CARE OF THE BARIATRIC PATIENT

Exploring the Role of the Primary Care Provider in Preparing For Bariatric Surgery and Delivering Long Term Post Operative Care

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Nothing to disclose
Objectives

- Assessing Indications, Appropriateness and Readiness for Bariatric Surgery
- Review of Commonly Performed Bariatric Surgery Techniques
- Understanding the Role of the Primary Care Provider in Delivering Long term Postoperative Care for the Bariatric Patient
Obesity

- Obesity is a chronic disease with increasing worldwide prevalence.
- According to the National Health and Nutrition Examination Survey, the prevalence of obesity in the US has increased from 23% to 35% between 1988 to 2012.
- Body Mass Index
  - *Underweight*: $<18.5 \text{ kg/m}^2$
  - *Normal weight*: $>18.5-24.9 \text{ kg/m}^2$
  - *Overweight*: $>25-29.9 \text{ kg/m}^2$
  - *Obesity*: $>30 \text{ kg/m}^2$
    - Class 1: 30-34.9 kg/m2
    - Class 2: 35-39.9 kg/m2
    - Class 3: $>40 \text{ kg/m}^2$
Current data on bariatric surgery

- In 2013 468,609 procedures were done worldwide per Angrisani et al who reported on a global overview of worldwide bariatric surgery.
- Most commonly performed procedure in the USA/Canada and in Asia was the sleeve gastrectomy.
- Most commonly performed procedure in Europe, Latin and South America was the bypass. Worldwide, the bypass is still the most commonly performed surgery.
- BMI lost after 5 years is on average 12-17 kg/m2.
number of surgeries performed in 2011

- United States and Canada: 120,000
- Brazil: 60,000
- France: 20,000
- Mexico: 10,000
- Australia and New Zealand: 5,000
- United Kingdom: 2,000
Data from the Swedish Obese Subjects study from 2008 involving over 2000 patients showed the following improvements in mortality 7 years after the Roux en Y Bypass.
Indications for bariatric surgery

- BMI over 40
- BMI over 35 + 1 obesity related comorbidity
  - DM
  - Moderate to severe osteoarthritis in the hips or knees
  - Moderate to severe sleep apnea
  - CAD
- Prior weight loss attempts
Contraindications

- Active Substance abuse
  - Use within the last six months
- Active psychiatric disease
  - Severe depression
  - Psychosis
  - Multiple suicidal attempts
  - Mental health hospitalization within the last year
- Active binging and bulimia
- Non compliance
- Poor compliance
- Pregnancy
Control of comorbid conditions

- Relative control of Diabetes
  - Elevated a1c is associated with postoperative hyperglycemia which is associated with wound infections, acute renal failure and reduced remission rates of diabetes
- Relative control of hypertension
  - BP not over 160/95
- Stable on psychiatric medications for at least a year
- Stable on HIV medications for at least a year
- Stable anemia
  - Hemoglobin over 11 in men and 10 in women
- Stable asthma
Other things to consider

- No surgeries in the past six months
- No evidence of esophageal varices
- Active nicotine use
  - *Should stop tobacco at least 6 weeks prior to surgery*
Behavioral factors contributing to weight problems

- Binge Eating Disorder
- Night Eating Syndrome
- Grazing
H pylori

- Gastric ulcers in symptomatic patients following bariatric surgery are related to the surgical procedure and not exposure to H pylori
- Currently, the evidence doesn’t support routine screening but screening is reasonable in high risk patients
Functional Capacity prior to surgery

- Able to ambulate 200 feet
Age

- Historically surgery was limited to adults over the age of 18.
- Some academic centers are performing surgery on adolescents who can independently exhibit informed consent.
- One study suggested that patients over the age of 55 had a threefold mortality risk compared to younger patients.
- But the American College of Surgeons National Surgical Quality Improvement Program found that data from 48,378 patients did not suggest advanced age is linked to a statistically increased risk of mortality.
Super Obesity

