Webinar Will Begin Momentarily

TODAY'S AGENDA:

- Introduction & Housekeeping
- Speaker Introduction
- Presentation
- Q&A
- Closing

Orgain

Professional Education Series

Support. Inform. Educate. Empower.

Gallstones, Deficiencies, & Hair Loss - Oh My! Managing the Nutrition Challenges of Weight Loss

WEBINAR HOST:

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Objectives

After this webinar, participants will be able to:

- ❏ Describe obesity treatment options including lifestyle, pharmacotherapy, and bariatric surgery
- ❏ Identify nutrition complications related to weight loss
- ❏ Apply evidence-based guidelines to manage nutrition complications

Agenda

L Lifestyle Weight Loss
- Science of Diets
- Gallstones
- Muscle Wasting
- Electrolyte Imbalance

K Pharmacotherapy
- Common Side Effects

L Bariatric Surgery
- Dumping Syndrome
- Post-Bariatric Hypoglycemia

K
- Constipation
- Micronutrient Deficiencies
- Hair Shedding

Q&A Session

Science of Diets

Popular Diets

Best Diets Overall

RANK	DIET NAME
#1	Mediterranean Diet
#2 (tie)	DASH Diet
#2 (tie)	The Flexitarian Diet
#4	WW (Weight Watchers) Diet
#5 (tie)	Mayo Clinic Diet
#5 (tie)	MIND Diet
#5 (tie)	Volumetrics Diet

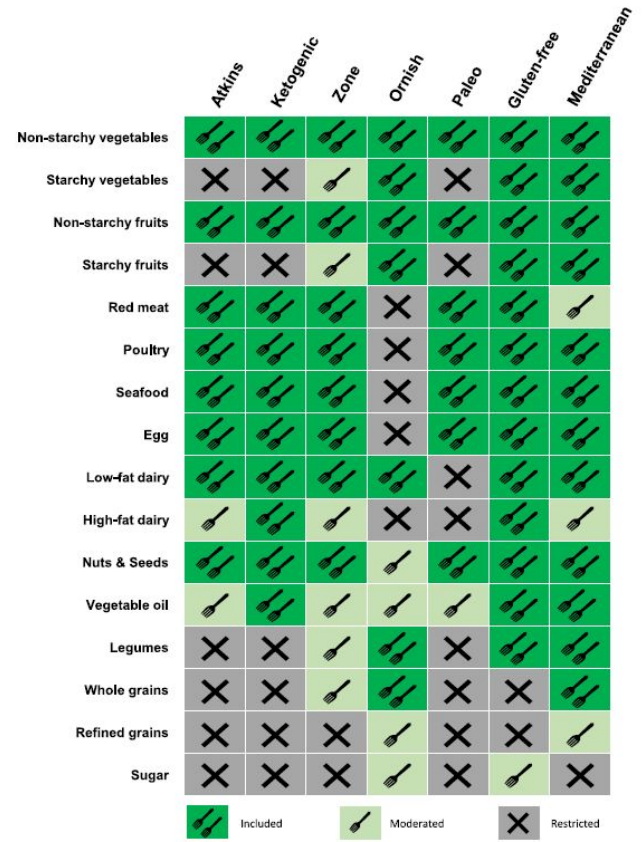


Fig. 1. Food groups included or excluded in popular diets: Atkins, Ketogenic, Zone, Ornish, Paleo, gluten-free, and Mediterranean.

health.usnews.com; Freire 2020

Top 5 Diets: Themes

Include:

- Vegetable and plant-forward, especially non-starchy veggies
- Variety of fruit, with some limits
- Whole grains
- Nuts & beans were occasional for some of the diets

No specific foods or food groupings that should be avoided

Limit alcohol & red meat

• A diet from the European Association for the Study of Diabetes Guidelines, which focuses on targeting food groups, rather than formal prescribed energy restriction while still achieving an energy deficit.
• Higher protein (25% of total calories from protein, 30% of total calories from fat, 45% of total calories from carbohydrate) with provision of foods that realized energy deficit.
• Higher protein Zone™-type diet (5 meals/day, each with 40% of total calories from carbohydrate, 30% of total calories from protein, 30% of total calories from fat) without formal prescribed energy restriction but realized energy deficit.
• Lacto-ovo-vegetarian-style diet with prescribed energy restriction.
• Low-calorie diet with prescribed energy restriction.

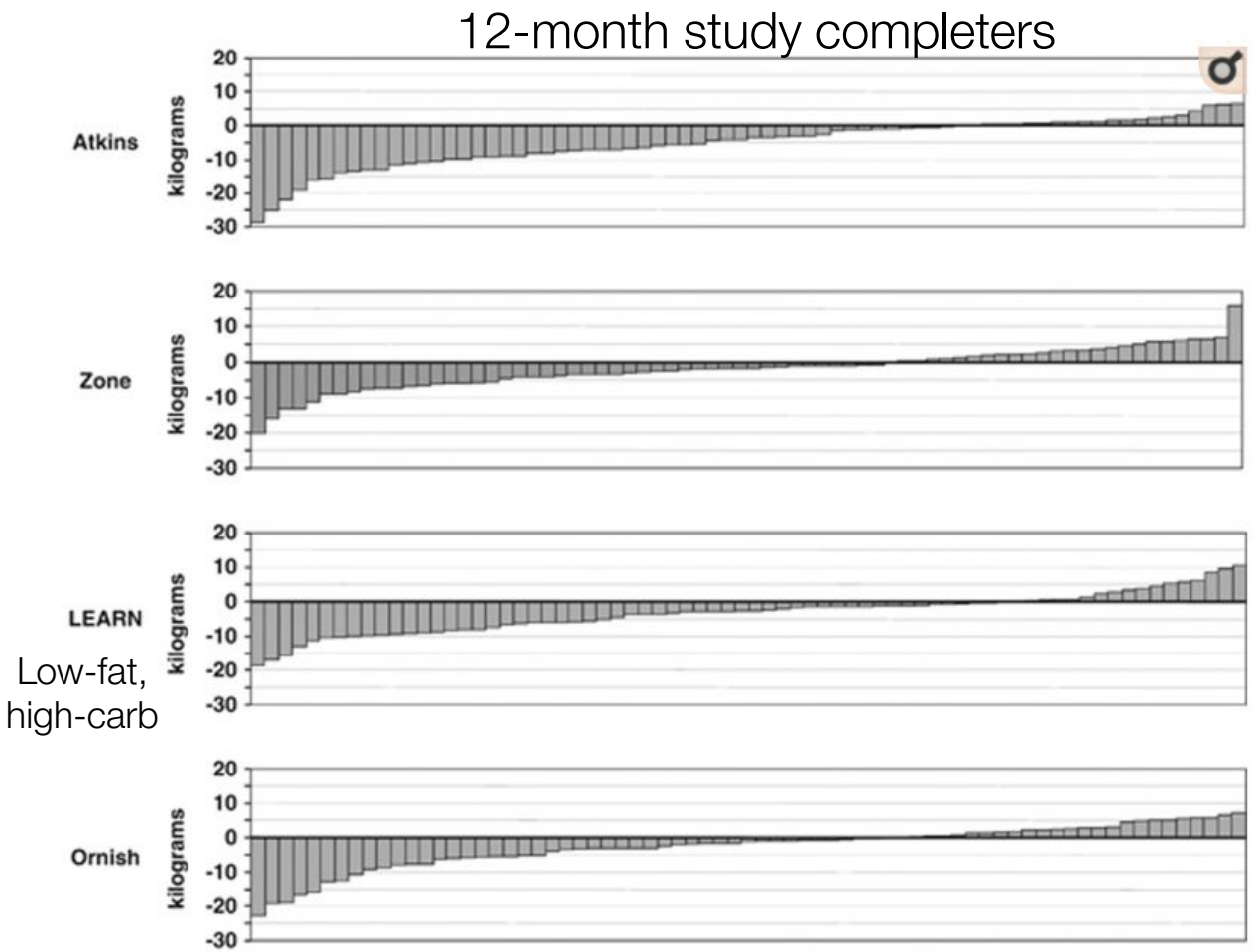
A variety of dietary approaches can produce weight loss…

