



Michigan Osteopathic Association

Updates in Bariatric Surgery

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Michigan Bariatric Society





- State Chapter of the American Society for Metabolic and Bariatric Surgery (ASMBS)
- Over 100 members made up of Physicians, and Integrated Health
- Education
- Advocacy



- Michigan Bariatric Surgery Collaborative (MBSC)



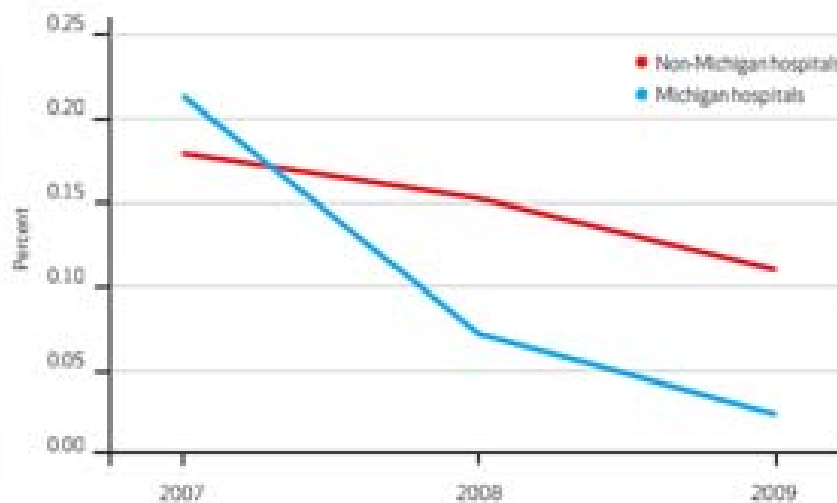
The Michigan Program

- Partnership between BCBSM, Michigan hospitals, and clinician scientists
 - Pilot test with PCI in 1998, broad implementation 2005-6
- \$28 million annual investment from BCBSM
- 10 collaborative quality improvement programs
 - PCI /PVI, Cardiac, NSQIP, bariatrics, breast cancer, cardiac CT, trauma, joint replacement, and medical admissions
 - 50+ hospitals
 - 100,000+ pts / year



EXHIBIT 3

Thirty-Day Mortality After Bariatric Surgery: Hospitals In Michigan Versus Hospitals Outside Of Michigan, 2007-09



source Michigan Surgical Quality Collaborative and National Surgical Quality Improvement Program registries, 2007-09. **notes** Thirty-day mortality rates declined faster in Michigan hospitals than in other hospitals participating in the National Surgical Quality Improvement Program ($p = 0.045$).



- Bariatric Surgery has gained support from the Majority of the Medical Societies.



- “ Bariatric surgery should be considered for adults with BMI $> _ 35$ kg/m² and type 2 diabetes, especially if
- the diabetes is difficult to control with lifestyle and pharmacologic therapy.”
- **–American Diabetes Association, 2009**

- “ When indicated, surgical intervention leads to significant improvements in decreasing excess weight and
- comorbidities that can be maintained over time.”
- **–American Heart Association, 2011**

- “ Bariatric surgery is an appropriate treatment for people with type 2 diabetes and obesity not achieving
- recommended treatment targets with medical therapies.”
- **–International Diabetes Federation, 2011**

