

# Review of Medical Nutrition Therapy In Surgical Treatment of Obesity

Bariatric Care Team Panel

University of Nebraska  
Medical Center



Nebraska  
Medicine

# Objectives

1. Identify surgical weight loss options
2. Identify key nutrition practice guidelines outlined in the 2008/2013/2016 ASMBS Guidelines
3. Identify key elements of nutrition assessment and treatment of obese patients in a clinical setting



# Bariatric Care Team Panelists

- Tiffany Tanner, MD
  - Bariatric surgeon
- Melissa Monzu-Sparks, RN, BSN, CBN
  - Case manager
- Justin Weeks, PhD
  - Psychologist
- Shawn Post, MS, RDN, LMNT
  - Dietitian (moderator)

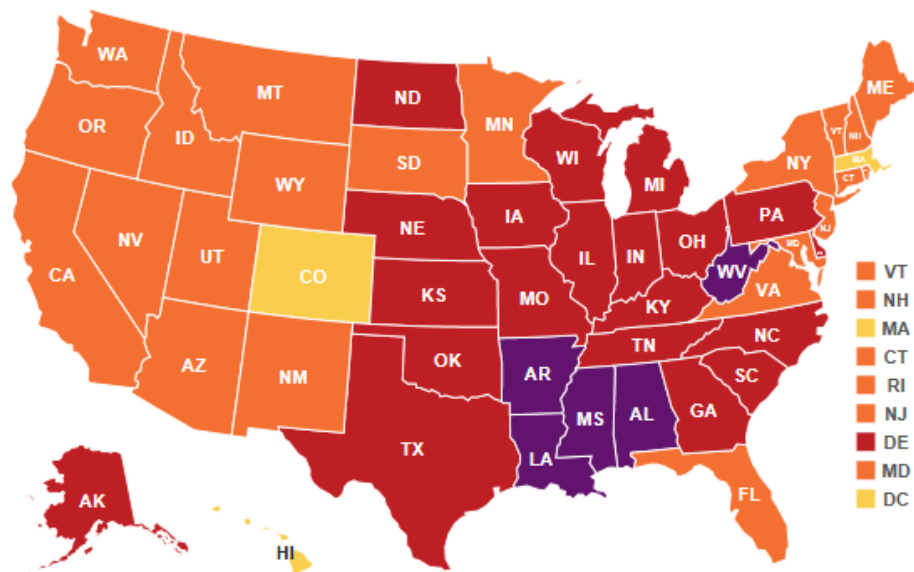


# Adult Obesity Rate by State, 2016

Select years with the slider to see historical data. Hover over states for more information. Click a state to lock the selection. Click again to unlock.

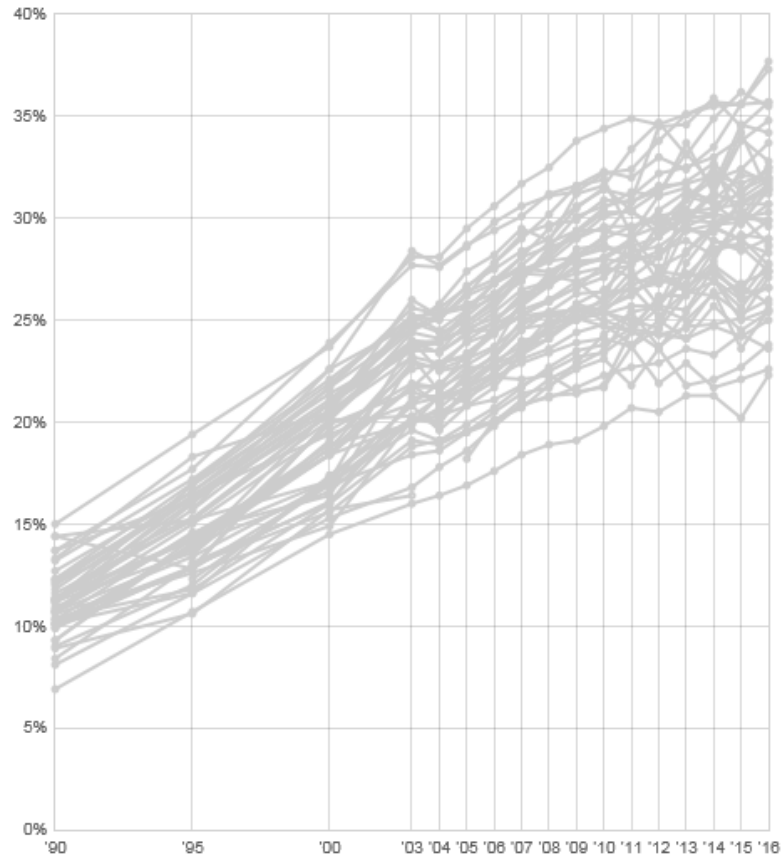
## Percent of obese adults (Body Mass Index of 30+)