- BMI over 50
- Would benefit from a 10% reduction in weight prior to surgery
Preoperative Weight Loss

- Preoperative weight loss can reduce liver size and make surgery less challenging in the operating room
- Can also improve comorbidities resulting in improvements in preoperative targets such as glycemic control
Age and risk appropriate cancer screening

- Patients should be followed by their primary care
- Age appropriate cancer
- screening is expected prior to surgery
- Obesity is a risk factor for certain cancers
  - Endometrial
  - Renal
  - Gallbladder
  - Breast
  - Colon
  - Pancreatic
  - Esophageal
Factors associated with poor outcome

- Open procedures
- Male gender
- Older age
- Congestive heart failure
- Peripheral vascular disease
- History of deep vein thrombosis
- History of pulmonary embolism
- Obstructive sleep apnea
- Impaired functional status
- Chronic kidney disease
Mortality Risk

- 30 day risk of mortality after roux en y and lap band was 0.08% according to data collected by the Longitudinal Assessment of Bariatric Surgery

- Adverse outcomes were increased with a history of DVT or PE, sleep apnea and diminished functional status
  - Discontinue oral contraceptives for a full cycle prior to surgery
  - Discontinue hormone replacement therapy 3 weeks before surgery
Types of surgery

- Mostly Restrictive
  - Lap band
  - Sleeve gastrectomy

- Mostly Malabsorptive
  - Biliopancreatic diversion with duodenal switch

- Combination of restrictive and malabsorptive
  - Roux en Y gastric bypass
Lap Band

- Restrictive
- 50-60% of excess body weight lost after two years
- Lowest mortality
- Lowest complication rate
- Highest reoperation rate
Vertical Sleeve Gastrectomy

- restrictive
- By 2016 became the most commonly performed bariatric procedure in the US and the world
- 60% of excess body weight lost after two years
Roux en Y Bypass

- Restrictive and malabsorptive
- 70% of excess body weight lost after two years
- Higher level weight loss
- Higher complication rate
BPD BPD-DS

- Fallen out of favor
- Associated with greater nutritional risk
- 70-80% excess body weight lost after two years
Metabolic changes after bariatric surgery

- **GLP-1**
  - Produced in the small intestine. Increases satiety, stimulates insulin secretion, decreases gastric motility
  - Increased postoperatively

- **PYY**
  - Produced in the small intestine. Decreases appetite, increases insulin secretion and slows gastric emptying
  - Increased postoperatively

- **Grehlin**
  - Produced in the fundus of the stomach. Increases food intake
  - Decreased postoperatively
### Changes in Hormones that Regulate Energy

<table>
<thead>
<tr>
<th>Hormone</th>
<th>Obesity</th>
<th>After RYGB</th>
<th>After VSG</th>
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<tbody>
<tr>
<td>Leptin</td>
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<tr>
<td>Adiponectin</td>
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<tr>
<td>Resistin</td>
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<tr>
<td>CCK</td>
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<tr>
<td>Grehlin</td>
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<tr>
<td>GIP</td>
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<td>GLP-1</td>
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<tr>
<td>Oxyntomodulin</td>
<td>?</td>
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<tr>
<td>PYY</td>
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<td>Amylin</td>
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<tr>
<td>Insulin</td>
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<tr>
<td>Glucagon</td>
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<td>?</td>
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Investigational procedures

- Intragastric Balloon
- Vagal Blockade
- Aspiration Therapy
Intragastric Balloon

- Balloon filled with 400-700ml of saline is endoscopically inserted intragastrically for a maximum of 6 months
- Deflated balloon can migrate to the small intestine and can cause bowel obstruction
- FDA approved to treat obesity with a BMI 30-40 and one or more comorbid conditions
Vagal Blockade

- The abdominal vagal nerve controls gastric emptying and signals the satiety center in the brain.
- FDA approved in patients with a BMI of 35-45 and at least one obesity related comorbidity.
- An electric pulse generator is implanted laparoscopically into the abdomen to block vagal nerve conduction between the brain and the stomach to reduce hunger.
Aspiration Therapy

- A device is placed via a small incision in the abdomen which contains a port valve to allow the device to drain stomach contents into the toilet about 20-30 minutes after each meal.

