Bariatric Surgery: A lasting option for patients suffering from obesity

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Disclosures

- Nothing to disclose

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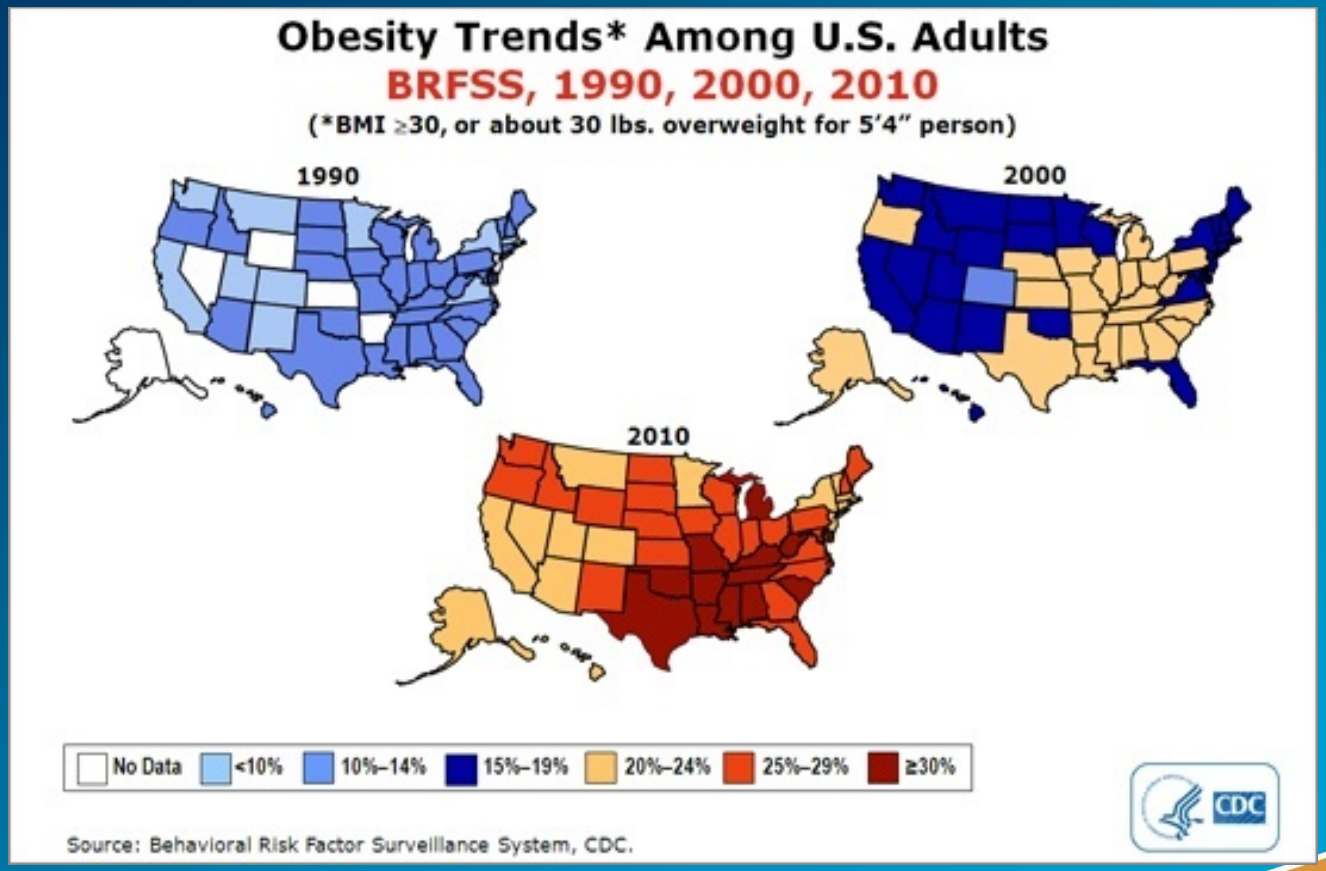
Obesity Trends 1990-2010

Center for Disease Control and Prevention



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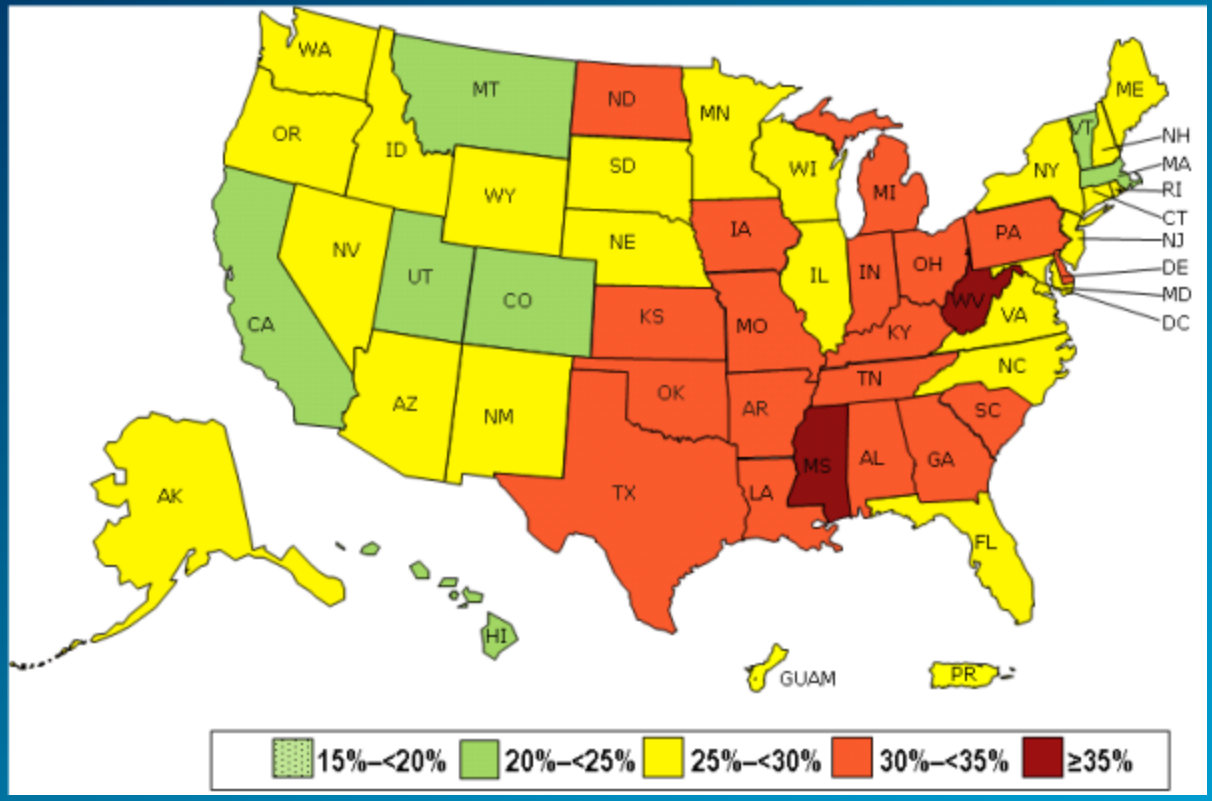
Obesity Trends in the US 2013