0 - 9.9%   10 - 14.9%   15 - 19.9%   20 - 24.9%   25 - 29.9%   30 - 34.9%   35%+



All States   West   Midwest   South   Northeast

## Adult obesity rates, 1990 to 2016



	5'0"	5'2"	5'4"	5'6"	5'8"	5'10"	6'0"	6'2"	6'4"	6'6"
150	29.4	27.5	25.8	24.3	22.9	21.6	20.4	19.3	18.3	17.4
160	31.3	29.3	27.5	25.9	24.4	23.0	21.7	20.6	19.5	18.5
170	33.3	31.2	29.2	27.5	25.9	24.4	23.1	21.9	20.7	19.7
180	35.2	33.0	31.0	29.1	27.4	25.9	24.5	23.2	22.0	20.8
190	37.2	34.8	32.7	30.7	28.9	27.3	25.8	24.4	23.2	22.0
200	39.1	36.7	34.4	32.3	30.5	28.8	27.2	25.7	24.4	23.0
210	41.1	38.5	36.1	34.0	32.0	30.2	28.5	27.0	25.6	24.3
220	43.1	40.3	37.8	35.6	33.5	31.6	29.9	28.3	26.8	25.5
230	45.0	42.2	39.6	37.2	35.0	33.1	31.3	29.6	28.1	26.6
240	47.0	44.0	41.3	38.8	36.6	34.5	32.6	30.9	29.3	27.8
250	48.9	45.8	43.0	40.4	38.1	35.9	34.0	32.2	30.5	29.0
260	50.9	47.7	44.7	42.1	39.6	37.4	35.3	33.5	31.7	30.1
270	52.8	49.5	46.4	43.7	41.1	38.8	36.7	34.7	32.9	31.3
280	54.8	51.3	48.2	45.3	42.7	40.3	38.1	36.0	34.2	32.4
290	56.8	53.2	49.9	46.9	44.4	41.9	39.4	37.3	35.4	33.6
300	58.7	55.0	51.6	48.5	45.7	43.1	40.8	38.6	36.6	34.7
310	60.7	56.8	53.3	50.1	47.2	44.6	42.1	39.9	37.8	35.9
320	62.6	58.7	55.0	51.8	48.8	46.0	43.5	41.2	39.0	37.1
330	64.6	60.5	56.8	53.5	50.5	47.4	44.8	42.5	40.3	38.2
340	66.5	62.3	58.5	55.2	51.9	48.9	46.2	43.7	41.5	39.4
350	68.5	64.1	60.2	56.6	53.3	50.3	47.6	45.0	42.7	40.5
360	70.5	66.0	61.9	58.2	54.9	51.8	48.9	46.3	43.9	41.7
370	72.4	67.8	63.6	59.8	56.4	53.2	50.3	47.6	45.1	42.8

Overweight

Obese

High Risk

Severely Obese

Very High Risk

Morbidly Obese



# Multiple Factors Influencing Obesity



# ASMBS SURGICAL ESTIMATIONS

## Estimate of Bariatric Surgery Numbers, 2011-2015

Published July 2016

	2011	2012	2013	2014	2015
<b>Total</b>	<b>158,000</b>	<b>173,000</b>	<b>179,000</b>	<b>193,000</b>	<b>196,000</b>
<b>RNY</b>	36.7%	37.5%	34.2%	26.8%	23.1%
<b>Band</b>	35.4%	20.2%	14%	9.5%	5.7%
<b>Sleeve</b>	17.8%	33%	42.1%	51.7%	53.8%
<b>BPD/DS</b>	0.9%	1%	1%	0.4%	0.6%
<b>Revisions</b>	6%	6%	6%	11.5%	13.6%
<b>Other</b>	3.2%	2.3%	2.7%	0.1%	3.2%
<b>Balloons</b>					~700 cases
<b>V-Bloc</b>					18 cases

ASMBS total bariatric procedures numbers from 2011, 2012, 2013, 2014 and 2015 are based on the best estimation from available data (BOLD, ASC/MBSAQIP, National Inpatient Sample data and outpatient estimations).



