

ON TRACK WITH BARIX

Support to Keep You On Track With a Healthful Lifestyle

Common Post-op Vitamin Deficiencies

Nutritional deficiencies can occur after bariatric surgery for several reasons. First, smaller portions result in an intake of fewer vitamins and minerals. Then, the breakdown of food into its small absorbable components is compromised without the benefit of the highly acidic churning environment of the larger stomach. Lastly, gastric bypass surgery results in a decreased length of small intestine for nutrient absorption.

Making healthful food choices, consistently taking the recommended vitamin and mineral supplements, and completing lab tests at the recommended intervals will help to keep your energy high and nutrition deficiencies at bay.

To help you in choosing the right supplements for your individual needs, let's take a look at the more common deficient nutrients individually and then how to choose supplements in general. The most common post-surgery nutrition deficiencies are iron, vitamin B12, and vitamin D. Protein, calcium, and folic acid are also important nutrients to monitor.

Iron

Iron has many important roles in the body, including oxygen transportation, immune function, and exercise performance. The recommended dietary allowances for iron are 15 mg for women and 10 mg for men.

Some post bariatric surgery patients develop iron deficiency. There are three main contributing factors that cause this to occur. Red meat, containing the best-absorbed form of iron (heme iron), is often limited due to tolerance. The lowered acid environment, created by (both the gastric sleeve and gastric bypass) surgery, decreases absorption. Gastric bypass surgery results in the primary absorption site for iron, the first section of the small intestine, being bypassed.

Iron supplementation, for those who require it, poses some challenges as well with nausea and constipation as common side effects. Iron supplements are best absorbed when taken on an empty stomach with a source of vitamin C, such as ¼ cup of orange juice. They should not be taken with a multi vitamin and mineral supplement or a calcium supplement since the calcium competes with iron for absorption. Enteric coated tablets may not dissolve easily and will decrease absorption. It's important to only take iron supplements when lab values indicate a need and your physician directs you to do so.

Including foods that are a good source of iron in your diet can help to prevent a deficiency. There are two types of iron found in foods, heme iron and non-heme iron. Heme iron is much better absorbed.



Forty percent of the heme iron from food is absorbed compared to 10% of the non-heme iron. Absorption improves when you combine an iron containing food with an acidic food, such as ground beef mixed with spaghetti sauce. Cooking in an iron skillet can also increase the iron content of food.

Vitamin B12

Vitamin B12 has many important functions. It has a role in the formation of the protective sheath around nerve cells; in the metabolism of carbohydrate, protein and fat; in the production of amino acids and fats; in the replication of genetic codes within each cell; and in the formation of neurotransmitters. Adults require 3 micrograms a day.

A Vitamin B12 deficiency can develop after surgery. Prior to surgery, gastric juices free vitamin B12 from foods. It then binds with a compound called intrinsic factor in the stomach prior to moving through to the lower small intestine for absorption.

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Because the lower stomach is bypassed in gastric bypass surgery and removed in gastric sleeve surgery, this process is much less efficient, resulting in a lower absorption rate of vitamin B12.

Vitamin B12 supplement options:

- Oral supplementation with vitamin B 12 has limited absorption following gastric bypass and gastric sleeve surgeries.
- Vitamin B12 injections are an option.
- Sublingual (under the tongue) supplements are a cost efficient and effective solution. They are available over-the-counter in both liquid and dissolvable tablet forms.
- A vitamin B12 nasal spray is available by prescription.

Supplementation for vitamin B12 will be recommended by your nutritionist or physician if your Vitamin B12 levels get close to or below the low end of the acceptable range. It's important to monitor and supplement a vitamin B12 deficiency to prevent irreversible nerve damage that can occur from a prolonged deficiency.

Folic Acid

Lab values for folic acid are frequently elevated in patients who routinely take the recommended vitamin and mineral supplements. Deficiencies are typically only seen when multivitamin and mineral supplements are not taken on a routine basis. Anyone considering a future pregnancy should keep a close eye on folic acid levels.

Thiamin

Vitamin B1, or thiamin, is one of eight B vitamins that help produce energy for the body by converting carbohydrates into fuel. Thiamin and the other B vitamins are needed for fat and protein metabolism; normal functioning of the brain and nervous system; and healthy skin, hair, eyes, and liver.

