



All About Vitamins

Metabolic & Bariatric Surgical Services

Womack Army Medical Center

Fort Bragg, NC 28310

Why are we talking about vitamins?

- Essential for many body processes that may affect weight regulation, such as:
 - Appetite
 - Metabolic rate
 - Nutrient absorption
 - Thyroid gland function
 - Adrenal gland function
 - Energy storage
 - Glucose control
 - Brain function

Vitamins and Bariatric Surgery

Bariatric procedures impact digestion and absorption of micronutrients, leading to possible vitamin and mineral deficiencies after surgery

Supplementation of a bariatric formulated Multivitamin, Iron, and Calcium with Vitamin D will decrease the risk of deficiencies and associated severe consequences

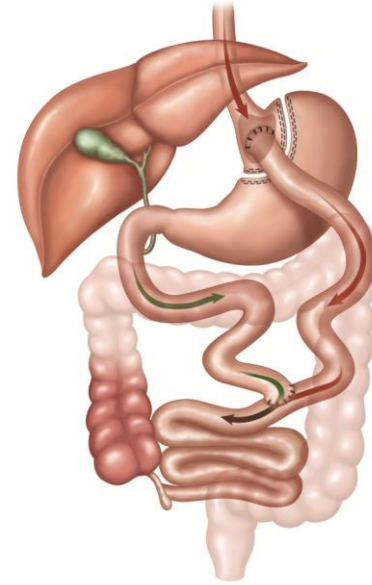
A note about digestion and absorption

- 90% of nutrient absorption occurs in the first 100-150 cm of the small intestine (the duodenum/jejunum)²
 - Depending on type of surgery, this section of the small intestine might be bypassed
- Digestive enzymes secreted by the cells of your stomach are needed for absorption of nutrients lower in the digestive tract.
 - With bariatric surgery, the availability of those enzymes are decreased due to surgically altered size of the stomach

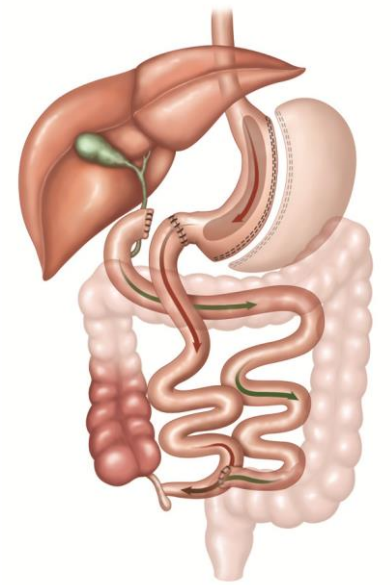


Digestive System
Before Surgery

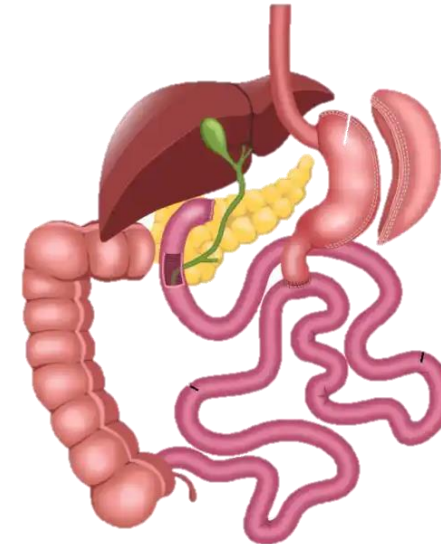
With malabsorptive procedures, digestion and absorption begins greater than 150cm from the first part of the small intestine.



Roux-en-Y Gastric Bypass



Duodenal Switch (BDP/DS)