Less than 1% of eligible individuals get

surgery

# Types of Bariatric Surgery

## Malabsorptive and Restrictive

- Roux-En-Y Gastric Bypass
- SIPS
- BPD/DS (Biliopancreatic diversion/duodenal switch)

## Restrictive

- Sleeve Gastrectomy
- Intragastric Balloon
- LAGB (laparoscopic adjustable gastric band)

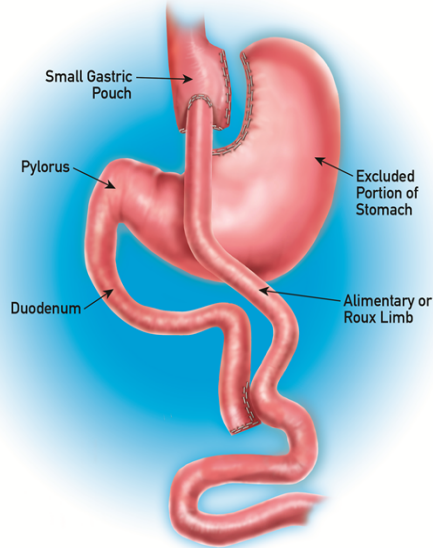
### To qualify for bariatric surgery:

- BMI  $\geq 35$  + 1 co-morbid condition
- BMI  $\geq 40$  without any co-morbid conditions





# Roux-En-Y Gastric Bypass



- 150 cm Roux Limb → increases malabsorption and increases weight loss
- Duodenum is 70 cm
- Common Channel: >250 cm for absorption of nutrients
- Average weight loss: 60-70% of excess BW in 1-1.5 years
- At 10 years, most patients regain 10-15% of BW (old habits die hard!)
- At risk to malabsorb: Ca, Fe, B12, D, folate, thiamine



# Risks Associated with Gastric Bypass

## Short-Term

- Leak at staple line or bowel connection
  - Abdominal infection or abscess
- Blood clot in leg veins
- Pulmonary embolus
- Wound problems (infection, hernia, scar)
- Nausea/vomiting
- Injury to the spleen, stomach, esophagus
- Pneumonia
- Risk for death (30 day mortality):  
0.1-0.4%

## Long-Term

- Internal hernia
- Bowel obstruction/blockage
- Narrowing (stricture) of intestinal connections
- Flatulence/gas
- Diarrhea/constipation
- Dumping syndrome
- Failure to lose weight/weight regain
- Vitamin/protein deficiencies/malnutrition
- Gallstones
- Ulcers