Centers for Disease Control and Prevention



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Obesity Trends

- 2011 CDC collected data shows 67% of US adults are overweight, 35.7% of whom are obese
- 2008: $147 billion in medical costs associated with obesity
- Causes of obesity include:
  - More sedentary lifestyle
  - Access to fast food
  - Larger portion sizes

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What causes obesity

- Obesity is the result of a combination of influences:
  - Your surroundings
    - The genes you inherited from your parents
    - How well your body turns food into energy
  - Your eating and exercising habits
    - Family environment contributes to the increasing prevalence of obesity.
  - Psychological factors

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Causes of Obesity

- Imbalance between caloric intake and energy expenditure:
  - Super-Size Phenomenon
    - Regular size McDonald's meal (600 calories)
    - Super-sized McDonald's meal (1800 calories)
  - In 45 minutes of exercise, a 154-pound person expends:
    - 330 calories bicycling
    - 700 calories running
    - 180, calories walking
    - and 230 calories dancing

Do Diets Work?

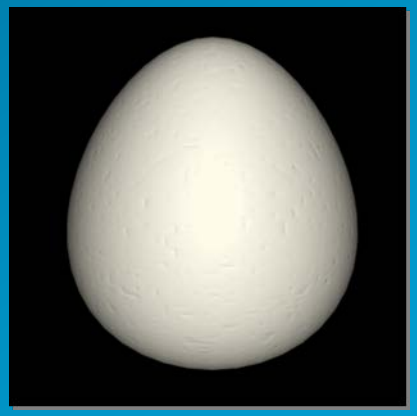
- Weight loss study
  - 811 subjects
  - 2 years
  - 4 types of diets
    - 20% fat, 15% protein, 65% carb
    - 20% fat, 25% protein, 55% carb
    - 40% fat, 15% protein, 40% carb
    - 40% fat, 25% protein, 35% carb
  - Average weight loss 4 kg= 8.8 lbs

Sacks, F., Bray, G., Carey, V., et al; Comparison of Weight-loss diets with different compositions of fat, protein and carbohydrates. New England Journal of Medicine, 2009 ; 360(9)

Does size matter?

Cookie 400 calories

Egg 70 calories



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Portion Sizes

Quadruple Bypass Burger

Megastuffed Oreo

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Harassed by Food

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Or Healthy Options

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Starbucks Nutritional Info

Item	Contents	Calories/fat/Carbs
Venti Café Latte	Whole Milk	290/15/23
Venti Café Mocha	Whole Milk, Whipped Cream	490/23/55
Venti White Chocolate Mocha	Whole Milk, Whipped Cream	620/27/79
Blueberry Scone	Blueberries, buttermilk, lemon	420/17/61
Reduced fat berry coffee cake with lemon crumble	Blueberries, dried cranberries, lemon crumble	320/11/52

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Healthier Options at Starbucks

Item	Contents	Calories/fat/carbs
Tazo tea	Tea leaves, herbals	5/0/5
Grande Cappuccino	Skim milk	80/0/12
Petite Vanilla Bean Scone	Vanilla bean	120/4.5/18
Evolution Harvest Almond Cocoa Bar	Almonds, multigrain crisp, agave	180/10/21
Chicken & Hummus Bistro Box	Chicken, pita, vegetables	270/19/37

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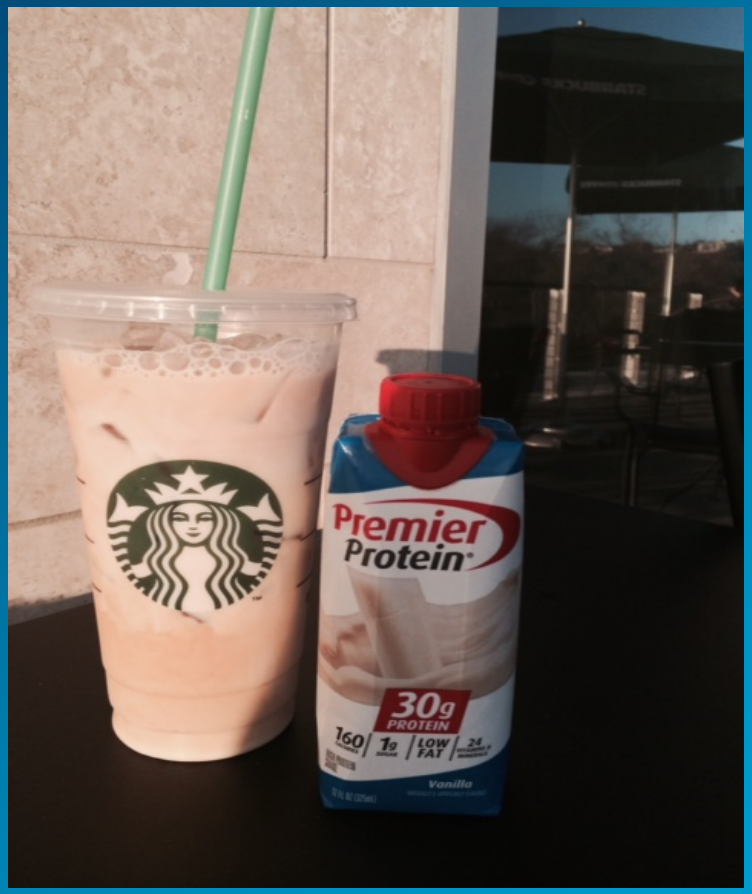
Combining options



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What classifies someone as obese?

- Using the BMI scale, (a calculation of weight to height ratio)
  - BMI of 18.5 or less= underweight
  - 18.5-24.9= normal weight
  - 25-29.9= overweight
  - 30-39.9= obese
  - 40 or greater= morbidly obese

  - BMI- calculation weight to height ratio
  - Formula: weight (kg)/height2/(m2)
  - Or 703 x weight (lb)/height in inches 2)

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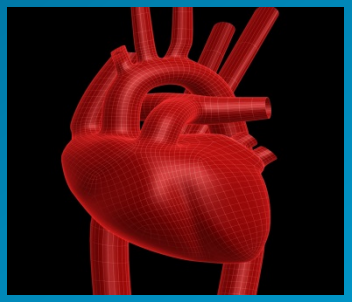
How does obesity affect a patient's health



- Higher risk of cardiovascular disease
- Higher risk of stroke
- Higher risk of mortality
- More prone to comorbid conditions, such as:
  - Hypertension
  - Hypercholesterolemia
  - Diabetes Type 2
  - Obstructive Sleep Apnea
  - Osteoarthritis

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Understanding the bariatric patient

- Most people who are obese have been that way most all their lives.
- Their body doesn't tell them when they are full.
- Psychological issues associated with food, eating, weight. This is their main coping mechanism.
- It is often hereditary and other members of their family are obese.
- The decision to have bariatric surgery is not easy.