if reduction in dietary energy intake is achieved.

• Mediterranean-style diet with prescribed energy restriction.
• Moderate protein (12% of total calories from protein, 58% of total calories from carbohydrate, 30% of total calories from fat) with provision of foods that realized energy deficit.
• Provision of high-glycemic load or low-glycemic load meals with prescribed energy restriction.
• The AHA-style Step 1 diet (with prescribed energy restriction of 1,500–1,800 kcal/day, <30% of total calories from fat, <10% of total calories from saturated fat)

Jensen et al. 2013

Variability in Response to Diets



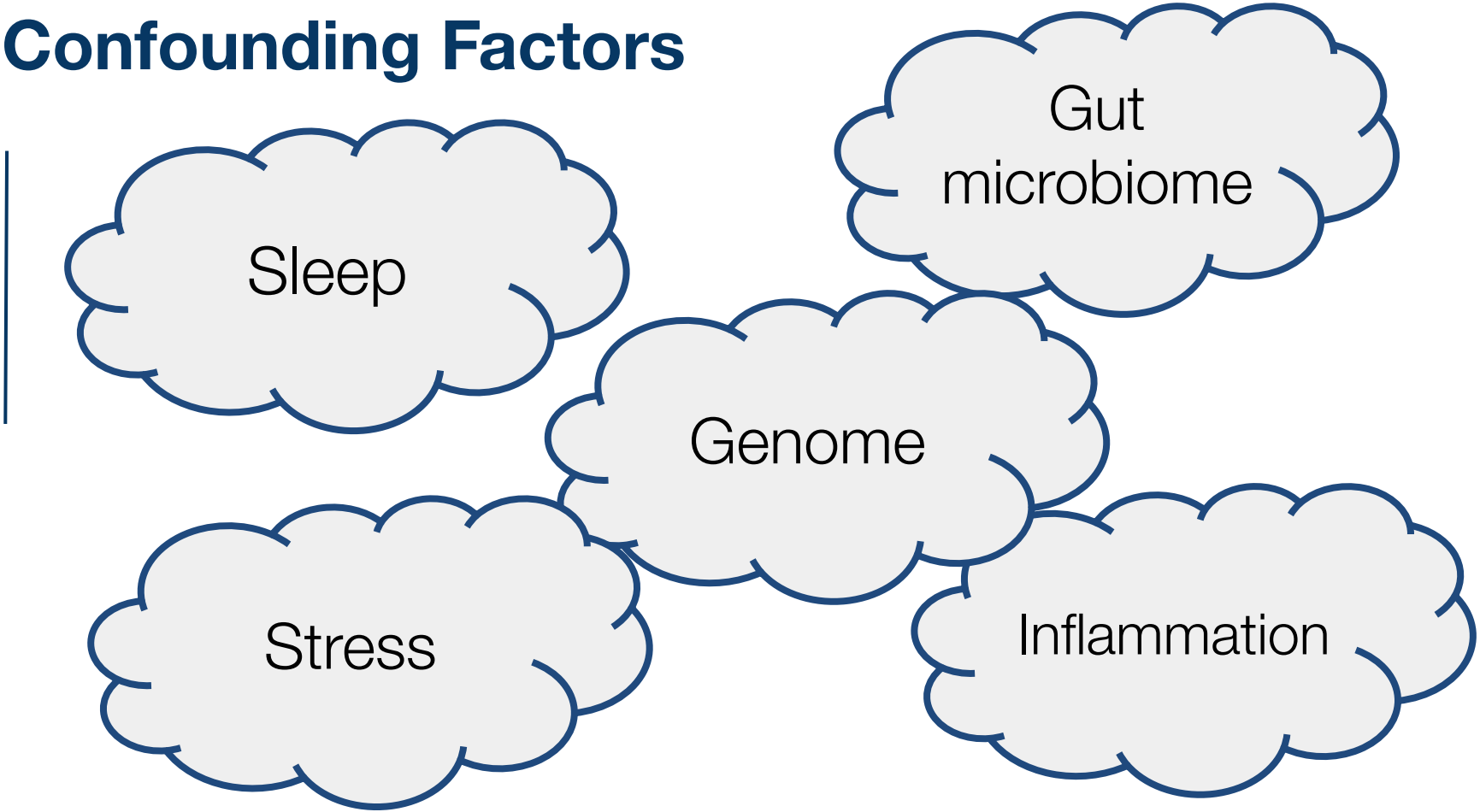
Low-fat, high-carb

Gardner 2012

Discussion Question

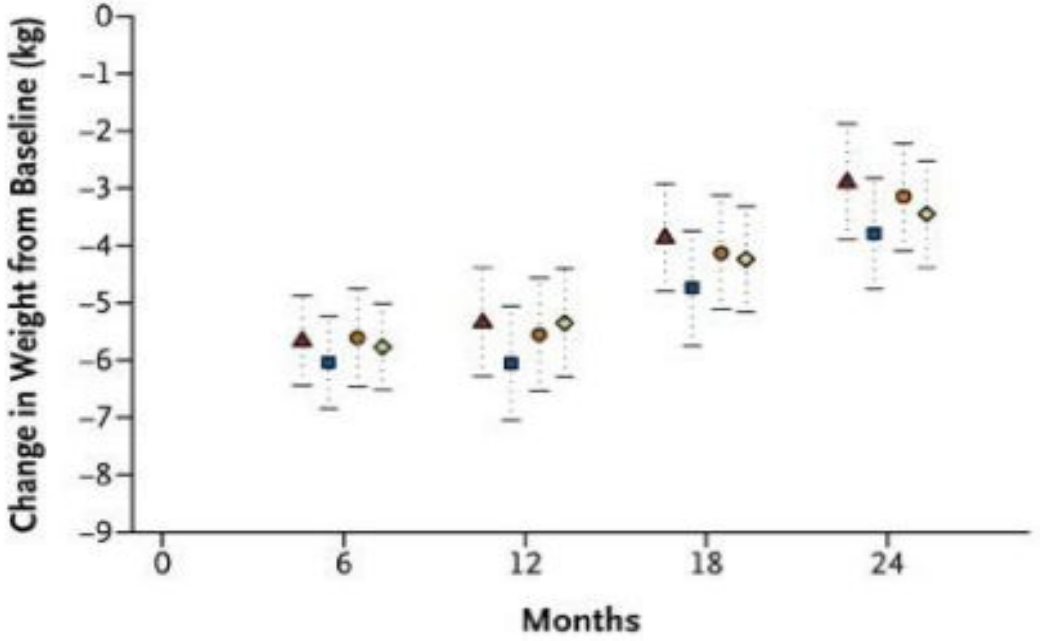
How does this information challenge your current practice?

Confounding Factors



Expected Outcomes

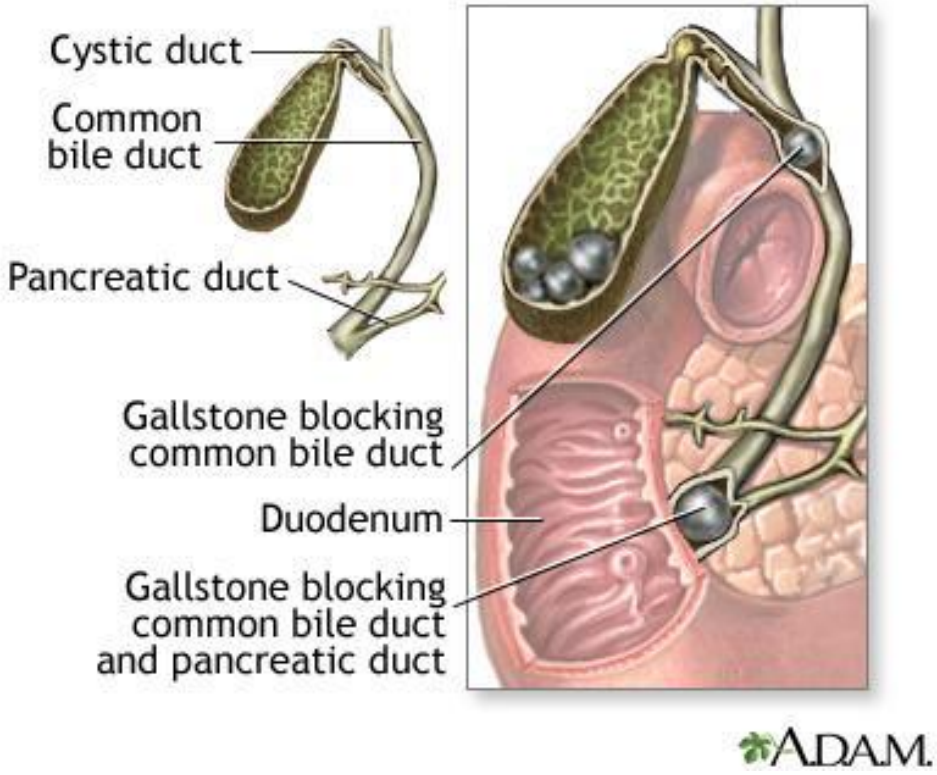
Average weight loss is maximal at 6 months with smaller losses maintained for up to 2 years while treatment and follow-up tapers



Sacks et al. 2009; Jensen et al. 2013

Lifestyle Weight Loss: Nutrition Challenges

Gallstones



Bile is a delicate balance of primarily cholesterol, bilirubin and bile salts.

An imbalance of components or poorly emptying gallbladder can lead to gallstones.

NIDDK 2017, Franceschelli Hosterman 2017

Risk for Gallstones

People with Obesity

- Higher levels of cholesterol in bile
- Gallbladder doesn't contract as effectively

People Losing Weight Rapidly

- Rapid weight loss cause the liver to release higher levels of cholesterol in the bile
- Fasting limits the contraction of the gallbladder

NIDDK 2017, Franceschelli Hosterman 2017

Interventions

- Treatment with ursodeoxycholic acid (UDCA; ursodial)
- Diets with higher fat content vs low-fat diets
  - Subjective; high-fat vs low-fat wasn't defined in study

Stokes et al. 2014, NIDDK 2017, Franceschelli Hosterman 2017

Muscle Wasting

During weight loss, there is risk of losing both muscle mass & muscle quality or strength

People with obesity have greater muscle mass but poorer muscle quality than people without obesity.

20-30% of each pound lost comes from muscle.