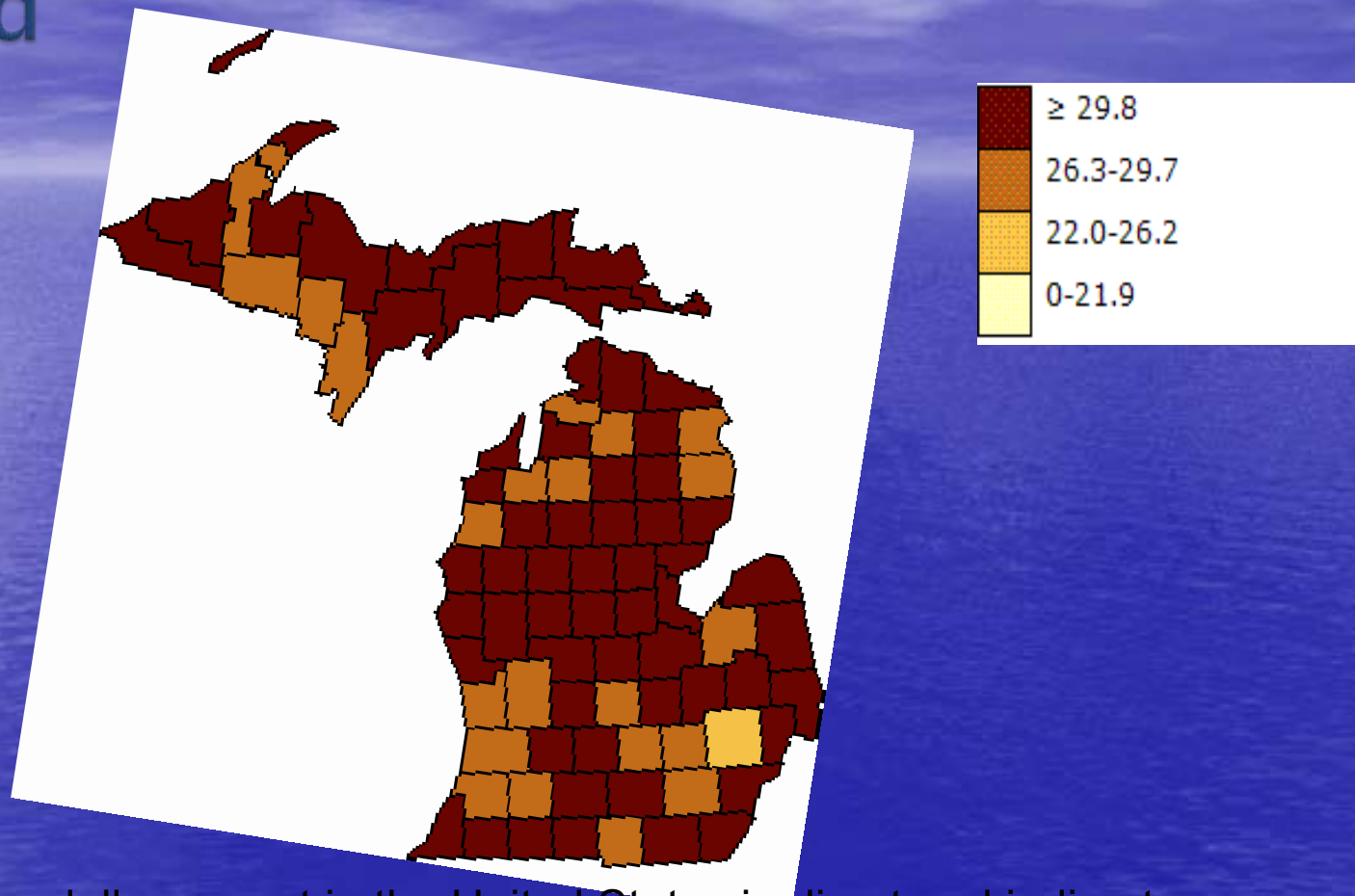
- “ Surgical intervention in obesity significantly reduces the risk of DM and the risk of future mortality and
- is cost effective.”
- **–American Association of Clinical Endocrinologists, 2011**

The Obesity Epidemic

- 3 in 5 Americans are either overweight/obese
- In the past 20 years, adult obesity has doubled
- Per the CDC, in 2010 obesity became the #1 cause of preventable deaths (#2 is smoking)
- 15 million individuals meet the criteria for morbid obesity³
- 75% of obese children become morbidly obese adults

Source: *The Surgeon General's Call to Action to Prevent Overweight and Obesity*

Prevalence and costs – 2008 adjusted



147 Billion dollars spent in the United States in direct and indirect costs of obesity annually.

Finkelstein, EA, Trogon, JG, Cohen, JW, and Dietz, W. Annual medical spending attributable to obesity: Payer- and service-specific estimates. *Health Affairs* 2009; 28(5): w822-w831.