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NIH Guidelines

- BMI 30-39.9 with comorbidities
- BMI 40 or greater without comorbidities
- Can’t lose weight or keep it off over the long term using other methods
- Well informed about the surgery and treatment effects
- Aware of the risks and benefits of surgery
- Ready to lose weight and improve his or her health
- Aware of how life may change after the surgery
- Aware of the limits on food choices, and occasional failures
- Committed to lifelong healthy eating and physical activity, medical follow-up, and the need to take extra vitamins and minerals

Ideal Bariatric Candidate

- Ideal Candidate
  - Motivated
  - Able to follow program
  - Feels like all other options for weight loss have failed and are willing to make necessary changes

- What Makes a Successful Candidate?
  - Willingness to follow the program before and after surgery
  - Successful with trial
  - Follow the guidelines for post-op success
    - Surgery, diet, exercise, follow up

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Surgical Options

- Sleeve Gastrectomy
- Gastric Sleeve Plication
- Gastric Band
- Gastric Bypass
- Duodenal Switch
- New options

- Revisions
  - Revision or reversal of gastric bypass

- Endoscopic Procedures
  - ROSE (Revision Obesity Surgery Endolumenal)
  - POSE (Primary Obesity Surgery Endolumenal)

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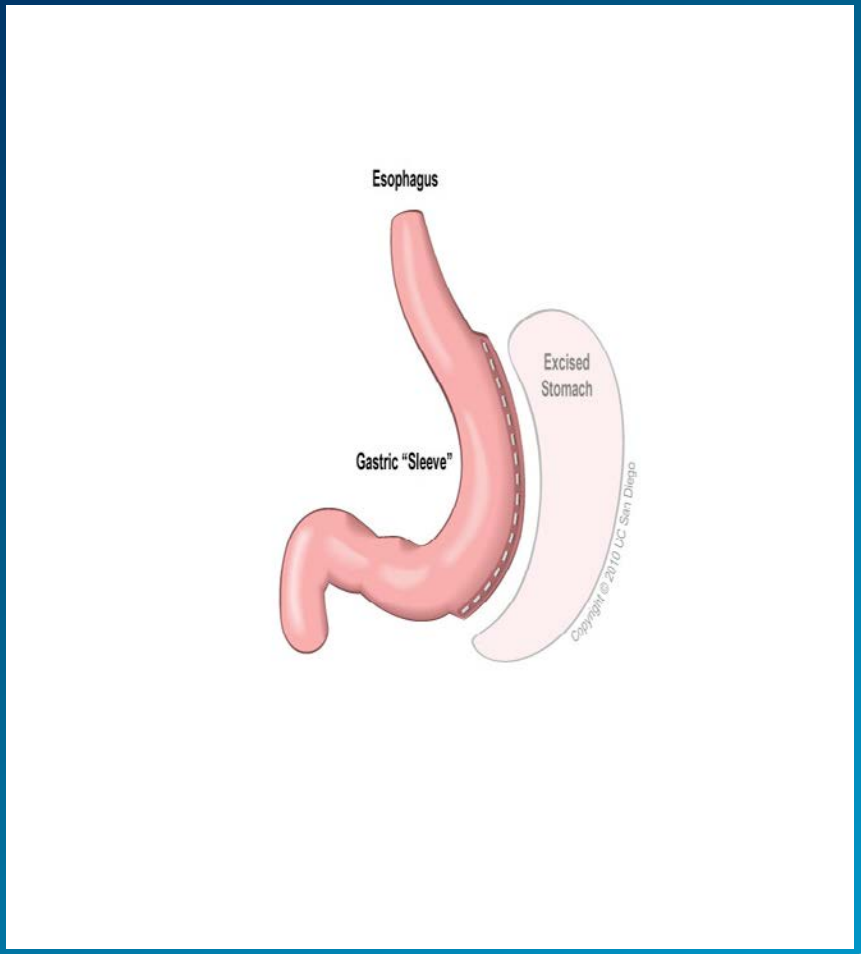
Sleeve Gastrectomy



- Removing 80% stomach
- Not reversible
- 50-60% excess weight loss
- Lose weight by early satiety

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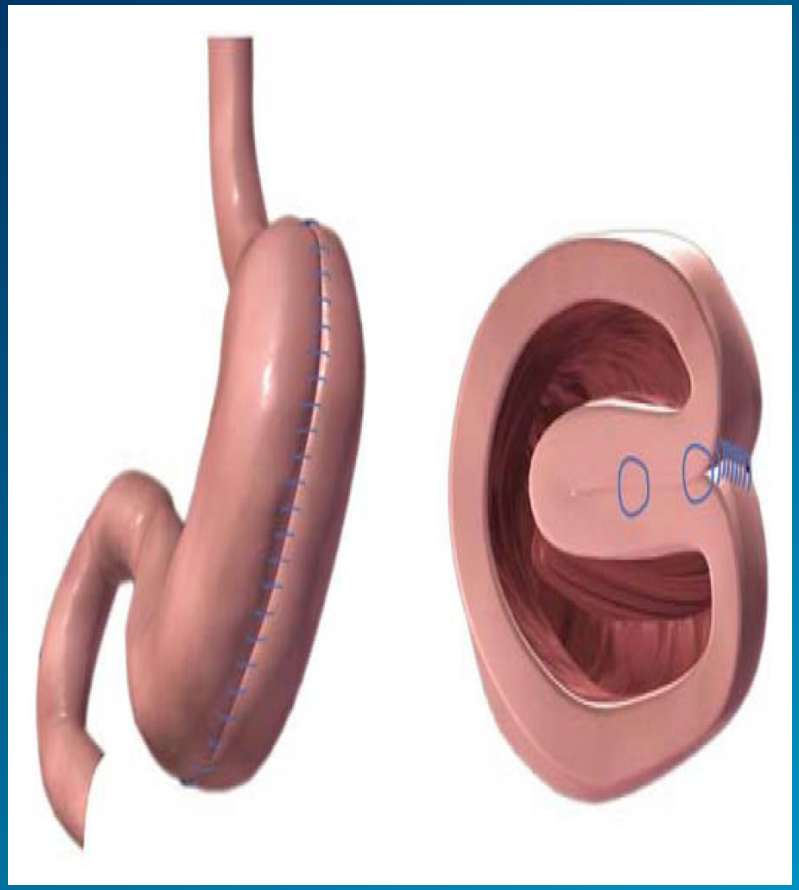
Gastric Sleeve Plication