- FDA approved in patients 22 and older with a BMI of 35-55

- Contraindicated in patients with eating disorders
LONG TERM EVALUATION OF THE POST OPERATIVE PATIENT
## Follow up after surgery

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Initial follow up</th>
<th>Interval until stable</th>
<th>Once stable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lap Band</td>
<td>One month</td>
<td>One to two months</td>
<td>Twelve months</td>
</tr>
<tr>
<td>Sleeve Gastrectomy</td>
<td>One month</td>
<td>Three to six months</td>
<td>Twelve months</td>
</tr>
<tr>
<td>Roux en Y Bypass</td>
<td>One month</td>
<td>Three months</td>
<td>Six to twelve months</td>
</tr>
<tr>
<td>Biliopancreatic Diversion</td>
<td>One month</td>
<td>Three months</td>
<td>Six months</td>
</tr>
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</table>
BOLD Study

- Compared over 38,000 bariatric patients who followed up at 3, 6, 12 months vs 12,466 bariatric patients who did not

<table>
<thead>
<tr>
<th></th>
<th>Resolution After Incomplete Follow up</th>
<th>Resolution After Complete Follow up</th>
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<tbody>
<tr>
<td>Diabetes</td>
<td>57.5%</td>
<td>62.3%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>42%</td>
<td>46.1%</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>41.1%</td>
<td>42.8%</td>
</tr>
</tbody>
</table>
Long term post operative assessment

- Adjust postoperative medications especially diabetic medications and antihypertensives
- At each visit monitor progress with weight loss and assess for any post operative complications
- Assess for visual, dermatologic, neurologic symptoms at each visit. These complaints can represent unique vitamin deficiencies
- Evaluate need for support groups
Management of Type 2 DM after surgery

- Discontinue insulin secretagogues (sulfonylureas, meglitinides)
- Adjust insulin
- Continue metformin until prolonged clinical resolution of diabetes is seen
Hyperlipidemia

- Monitor lipid levels periodically
- Lipid lowering medications should not be stopped
Hypertension

- Monitor blood pressure at every visit
- Actively titrate down blood pressure medications with weight loss
Sleep apnea

- OSA is prevalent in up to 94% of patients prior to bariatric surgery
- 38% of bariatric patients are undiagnosed
- Can take a year to wean off
Exercise

- Monitor adherence with physical activity recommendations
- Moderate aerobic physical activity at a minimum of 150 minutes per week
- Goal of 300 minutes per week
- Strength training 2-3 times per week
Post operative Diet

- 5 servings of fruits and vegetables a day
- Eliminate concentrated sweets
- Fluids should be consumed slowly preferable 30 minutes after meals to avoid GI upset
- 1.5-2.0g of protein/kg ideal body weight
  - About 90g of protein a day
Vitamin and Mineral Supplementation

- 2 chewable Multivitamins containing iron, folic acid, thiamine, B12
  - Vitamin A: 500mcg
  - Thiamine: 1.2mg
  - Vitamin E: 10mg
  - Vitamin K: male-120mcg; female 90mcg
  - Iron: 10mg
  - Folic Acid: 400mcg
  - Biotin: 30mcg
  - Selenium: 55mcg
  - Zinc: male-11mg; female-8mg
  - Copper: 2mg

- Calcium: 1200-1500mg
- Vitamin D: At least 3000 IU
- Vitamin B12: 500-1000mcg
Pregnancy after surgery