Medical Impact of Obesity

- Diabetes type 2
- Hypertension
- Lipid disorders
- Heart disease
- Asthma
- Sleep apnea
- Gallstones
- NASH (non-alcoholic steatohepatitis)
- Urinary incontinence
- Gastroesophageal reflux
- Osteoarthritis and gout
- Infertility and menstrual problems
- Obstetric complications
- Low back pain
- DVT & thromboembolism
- Depression
- Immobility
- Increased cancer risk
- Venous/stasis ulcers
- Skin infections
- Accidents

No Matter how they get there,
the likelihood of getting out is
low without surgery

Consider This

- Breast Cancer Kills 40,000 per year
- Colon Cancer Kills 30,000 per year

- Morbid Obesity kills 400,000 per year
- Documented 12-15 year reduction in life expectancy if untreated

NSQIP Data United States

<u>Surgery</u>	<u>Complications</u>	<u>Mortality</u>
LS Appy	5.1%	0.1%
LS Gastric Bypass	5.2%	0.2%
LS Chole	3.3%	0.3%
General Surgery	11.6%	1.7%
Colon Surgery	28.0%	4.4%

1991 NIH Guidelines for Surgical Candidates

- BMI $>$ 40 if patient failed "conventional" treatment
- BMI 35-40 if patient failed "conventional" treatment and comorbidities
 - Diabetes mellitus
 - Coronary artery disease
 - Severe DJD
 - Obstructive sleep apnea
 - Hypertension
 - Dyslipidemia

Keep in Mind...

- Obesity is one of the most intimate, sensitive and deeply personal topics one can talk about
- Most people suffering with obesity truly desire to talk about it and desperately want help
- Be mindful that many will need behavior counseling along with diet and exercise modification to have long term success
- Be aware of your personal bias
- Don't be afraid to refer

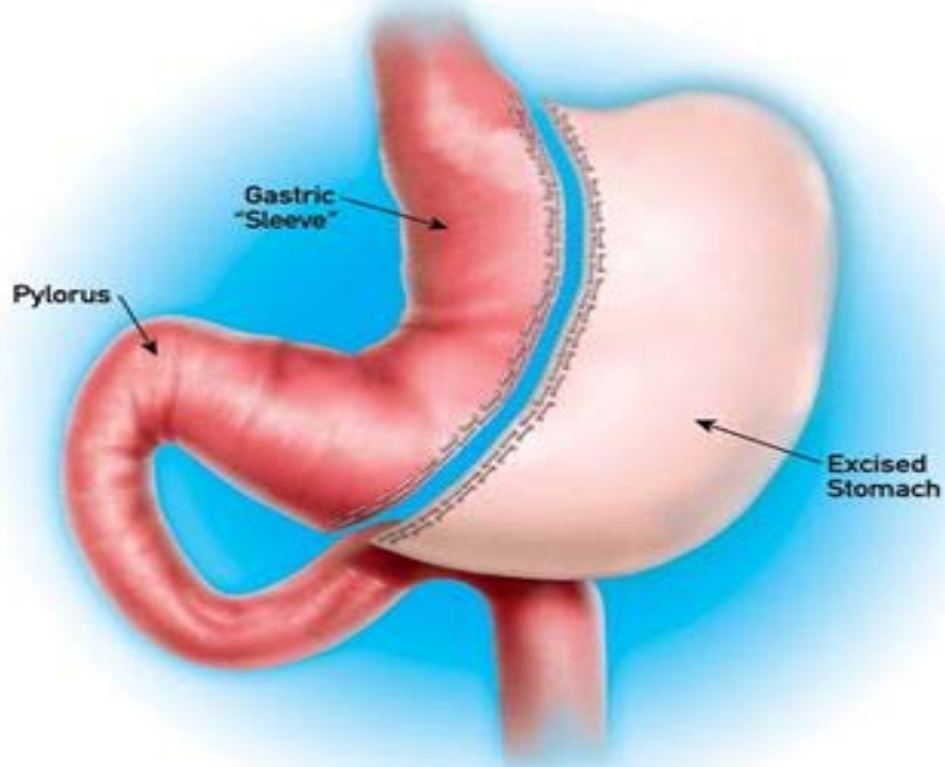
Surgical Weight Loss Mechanisms

- 1. Restriction
 - Lap Band
 - VBG
 - Sleeve Gastrectomy
 - Gastric Bypass
- 2. Malabsorption
 - Jejunioileal Bypass
 - Duodenal Switch
 - Gastric Bypass
- 3. Appetite/Satiety
 - All operations to some extent