- Fold stomach to reduce surface size
- Prone to nausea
- post-op
- EWL at 9 months 65%

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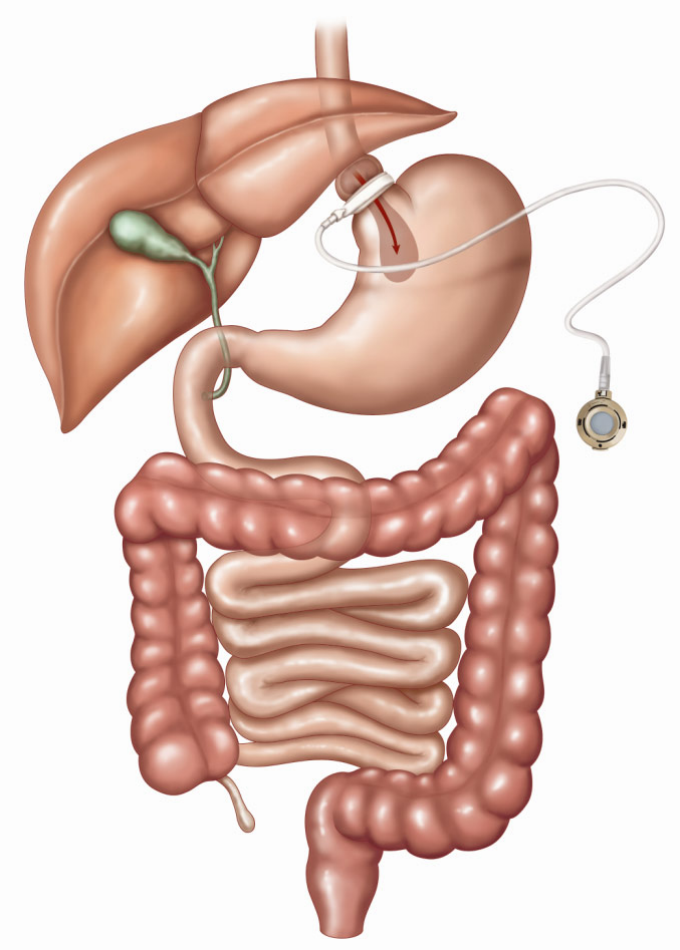
Gastric Band



- Band around upper part of stomach
- Eat smaller meals
- Band is adjusted according to patient's level of satiety
- No cutting or stapling
- 40-50% excess weight loss

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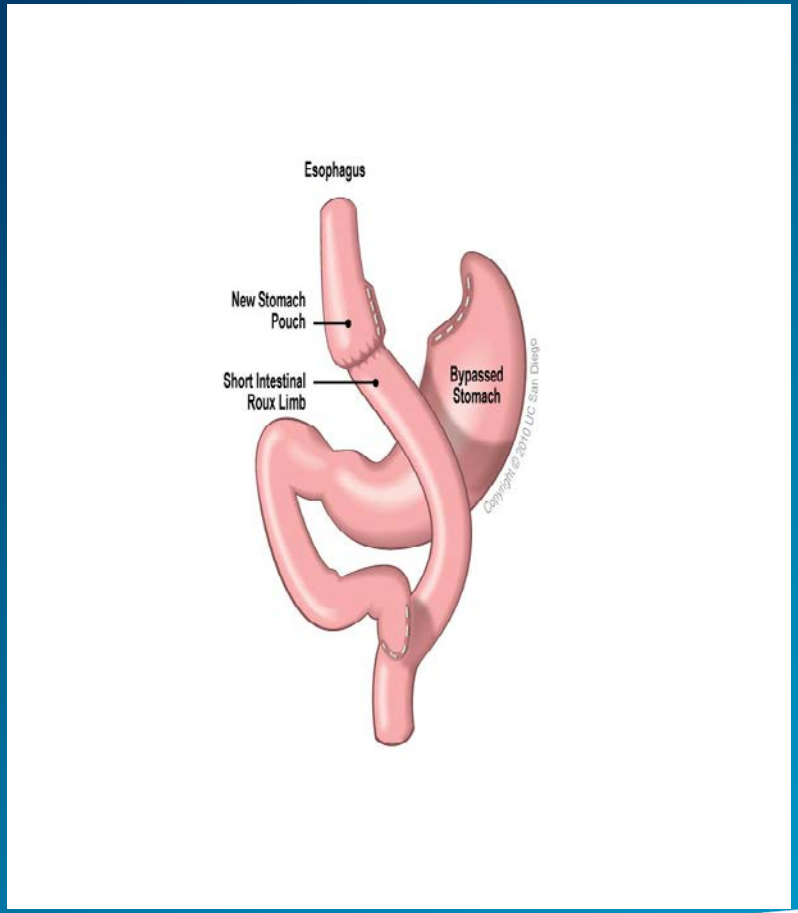
Gastric Bypass



- Hybrid procedure
- Stomach-small pouch
- Y-shaped part of the small intestine attached to the stomach pouch
- Food can bypass the duodenum, as the bypass extends to the initial portion of the jejunum

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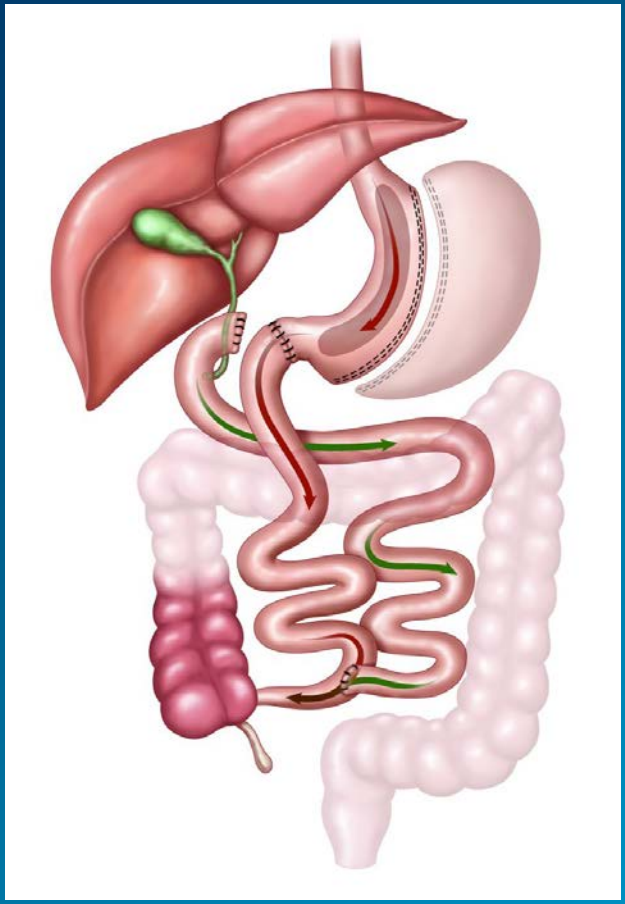
Duodenal Switch



- Restrictive and malabsorbtive
- Stomach converted to sleeve
- Part of duodenum left intact
- Rearranging the small intestine to separate the flow of food from the flow of bile and pancreatic juices.
- Food and digestive juices interact only in the last 18 to 24 inches of the intestine, allowing for malabsorption.