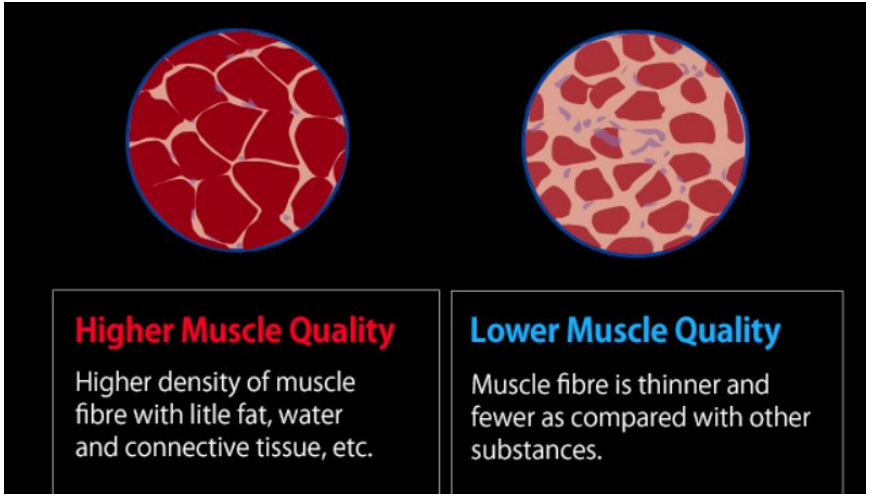
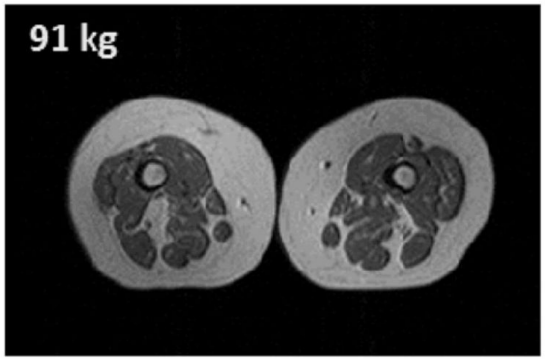


Image from Tanita.com

Cava et al. 2017

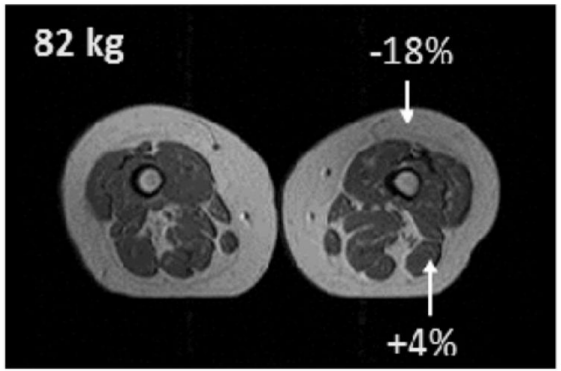
Sarcopenic Obesity

Obesity with decreased muscle mass and function



Fat mass = 42 kg Lean mass = 50 kg
Relative lean mass = 54 %

Exercise + weight loss



Fat mass = 34 kg Lean mass = 49 kg
Relative lean mass = 60 %

Bouchonville & Villareal 2014

Interventions

- Regular physical activity, especially resistance training
  - Preserves muscle mass & strength
- High protein intake – at least 1.25x the RDA
- For sarcopenic obesity:
  - testosterone only indicated with symptomatic hypogonadism
  - limited evidence for myostatin inhibitors

Cava et al. 2017, Bouchonville & Villareal 2014

Discussion Question

Do you assess for muscle wasting?

If yes, how?

If no, what are the barriers?

Electrolyte Imbalances

Common causes related to dieting:

- very low carbohydrate diet
- fluid loss from heavy exercise or physical activity
- eating disorders

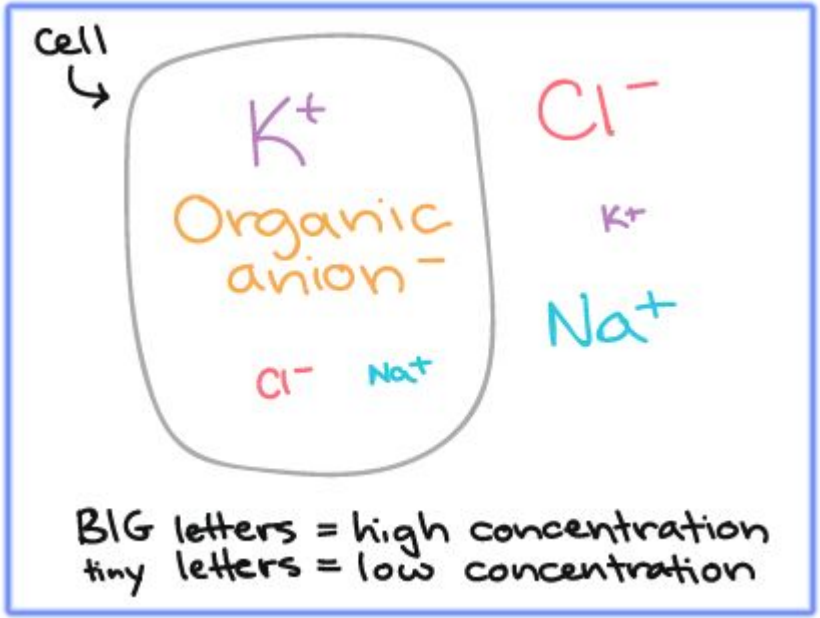


Image:https://www.khanacademy.org/science/biology/human-biology/neuron-nervous-system/a/the-membrane-potential

Very Low Carb Diets

Reduction in carbohydrate

Less insulin secreted; more water excreted

Kidneys excrete more sodium

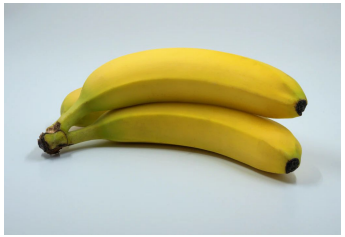
Sodium loss impacts electrolyte balance

Signs & Symptoms:

- Fatigue
- Struggling during physical exertion
- Diarrhea
- Arrhythmia

Nutrition Intervention

- Add more salt to foods
- Use salty snacks during training or athletic events
- Choose foods high in magnesium & potassium, or supplement



Pharmacotherapy: Nutrition Challenges

Polling Question

Are you using weight loss medications in your practice setting?

Pharmacotherapy

In 2015, **15 times more diabetes drugs** (excluding insulin) were dispensed to outpatients in the United States compared with weight loss medications

46% of adults fit the criteria for use of weight loss medications with only **2% receiving treatment**.

8.4% of adults are diagnosed with diabetes with **86% receiving diabetes medications**.

