How GI surgery can affect metabolic issues 2015

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Obesity is a Metabolic Disease

- Increases your chance of developing one of these and/or additional diseases:
  - Liver disease
  - Gallbladder disease
  - Type 2 diabetes
  - Menstrual/Infertility problems
  - Gout
  - Sleep apnea
  - Asthma
  - Heart disease
  - High blood pressure
  - GERD
  - Osteoarthritis
  - Gout

Type 2 diabetes

[Diagram showing various body systems in relation to obesity]
Metabolic man

• Severe Obesity
• Hypertension
• Dyslipidemia
• Diabetes
• Coronary artery disease
• Severe arthritis
• Nonalcoholic steatohepatitis (NASH)
• Obstructive sleep apnea
• GERD
• DJD left knee requiring replacement
Co-morbidities

- How many do you think your patients have?
- How many medications do your patients take?
- How much do they cost monthly?
- How much are they affecting their life?
Why Get your Patient’s Weight Under Control?

- #1 Increase your life span (possibly 13-20 years)
- #2 Reduce/eliminate co-morbidities (future and present)
- #3 Personal
  - Feel better
  - More active
  - Other
# Obesity Treatment Guide

<table>
<thead>
<tr>
<th>Treatment</th>
<th>BMI Category (kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25-26.9</td>
</tr>
<tr>
<td></td>
<td>27-29.9</td>
</tr>
<tr>
<td></td>
<td>30-34.9</td>
</tr>
<tr>
<td></td>
<td>35-39.9</td>
</tr>
<tr>
<td></td>
<td>≥40</td>
</tr>
<tr>
<td>Bariatric Surgery</td>
<td>With comorbidities</td>
</tr>
<tr>
<td>Pharmaco-therapy</td>
<td>With comorbidities</td>
</tr>
<tr>
<td>Diet, Exercise, Behavior Therapy</td>
<td>With comorbidities</td>
</tr>
</tbody>
</table>

Energy Balance Equation


What has more risk, surgery or staying the same weight?

**Figure 2. Unadjusted Cumulative Mortality.**

The hazard ratio for subjects who underwent bariatric surgery, as compared with control subjects, was 0.76 (95% confidence interval, 0.59 to 0.99; \( P=0.04 \)), with 129 deaths in the control group and 101 in the surgery group.
Before Bariatric Surgery
Annual per capita costs for health care claims by body mass index (BMI), 2007, $

<table>
<thead>
<tr>
<th>BMI</th>
<th>Normal</th>
<th>Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25</td>
<td>3,950</td>
<td></td>
</tr>
<tr>
<td>30–34</td>
<td>4,675</td>
<td>6,120</td>
</tr>
<tr>
<td>35–39</td>
<td></td>
<td>7,555</td>
</tr>
</tbody>
</table>

+91%  
+55%  
+18%  

Weighted average per capita cost of health care for obese patients is $5,500

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For US adult population (ages 20–64); data for BMI of 25 to 29 (considered overweight, not obese) not shown.

Source: D2Hawkeye database of ~20,000 people with biometric data; National Bureau of Economic Research; US Census Bureau; McKinsey analysis
Surgical Treatment For Morbid Obesity

Lap-BAND®, Gastric Bypass, and Gastric Sleeve
Normal Anatomy
Stomach & Intestines

- Esophagus
- Stomach
- Liver
- Gall Bladder
- Pancreas
- Large Intestine
- Small Intestine
- Appendix
- Rectum

*Picture provided by AllReferHealth.com
Surgical Treatment For Morbid Obesity

Lap-BAND®

- **One weight loss component:**
  - Reduces the size of the stomach

*Picture provided by AllReferHealth.com*
Surgical Treatment
Morbid Obesity

SLEEVE GASTRECTOMY

- Procedure that removes 2/3’s of the stomach
- Two weight loss components:
  - Restrictive – reduces size of the stomach
  - Hormonal changes
Surgical Treatment
Morbid Obesity

GASTRIC BYPASS

Three weight loss components:

• Reduces the size of the stomach
• Reduces calorie absorption
• Hormonal changes

*Picture provided by AllReferHealth.com
Duodenal Switch

- May be performed in one or 2 operations
- Best for weight loss and resolution of comorbidities
- Highest rate of fat soluble vitamin deficiencies
- Highest rate of complications and morbidity
Comorbidity Resolution After Bariatric Surgery

- Resolution or improvement of comorbidities
- Only surgery has resulted in weight maintenance for the long-term
After Bariatric Surgery

- ↓ 142 pounds after gastric bypass
- Sleep apnea resolved
- High blood pressure - resolved
- Hyperlipidemia - off medicine
- Knee pain-gone
- Energy - increased
Gastric Bypass vs Lap-BAND® vs Gastric Sleeve
# Gastric Bypass vs Lap-BAND® vs Sleeve