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POSE: Primary Obesity Surgery Endolumenal

- Primary surgery for weight loss
- Done endoscopically- no scars
- Suture anchors are inside the stomach

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Pre-op Care

- All bariatric patients
  - Dietitian
  - Bariatrician/Internal Medicine
  - Psychology
  - Surgeon
  - Nurse Practitioner/Fellow
  - Patient Advocate

Are on pre-op liquid diets (except revisions- vary)

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4 Factors for Success

- Surgery
- Diet
- Exercise
- Accountability

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Why do we do a pre-op liquid diet

- Shrinks liver
- Less bleeding
- Less operating time
- Less pain

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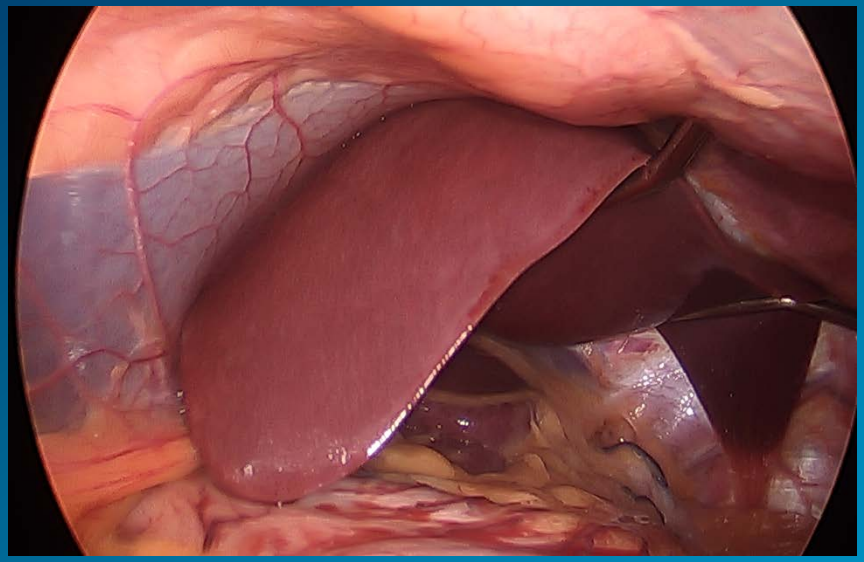
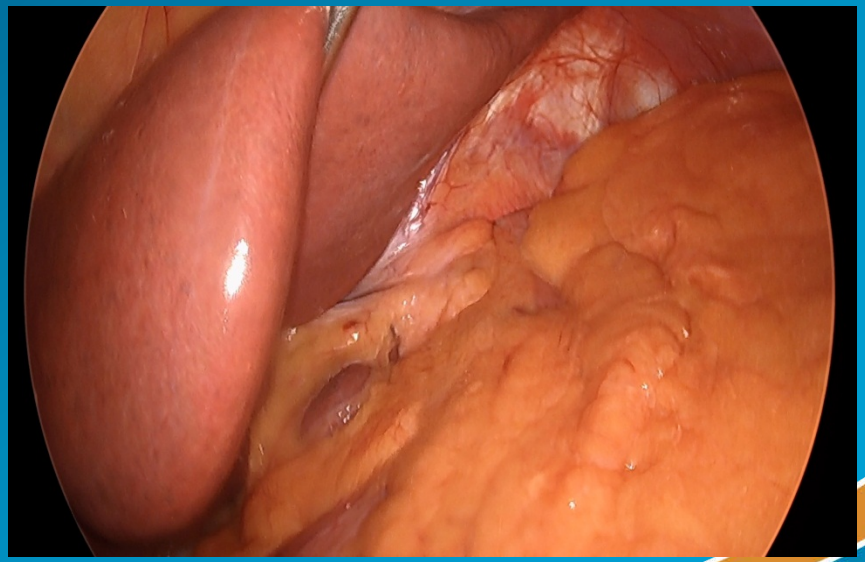
Pre-op liquid diet- Effect on Surgery

Followed pre-op liquid diet



Did not follow pre-op liquid diet



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Day of Surgery

- All bariatric patients are weighed pre-operatively the day of surgery
- Pre-operatively and while hospitalized patients receive anticoagulation (Lovenox or Heparin)
- Appropriate bed size is needed (for patient's weighing >350, need Sizewise bed)

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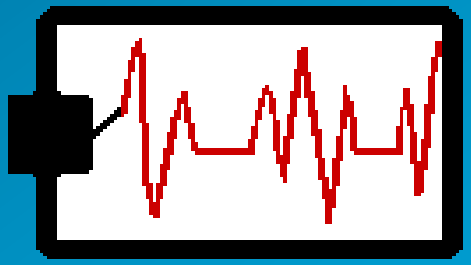
Post-op care for Bariatric Patients

- All patients go to med/surg with telemetry; revisions may go to ICU)
  - Telemetry
    - Sustained tachycardia- indicates leak
  - Continuous pulse ox
    - Majority of patients have OSA



- Have received post-op instructions prior to admission

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Post-op Surgery Risks

- All surgeries come with risk of:
  - Stroke
  - Heart attack
  - Death
  - Infection
  - Bleeding
  - Pneumonia
  - Deep Vein Thrombosis
  - Pulmonary Embolism

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Post-op Bariatric Surgery Risks

- Bariatric Surgery Risks:
  - Sleeve Gastrectomy: Gastric leak/perforation
  - Gastric Bypass: Gastric leak/perforation, marginal ulcer, fistula, dumping syndrome, lactose intolerance
  - Gastric Band: Pouch enlargement, band slippage, port or catheter complications

Post-op Bariatric Risks

- Duodenal switch: Malabsorption/malnutrition
  - Vitamin deficiencies: Including night blindness- Vitamin A deficiency
- Osteoporosis
- Chronic diarrhea

- ROSE/POSE: sore throat, gastric/esophageal perforation

Post-operative Pain

Generally located at the incisions

– (except ROSE/POSE- throat pain)

Pain from laparoscopic surgery may radiate to left shoulder

Need to distinguish between post-op pain and chest pain

Pain with PO intake- may indicate leak

I

NTERVENTIONS:

Check vital signs- note elevated temp, tachycardia

May need CBC to check WBC

Evaluate for leak

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Equipment

- Consider weight limitations of furniture
- Toilets- hold 350 lbs- check for toilet jack if your patient weighs greater than 350 lbs
- If larger than 350 lbs, need Sizewise bed
- Note weight limitations of CT scanner
- Walkers
- Beds
- Chairs

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COMPLICATIONS: Leak

- Assessing for leak
  - Band/ROSE/POSE- uncommon but can occur during surgery
  - Sleeve- not frequent but generally occurs on staple line at GE Junction
  - Gastric Bypass- can occur at gastrojejunal anastamosis or jejunal/jejunal anastamosis; or unknown perforation of bowel
  - Signs/Symptoms
    - ELEVATED HEART RATE- sustained tachycardia
    - Elevated temperature
    - May experience drop in BP

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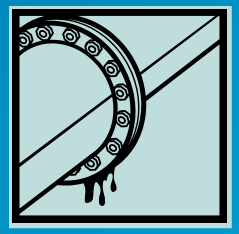
COMPLICATIONS: Leak

- Abnormal drainage
- Increased pain- may radiate to left shoulder
- Elevated WBC count
- Decreased urine output



INTERVENTIONS:

- Make patient NPO
- Evaluate for leak- imaging

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COMPLICATIONS: Leak

- May order CT Scan (with small amount water-soluble contrast)
- Or UPPER GI (water-soluble contrast)
- Patient may need to return to OR or transfer to ICU

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COMPLICATIONS: Hemorrhage

- Can occur from leak, injury to internal organ
- Signs/symptoms:
  - Decreased Blood Pressure
  - Elevated heart rate
  - Increased respiratory rate
  - Decreased urinary output
  - Drop O2 saturation
  - Increased bloody drainage in JP or from incisions

COMPLICATIONS: Hemorrhage

- May have hematemesis
- Bloody BM

INTERVENTIONS

- MAKE PATIENT NPO
- Check VS
- Consider 2nd IV access, type and cross, CBC
- Discontinue Toradol, anticoagulation

- 90 % bleeds may stop spontaneously
- May need to return to OR

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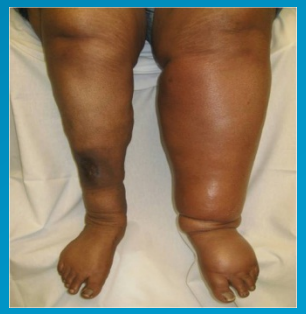
COMPLICATIONS: Deep Vein Thrombosis

- Prevention:
  - Anticoagulation: Lovenox 40mg or Heparin 5,000 units pre-op day of surgery
- 40 mg daily for Sleeve/Gastric Bypass
- Athrombic boots while in bed
- Ambulate and hydrate
- Patients with BMI greater than 50 or high risk go home on extended Lovenox



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COMPLICATIONS: Deep Vein Thrombosis

- Assess for DVT
  - Pain, generally in calf
  - Assess redness, warmth, tenderness, swelling

INTERVENTIONS

- Doppler ultrasound
- D Dimer
- Anticoagulation

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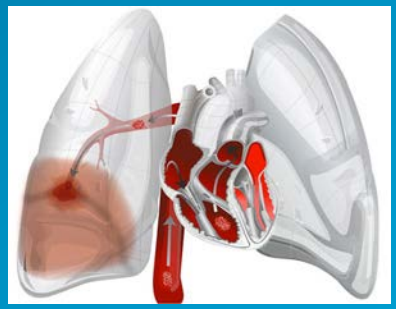
Pulmonary Embolism

- Signs/Symptoms
  - Chest pain- sudden onset, worse with deep inspiration
  - Shortness of breath
  - Anxiety/apprehension
  - Sweating
  - Passing out
  - Low O2



INTERVENTIONS

- Oxygen
- CT angiogram chest; VQ scan
- Thrombolytic therapy

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Bariatric Diet: Pre and post-op

- Pre-op: low sugar, low fat, moderate protein 600-800 calories
- Post-op
  - 2 weeks liquid diet, 2 weeks pureed diet
  - weeks soft diet, then full 1200 calorie diet

Recommendations:

- Variable
  - 60-80 grams protein; duodenal switch 90 grams; or
  - 1 gram per kg daily protein intake
  - 100 grams carbs
  - 20 grams fat

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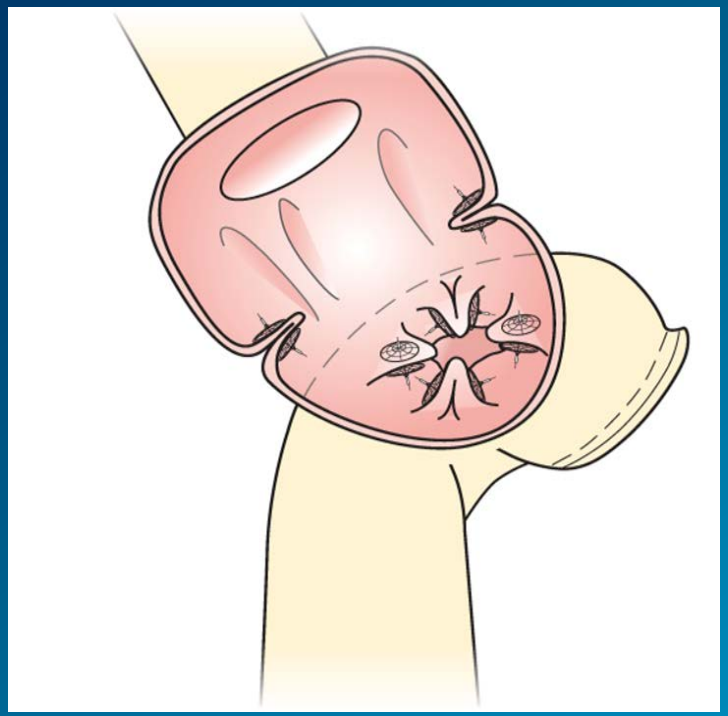
Why Bariatric Surgeries Fail

- Lack of follow up
- Surgical complications
- Patient not following diet, exercise program
- Need the best surgery for the patient- decided on an individual basis

Revision Endoscopic Obesity Surgery



- Revision of Gastric Bypass
- Done endoscopically
- Reduces surface area for experience early satiety

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Endoscopic Revision after Gastric Bypass

- Candidate: lost at least 50% with original bypass
- Regained weight (generally 25%)
- Post-op at least 2 years
- Study examined 25 patients who regained ~ 50 lbs from nadir
- Average BMI 43 at revision
- Lost additional 22 lbs at 12 months post revision

Jirapinyo, P., Slattery J., Ryan, M.B. et al, Evaluation of an endoscopic suturing device for transoral outlet reduction in patients with weight regain following Roux-en-Y gastric bypass Endoscopy 2013; 45(07): 532-536