Thomas et al 2016, Kahan 2017

Barriers to Pharmacotherapy

- Lack of recognition of obesity as a disease
- Belief that obesity does not require pharmacotherapy
- Limited insurance coverage or time
- Lack of patient expectation for comfort to discuss weight loss treatment options with providers
- Provider bias towards weight / obesity
- Prescribers are not familiar with these meds nor comfortable with prescribing them

Thomas et al 2016, Kahan 2017, Busko 2019

FDA-Approved Indications

- Patients with obesity (BMI > 30)
- Patients with BMI > 27 with presence of adiposity-related complication (type 2 diabetes mellitus, hypertension, dyslipidemia)

Always an adjunct to lifestyle modifications

If no clinical improvement after 12-16 weeks with one anti-obesity medication, consider alternative anti-obesity medication or increasing dose (if applicable).

Thomas et al 2016, Kahan 2017, Busko 2019

FDA-Approved Meds

- Orlistat
- Phentermine / Topiramate ER
- Naltrexone SR / Buproprion SR
- Liraglutide 3.0mg

Note: Lorcaserin (Belviq) Removed Feb 2020

Tak 2020; Kahan 2017

Orlistat (Xenical®; OTC: alli®)

Drug action

Pancreatic lipase inhibitor
Reduces absorption of ingested fat

Adverse effects

GI (diarrhea, flatulence), especially with consumption of added fat. May promote gallstones and kidney stones. May have malabsorption of fat soluble vitamins (ADEK)

Contraindications

Pregnancy, cholestatsis, chronic malabsorption

Drug interactions with cyclosporine, hormone contraceptives, seizure medications, thyroid hormones, warfarin

Obesity Algorithm 2019; Kahan 2017

Orlistat (Xenical®; OTC: alli®)

Nutrition Implications :

- Educate patient on low-fat dietary intake
- Binds fat-soluble vitamins; may require additional supplementation
- Take vit/min supplements at bedtime (medication is with meals)

Outcomes: Orlistat plus counseling doubled weight loss seen with placebo/counseling

Obesity Algorithm 2019; Kahan 2017

Phentermine/Topiramate ER (Qsymia®)

Drug action	Appetite suppressant, sympathomimetic amine & anticonvulsant
Adverse effects	Paresthesia, dizziness, dysgeusia, insomnia, constipation, dry mouth
Contraindications	Pregnancy; topiramate is a known teratogen. Monthly pregnancy tests recommended. Should not be used in patient with glaucoma, uncontrolled high BP, heart disease, or hyperthyroidism

Obesity Algorithm 2019; Kahan 2017

Phentermine/Topiramate ER (Qsymia®)

Nutrition Implications:

- Managing dry mouth without added calories
- Constipation prevention
- Dysgeusia may require patient to try new seasonings/spices. Also noted taste change with carbonated beverages

Outcomes: Drug combination more successful than either drug alone; reduced progression to type 2 diabetes

Obesity Algorithm 2019; Kahan 2017

Naltrexone SR/ Bupropion SR (Contrave®)

Drug action	Dopamine & norepinephrine reuptake inhibitor & opioid receptor antagonist. Affect hypothalmic appetite center or mesocorticolimbic dopamine system.
Adverse effects	Nausea, constipation, diarrhea, headache. Most resolve in days to weeks and do not recur
Contraindications	Uncontrolled hypertension, seizure disorders, chronic opioid use, MAOI use, pregnancy

Obesity Algorithm 2019; Kahan 2017

Naltrexone SR/ Bupropion SR (Contrave®)

Nutrition Implications:

- Management of short-term GI symptoms (constipation, diarrhea, nausea, vomiting)
- Can also help with smoking cessation

Outcomes: 5% weight loss

Obesity Algorithm 2019; Kahan 2017

Liraglutide 3.0 mg (Saxenda®)

Drug action	Glucagon-like peptide 1 receptor agonist
Adverse effects	Nausea, GI symptoms
Contraindications	History of medullary thyroid carcinoma, multiple endocrine neoplasia type 2, acute pancreatitis, pregnancy, breastfeeding

Obesity Algorithm 2019; Kahan 2017

Liraglutide 3.0 mg (Saxenda®)

Nutrition Implications:

- Management of GI complications (nausea, diarrhea, constipation, abdominal pain)
- Educate patients on hypoglycemia if taking diabetes medications (especially sulfonylureas or insulin)

Outcomes: Average 9% weight loss; 71% of participants maintained at 3 years. Reduced progression to diabetes by 80%.

Obesity Algorithm 2019; Kahan 2017

Off-Label Use

Drug is being used for unapproved indication, population, dosage, or duration

Not necessarily illegal nor unethical

- Some jurisdictions limit prescribers

Examples:

- Phentermine used below BMI cutoff or combined with other
- Metformin used for pre DM + weight loss, but approved for DM
- Liraglutide 1.8 used for weight loss, but approved for DM

Hendricks 2017; Brown 2015

Obesity-Promoting Pharmacotherapy

Common Classes

- Anti-Diabetes
- Psychiatric/Neurologic
- Antiseizure / Anticonvulsants
- Steroid Hormones
- Antihistamines

Mechanisms

- Stimulation of Appetite
- Absorption and storage of glucose
- Slowing of metabolism
- Shortness of breath; fatigue (reducing activity)
- Water retention

Effects can vary person to person

Kyle & Kuehl nd, Blahd 2016 , Beksinska, Smit & Guidozzi 2011

Obesity-Promoting Pharmacotherapy

There's hope!