<table>
<thead>
<tr>
<th></th>
<th>GASTRIC BYPASS</th>
<th>LAP-BAND®</th>
<th>SLEEVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average time in the hospital (days)</td>
<td>1-2</td>
<td>0-1</td>
<td>1-2</td>
</tr>
<tr>
<td>Standard # of office visits in the first year after surgery</td>
<td>7</td>
<td>~9-12</td>
<td>7</td>
</tr>
<tr>
<td>Reversible?</td>
<td>Not Practical</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Speed of excess weight loss</td>
<td>Faster</td>
<td>Slower</td>
<td>Med</td>
</tr>
<tr>
<td>Loss of excess weight</td>
<td>Slightly More</td>
<td>Slightly Less</td>
<td>Middle</td>
</tr>
<tr>
<td>Loss of medical problems (co-morbidities)</td>
<td>Slightly More</td>
<td>Slightly Less</td>
<td>Middle</td>
</tr>
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## Gastric Bypass vs Lap-BAND® vs Sleeve

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<th>Gastric Bypass</th>
<th>Sleeve</th>
<th>Lap-BAND®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious complication rate our center</td>
<td>3%</td>
<td>1-3%</td>
<td>&lt; 1%</td>
</tr>
<tr>
<td>Need to Take vitamins forever</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Vitamin deficiencies (preventable)</td>
<td>More</td>
<td>LESS</td>
<td>Less</td>
</tr>
<tr>
<td>Protein deficiencies (preventable)</td>
<td>More</td>
<td>LESS</td>
<td>Less</td>
</tr>
<tr>
<td>Stretching of the pouch (preventable?)</td>
<td>Yes</td>
<td>Possibly</td>
<td>Yes</td>
</tr>
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</table>
Mortality of Bariatric Surgery

0.08% Most recent from JAMA 162,000 patients in 16 studies

Equivalent to:
- Cholecystectomy
- Hysterectomy
- Appendectomy
- C-section
- Ventral Hernia repair
The Bariatrics Team

- Patient
- Nurses/Nurse Practitioner
- Psychologists
- Exercise Instruction
- Registered Dietitians
- Surgeons
  - Board certified in general surgery
  - Members of American Society for Metabolic and Bariatric Surgery

Some parts of the team may be offsite and you will be referred to them.
Inflammatory Prevention and Bariatric Surgery

- Metabolic syndrome → increase cardiovascular risk via atherosclerosis
- Atheroma formation
  - Systemic inflammatory markers
  - Endothelial level
    - Activating adhesion molecules
- Changes in weight or bariatric surgery shows decrease in all of the inflammatory factors and a vasodilatory response occurs
Risk reduction of complications of metabolic syndrome before and 6 years after gastric bypass surgery

- 217 diabetic patients underwent GB at least 5 year follow up
- Reduction (Compared to Framingham and other study risks)
  - Overall risk CVD ↓27%
  - CHD ↓20%
  - MI ↓40%
  - CVA ↓42%
  - Nephropathy ↓45%
  - Retinopathy ↓50%
  - Cardiovascular mortality ↓18%

All with p value less than 0.05
Gastroesophageal Reflux

- LRYGB is a very effective treatment for GERD, leading to complete resolution or significant improvement of symptoms and decreased medication use.
- Resolution of GERD in 72 to 98% of patients.1, 5, 19

Non-alcoholic Fatty Liver Disease

- NAFLD includes a spectrum of disease that begins with fatty infiltration of the liver and progresses to fibrosis and ultimately to cirrhosis in 25% of patients.
- Prevalence of NAFLD in morbidly obese patients ranges from 20% to 40%.
- After surgical weight loss of 59% EWL, there was marked improvement in liver steatosis (from 88% to 8%), inflammation (from 23% to 2%), and fibrosis (from 31% to 13%) with an interval of 15 +/- 9 months between biopsies.

Take Home Message

- Who is not working?
  - all of us

- How do we make changes
  - Staff needs to spend time to help with the education and implementation of the lifestyle changes
    - Patient care managers for highest risk

- Will this help with population health?
  - Yes but we need the systems and support to make the changes

- Get the knowledge to effect change
Were do we start?

- Acknowledge weight is an issue
  - Use actual weight or BMI
- Be consistent with the message with your whole office and with the primary care
- Have staff that can be the go to people to help educate the patient and reinforce when you are seeing the patient. If you do not inquire and give accountability for the patient they will think this is not important
- Make the patient tell you the plan or goals until next visit
- Make patients and staff accountable