- Fertility improves after surgery
- Avoid pregnancy 12 – 18 months postoperatively
- Nutritional surveillance every trimester should include checks of iron, folate, B12, calcium, fat soluble vitamins
- Those with a lap band should have their band adjusted to account for appropriate weight gain for fetal health
Contraception after Surgery

- American College of Obstetricians and Gynecologists recommends Nonoral contraception is advised with the roux en Y as it is a malabsorptive procedure.
NSAIDs

- NSAIDs should be completely avoided after bariatric surgery
- They have been associated with anastomotic ulcerations and perforations
Avoid Tobacco after surgery

- Increased risk of poor wound healing
- Increased risk of anastomotic ulcer
Alcohol Consumption after surgery

- High risk groups should avoid alcohol
- Surgery results in impaired alcohol metabolism
  - Accelerated alcohol absorption accounting for a shorter time to reach maximum concentration in the blood
  - Higher maximum alcohol concentration
  - Longer time to eliminate alcohol
- Risk of alcohol use disorder
Alcohol Consumption

- One study found the following blood alcohol concentrations preoperatively and 6 months after surgery after consuming 5 oz of red wine:

<table>
<thead>
<tr>
<th>Time</th>
<th>Blood alcohol percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to surgery</td>
<td>0.24%</td>
</tr>
<tr>
<td>Six months after surgery</td>
<td>0.88%</td>
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</table>
ASSESSMENT OF POSTOPERATIVE COMPLICATIONS
Anemia

- Consider iron, vitamin A, vitamin B12, vitamin E, folate, zinc, copper deficiency
Neurological deficits

- Consider niacin, B12, vitamin E, copper deficiencies
Visual disturbances

- Consider vitamin A, thiamine, vitamin E deficiencies
Skin disorders

- Consider vitamin A, niacin, zinc, riboflavin deficiencies
Changes to Bone Mineral Density

- Dexa advised two years after surgery
- BMD is positively correlated to fat mass and lean mass preoperatively and lean mass postoperatively
- Post operative vitamin D and PTH deficiencies can also contribute to development of bone mineral density reduction
Cholelithiasis

- Rapid weight loss can increase the risk of gallstones
- Can consider prophylactic cholecystectomy
- Ursodeoxycholic acid 300mg daily can significantly reduce gallstone risk after RYGB
Gout

- Some studies have suggested an increased risk of gouty attacks after rapid weight loss
Nephrolithiasis

- Avoiding oxalosis and calcium oxalate stone production includes avoiding dehydration.
- Probiotics containing Oxalobacter formigenes can be used to help improve renal oxalate excretion and improve supersaturation of renal oxalate levels.
- The etiology of hyperoxaluria after bariatric surgery is unknown.
Complications specific to the lap band

- Persistent vomiting, regurgitation should be treated with removal of fluid from an adjustable lap band
- Persistent symptoms of acid reflux, chronic cough and recurrent aspiration pneumonia after lap band raises concern for band being too tight, development of a large gastric pouch or esophageal dilation
- Slipped band
- Erosion
Internal hernia

- Bypass patients can develop internal herniations of bowel through defects in mesenteric tissue.
- Symptoms are nonspecific and vague including post-prandial abdominal pain, nausea, vomiting.
- If this is suspected exploratory laparotomy or laparoscopy is advised because this can be missed with upper GI and CT scans.
Closed loop bowel obstruction

- Can occur secondary to an internal hernia
- Sudden onset severe periumbilical abdominal pain any time after weight loss surgery
- Should be evaluated by an abdominal and pelvic CT to exclude this potentially life threatening complication of
Body Contouring and Excess Skin removal

- Best pursued after 12-18 months after bariatric surgery after weight loss has stabilized
- Can reduce impairment of hygiene, discomfort and disfigurement caused by excess tissue after bariatric surgery
Risk of suicidality

- A review of 28 studies showed a higher suicide rate in bariatric surgery patients compared to the general population.
- 95 suicides were identified when examining 190,000 person-years of post bariatric surgery data. This is a rate of 4.1/10,000 person-years.
Cross Addiction Transfer