Lap Band

- Advantages:
 - very low major complication rate <1%
 - adjustable
 - normal nutrient absorption
 - feasible to perform with single incision techniques
 - reversible
- Disadvantages:
 - some foods may be difficult to swallow
 - requires frequent adjustments
 - may create problems with heartburn/regurgitation
 - slower and less predictable weight loss 50-60%EWL

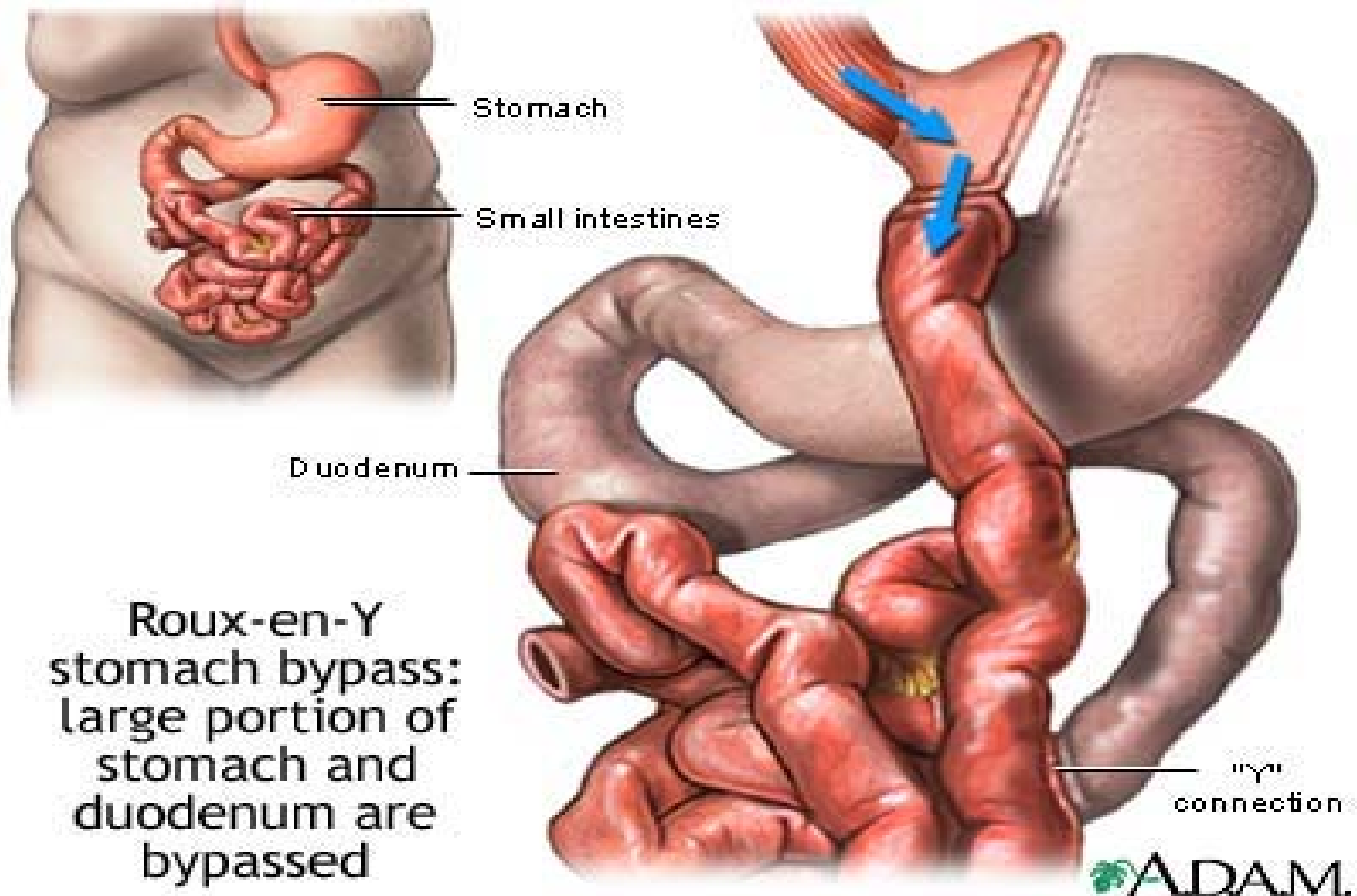
Laparoscopic Sleeve Gastrectomy



Sleeve Gastrectomy

- Advantages
 - Good long term result 60-65%EWL
 - No malabsorption
 - Most solid foods well tolerated over time
 - Relatively good safety profile
- Disadvantages
 - May create problems with GERD
 - Irreversible procedure
 - May require a second step conversion to gastric bypass
 - Little data on long term results after 3 years