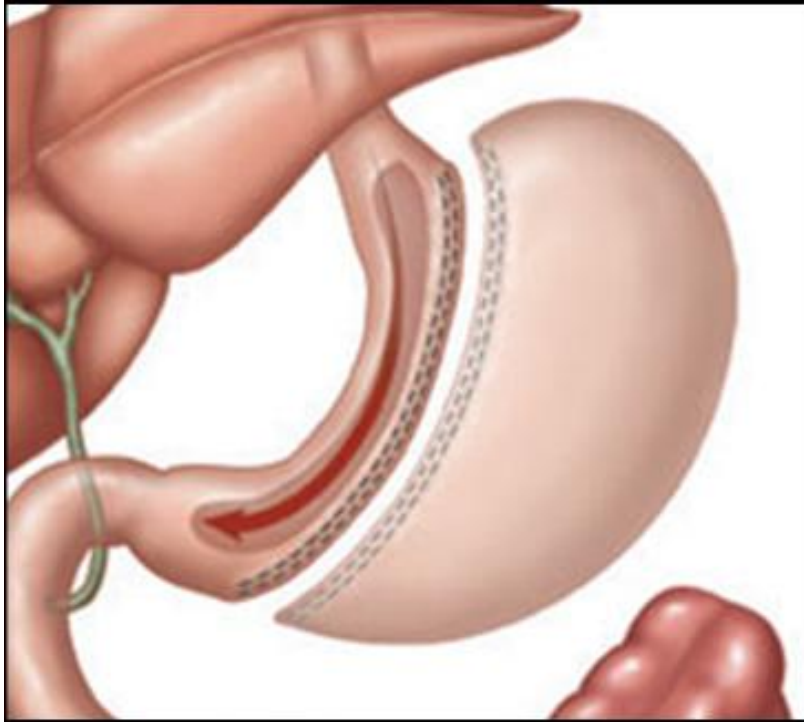


# Benefits of Gastric Bypass

- Diabetes: 90% become diet controlled
  - Most patients leave the hospital on **NO** medicines
- High blood pressure: 66% resolved; 33% less medications
- Reflux/Heartburn: 95% resolved
- Sleep apnea: 90 % resolved
- Stress Incontinence: 90% resolved
- High cholesterol/triglyceride: 90% resolved



# Sleeve Gastrectomy



- Newer procedure created for a two-step procedure
- Restrictive effect from the stomach
- Removes ~80-85% of the stomach - NON-reversible
- NO malabsorption
- Big benefit → reduced ghrelin production, so patients do not feel hungry
- Average weight loss: 50% of excess BW in 1-1.5 years
- Nutrients of concern: B12, iron, thiamine, calcium



# Risks of Sleeve Gastrectomy

- Leak
- Post-op bleeding
- Nausea/vomiting
- Blood clot in leg veins
- Pulmonary embolus
- Wound problems - infection, hernia, scar
- Injury to spleen, stomach, or esophagus
- Pneumonia
- Risk of death (30-day mortality rate): 0.1-0.2%

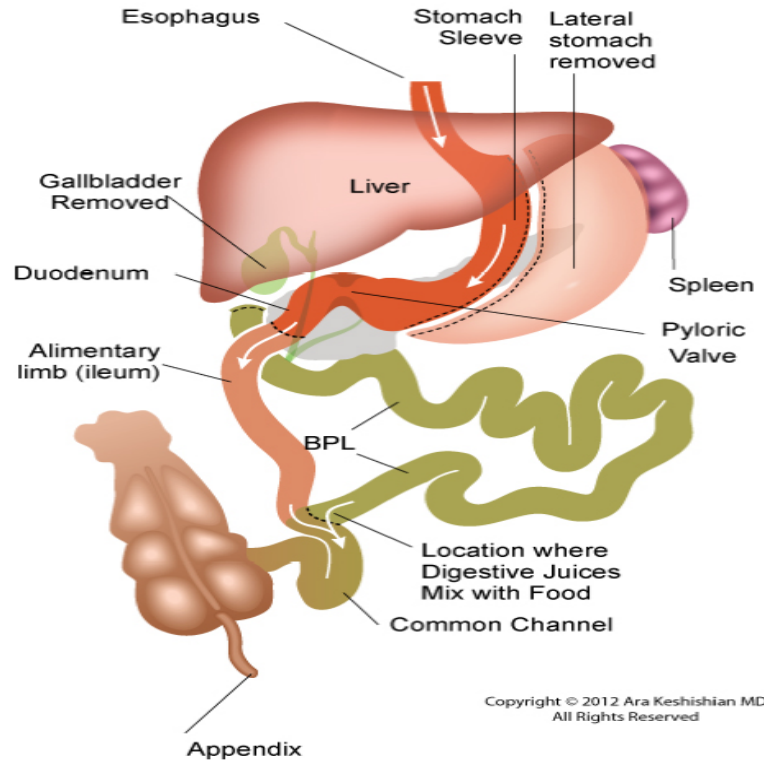


# Benefits of Sleeve Gastrectomy

- Early data shows good resolution of co-morbidities similar to the gastric bypass
- No intestinal bypass
  - No internal hernias
  - No dumping syndrome
  - Less vitamin deficiencies, protein malnutrition, anemia, osteoporosis
- Second stage operation available if inadequate weight loss