Bariatric surgery can increase the risk of thiamin deficiency especially in those who have preexisting thiamin deficits, low nutrient intake, had a malabsorptive bariatric procedure, or episodes of chronic nausea and vomiting. Symptoms of thiamin deficiency include headache, nausea, fatigue, irritability, depression, abdominal discomfort, swelling/tingling/burning sensation in hands and feet, confusion, trouble breathing, and uncontrolled eye movement.

Gummy vitamins do not contain the essential B vitamins thiamin and riboflavin and are therefore not recommended after surgery.

Vitamin D

Known as the sunshine vitamin, vitamin D is activated in the body during exposure to sunlight. Vitamin D is also found in some fish, fish liver oils, and egg yolks, and in fortified dairy and grain products.

Vitamin D helps the body use calcium and is essential for strong bones. Research indicates that vitamin D may play a role in the prevention and treatment of diabetes, hypertension, glucose tolerance, and multiple sclerosis. A low level of vitamin D can increase the risk of death from cardiovascular disease, cognitive impairment, asthma, and even cancer.

Bone pain and muscle weakness can be symptoms of a vitamin D deficiency, although many people have no symptoms.

Supplementation of 1000-2000 International Units of vitamin D is recommended after bariatric surgery to prevent a deficiency. Higher levels of supplementation may be recommended if a vitamin D deficiency exists.

Calcium

We often hear about calcium's role in keeping our bones and teeth strong, but calcium has some other very important functions. Our bodies maintain a very tight range of calcium in the blood so that it is available for the maintenance

of a regular heartbeat, transmission of nerve impulses and blood clotting. Recommendations after weight loss surgery are 1500 mg of calcium from a combination of food/beverage and supplement sources. Hypertension, osteoporosis, and metabolic bone disease can result from a deficiency.

Calcium is absorbed in the first section of the small intestine, the section bypassed with gastric bypass surgery. This can reduce the amount of calcium that is absorbed so it is important to insure an adequate intake from dietary or supplement sources.

If you're not able to consistently obtain adequate calcium intake from your diet, supplementation is important. Common calcium supplements are calcium citrate or calcium carbonate. Either form can be an effective supplement, but there are some differences to consider.

- Calcium carbonate supplements are smaller in size and less expensive. Absorption is enhanced when taken with food.
- Calcium citrate is well absorbed in a non-acid environment, as occurs after gastric bypass and gastric sleeve surgeries, and can be taken with or without food. Pill size will be larger although chewable supplements are available.

Multivitamin and Mineral Supplements

Vitamins and minerals are nutrients needed in very small amounts for good health. Your body requires the same amount of each vitamin and mineral as it did before the surgery, but because you are eating so much less food and there may be decreased absorption, supplementation is needed. Chewable or liquid supplements are recommended for the first period after surgery and are a good long-term option. If you choose to switch to a pill form, be sure that it is

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smaller than an “M&M” in diameter. Taking complete multi vitamin and mineral supplements for life is recommended.

Individuals may have different needs for specific nutrients or preferences in the type of supplements they choose. For those reasons, we do not recommend a specific brand or supplement over another. Choose the type of supplement that meets your needs and preferences using the information below to make an informed decision.

- Keep in mind that more isn't always better—some vitamins and minerals are toxic in large amounts.
- Use caution when using herbal supplements. There is very little regulation on these substances. Avoid “weight loss formulas” which may include stimulants or ingredients whose effectiveness has not been proven.
- Natural and synthetic vitamins are virtually identical.
- Look for the USP (United States Pharmacopoeia) mark on the bottle. The manufacturer pays for this testing. This means that the listed ingredients are indeed in the supplement and that the supplement will dissolve. It does not guarantee safety.
- % Daily Values means the same thing as % USRDA (US Recommended Daily Allowance). Labels use them interchangeably. This is the FDA's advice on how much of the vitamin or mineral to shoot for each day.
- Check the expiration date on the bottom of the bottle.
- Store brands are usually just as good as national brands.
- Supplements can be called “High Potency” if at least 2/3 of its nutrients have 100% or more of the Daily Value (DV).
- “Advanced,” “Complete,” or “Maximum” formulas can mean anything.