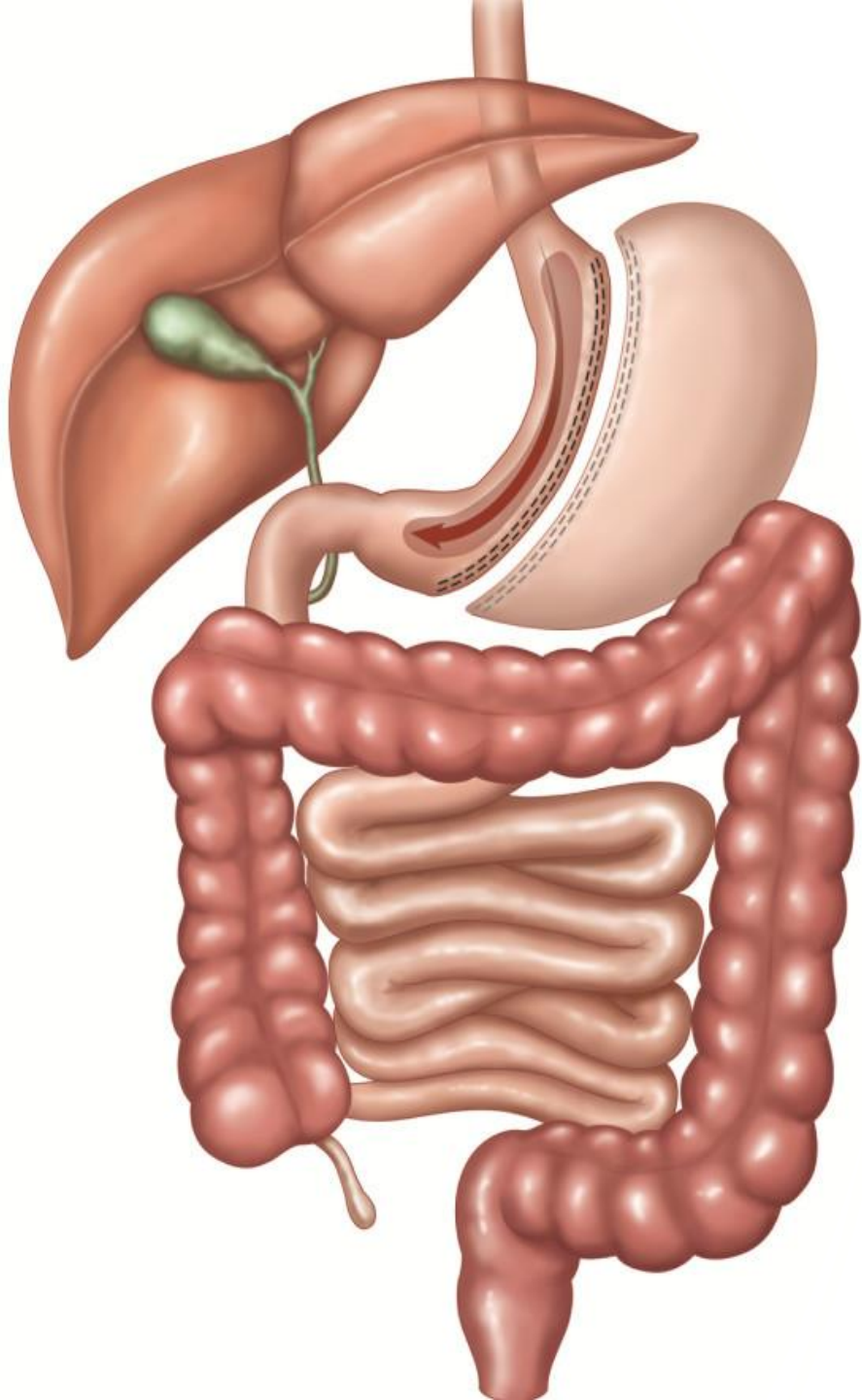


SADI-S

So what does this have to do with vitamin supplementation?

- Over the counter (OTC) vitamins are formulated for anatomy that has not been surgically altered.
 - Those vitamins are meant to be absorbed in the first part of the small intestine.
- Bariatric vitamins are formulated for absorption lower in the digestive tract.





But I have a sleeve...

- There is a risk for vitamin and mineral malabsorption.
 - The stomach also produces enzymes that are important for the digestion and absorption of vitamins and minerals.
 - When a portion of the stomach is removed, the availability of those enzymes is decreased.
 - Additionally, food intake is being restricted by this procedure, which could lead to deficiencies as well.

