |
| 300              | 58.7 | 55.0 | 51.6 | 48.5 | 45.7 | 43.1  | 40.8 | 38.6 | 36.6 | 34.7 |
| 310              | 60.7 | 56.8 | 53.3 | 50.1 | 47.2 | 44.6  | 42.1 | 39.9 | 37.8 | 35.9 |
| 320              | 62.6 | 58.7 | 55.0 | 51.8 | 48.8 | 46.0  | 43.5 | 41.2 | 39.0 | 37.1 |
| 330              | 64.6 | 60.5 | 56.8 | 53.4 | 50.3 | 47.4  | 44.8 | 42.5 | 40.3 | 38.2 |
| 340              | 66.5 | 62.3 | 58.5 | 55.0 | 51.8 | 48.9  | 46.2 | 43.7 | 41.5 | 39.4 |
| 350              | 68.5 | 64.1 | 60.2 | 56.6 | 53.3 | 50.3  | 47.6 | 45.0 | 42.7 | 40.5 |
| 360              | 70.5 | 66.0 | 61.9 | 58.2 | 54.9 | 51.8  | 48.9 | 46.3 | 43.9 | 41.7 |
| 370              | 72.4 | 67.8 | 63.6 | 59.8 | 56.4 | 53.2  | 50.3 | 47.6 | 45.1 | 42.8 |
| 380              | 74.4 | 69.6 | 65.4 | 61.5 | 57.9 | 54.6  | 51.6 | 48.9 | 46.4 | 44.0 |
| 390              | 76.3 | 71.5 | 67.1 | 63.1 | 59.4 | 56.1  | 53.0 | 50.2 | 47.6 | 45.2 |
| 400              | 78.3 | 73.3 | 68.8 | 64.7 | 60.9 | 57.5  | 54.4 | 51.5 | 48.8 | 46.3 |
| 410              | 80.2 | 75.1 | 70.5 | 66.3 | 62.5 | 59.0  | 55.7 | 52.8 | 50.0 | 47.5 |</p>
<table>
<thead>
<tr>
<th>BMI &amp; Obesity</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptable Range</td>
<td>18.5–24.9</td>
</tr>
<tr>
<td>Overweight</td>
<td>25–29.9</td>
</tr>
<tr>
<td>Obese</td>
<td>30–34.9</td>
</tr>
<tr>
<td>Severe Obesity</td>
<td>35–39.9</td>
</tr>
<tr>
<td>Morbid Obesity</td>
<td>40–49.9</td>
</tr>
<tr>
<td>Super-Morbid Obesity</td>
<td>50–+++</td>
</tr>
</tbody>
</table>

Body Mass Index = $\frac{\text{weight (kg)}}{\text{height (m}^2\text{)}}$
Obesity Co-Morbidities

- Economic
- Physical
- Psychological
- Social
- Medical
Medical Co-Morbidities

Respiratory Dysfunction* (~10–20%)

- Hypertension (~25–55%)
- Diabetes (~14–20%)
- Urinary Stress Incontinence (~50%)
- Gall Bladder Disease (~25–45%)

Cardiac Dysfunction (~10–15%)

- Arthritis (~20–25%)
- Hyperlipidemia (~35–45%)
- Menstrual Irregularities (~50%)

≡ (Incidence) ≡

*Includes Sleep Apnea
Physical Co-Morbidity

- Clothing choice and prices
- Furniture incapacity
  - seats: theater, planes, buses
  - restaurant booths
  - toilet/shower cubicles
- Personal hygiene (reach limit)
- Tying shoelaces
Discrimination

Workplace  School  Home
Friends  Associates
Doctors/Providers
**COSTS: US**

> $140 billion

- **Personal:** > $30 billion
- **Medical Care:** > $68.8 billion
- **Business/Society:** ????

- Accidents
- Fatigue
- Mobility
- Sick Days
- Disability
Surgery has proven effective over the long term for most patients with clinically severe obesity

-NIH Consensus Development Conference Statement
Why Surgery?

- Surgery is an accepted and effective approach
- Improvement in co-morbidities
- Other methods provide short term weight loss
Medical therapy can offer short term gains, but in the morbidly obese population surgical therapy is more definitive.
Medical Treatment of Obesity

- **Diet** – low in calories, fat and carbohydrates
- **Exercise** – 40 minutes 3-5 times per week
- Jenny Craig, Nutrisystem, Weight Watchers

- **Drugs/Prescription medications**
  - Stimulants/appetite suppressants (Phentermine)
  - Antidepressants (Meridia®)
  - Reduce fat absorption (Xenical®)
Oral cavity
Tongue
Oropharynx
Esophagus
Liver
Stomach
Pancreas
Gallbladder
Duodenum
Transverse colon
Jejunum
Ascending colon
Ileum
Sigmoid colon
Rectum
Cecum
Appendix
Anal canal and anus
Restrictive