Roux-en-Y Gastric Bypass



Roux-en-Y stomach bypass: large portion of stomach and duodenum are bypassed



Laparoscopic Gastric Bypass

- Advantages:
 - Excellent excess weight loss 65-75%
 - Metabolic effects on glucose, cholesterol
 - Solid food well tolerated
 - Rarely requires surgical revision/reversal
- Disadvantages:
 - Potential nutrient deficiencies
 - Ulcer risk with aspirin/NSAIDS
 - Higher risk of major complications <4%

■ Benefits of bariatric surgery

Migraine
57% resolved¹⁸

Pseudotumor cerebri
96% resolved⁷⁹

Dyslipidemia, hypercholesterolemia
63% resolved¹⁸

Nonalcoholic fatty liver disease
90% improved steatosis
37% resolution of inflammation
20% resolution of fibrosis on repeat biopsy⁷⁷

Metabolic syndrome
80% resolved⁷⁷

Type 2 diabetes mellitus
83% resolved⁷⁸

Polycystic ovarian syndrome
78% resolution of hirsutism
100% resolution of menstrual dysfunction⁸¹

Venous stasis disease
95% resolved⁸⁰

Quality of life
improved in 95% of patients¹⁸

Depression
55% improved or resolved

Obstructive sleep apnea
74-98% resolved^{18,19}

Asthma
82% improved or resolved¹⁸

Cardiovascular disease
82% risk reduction⁴

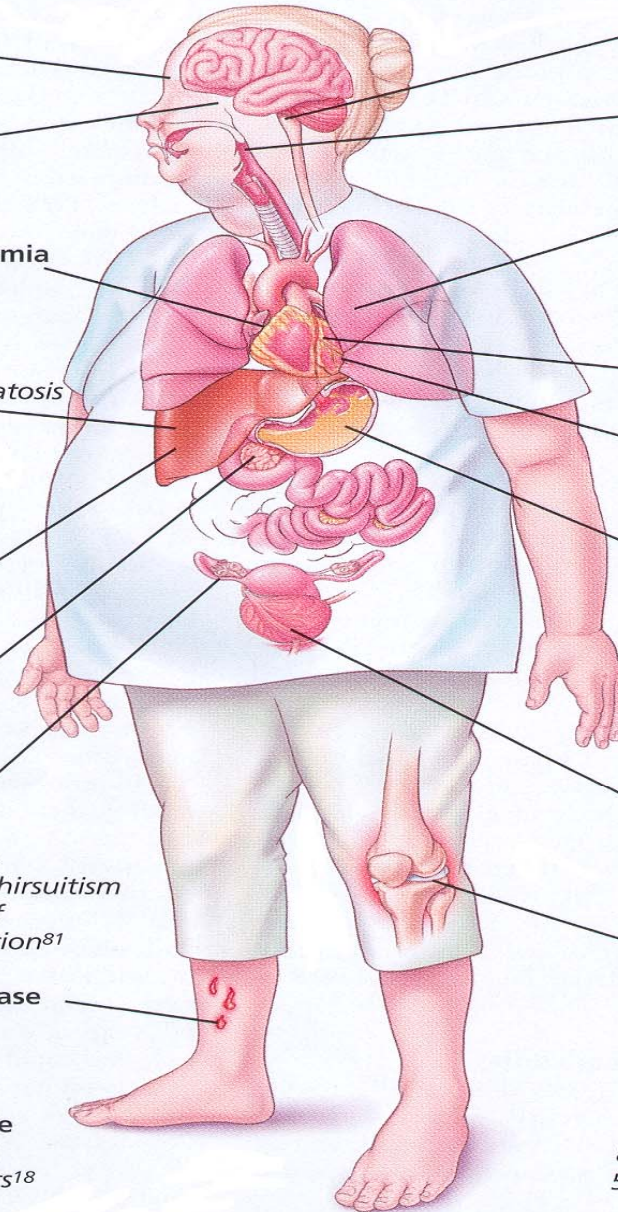
Hypertension
52-92% resolved^{15,18,19}

Gastroesophageal reflux disease
72-98% resolved^{15,18,19}

Stress urinary incontinence
44-88% resolved^{15,18}

"Orthopedic problems" or "degenerative joint disease"
41-76% resolved^{15,18}

Death
89% reduction in 5-year death rate⁴



Getting Your Patient Approved

Documenting Weight Loss Attempts

- Document Weight, Height
- Discussion regarding weight loss
- Write the diagnosis: Morbid Obesity
- Some type of treatment plan
 - medications, programs (weight watchers)
- Previous failures count!
 - Phen-Phen, Redux etc.

Overall Surgical Cost

- 3651 Bariatric surgery patients paired with matched cohort of population
- Total healthcare costs calculated
- Downstream cost savings associated with bariatric surgery are estimated to offset the initial cost in 2 years for laparoscopic and 4 years with open surgery

Cremieux, PY, Buchwald, H, Shikora, SA et al. Am J Manag Care
2008;14:58-96

Obesity and Mortality Rate

- Canadian observational matched cohorts
