Bariatric Surgery
A Treatment Option for Morbid Obesity

Casey Hammerle MS, RN, CNS
Program Coordinator for Bariatric Surgery
at Upstate Medical University, Syracuse NY
The Problem

- 69% of Americans are overweight
- 36% of Americans are obese (BMI>30)
- 5% of Americans are Morbidly obese
  (15 million people)
Prevalence* of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2013

*Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.
BMI Classifications

<table>
<thead>
<tr>
<th>BMI</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>18.5 – 24.9</td>
<td>Normal</td>
</tr>
<tr>
<td>25.0-29.9</td>
<td>Over weight</td>
</tr>
<tr>
<td>30.0-34.9</td>
<td>Obese</td>
</tr>
<tr>
<td>35.0-39.9</td>
<td>Severe Obesity</td>
</tr>
<tr>
<td>40.0-50.0</td>
<td>Morbid Obesity</td>
</tr>
<tr>
<td>&gt;50</td>
<td>Super Obesity</td>
</tr>
</tbody>
</table>
What is Morbid Obesity?

• BMI > 40
• BMI > 35 with co-morbid diseases
Risk of What?

- Type 2 diabetes
- Hypertension
- Sleep apnea
- Dyslipidemia
- Coronary artery disease
- Stroke
- Gallbladder disease
- Osteoarthritis
- Some Cancers (stomach, endometrial, breast, colon)

Source: [www.cdc.gov/nccdphp/dnpa/obesity](http://www.cdc.gov/nccdphp/dnpa/obesity) on 3/08
Obesity is a Metabolic Disease

- Sleep apnea
- Asthma
- Heart disease
- High blood pressure
- GERD
- Type 2 diabetes
- Gallbladder disease
- Menstrual problems
- Infertility problems
- Gout
- Osteoarthritis
Why is this Happening?

“Genetics loads the gun… the environment pulls the trigger” – George Bray MD, 1996
Environment:

Back in the day of cavemen, they were forced to consume what they were able to hunt or gather.

Food choices were limited.

Portions were limited.

Physical activity was necessary to stay alive.
Processed Foods

• High in Trans Fats
• High in Sugar & High Fructose Corn Syrup
• High in Refined Carbohydrates
• “Hyper Rewarding” and Lead to Over consumption
  – People Can Literally Become Addicted to Junk Foods
• Low in Nutritional value
  – Low in Fiber
  – Less Energy and Time to Digest
Environment & Behaviors

- Elevators
- Escalators
- Moving sidewalks
- Automobiles
- Riding lawnmowers
Behavior: Declining Attention to Physical Fitness

- The majority of U.S. adults are not physically active on a regular basis
- Schools having less required physical activities
Weight Loss Treatments Options

- **Surgery**
  - BMI 35+ with comorbidities
  - BMI 40+

- **Pharmacotherapy**
  - BMI of 27+ with comorbidities
  - BMI of 30+

- **Behavior Modification (diet and exercise)**
  - BMI of 25+
Treatment Continuum

- **Step 1: Behavior modification**
  - recommended for BMIs above 25.
    - The vast majority of people who attempt this method fail
      - Some studies suggest as many as 90% will regain the lost weight
      - Not only will weight lost be regained, but often patients report gaining more than what was lost.
      - We call this yo-yo dieting.

Surgery
- BMI 35+ with comorbidites
- BMI 40+

Pharmacotherapy
- BMI of 27+ with comorbidites
- BMI of 30+

Behavior Modification (diet and exercise)
- BMI of 25+
Step 2: Pharmacotherapy

- Medications for weight loss
  - Most work by suppressing appetite
  - Many over the counter options show small to no success
  - Prescription drugs like Xenical, Meridia, and Tenuate have many cautions that need to be considered.
  - Side effects and drug-drug interactions
Why Surgery for Weight Loss?

