



Supplementation after Bariatric Surgery - What Will I Need?

by Pam Helmlinger, RD, LDN, CDE; and Pamela Davis, RN, BSN, CBN, MBA

One of the most important commitments you can make to yourself when you undergo bariatric surgery is a lifelong commitment to taking recommended vitamin and mineral supplements. Unfortunately, you will be unable to rely on meeting your nutritional needs through diet alone once you have surgery - regardless of which procedure you choose.

Quality of Supplements

Ingredients in dietary supplements come from all over the world; many from China, India, and third-world countries where controls on processing may be inferior to those in the U.S. or Europe. Manufacturers may choose from a variety of sources, forms and grades of nutrients. Accepted standards for most nutrients follow the guidelines set out by the United States Pharmacopoeia (USP) and National Formulary (NF) and exist for more than 2,000 ingredients. If distributors choose to specify that they are using certified ingredients, these designators may appear on labels or may be omitted due to space limitations. If information is not supplied on the label, it becomes the responsibility of the consumer to obtain it.

Form and Delivery Method

The form and delivery method of these nutrients also make a difference in bioavailability and even toxicity levels. Without education on which form of vitamin or mineral you need, there can be vital differences in their functions; niacin, vitamin E, calcium, iron, selenium, and thiamine are just a few examples that can be found in a multivitamin that may not exist in the preferred form. Therefore, reading the daily value cannot be taken at face value as you may not absorb close to what the label claims you receive from the product.

Regardless of the delivery method – chewable tablets, liquids, hard-coated tablets, or gelatin capsules- the quality of nutrients and other ingredients are significant.

- **Hard-coated tablets** pose the greatest challenge to bariatric surgery patients as they typically break apart with stomach acid and churning. Some capsules are acceptable as they break apart with moisture and heat.
- **Chewable products** that are broken apart by chewing and liquids can also be ideal choices if the ingredients are appropriate and they are not sweetened with excessive amounts of sugar.

If the calorie and sugar content is not listed, the consumer must decipher the ingredients list or inquire about the contents from the manufacturer, especially if they have any allergies. Thus, choosing a reputable manufacturer that you trust is an important decision after any bariatric surgery, and there are numerous bariatric supplement companies in the industry. Not only should you ensure their vitamins and

minerals meet your needs according to American Society for Metabolic and Bariatric Surgery's (ASMBS) guidelines for your procedure, but doing your research on the forms and delivery methods and asking questions about their lab analysis to verify materials for accuracy should be part of your decision process. Choosing a product from the company's selection that you can tolerate and adhere to for a lifetime is the other half of the equation.

As a dietitian, helping patients understand issues of advertising false claims, the regulations that exist, and the science behind supplementation, can be daunting, to say the least. The best assurance in recommending a product is to seek out those manufacturers that have been GMP-certified by an independent auditor or by the FTC. The less nutritional deficiencies that need to be treated following bariatric surgery, the better and the healthier the patient will be in the long term. After all, the main reason patients sought surgery in the first place was their health, so disregarding the importance of supplementing the diet with appropriate micronutrients in a form they absorb well, can be counterproductive.

Knowing what you are taking and establishing an open line of communication with your program dietitian, surgeon, or primary care physician, in addition to seeking information from supplement companies, is one of your best bets in maintaining your health after bariatric surgery.

Which Micronutrients Will I Need to Supplement?

Unfortunately, one cannot rely on simply taking a multivitamin to achieve the desired results in preventing micronutrient deficiencies after bariatric surgery. While the majority of vitamin and mineral requirements can be met with the right multivitamins, you will need to focus additionally on calcium, vitamin B12, vitamin D, and potentially iron in addition to that in the multi formula (primarily for menstruating women).

It can be challenging to adhere to the recommended vitamin and mineral regimen required for those who have undergone surgery. In addition to a complete, high-potency vitamin (meeting 200% daily value for most of the nutrients on the label), sleeve gastrectomy and roux-en-y gastric bypass patients need to take additional calcium split into 2-3 doses per day, vitamin D (depending on the amount in multivitamin), and vitamin B-12. Patients who have undergone more malabsorptive surgery such as duodenal switch require even higher potency supplements, including the fat-soluble vitamins (A, D, E, and K). Many specific bariatric formulations of multivitamins exist, which should provide the amounts and forms of micronutrients recommended or best absorbed after bariatric surgery.