# Duodenal Switch (BPD/DS)



- Much more malabsorptive than RyGB/SIPS
- Typically for severely obese (BMI >50)
- 75% stomach removed; 75% of GI tract bypassed
- Common channel: 50-150 cm (essentially short gut)
- Malabsorb fat >70% and protein ~25%
- ADEK supplementation is crucial due to increased risk for nutrition deficiencies
- Average weight loss: 70-80% excess BW
- Considered best treatment for T2DM
- At risk to malabsorb: iron, calcium, zinc, B12, folate, ADEK, protein



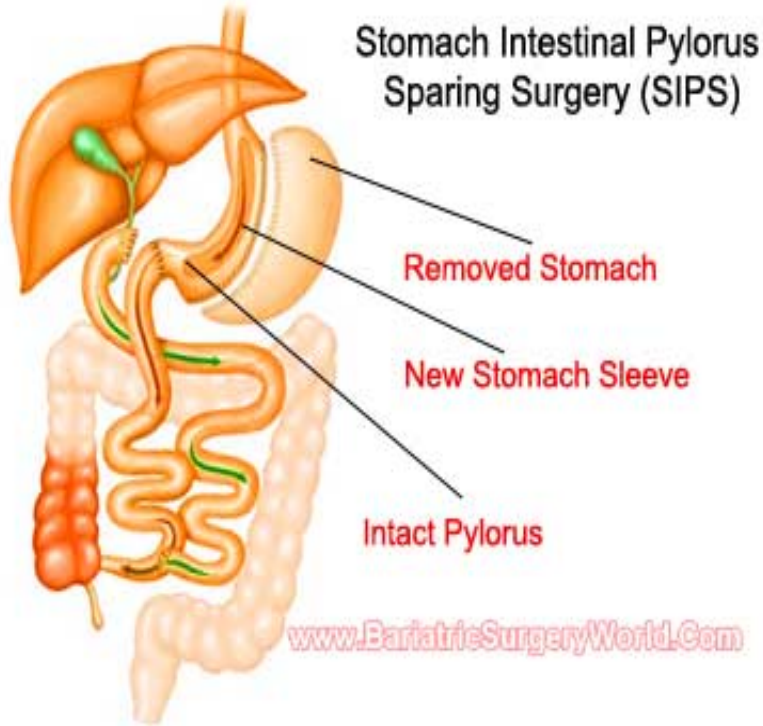
# Risks of BPD/DS

- Essentially short gut syndrome
- High level of malabsorption
  - Must supplement fat soluble vitamins (ADEK)
  - Carefully monitor labs
- Bacterial overgrowth





# SIPS (Stomach Intestinal Pylorus Sparing Surgery)



- Newer procedure to create more malabsorption → essentially a hybrid of a bypass and a sleeve
- Common channel is 300 cm
- Less side effects than BPD/DS
- Can be used as a primary surgery or revision surgery
- Current data shows 70% EBW lost at 1 years, but still too early to tell



# Risks Associated with SIPS

- Leak
- Stricture
- Intussusception
- Obstruction
- Hernias
- Malabsorption
- Vitamin and Mineral deficiencies