Combination:
Restriction & Malabsorption
Purely Restrictive

Restricts the amount of food that you can consume and therefore decreases the number of calories eaten. This type of procedure does not alter the digestive or absorptive function of the intestine.
Adjustable Gastric Banding

Purely Restrictive Procedure
The Band is placed around the top of the stomach and induces weight-loss in 3 ways:

- Creates a small “stomach pouch” that fills with just a little amount of food (causing a sensation of “fullness”)
- “Squeezes” the stomach like an hourglass keeping food in the stomach pouch (prolonging the sensation of “fullness”)
- Suppresses or takes away the appetite

Port located under skin on belly
**Adjustments:**

In office vs. Radiology
Once a month at least, more in the beginning

Average amount of adjustments needed is 3-4
Determined at office visit:
Depends on quantity of food, amount of weight lost, degree of hunger
Adjustable Gastric Banding

Complications:

- Slippage 2%
- Erosion 1%
- Infection <1%
- Bleeding <1%
- Esophageal/Stomach Dilation 2%
- Nausea/Vomiting/stoma obstructions 5%
- Access Port Problems 2%

Hiatal Hernia
Adjustable Gastric Banding

- **Weight Loss:**
  - 5-25 lbs in first two weeks
  - 1-2 lbs weekly
  - Average Weight Loss in 1 year = 65 lbs
  - Weight Loss continues year after year
  - Operative Time = 45 min to 1 hr
  - Hospital Stay = Same Day or 23 hours
Adjustable Gastric Banding

Questions?
Sleeve Gastrectomy

- Stomach divided with staples. 80% removed leaving banana shaped stomach
- 1st step before another procedure (gastric bypass) for High BMI
- Gaining Popularity since the year 2000 as Single Procedure
Sleeve Gastrectomy

Risks: 3 - 5%

- Perforation/Leak
- Ulcer
- Bleeding
- Infection
- Narrowing/Obstruction of stomach
Sleeve Gastrectomy

- Average % Weight Loss 65%
- No need for Adjustments
- Remove Ghrelin (Hormone that Controls Hunger and Appetite)
- Maintain Normal Digestion
- Average operative time is 1-1/2 hours
- Average hospital stay is 1-3 days
Combination Procedures

- Roux en Y Gastric Bypass
The Roux-en-Y gastric bypass (known simply as the Gastric Bypass) is a Combination Procedure done Laparoscopically.

It causes weight loss by restricting the food intake, and creating a certain amount of malabsorption.
The stomach is stapled into 2 parts, one small and one large. The small piece becomes the "new" stomach **pouch**.

- The pouch is 5% of the size of the old stomach, therefore holds much less food.

- The larger portion of the stomach stays in place, however it will lie dormant for the remainder of the patient’s life.
The beginning section of the small intestine (the jejunum) is divided using a surgical stapler approximately 3 feet from the end of the stomach.
The section coming from the stomach is reattached to the small intestine ("A" on the diagram) approximately 100 to 150 centimeters (3 to 5 feet) from the recently stapled end of the small intestine.

This forms the Roux limb.

The Roux limb is then brought next to the pouch
The Roux-en-Y Procedure

- The end of the Roux limb is then attached to the newly formed pouch (red arrow)
- The Roux limb carries food to the intestines
- The Y limb carries digestive juices from the pancreas, gall bladder, liver and duodenum to the intestines
- The food and the digestive juices mix where the Roux limb and Y limb meet ("A")
Roux en Y Gastric Bypass

Complications:
- Death: 0.5-1.0%
- Leak: 3.0%
- Stricture: 5%
- Intestinal Blockage: 5%
- Ulcer: 7%
- Bleeding: <1%
- Blood Clot: <1%
- Dumping Syndrome: 5%
- Vitamin and Supplement Deficiencies: 5%
Rapid Weight loss
- First month----------25-30 pounds
- Average weight loss in 1 year 74-80%

- Operative Time 1-1/2hrs to 3hrs
- Hospital Stay 1-3 days
Roux en Y Gastric Bypass

Questions?
Benefits of Laparoscopy:

- Less pain
- Less physiological trauma
- Faster recovery
- Less pulmonary complications
- Less wound infections
- Less hernia formation
- Less splenic trauma
- Superior cosmetic result
Obesity is a long-term, progressive, multi-factorial disease that costs and kills, especially the morbidly obese.

The disease is increasing in epidemic proportions—a major modern problem.

Obesity surgery is effective long-term with weight loss and co-morbidities.
Preoperative preparation:
- Psychological evaluation
- Nutritional counseling
- Comprehensive Preoperative Testing
- Echo, EKG, PFT’s, Venous Duplex, CXR, Blood Work, Ultrasound Liver/Gallbladder
- Additional Testing
- Clearance by Primary Care Physician and Specialists