- Data from studies show a 5-30% risk of cross addiction after bariatric surgery
Behavioral Factors Contributing to Weight Regain

- Binge eating disorder and grazing are associated with inadequate weight loss or weight regain after RYGB.
- One study found that the presence of 2 or more psychiatric conditions was associated with inadequate weight loss or weight regain after LAGB or RYGB.
Post prandial hypoglycemia

- Can occur after RYGB or BPD/BPD-DS
- Differentiate between Dumping Syndrome and Hyperinsulinemic Hypoglycemia
- If nutritional manipulation hasn’t improved this then should undergo evaluation to differentiate between non insulinoma pancreatogenous hypoglycemia syndrome, factitious, iatrogenic causes, dumping syndrome and insulinoma
- NIPHS can be treated with dietary changes specifically following a low carb diet
- NIPHS can also be treated with pharmacotherapy: acarbose, octreotide, calcium channel blockers
Dumping Syndrome

- Occurs earlier on in the postoperative period
- Occurs within 30 minutes of a meal
- Symptoms include
  - Tachycardia and palpitations
  - Abdominal cramping
  - Loose stools
  - Nausea, vomiting
- Mechanism
  - Rapid gastric emptying of hyperosmolar nutrients
  - Systemic volume contraction
  - Bowel distension and rapid reduction of volume
Hyperinsulinemic Hypoglycemia

- Occurs later on in the post operative period
- Occurs 1-3 hours after a meal
- Symptoms include
  - Tremor, anxiety, parasthesia
  - Hunger
  - Sweating
  - Confusion and fatigue
- Mechanism
  - Hyperfunctioning of incretins after surgery (GLP-1)
  - Non insulinoma pancreatogenous hypoglycemia syndrome
    - Arterial calcium stimulation
    - Low carb diet, octreotide, diazoxide, acarbose, calcium channel blockers
  - Factitious or iatrogenic causes
    - Check insulin, C peptide. Drug Screen, Acarbose and Miglitol can cause it
  - Insulinoma
    - Imaging, 72 hour fast
Revision

- Patients who have undergone RYGB with a nonpartitioned stomach who develop a gastrogastric fistula, herniation with symptoms of weight regain, marginal ulcer or stricture may benefit from revision.

- Can be advised when serious complications related to previous surgery can not be managed medically.

- Revisional RYGB after LAGB is safe and effective but with less weight loss compared to primary RYGB procedures.
LABORATORY ASSESSMENT AND MANAGEMENT OF ABNORMALITIES
Micronutrient absorption
## Labs to check yearly (ASMBS)

<table>
<thead>
<tr>
<th></th>
<th>LAGB</th>
<th>LSG</th>
<th>RYGB</th>
<th>BPDDS</th>
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<tbody>
<tr>
<td><strong>CMP</strong></td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td><strong>CBC</strong></td>
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<td>x</td>
<td>x</td>
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<tr>
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<td>x</td>
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<td><strong>24 hour urine Ca</strong></td>
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<td>x</td>
<td>x</td>
<td>x</td>
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<td><strong>B12</strong></td>
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<td>x</td>
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<tr>
<td><strong>Folic Acid</strong></td>
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<td>x</td>
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<tr>
<td><strong>Iron Studies</strong></td>
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<td>x</td>
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<tr>
<td><strong>25 Vitamin D</strong></td>
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<td></td>
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<td>x</td>
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<tr>
<td><strong>PTH</strong></td>
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<tr>
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<tr>
<td><strong>copper</strong></td>
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<tr>
<td><strong>zinc</strong></td>
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<td><strong>selenium</strong></td>
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<td><strong>thiamine</strong></td>
<td>With symptoms</td>
<td>With symptoms</td>
<td>With symptoms</td>
<td>With symptoms</td>
</tr>
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</table>
Complete Metabolic Panel