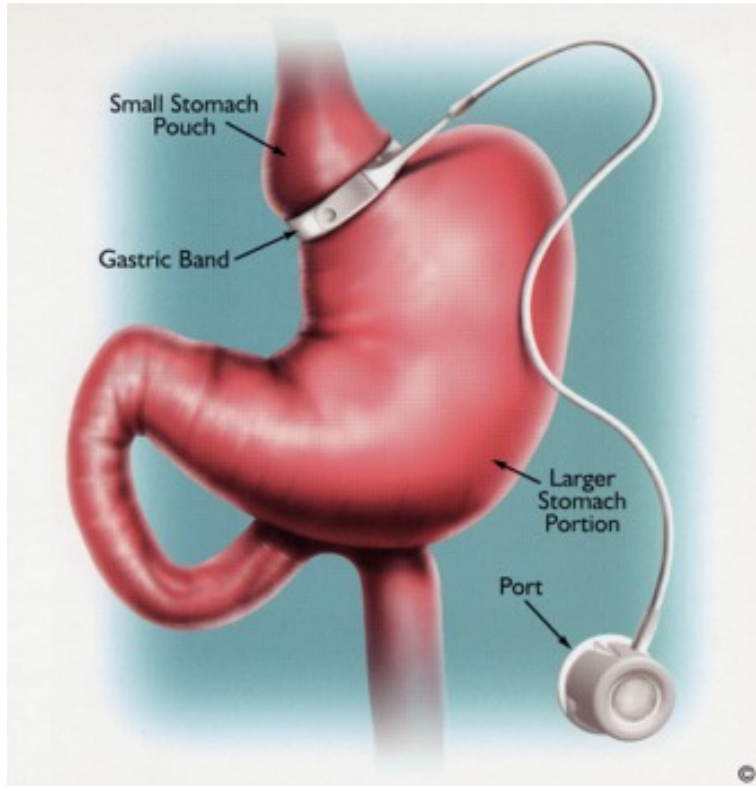


# Benefits of SIPS

- ~70+% of excess weight loss at 12 months
- Early weight loss data shows promising results, but too early to tell
- Nutrition monitoring and supplementation mirrors DS recommendations, but malabsorption is less



# LAGB (Laparoscopic Adjustable Gastric Band)



- Restricts amount of food upper stomach can hold (~1/2 cup)
- Normal absorption of nutrients
- Need frequent adjustments of the band (fill to make tighter)
- Easily reversible
- Average weight loss: 40% of excess BW
- Complications: erosion in the stomach, slip, chronic n/v
- Nutrients of concern: folate, thiamin, B12, calcium
- 1 in 5 LAGB patients undergo reoperation

# Nutritional Considerations Post-Surgery

Dependent on surgery (malabsorptive + restrictive versus restrictive)

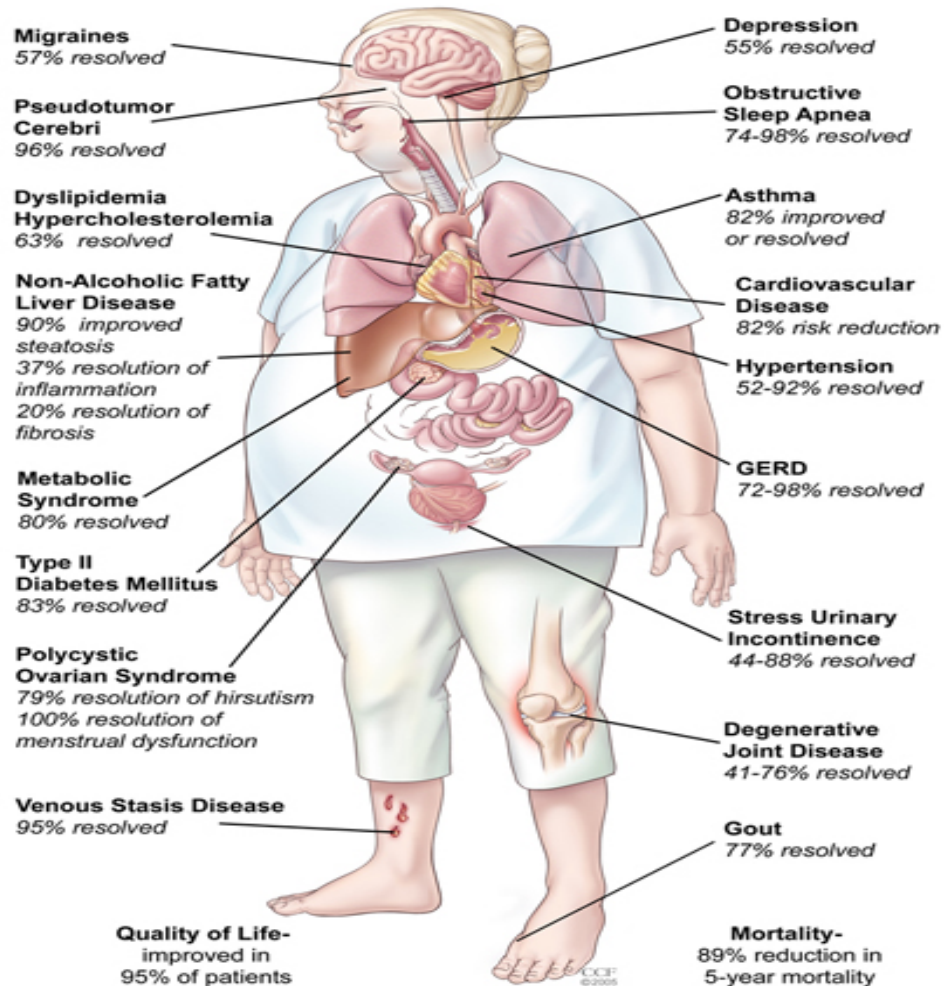
- Risk for protein-energy malnutrition
- Protein supplementation, fat/carbohydrate restriction is a *MUST*
- Adequate hydration
- Daily vitamin and mineral supplementation is also a *MUST*
- Ability to follow nutrition and program recommendations lifelong