 - Surgical 1035 pts Medical 5762 pts
- Excess weight loss 68% gastric bypass
- Surgery group had 50% fewer hospitalizations
- \$6,000,000 savings per 1000 patients
- 5 year mortality rates
 - Surgical 0.68% Medical 6.17%
 - Relative risk reduction 89%

The 5 most common nutritional deficiencies following bariatric surgery

Vitamin or mineral	Food source
Iron	Green leafy vegetables, eggs, fish, legumes, beef, poultry, enriched cereals
Vitamin B12	Beef, poultry, fish, eggs, milk
Thiamine	Beef, pork, whole grains, dried beans, peas
Calcium	Dairy products, canned fish with bones, almonds, Brazil nuts, oysters, tofu
Vitamin D	Eggs, fish oil, sardines, salmon, milk

Routine supplementation

Restrictive operations

Adjustable gastric banding

- Multivitamin ➤ Once daily
- Calcium citrate with vitamin D ➤ 1500 mg/d + 400 U vitD

Sleeve gastrectomy

Same as banding plus:

- Vitamin B12 ➤ ≥ 350 $\mu\text{g/d}$ orally

Routine supplementation

Malabsorptive operations

Roux-en-Y gastric bypass

- Multivitamin
 - Twice daily
- Calcium citrate + vitamin D
 - 1500-2000 mg/d + 400-800 U/d
- Elemental iron
 - 40-65 mg/d
- Vitamin B12
 - ≥ 350 $\mu\text{g/d}$ orally

BPD \pm DS

Same as bypass plus:

- \uparrow Calcium citrate + vit D
 - 1800-2400 mg/d + 800 U/d
- Fat soluble vitamins
 - Vit A 10,000 U/d, Vit D 2000 U/d, Vit K 300 mcg/d

Lab Surveillance

Roux-en-Y Gastric Bypass

Q 3-6 mo 1st yr then annual

- CBC
- Electrolytes, glucose
- Iron studies, ferritin
- Vitamin B12
- Liver function
- Lipid profile
- 25-Hydroxyvitamin D
- Optional
 - Intact PTH
 - Thiamine
 - RBC folate

Weight Regain after Bariatric Surgery


- The most common “complication” after bariatric surgery
- Some estimates as high as 40% of all patients
- Setting pre-operative expectations are key to success
- The cause

Weight Regain after Bariatric Surgery



Pregnancy after Bariatric Surgery

- Most data supports a safer pregnancy after bariatric surgery
- Controlling weight gain during pregnancy is critical (<30 lbs)
- Prenatal vitamins BID
- Check vitamin levels once per trimester
- Most surgeons instruct patients not to become pregnant during first year after surgery