Common Vitamin/Mineral Deficiencies

- Vitamin D/Calcium – typically will not see any symptoms until a bone fracture occurs or w/diagnosis of osteopenia/osteoporosis
- Iron – craving for ice, pallor, dark circles under eyes, brittle nails, fatigue, always cold, weakness, irritability
- Vitamin B12 – tingling extremities, confusion, depression, dementia, anemia
- Vitamin B1 (Thiamine) – mild to severe confusion, memory loss, nervousness, temporary to permanent paralysis, coma – can cause permanent neurological problems but if caught early, can be completely cured
- Folate – fatigue, headaches, insomnia, neural tube defects in fetus
- Zinc – skin lesions, poor wound healing, hair loss, nails ‘like paper,’ smooth swelling of tongue, diarrhea

Benefits of Bariatric Formulated Vitamins



- All-inclusive multivitamins help to minimize the number of supplements taken in a day
 - Saves money!!
 - Decreases possible GI upset with multiple supplements
- Contains all the appropriate nutrients needed after bariatric surgery
- Decreases the risk of developing nutrient malabsorption

Bariatric Vitamins

BARIATRIC
fusion[®]
COMPLETE NUTRITION

BarimELTS[®]

**Bariatric
Advantage.**
NUTRITIONAL PRODUCTS

UNJURY[®]

 **PRO CARE HEALTH**
HELPING YOU MAINTAIN A BALANCED LIFE

Celebrate[®]
Nutritional Supplements

Paich Aid

 **BARIATRIC PAL**[®]

 **tespo vitamins**

How to choose the right vitamin for you??

Does it meet the ASMBS recommendations specific to your surgery?

How does it taste?

How many pills/tablets/chews do I want to take a day?

Can I remember to take multiple medications through the day or will I forget?

How much do they cost?

Are they available to me?

Recommendations on Vitamins

- Complete Multivitamin (MV)
 - 200% Daily Value of most contents
 - Bariatric formulated will eliminate the need for additional vitamin D and B12 supplementation
 - May also eliminate additional iron if choose a formula containing iron
- Calcium CITRATE
 - 1,200-2,400 mg/day (depending on type of surgery)
 - Only take 500-600mg at a time
 - Take 2 hours apart from a multivitamin that contains iron or iron.
- Vitamin D
 - 3,000 International Units (IU) daily
 - Often included in bariatric formulated MV
- Vitamin B12
 - 350-500 mcg/day
 - Often included in bariatric formulated MV
- Iron
 - Most people need 18-36mg/day
 - Often included in bariatric formulated MV
 - Patient's who are female and still menstruating as well as patient's that are iron deficient require 45-60mg/day

Recommendations vary based on surgery

Sleeve & Bypass

- Any bariatric formulated MV that meets the recommendations for vitamin and mineral supplementation after surgery.
- 1,200 – 1,500 mg of Calcium Citrate daily
- Iron supplement
- Vitamin D3

SADI-S & Duodenal Switch (DS)

- Bariatric ADEK Multivitamin
 - Higher in fat soluble vitamins (A, D, E, and K)
- 1,800 – 2,400 mg of Calcium Citrate daily
- Iron supplement
- Vitamin D3

OTC v. Bariatric Formulated Vitamins

The American Society of Metabolic and Bariatric Surgery has provided the gold standard recommendations for vitamin and mineral supplementation for any patient undergoing metabolic and bariatric surgeries.

MICRONUTRIENT	MINIMUM DAILY RECOMMENDED LEVELS TO PREVENT DEFICIENCY BASED ON ASMBS GUIDELINES	NUTREINT LEVELS FOUND IN TWO OTC FLINSTONES CHEWABLE VITAMINS W/IRON
Iron	18-60mg	36mg
B12	352-500mcg	2.4mcg
Folate	400-1000mcg	400mcg
Thiamin (B1)	12mg + 50-100mg	1.2mg
Calcium	1,200-2,400mg	Does not contain
Vitamin D	3,000IU	1,200IU
Vitamin A	5,000-10,000IU	2,666.7IU
Vitamin E	15-19mg	14mg
Vitamin K	90-300mcg	Does not contain
Zinc	8-22mg	10mg
Copper	1-2mg	Does not contain
Selenium	>100mcg	Does not contain