# Potential Nutritional Complications Post-Surgery

- Dumping syndrome
- Dehydration
- Protein/vitamin/mineral deficiencies
- Binge eating and/or grazing
- Weight regain





# Pre-Operative Process/Screening for Patients at NMC

- Information session
- Meeting the PA to screen patient
  - Full body analysis using InBody Scale (bioelectrical impedance analysis)
- Bari Block: meet with RD, psychologist, exercise physiologist
- Possible supervised weight management requirement
- *New protocol*: lose certain amount of weight based on BMI
  
- **Goals:** Pre-op compliance/understanding to be successful post-op





# Components of Nutrition Assessment

- Weight History
- Weight Loss Attempts
- Medical History
- Labs
- Psychological History
- Psychosocial
- Drug/alcohol/tobacco abuse
- Physical activity
- Motivators and barriers
- Diet Intake/food recall



# Focus of Pre-Operative Nutrition Education/Counseling

- Personal responsibility + lifestyle choices
- Self-monitoring
  - Food Logs, phone apps
- Post-Operate intake/diet progression
  - Diet/nutrition/hydration
  - Vitamin and mineral supplementation (malabsorption)
  - Use of protein shakes/supplements
  - Mindful Eating



# Post-Op Diet Progression

**Night of Surgery** - sugar-free clear liquids;  
water (GB1)

**4 days after surgery** - add protein shakes (GB2)

**1 week after surgery** - add in cottage cheese,  
Greek yogurt (GB3a)

**2 weeks after surgery**- high protein, pureed  
consistency (GB3b)

**4-6 weeks after surgery** - High protein, soft  
foods (GB4)



# Nutrition Goals Post Surgery

## 0-6 Months Post-Op

- 60-70 grams protein/day
- <90 grams of carbohydrates/day
- <850 calories/day

## 12+ Months Post-Op

- 80-120 grams protein/day
- <130 grams of carbohydrates/day
- <1300 calories/day

## For Life

- Focus on protein at all meals and supplementation as needed
- Limiting carbohydrates, grains, junk foods, sugary foods/drinks, fast food
- Vitamins+minerals
- Hydration, hydration, hydration -64 ounces minimum!
- Regular physical activity



# Vitamin and Mineral Supplementation

Vitamin	Dose Instructions	Directions
<b>Multivitamin- Mineral Supplement</b>	Recommend: 200% of daily value	Begin with chewable or liquid Progress to tablets as tolerated Choose a complete formula with: 45-60 mg elemental iron, 400-1000 ug folic acid, 12 mg thiamine, and contains selenium and zinc in each serving. Avoid incomplete children's vitamins.
<b>Vitamin B-12</b>	350-1,000 mcg per day	Available sublingual, liquid, mouth spray or nasal gel/spray
<b>Calcium Citrate</b>	1,200-1,500 mg per day	Begin with chewable and progress to tablets as tolerated. Split into 500-600 mg doses. Space evenly throughout the day and take with food.
<b>Vitamin D-3</b>	3000 International Units per day	Often found in gel capsules, but is now made in chewable form. Often found in combination with Calcium.

Reference Source: 2016 Clinical Practice Guidelines Bariatric Surgery Patient ASMBS and AACE



# Amanda: Gastric Bypass



# References

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# Questions?

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