- For many of these medications, weight-neutral options are available
- If alternatives are not available, many side effects can be managed
- Encourage patients not to discontinue medication without discussing with MD

Kyle & Kuehl nd, Blahd 2016

Resources

Quick Takes: What You Need to Know About The 5 FDA-Approved Obesity Drugs
https://www.medscape.com/viewarticle/876411 (need to create free Medscape account)

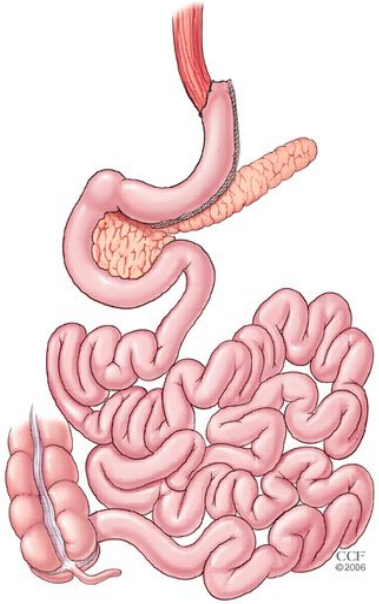
Obesity Medicine Association Obesity Algorithm Powerpoint
https://obesitymedicine.org/obesity-algorithm-powerpoint/ (need to request free download)

Prescription Medications to Treat Overweight and Obesity
https://www.niddk.nih.gov/health-information/weight-management/prescription-medications-treat-overweight-obesity

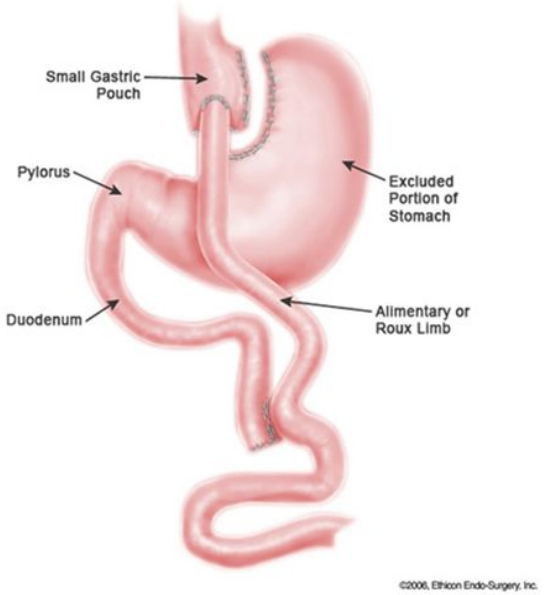
Download a list of medications at:
https://www.obesityaction.org/community/article-library/prescription-medications-weight-gain

Bariatric Surgery: Nutrition Challenges

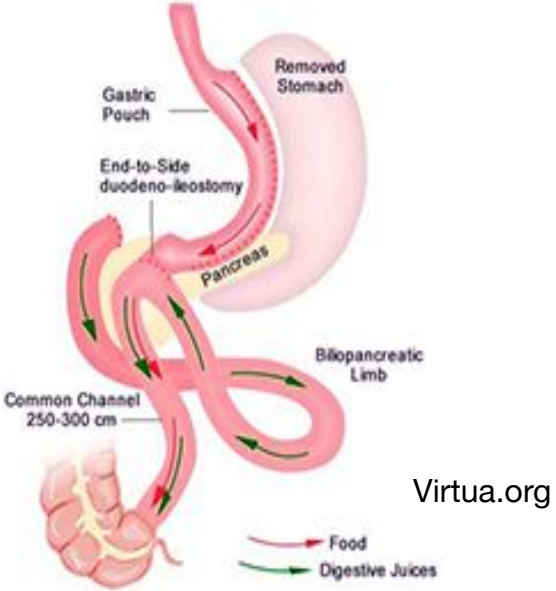
Common Bariatric Surgeries



Sleeve Gastrectomy



Roux-en-Y Gastric Bypass



Virtua.org

Single Anastomosis Duodenal Switch

Bariatric Surgery Estimates

Published June 2018

	2011	2012	2013	2014	2015	2016	2017	2018*
Total	**158,000**	**173,000**	**179,000**	**193,000**	**196,000**	**216,000**	**228,000**	**252,000**
Sleeve	17.8%	33.0%	42.1%	51.7%	53.6%	58.1%	59.4%	61.4%
RYGB	36.7%	37.5%	34.2%	26.8%	23.0%	18.7%	17.8%	17.0%
Band	35.4%	20.2%	14.0%	9.5%	5.7%	3.4%	2.7%	1.1%
BPD-DS	0.9%	1.0%	1.0%	0.4%	0.6%	0.6%	0.7%	0.8%
Revision	6.0%	6.0%	6.0%	11.5%	13.6%	14.0%	14.1%	15.4%
Other	3.2%	2.3%	2.7%	0.1%	3.2%	2.6%	2.5%	2.3%
Balloons	—	—	—	—	0.3%	2.6%	2.8%	2.0%

The ASMBS total bariatric procedure numbers are based on the best estimation from available data (BOLD,ACS/MBSAQIP, National Inpatient Sample Data and outpatient estimations).

**New methodology for estimating outpatient procedures done at non-accredited centers.*

https://asmbs.org/resources/estimate-of-bariatric-surgery-numbers

Polling Question

How would you rate your opinion on bariatric surgery on a scale of 1 to 5.

1 = not supportive, 5 = highly supportive

Facts about Bariatric Surgery

The risk of bariatric surgery is about the same as the risk of gallbladder surgery

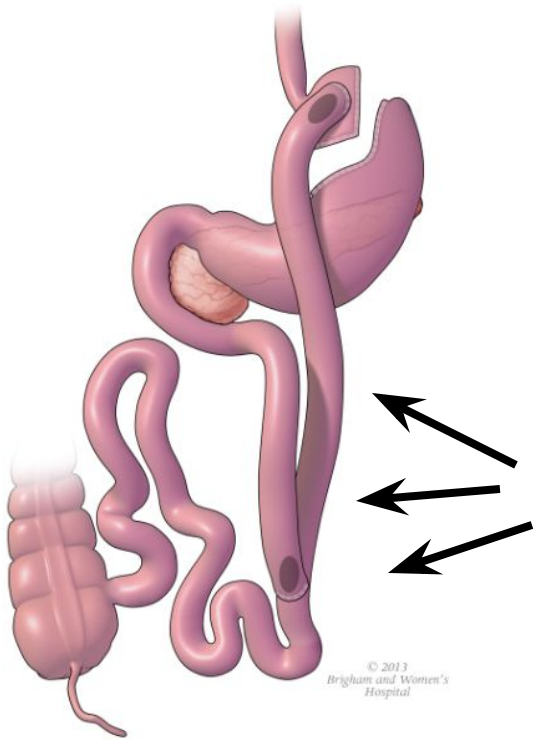
It's a metabolic treatment and the most effective one for obesity and type 2 diabetes

'Success' rates are about 85% 5 years after surgery

It is not a cure for obesity or type 2 diabetes

Schulz 2017

Pathophysiology of Dumping Syndrome



Fluid shift

- Rapid passage of nutrients to the small intestine which causes an osmotic fluid shift
- Triggered by simple carbohydrates
- Symptoms are gastrointestinal and vasomotor; occur within 30-60 minutes after eating