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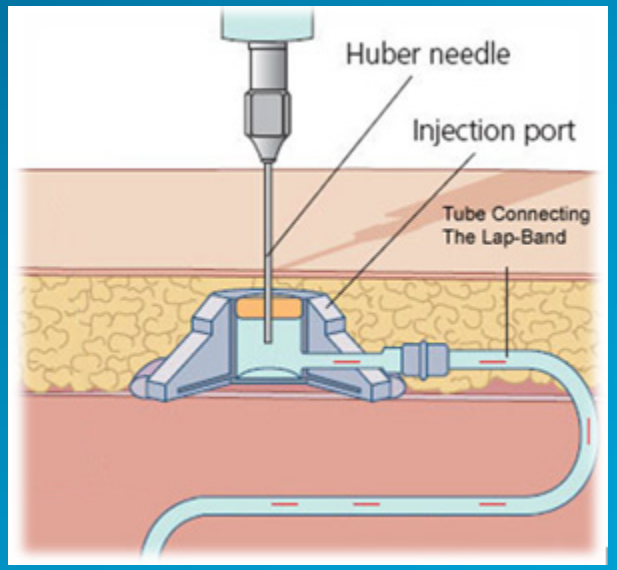
Gastric Band Management

- Gastric Band Adjustments
  - Not feeling restricted
  - X ray shows good flow of contrast without restriction



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Complications of Gastric Banding

- Requiring urgent intervention
  - Pouchitis
  - Band slippage
  - Gastric Band erosion
  - Port complications
  - band complications
- Requiring timely intervention
  - Reflux
  - Difficulty swallowing textured foods (chicken, hamburger)

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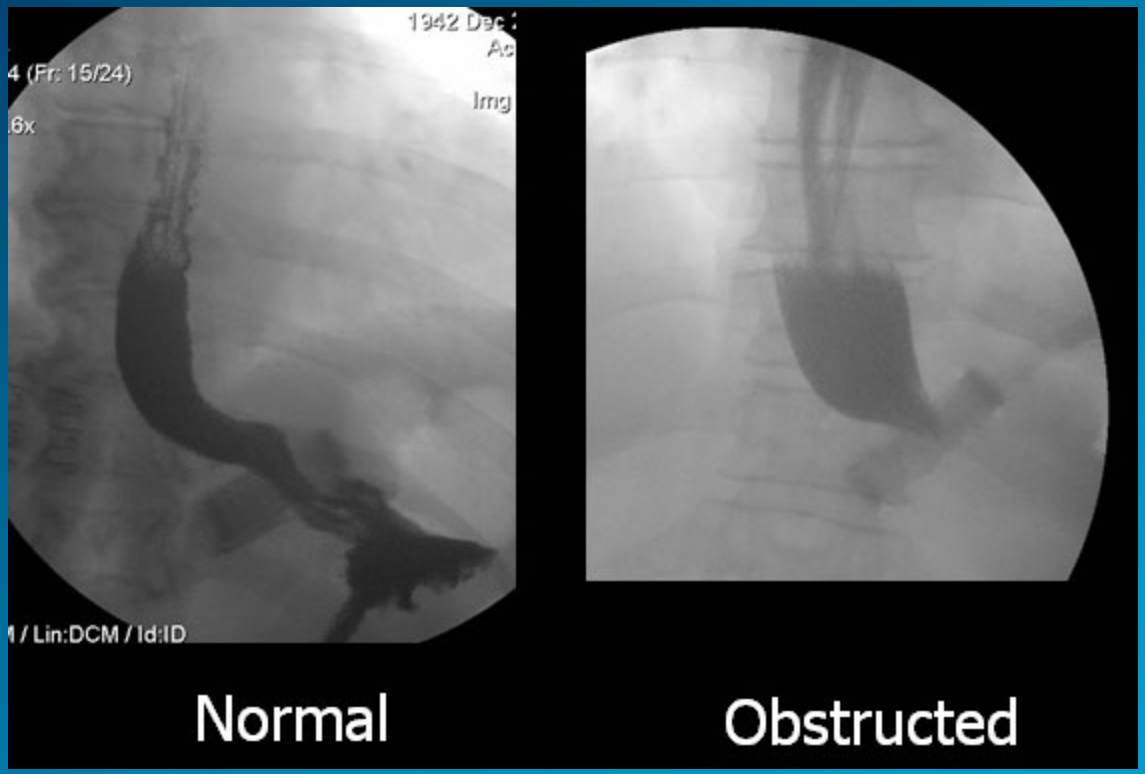
Gastric Band Imaging



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Post-operative

- Follow up- every 3 months for 18 months, then annually
- Support group
- Labs
- What to expect after 18 months?
  - 50-70% excess weight loss
  - Resolution of diabetes, HTN, improvement of OSA

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Exercise

- American Society for Metabolic & Bariatric Surgery
- Pre-operative exercise- mild exercise
- (20 minutes, 3-4 times/week)
- Post-operative exercise-
  - Walking post-op day 1
  - Increase walking schedule
  - Light weight training when cleared by surgeon

– ASBS Public/Professional Education Committee, ASMBS 2012(1) ; ASBMS Bariatric Surgery Post-operative concerns, from www.asmbs.org

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Types of Exercise

- Aerobic Exercise- cardiovascular strengthening
- Strength Training- weight maintenance; prevent injuries
- Flexibility

Timing

- At least 10 min- time for endorphins to kick in
- Heart rate adjusts to comfortable, elevated rate

Barriers to Exercise

- Lack of time
- Physical discomfort
- Fatigue
- Lack of interest
- Lack of discipline
- Proximity of workout facility

- Watowicz, R.P, Taylor, C.A., Eneli, I.U. Lifestyle behaviors of obese children following parental weight loss surgery.
- Obesity Surgery, 2013:23(2)
- Egan, A.M., et al Barriers to exercise in obese patients with type 2 diabetes. QJM, 2013 (March)

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Activities to get started

- Take the stairs versus the elevator.
- Walk up and down a flight of stairs 5 times during each TV commercial.
- Park your car as far away as possible from your destination.
- Do 5 jumping jacks before brushing your teeth.
- Take a walk after lunch or dinner.