- Every year
Complete blood count and platelets

- Every year
Lipids

- Every 6-12 months
TSH in the absence of established thyroid disease

- Severe obesity is associated with increased TSH levels and subclinical hypothyroidism
- Following bariatric surgery and weight loss, TSH levels decrease
- Hypothyroidism only accounts for about a 2kg increase in weight compared to those without hypothyroidism
- Routine screening simply due to an obese state is not advised
Most Common Deficiencies

- Calcium
- Vitamin D
- Iron
- B12
24 hour calcium

- Check at 6 months and then 12 months and then yearly
- Hypocalcemia is a late finding
- Calcium deficiency can be caught sooner with a finding of hypocalciuria
- Signs of profound calcium deficiency
  - Carpopedal spasm
  - Tetany
  - Seizure
- Calcium Citrate is preferred for supplementation. It does not require HCl for absorption
25-vitamin D

- Check yearly after RYGB, BPDDS
- Osteomalacia
  - Bony pain
  - Muscle weakness
- Goal is above 30 after surgery
- 50,000 IU 1-3 times a week until normalized
Iron studies

- Check yearly after RYGB, BPDDS
- Deficiency presents with fatigue and weakness
- Ferrous fumarate is better absorbed in a low acidic environment
- Normal range: female- 30-160 mcg/dl; male- 30-300 mcg/dl
- Repletion:
  - 150mg of elemental iron per day
  - or 510mg IV 2 doses over 2 weeks
  - or 200 mg every other day for 14 days
Vitamin B12

- Check Every year
- Deficiency can present with neuropathy
- Normal range: 160-950pg/ml
- Repletion: 1000mcg IM several times a week
Folic acid

- Check yearly after RYGB, BPDDS
- Deficiency after bariatric surgery is rare. Occurs in the setting of severe malnutrition
- An elevation can suggest bacterial overgrowth
- Normal range: 3.1-17.4ng/ml
- Repletion: 800mcg/day
Parathyroid hormone

- Check yearly after RYGB, BPDDS
- Is elevated (over 60) in the setting of Calcium deficiency
Vitamin A

- Check yearly after BPDDS. Optional for RYGB
- Night blindness
- Xerophthalmia
- Keratomalacia
- Bitot’s spot
- Follicular Hyperkeratosis
- Dry sin
- Pruritis
- Normal range over 25 microgram/dl
- Replete with 5000-10000 IU a day until levels normalize
zinc

- Check with symptoms of deficiency for RYGB, BPDDS
- Alopecia
- Glossitis
- Nail dystrophic changes
- Rash
- Male patients with hypogonadism or erectile dysfunction
- Normal range: 11mg/day in men and 8mg/day in women
- Supplement 60mg Qday to TID
- Zinc replacement can cause copper deficiency
  - *Supplement 1mg of copper for every 8-15mg of zinc*
Copper

- Check with symptoms of deficiency for RYGB, BPDDS
- Test for copper if taking liquid vitamin supplements as copper is not often included in these preparations
- Anemia, neutropenia
- Myeloneuropathy
- Impaired wound healing
- Normal range: over 70 microgram/dl
- Repletion: 2.5mg IV over 6-12 hours for five days
Selenium deficiency

- Check with symptoms of deficiency for RYGB, BPDDS
- Skeletal muscle dysfunction
- Cardiomyopathy
- Mood disorders
- Impaired immune function
- Macrocytosis – unexplained anemia or fatigue
- Metabolic bone disease
- Persistent diarrhea
- Dietary reference intake: 55mcg a day
Thiamine deficiency

- Presents with intractable vomiting early in the postoperative period
- Rapid weight loss
- Excessive alcohol use
- Neuropathy and encephalopathy
- Heart failure
- Normal ranges: 30-60mcg/dl in females and 30-300mcg/dl in males
- Repletion: 100mg/day for 7-14 days. Continue 10mg a day until symptoms resolve
Vitamin E deficiency