BARIATRIC SURGERY SUPPLEMENTS

Supplements are key to your health. Below are general recommendations; for individual recommendations, ask your bariatric surgeon or nutritionist.

Supplement	Gastric Bypass	Gastric Sleeve	Adjustable Gastric Band
Complete Multivitamin and Mineral Supplement (MVI) <i>Available in chewable, pill or liquid form</i>	2 per day	2 per day	1 per day
OR			
Bariatric Formula (MVI) <i>Available in chewable, pill, crystals, and capsule form</i>	As directed on label	As directed on label	As directed on label
Calcium Citrate <i>Available in chews, soft chews, crystals, liquid and pill form (pills may be large)</i>	1500-2000 mg	1500 mg	1500 mg
Vitamin D <i>Available in pill and liquid form</i>	1000-2000 IU <i>This includes the amount found in MVI and calcium supplements)</i>	1000-2000 IU <i>This includes the amount found in MVI and calcium supplements)</i>	1000-2000 IU <i>This includes the amount found in MVI and calcium supplements)</i>
Sublingual Vit. B12 <i>Available in dissolvable tablet or liquid form—place under tongue</i>	Preventative: 500 mcg <i>To restore lab values above 400 pg/ml: 1000 mcg</i>	Preventative: 500 mcg <i>To restore lab values above 400 pg/ml: 1000 mcg</i>	Amount of Vit. B12 in MVI should be adequate
Iron <i>Available in pill or chewable form. Take iron on an empty stomach if tolerated. Do not take within 30 minutes of MVI or calcium supplement.</i>	Preventative: 18 mg if not contained in MVI <i>To restore lab values: follow advice of doctor or dietician</i>	Preventative: 18 mg if not contained in MVI <i>To restore lab values: follow advice of doctor or dietician</i>	Preventative: 18 mg if not contained in MVI <i>To restore lab values: follow advice of doctor or dietician</i>

Our **GREATEST WEAKNESS** lies in giving up. The most certain way to **SUCCEED** is always to try just **ONE MORE TIME.**

Thomas Edison

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Share Your SUCCESS

Tell us about how your life has changed as a result of your weight loss surgery. Your story may be printed in this publication or on one of our websites and can serve as an inspiration to others.

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We'd love to hear from you!

QUESTIONS ABOUT FINANCING YOUR SURGERY?

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Recipes

Pumpkin Muffins

1 cup pumpkin puree
3 cups almond flour
1/3 cup unflavored whey protein powder
2 tsp baking powder
1/2 tsp baking soda
1/2 tsp salt
1 1/2 tsp cinnamon
1/2 tsp ginger
1/4 tsp cloves
1/4 cup butter, softened
1/2 cup Swerve Sweetener or other erythritol
3 large eggs
1/2 tsp vanilla extract
1/3 cup skim milk

Preheat oven to 325F and line 15 muffin tins with paper liners.

In a medium bowl, whisk together the almond flour, protein powder, baking powder, baking soda, salt and spices.

In a large bowl, beat butter with sweetener until well combined. Beat in pumpkin puree, eggs and vanilla extract. Add in dry mixture and milk. Mix well.

Fill each muffin cup 2/3 full. Bake 23 minutes or until tops are set and edges are just browned. Let cool in pan 15 minutes. Makes 15 servings.

NUTRITION INFORMATION PER SERVING: 183 calories, 8 grams protein, 16 grams fat, 15 grams carbohydrate (8 grams sugar alcohol, 3 grams fiber), 167 mg sodium.



Scrambled Egg Cup

2 Eggs
2 tbsp. skim milk
2 tbsp. Cheddar cheese, shredded
Salt and pepper, as desired

Coat a 12-oz. microwave-safe coffee mug with cooking spray. Add eggs and milk and mix until blended. Stir in cheese.

Microwave on high for 45 seconds; stir. Microwave until eggs are set, 30 to 45 seconds longer. Season with salt and pepper to taste. Makes 1 serving.

Nutrition information per serving:
215 calories, 17 grams protein, 15 grams fat, 2 grams carbohydrate, 244 mg sodium.

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