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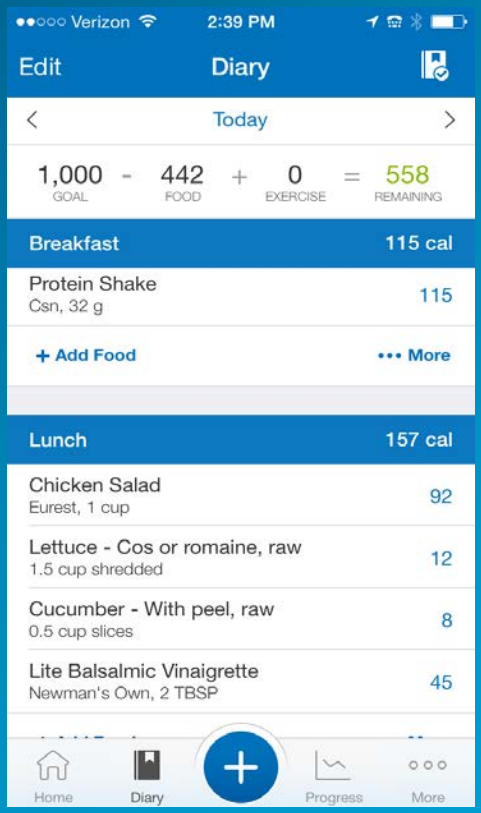
Self Monitoring Tools

- Self-monitoring Aps
  - Myfitnesspal
  - LoseIt
  - Time2Eat
  - Calorie Counter



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Self Monitoring Tools

- Devices
- Fitbit
- Jawbone up
- Garmin Vivosmart

- Fitbit Charge

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Self Monitoring and Eating Related Behaviors

- 123 participants
- 12 month study
- Post-menopausal overweight-obese women
- Mean weight loss: 10.7%
- Poor weight loss factors
  - Skipping meals
  - Eating out for lunch

Kong, A., Beresford, S., Alfano, C. et al; Self-monitoring and eating-related behaviors are associated with 12-month Weight loss in postmenopausal overweight-to-obese women; Journal of Academy of Nutrition and Dietetics 122(9) 1428-1435

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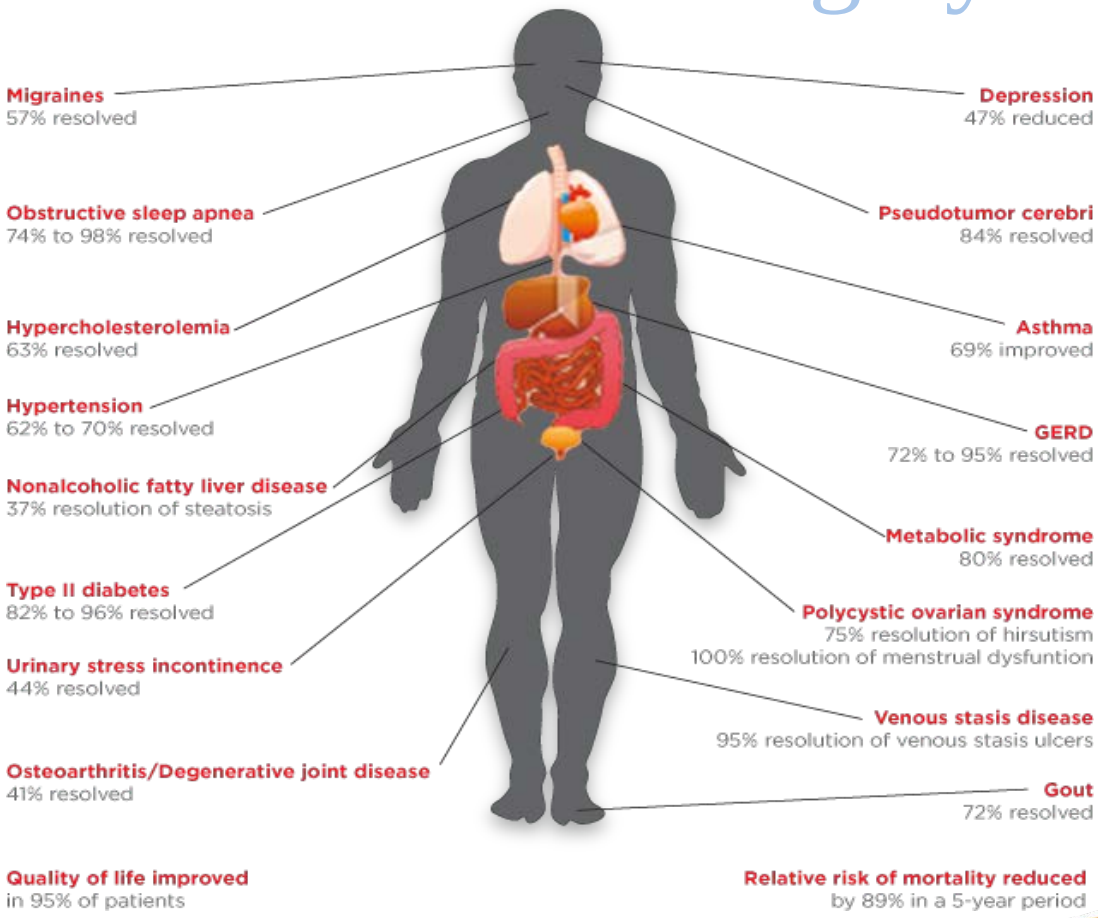
Resolution of Comorbidities after Bariatric Surgery



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Resolution of Diabetes Type 2 after Gastric Bypass

- GLUT-1- Gluose transporter 1; normally found in intestine of fetus
- Study in rats
- Reprogramming of intestinal glucose metabolism to meet its increased demands
- Glucose is directed toward metabolic pathways that support tissue growth.
- Reprogramming of intestinal glucose metabolism is triggered by the exposure of the Roux limb to undigested nutrients.
- Reprogramming of intestinal glucose metabolism renders the intestine a major tissue for glucose disposal, contributing to the improvement in glycemic control after RYGB

Saeidi, N., Meoli, L. et al Reprogramming of Intestinal Glucose Metabolism and Glycemic Control in Rats After Gastric Bypass. Science 26 July 2013: Vol. 341 no. 6144 pp. 406-410

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Effects of Gastric Bypass Surgery in Patients With Type 2 Diabetes and Only Mild Obesity

- 66 patients for 6 years
- BMI 30-35
- Severe longstanding diabetes (12.5 +/-7.4 years)
- HgbA1c 9.7 +/- 1.5
- Mean HgbA1c fell to 5.9 (despite medication cessation)
- Weight loss failed to correlate with several measures of improved glucose homeostasis
- Consistent with weight-independent antidiabetes mechanisms of RYGB.

- Cohen, R.V, Pinhiero, J.V et al, Diabetes Care. 2012 Jul; 35(7): 1399–1400

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Empathy Training

- EMPATHY: The ability to identify with and understand someone else's feelings or difficulties.

- All staff working with the bariatric population are required to have empathy training

- Staff examine:
  - Attitudes toward the obese population
  - Perceptions and beliefs
  - How do they feel?

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The future for optimal weight loss

- Combination medication and surgery
- New surgical procedures

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Conclusion

- Surgery offers lasting option for weight reduction
- Right surgery in right patient
- Resolution or improvement of comorbidities

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