**MEDICATION ISSUES
AFTER BARIATRIC
SURGERY**

Medication Issues

- Medications need to be adjusted or weaned
- Patients cannot take large pills
- Elixirs are recommended
- Medication must be crushed or cut down to appropriate size if too large
- LA, SR, CR, etc; absorption rate may be altered

Medication Issues

- **Avoid or Limit use of NSAID's and ASA products!**
 - Increased risk for GI bleeding, ulceration or perforation
- **Avoid or Limit use of Oral Biphosphonates!**
 - Increased risk for GI bleeding, ulceration or perforation
- **Avoid or Limit use of Diuretics!**
 - Patients can become severely dehydrated
 - Vitamins may be excreted from body faster and expedite potential complications associated with vitamin and mineral deficiency

Medication Issues

- Intravenous and enteral routes preferred
- Subcutaneous route
 - Adipose tissue has decreased blood supply
 - Delayed onset of action
 - Unpredictable duration of action
 - May not have a therapeutic effect
- Intramuscular injection can inadvertently result in subcutaneous administration

Medication Issues

- **Metformin**
 - Potential for B12 deficiency
 - However, B12 deficiency may not be an issue because medication requirements decrease as patient's lose weight
 - Absorbed slowly and incompletely in duodenum
- **Coumadin**
 - May have greater efficacy due to decreased absorption of vitamin K and decreased antagonism (resulting in toxicity)
 - Some isolated reported cases of increased requirements after gastric bypass.
- **Oral Contraceptives**
 - Malabsorption may occur, thus increasing chances of pregnancy

Medication Issues

Vasotec	Hydrolyzed in stomach, absorbed in small intestine	Decreased activity
Ketoconazole	Absorbed in stomach; requires acidic environment	Decreased activity
Lamictal	Absorbed in stomach and proximal small intestine	Decreased activity
Glucophage	Absorbed in duodenum	Decreased activity
Lopressor	Absorbed in stomach and duodenum	Decreased activity
Niacin	Absorbed in duodenum	Decreased activity
Zyprexa	Absorbed in stomach. SL not more efficacious	Decreased activity
Seroquel	Likely absorbed in stomach and duodenum	Decreased activity
Altace	Decreased absorption with steatorrhea	Decreased activity
Zocor	Hydrolyzed in stomach	Decreased activity
Ambien	Absorbed rapidly; likely in stomach; affected by food	Delay in effect

Medication Issues (Antihypertensives)

- Vasotec
 - Hydrolyzed to active form in stomach and is absorbed in the small intestines
 - May exhibit decreased activity
- Lopressor
 - Absorbed rapidly in stomach and duodenum
 - May exhibit decreased activity
- Altace
 - Exact location of absorption is unknown
 - Decreased absorption documented in patients with steatorrhea
 - Consider other agents

Antidepressants & Weight Gain

- Marked Weight Gain
 - Amitryptilline (Elavil)
 - Nortriptyline (Pamelor, Avenryl)
 - Imipramine (Tofranil)
- Intermediate Weight Gain
 - Maprotiline (Deprilept, Ludiomil, Psymion)
 - Mirtazapine (Remeron)
- No/Slight Weight Gain
 - SSRI's (Prozac, Paxil, Zoloft, Lexapro, Luvox, Celexa)
 - MAO-I (Phenelzine, Isocarboxazid, Tranylpromine, Moblobemide)
- Weight Loss
 - Bupropion (Wellbutrin)

Hypertension Medications that Promote Weight Gain

- Alpha Blockers
 - Prazosin (Minipress)
 - Doxazosin (Cardura)
 - Terazosin (Hytrin)
- Alpha Agonists
 - Methyldopa (Aldomet)
 - Clonidine (Catapres)
- Beta Blockers
 - Propranolol (Inderal)

Weight Gain Issues

- Risk to benefit considerations
- Try to avoid medications that cause weight gain or increase appetite
- Consider alternatives if weight gain is observed
- Minimize doses if drugs cannot be avoided

Helpful Resources

Websites

- www.healthysd.gov
- <http://www.nutrition.gov>
- <http://www.nlm.nih.gov>
- <http://www.myfooddiary.com>
- <http://www.myfitnesspal.com>
- <http://sparkpeople.com>

Books

- Eat This Not That
- Calorie King
- Food Rules

Questions??

For Further Questions

Call 586 596 8885