– Behavior Modification
  • Diet and exercise
– Medication
– Yo-yo effect
• 97% of people who lost weight, regained.
Metabolic Set Point
THE VICIOUS DIET CYCLE

DIET

FEAST RESPONSE
- Reduced metabolic rate
- Loss of muscle
- Regain weight from fat

FAMINE RESPONSE
- Lose weight from lean muscle and fat
- Reduced metabolic rate
- Increase in fat storage

FALL OFF

REPEAT

overweight

decrease in calories

increase in calories

Knowing changes everything.
Step 3: Surgery

• Surgical procedures
  – Treatment for severe obesity when the first 2 methods have proven not successful.
  – Helps get the weight off and keep it off.
  – All types of bariatric surgery lead to very reduced calorie intake, especially in the first 6 months postoperative,
    • typically ranging less than 1000 calories/per day
  – Surgery types
    • Restrictive operations
    • Malabsorption operations
    • Combination operations
Restrictive Operations

- Weight loss achieved because patient feels full after taking in a small amount of food
- Examples:
  - Vertical Banded Gastroplasty
  - Laparoscopic Adjustable Gastric Band
  - Vertical Sleeve Gastrectomy
Malabsorptive Operations

- Weight loss achieved because path of digestion is changed. Not all components of food are absorbed.
- Example: Jejunoileal Bypass
Combination Operations

- Have both restrictive and malabsorptive properties
  - Roux-en-Y Gastric Bypass
  - Duodenal Switch
## Let’s Compare

<table>
<thead>
<tr>
<th>Surgery</th>
<th>V-BG**</th>
<th>Band</th>
<th>Sleeve*</th>
<th>DS</th>
<th>Bypass*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Restrictive</td>
<td>Restrictive</td>
<td>Restrictive</td>
<td>Malabsorptive</td>
<td>Restrictive &amp; Malabsorptive</td>
</tr>
<tr>
<td>Excess weight loss</td>
<td>40%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
<td>70%</td>
</tr>
<tr>
<td>Resolution of Type II Diabetes</td>
<td>Not found</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
<td>79%</td>
</tr>
<tr>
<td>Can be converted to another procedure?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Very difficult</td>
<td>Very difficult</td>
</tr>
</tbody>
</table>
Centers that do more, perform better

<table>
<thead>
<tr>
<th></th>
<th>High volume (&gt;100 cases/year)</th>
<th>Medium volume (50-100 cases/year)</th>
<th>Low volume (&lt;50 cases/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean No of cases/year</td>
<td>157</td>
<td>71</td>
<td>15</td>
</tr>
<tr>
<td>Mean No of days of stay</td>
<td>3.8*</td>
<td>4.4</td>
<td>5.1*</td>
</tr>
<tr>
<td>Mortality (%)</td>
<td>0.3*</td>
<td>0.5</td>
<td>1.2*</td>
</tr>
<tr>
<td>Complications (all types) (%)</td>
<td>10.2*</td>
<td>12.3</td>
<td>14.5*</td>
</tr>
<tr>
<td>Complications of medical care (%)</td>
<td>7.8*</td>
<td>9.5</td>
<td>10.8*</td>
</tr>
</tbody>
</table>

*P < 0.05. Data from Nguyen et al. *Ann Surg* 2004;240:586-94.
The longer we do this, the better we get.
What is the risk of death?

**Comparative Mortality**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Craniotomy</td>
<td>10.7%</td>
</tr>
<tr>
<td>Esophagectomy</td>
<td>9.1%</td>
</tr>
<tr>
<td>Pancreatectomy</td>
<td>8.3%</td>
</tr>
<tr>
<td>Peds Heart</td>
<td>5.4%</td>
</tr>
<tr>
<td>Aortic Aneurysm</td>
<td>3.9%</td>
</tr>
<tr>
<td>CABG</td>
<td>3.5%</td>
</tr>
<tr>
<td>Hip Replacement</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

**Bariatric Surgery**

0.28%

What other risks are associated with Bariatric Surgery?