Cost Comparison

Over-the-Counter vs ProCare Health Supplements



2-3/day

1/day

1/day



1-2/day

2-3/day



1/day



3/day

8-10
supplements per day*

\$58.58
per month

Does not include shipping

VS

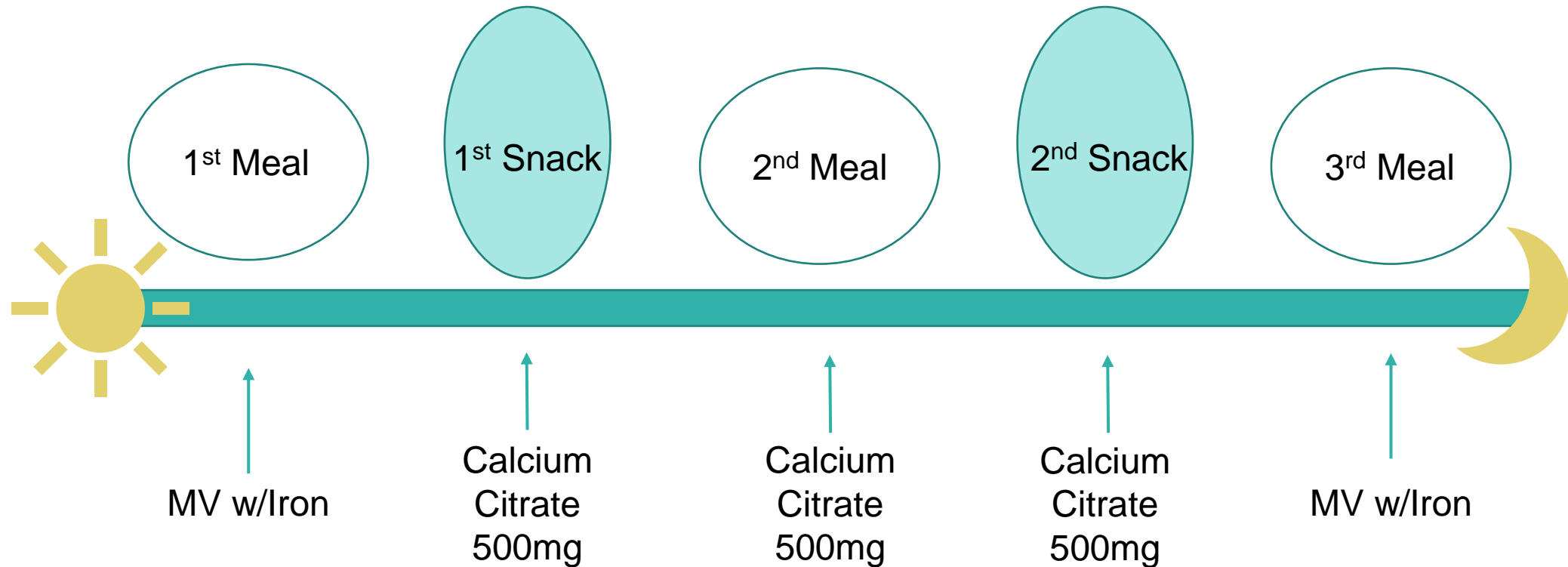
4
supplements per day*

\$41.98
per month

When you subscribe to Automatic Shipping to save 30%

* Number of supplements needed to meet ASMBS guidelines

Sample Vitamin Dosing Schedule



May differ based on type of surgery and nutrient needs

Vitamin Formulations

- Capsules
- Tablets
- Chewable tablets
- Soft Chews
- Drink Mix
- Shakes
- Patches



Sample Vitamin Maintenance Plan

RECOMMENDATION	TYPE OF VITAMIN	FREQUENCY	COST
Multivitamin	Choose 1 Brand		
(Pick one of the choices)	ProCare Health Multivitamin w/Iron (chews or capsules)	1 daily	\$11.99 (1 month) + tax and S&H
	Probiotic Multi w/Iron (capsules)	2 daily	\$18.99 (1month) + tax and S&H
Calcium with Vitamin D3	Choose 1 Brand		
(Pick one of the choices or mix/match)	ProCare Health Calcium Chews (Sea-salted Caramel, Dinner Mint, or Cinnamon Bun)	3 daily	\$11.99 (30 count) \$29.99 (90 count) + tax and S&H
	ProCare Health Chocolate Calcium Bars	3 daily	\$23.99 (30 count) \$59.39 (90 count)

**Additional supplements may include Vitamin D3, B12 and/or B-Complex (or others) – dependent on your individual needs and program requirements.*

**Some of the prices listed are auto-ship pricing.*

Overcoming nausea from taking vitamins

- Try a different brand or form of multivitamin
- Try a multivitamin with less or without iron
- Try taking your multivitamin with food if taking a capsule or pill
 - You may even break open a capsule form and sprinkle the contents on your food to take
- Take your vitamin at night before bed
- Drink lots of water when taking vitamins

References

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