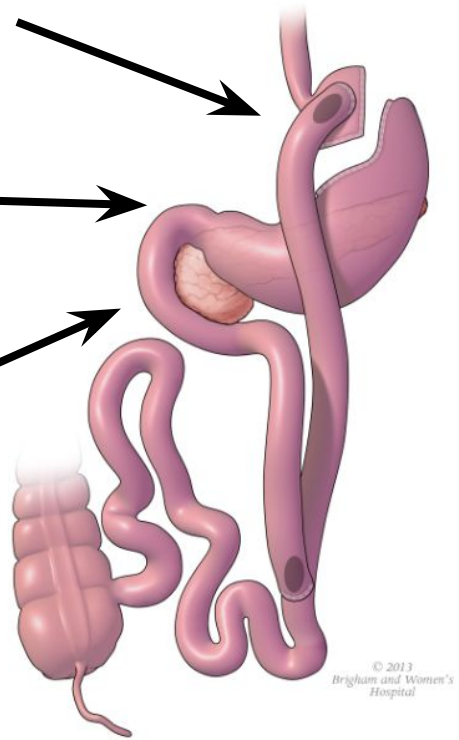
Tack & DeLoose 2014; Kanth & Roy 2017

RNY Impacts Gastric Emptying

Vagotomy

Lack of pyloric sphincter

Duodenal feedback lost



Reduction in fundic reservoir

Hormonal secretions that sustain gastric digestion are impacted

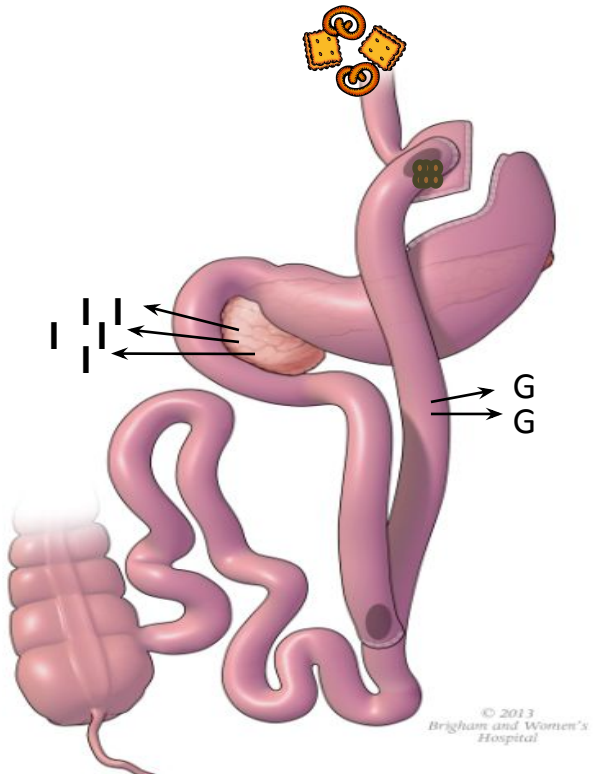
Kanth & Roy 2017

Nutrition Intervention

- Avoid added sugars in beverages and foods
  - Sometimes natural sugars (fructose, lactose) can be problematic
- Avoid eating and drinking at the same time
  - Drink 30 to 60 min after eating
  - Be mindful of watery foods like soups
- Pectin, guar gum, glucomannan ?

Tack & DeLoose 2014; Kanth & Roy 2017

Pathophysiology of Post-Bariatric Hypoglycemia



- Typically presents 2+ years s/p gastric bypass
- Rapid hypoglycemia from exaggerated insulin response (incretin effect)
- Food moves to small intestine more quickly; triggers hormone release (GLP-1 and GIP) which stimulates insulin response
- Symptoms of hypoglycemia occur 1-3 hours after a meal

Salehi et al. 2018

Nutrition Intervention

Goal: Delay transit of food through GI tract

- Small, frequent meals (5-6 times per day)
- Limit carbohydrate to 15-30 grams per meal
    - Choose complex carbohydrate foods
- Have source of protein and/or fat at each meal
- Avoid drinking during meal and 30 min after
- Uncooked cornstarch mixed into unsweetened beverages, yogurt, cottage cheese

Salehi et al. 2018; Botros et al. 2014; Ritz et al. 2012; Gremse et al. 1990

Beyond Nutrition Management

- Medications like acarbose or octreotide
- Reversal of gastric bypass doesn’t always help
- Placement of G-tube

Salehi et al. 2018; Ritz et al. 2012

Constipation Assessment

Assess for constipation vs bowel changes

There is a new normal for bowel movements after surgery.

Not having a bowel movement doesn't necessarily equal constipation.

- ➔ Check for last bowel movement; ideally every 3 days without abdominal pain or exertion
- ➔ What type and volume of intake are they currently having
- ➔ Assess fluid intake
- ➔ Assess fiber intake

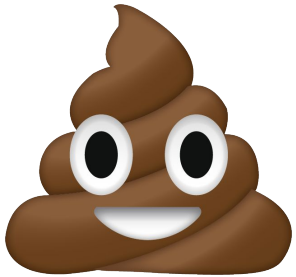
Greenstein & O'Rourke 2011; Foxx-Orenstein, McNally, & Odunsi 2008; Grosse et al 2019, Potoczna 2008

Common Causes

- Change in bowel function / slow peristalsis
- Decreased intake
- Low fiber liquid diets
- Elimination of coffee
- Pain medications (opioids)
- Dehydration

Greenstein & O'Rourke 2011; Foxx-Orenstein, McNally, & Odunsi 2008; Grosse et al 2019, Potoczna 2008

Nutrition Intervention



Stool softeners and/or laxatives

- Senna or Miralax can initiate bowel movement

Assess for adequate fiber intake

- Slow and steady supplementation as needed
- Soluble fiber bulks stool and insoluble facilitates movement

Assess for dehydration

If pt discontinued caffeine, resume morning dose

Encourage daily activity

Greenstein & O'Rourke 2011; Foxx-Orenstein, McNally, & Odunsi 2008; Grosse et al 2019, Potoczna 2008

Bristol stool chart

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on its surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clear-cut edges (passed easily)
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces, **Entirely liquid**