- Pulmonary embolus 0.9%
- DVT 1.3%
- Leak 2.1-5.1%
- Stricture 5-12%
- Ulcer 20%
- Internal hernia 8.6%
- Vitamin or mineral deficiency

References:
Upstate Surgeries by the numbers

- Overall volumes increased each year with a peek in 2013
- 95% of operations done at Community Campus (400/12)
- Roux-en-Y (gastric bypass) continues to be the most commonly preformed procedure
- Sleeve volume is increasing
- Lap band volume has drastically decreased over last 3 years

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bypass</td>
<td>328</td>
<td>383</td>
<td>318</td>
<td>261</td>
</tr>
<tr>
<td>Sleeve</td>
<td>15</td>
<td>87</td>
<td>185</td>
<td>151</td>
</tr>
<tr>
<td>Band</td>
<td>38</td>
<td>12</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Annual Total</td>
<td>381</td>
<td>482</td>
<td>505</td>
<td>412</td>
</tr>
</tbody>
</table>
Upstate Surgeries by the numbers

- Roux-en-Y
- Vertical Gastric Sleeve
- Lap Band
- Yearly total

Graph showing the number of surgeries performed from 2011 to 2014.
Pre-operative Pathway

• Information session
• Meet with surgeon and RD
• Monthly appointments with NP
• Nutrition Class
• Completed checklist
  – Some will have endoscopy
  – Some will be placed on liquid diet within 2 weeks of operation
Pre-Operative Dietary training

Pre-operative effort pays off post operatively

- Kinds and amounts of food
  - Nutritional value
- Stop eating when no longer hungry
- Eating styles
  - Grazing
  - Grab and go
  - Gorging
  - Emotional eating

- Eating behaviors
  - 3 meals that last 20-30 minutes
  - Sitting
  - Small plates
  - Fork down between bites
  - One bite every 3-5 minutes
  - Attention to taste
- Liquids
  - No drinking with meals
    - Drink 30 min before and 30 min after
  - No gulping
  - No carbonation
  - No straws
In the Hospital Pathway

• Night of surgery
  – Out of bed
  – Pain medicine in IV
• Day 1 after surgery
  – Foley out (Roux-en-Y only)
  – Water trials
  – Pain medicine in liquid
  – Walking in hallway
• Day 2 after surgery
  – Discharge to home
  – Protein shakes at home (GI)
Post Operative Diets

- 3 stage diet
- Avoid dehydration by consuming 48-64 ounces per day of calorie free fluids
- Protein Supplements
  - Minimum of 40gm per day
  - Low cal
  - Start day of discharge
- Nutrient supplementation
  - Resume at 2 weeks post op
    - Multi vit
    - Vit B12
    - Calcium
    - Vit D
Gastric Bypass and Sleeve

- **Stage 1**
  - Calorie free liquids and Protein shakes for 7 days

- **Stage 2**
  - Low Fat, No sugar added soft foods
    - 3 meals
    - No drinking with meal
    - Protein first
    - Bite should be teaspoon size
    - Bites 3 minutes apart
    - One food at a time
    - About 6 weeks in this stage

- **Stage 3**
  - High protein, low fat, low sugar, regular consistency
Post-operative Pathway

• Follow up for life
  – 2 weeks
  – 6 weeks
  – 3 months
  – 6 months
  – 12 months
  – 18 months
  – Then yearly for life
MEASURE OF SUCCESS
HOW MUCH EXCESS WEIGHT IS LOST?

<40% = failure
40-50% = fair
50-60% = good
>60% = excellent

Overall results; 85% Good – Excellent
Surgery is a tool

- [http://www.upstate.edu/community/services/bariatric/index.php](http://www.upstate.edu/community/services/bariatric/index.php)
Knowing changes everything.

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Upstate University Hospital Community Campus