- Rare – insufficient data to support screening of deficiency
- Sensory and motor neuropathy
- Ataxia
- Loss of sensory vibration
- Muscle weakness
- Retinal degeneration
- Hemolytic anemia
- Measure serum alpha tocopherol. A value less than 0.5mg/dl suggests deficiency
- RDA: 12mg a day
Vitamin K deficiency

- Insufficient data to support screening of deficiency
- Hemorrhagic disease
- Normal Range: PT = 10-13s
- Repletion: 1mg/day vit K until INR is over 1.4
Vitamin C deficiency

- Scurvy
  - Fatigue
  - Petichiae
  - Ecchymoses
  - Bleeding gums
  - Depression
  - dry skin
  - Poor wound healing

- RDA: 75mg in women and 90mg in men
Riboflavin deficiency

- Stomatitis
- Anemia
- Scaly dermatitis
- Check erythrocyte glutathione reductase assay. A coefficient over 1.4 suggests deficiency
- RDA is 1.1 in women and 1.3 in men
Niacin deficiency

- Pellagra rash
- Nausea, vomiting
- Measure urinary N-methyl nicotinamide or erythrocyte NAD/NADP ratio
- RDA: 16mg in men and 14mg in women
Macronutrient Deficiency

- Protein malnutrition
- Check albumin or pre-albumin if there is a concern
Question 1

- Which of the following is true regarding current best practices prior to consideration of bariatric surgery:
- A) Bariatric Surgery is limited to individuals over the age of 18
- B) Individuals with a BMI of above 50 would benefit from a 10% weight loss of their pre surgical body weight
- C) An appropriate candidate includes a patient with a BMI of 37 and mild obstructive sleep apnea
- D) Coronary Artery Disease is a contraindication to Bariatric Surgery
- E) Bariatric surgery should not be performed if there is any previous history of suicidal attempt
Question 2

- Which of the following is true regarding current techniques for bariatric surgery:
- A) Adjustable gastric banding represents the majority of bariatric surgeries performed currently
- B) Adjustable gastric banding has the lowest mortality and complication rate compared to the bypass or sleeve gastrectomy
- C) Adjustable gastric banding has the lowest reoperation rate compared to the bypass or sleeve gastrectomy
- D) Adjustable gastric banding has more effective weight loss compared to the sleeve gastrectomy and gastric bypass
- E) Studies indicate that weight lost with the sleeve gastrectomy differs substantially when compared the weight lost with the bypass
Question 3

- Which of the following is true regarding bariatric surgery:
  - A) Oral contraception is the strongly advised following the Roux en Y Bypass
  - B) Following bariatric surgery, fertility substantially improves
  - C) Pregnancy should be avoided for 6-12 months postoperatively
  - D) Lab Bands pose a considerable threat to a planned pregnancy and should be removed if a patient is considering pregnancy
  - E) Because oral contraceptives and hormone replacement pose a significant risk of deep vein thrombosis and pulmonary sleep apnea post operatively - it is recommended that women suspend oral contraceptives and hormone replacement at least three months prior to an anticipated surgery
A 60 year old man is brought to your office urgently because of intractable nausea and vomiting. He had a Roux en Y procedure 14 days ago. He hasn't been able to keep anything down the past two days. His wife brought him in today because she was alarmed at the fact that he became confused and light headed. This scenario most likely represents a deficiency in which of the following:

- A) Vitamin B12
- B) Thiamine
- C) Selenium
- D) Vitamin A
- E) Folic Acid
Question 5

- The following is recommended regarding exercise in the patient who has had bariatric surgery:
  - A) The primary care provider should monitor adherence with physical activity recommendations
  - B) Moderate aerobic physical activity is recommended at a minimum of 150 minutes per week
  - C) Patients should aim at exercising for 300 minutes a week
  - D) Strength training is advised 2-3 times a week
  - E) All of the above is advised