Polling Question

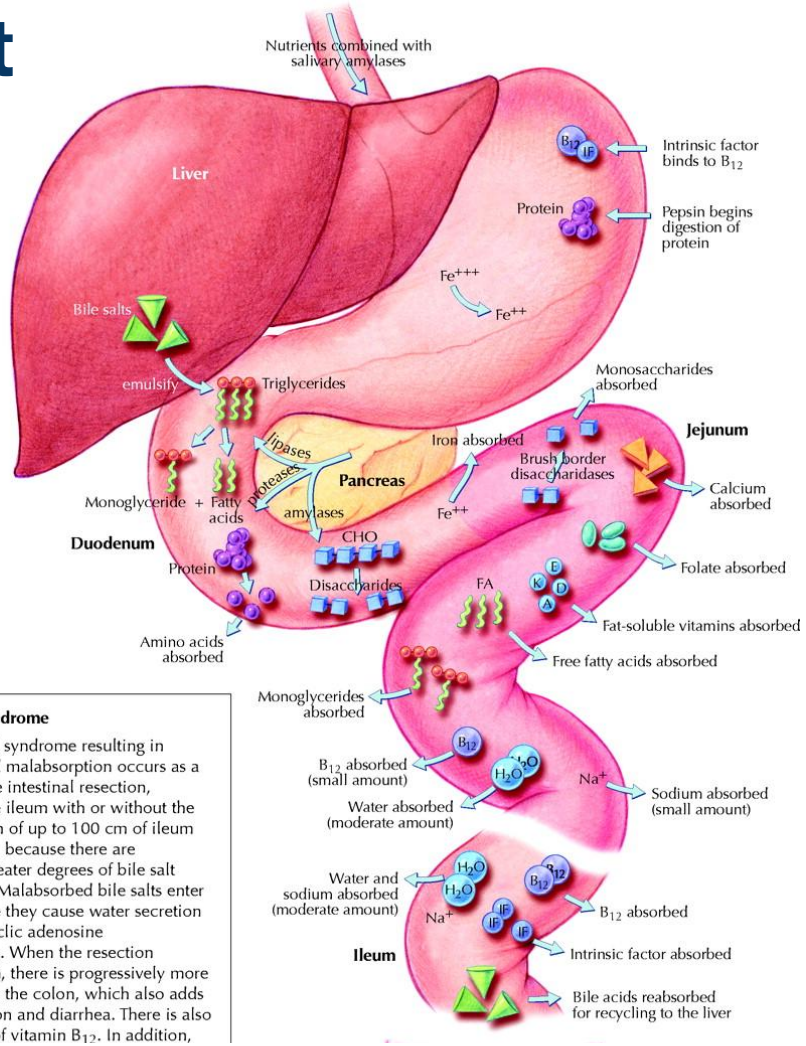
On average, how many of your patients complain of constipation?

Why Micronutrient Deficiencies after Bariatric Surgery?

- Reduced intake of food after surgery
  - Potential aversions and food intolerances
- Changes to GI tract
  - Intrinsic Factor (IF) in fundus of stomach
  - Fewer parietal cells secreting hydrochloric acid (HCl)
    - Less acidic environment
  - Bypass of duodenum and jejunum

Parrott et al 2016, Patel 2017

Sites of Nutrient Absorption



Short bowel syndrome

The short bowel syndrome resulting in dehydration and malabsorption occurs as a result of massive intestinal resection, especially of the ileum with or without the colon. Resection of up to 100 cm of ileum causes diarrhea, because there are progressively greater degrees of bile salt malabsorption. Malabsorbed bile salts enter the colon where they cause water secretion by activating cyclic adenosine monophosphate. When the resection exceeds 100 cm, there is progressively more fatty acid loss in the colon, which also adds to water secretion and diarrhea. There is also malabsorption of vitamin B_{12}. In addition,

Jeejeebhoy 2002

Nutrients of Interest

Calcium 1200-2400 mg	Vitamin D 3000 IU	Iron 18-60 mg	Vitamin B12 350-500 mcg
Thiamin (B1) 12-50 mg	Vitamin A 5000-10000 IU	Vitamin E 15 mg	Vitamin K 90-300 mcg
Zinc 8-22 mg	Copper 1-2 mg	Selenium & Magnesium	

Parrott et al 2016

Overcoming Barriers to Supplements

Barriers

- Deficiencies are hard to see
- Forgot / confusing
- Inconvenient
- Hard to swallow
- Side effects
- Expensive
- Too many

Strategies

- Determine readiness-to-change
- Elicit self-reported barriers
- Discuss what they know and the information that they have received
- One consistent voice
- Build strong patient / provider relationships
- Written material with images

Modi et al. 2013; Mahawar et al 2019; Story et al. 2017

Hair Shedding

Telogen effluvium – temporary hair loss due to the excessive shedding of resting (telogen hair) following a shock or a stressful event to the body

Typically see hair loss beginning 2-3 months post surgery and regrowth starting 6-7 month post surgery

Be suspicious of a nutritional contribution to post-op surgery hair loss if:

- Hair loss continued more than one year after surgery
- Hair loss started more than six months after surgery
- Patient has had more rapid than expected weight loss
- Low serum values or deficiencies

Ruiz-Tovar et al 2014, Katsogridaki et al 2018, Guo et al 2017, Almohanna et al 2019

Hair Shedding Evaluation

Evaluate:

- Multivitamin use and consistency
- Multivitamin itself - is it missing any nutrients or has lower amounts than recommended
- Iron status
- Zinc status
- Protein levels
- Overall nutritional Intake
- *Note: other nutrients associated with hair health include vitamin A, inositol, folate, B-6 and essential fatty acids

Jacques 2011

Nutrition Intervention

Check multivitamin and protein source
80-100 g protein
65 mg elemental iron *may need 1-2 tabs per day
15 mg zinc
1-2 mg biotin

A quick note on biotin: Added biotin does not always = hair growth.
Most GI bacteria create enough biotin to meet needs.

Jacques 2011, Ruiz-Tovar et al 2014, Katsogridaki et al 2018, Guo et al 2017, Almohanna et al 2019

Summary

Obesity is a chronic disease that requires many types of treatment throughout the lifespan.

Weight loss does carry a risk of nutrition challenges. The dietitian plays an essential role on the interdisciplinary team when identifying and managing these conditions.

Consider the pathophysiology of the condition and use evidence-based resources when managing nutrition challenges.

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