Calcium citrate is the preferred form of calcium since it does not require hydrochloric acid in order to be absorbed; calcium carbonate may be taken by those who have restrictive only procedures- gastric band, balloon, and sleeve gastrectomy- and is best taken with a meal while there is churning to assist in absorption. Dosages of calcium should be split into no more than 500-600 mg at once and split evenly throughout the day. Keep the split dosages in mind when selecting a calcium supplement if you spend the majority of your day away from home. Convenience can be key in adherence, and a pill organizer is another key that may be the trick to consistency. Something that is individually wrapped is likely simpler to take on-the-go than a liquid or container full.

Vitamin B12 is recommended at a dose of 300-500 mcg daily in a sublingual form, meaning it dissolves preferably under the tongue or between cheek and gum. Alternatively, patients may choose a nasal spray (which requires a prescription) or an intramuscular monthly injection, also a prescription. Therefore, the form in a multivitamin will not necessarily prevent a vitamin B12 deficiency for the long-term. It is very cost-effective and therefore is a good preventative measure to take for both sleeve gastrectomy as well as those with malabsorptive procedures.

Vitamin D is found to be lacking in 90 percent of bariatric patients preoperatively. A correction dose of ergocalciferol or vitamin D3 (cholecalciferol) should be taken for at least eight weeks when an abnormality presents itself prior to surgery. The standard amount of vitamin D3 in a multivitamin does not supply adequate protection to prevent bone resorption after surgery. If one is not supplementing a bariatric multivitamin formula containing at least 1000 IU vitamin D3, a maintenance dose should be taken and vitamin D-25-OH levels monitored routinely to ensure levels are not exceeding the normal limits.

More than likely, one who has bariatric surgery will face abnormalities in the area of micronutrients at some point following surgery. Therefore, it is crucial that treatment be aggressive to correct deficiencies along with lifelong screening to prevent bone loss, irreversible damage, and preventable complications.

Common Questions Post-Surgery:

- 1. Are some vitamins better than no vitamins?** Yes, of course.
- 2. Are bariatric formulated vitamins worth the money?** Yes, vitamin deficiencies after bariatric surgery can usually be prevented by taking high quality supplements as specifically directed by your surgeon, dietitian or nurse.

Cost versus Quality – Do you really get what you pay for?

As outlined before, as a post bariatric surgery patient, you want to choose high quality supplements that will meet your needs. I'm quite often asked how much the supplements will cost and if bariatric formulated vitamins are necessary. Many years ago, we did not know as many details on the specific absorption of micronutrients after bariatric surgery and there were very few options for supplements; therefore, it was not uncommon for patients to be advised to take twice the recommended adult dose of Flintstones vitamins.

The field of bariatric surgery has advanced greatly over the past decade, and so have the quality and quantity of vitamin options for bariatric surgery patients. As detailed previously, the specific combination of supplements (multi-vitamin, iron, calcium, B12, etc.) will vary per individual; however, all post bariatric surgery regimens begin with a high quality multi-vitamin. The chart on the next page does not encompass all options available; it does compare several high quality, cost-efficient bariatric-formulated multi-vitamin options with a standard adult multi-vitamin (Centrum) and a children's chewable (Flintstone's Complete).

Final Thought!

Vitamin deficiencies after bariatric surgery can be quite troublesome to correct, so don't choose poorly based solely on cost.

About the Authors:

Pam Helmlinger, RD, LDN, CDE, is a registered and licensed dietitian specializing in bariatrics. She received her Bachelor's degree in Dietetics from Harding University in 2001 and her experience includes ten years at Tristar Centennial's Center for Weight Management. She holds a certificate of training in adult weight management from the Academy of Nutrition and Dietetics and became a Certified Diabetes Educator in 2012. She has a passion for helping patients throughout their weight-loss journey from medical weight-loss to preparing for surgery and maintaining weight loss for the long-term.

Pamela Davis, RN, BSN, CBN, MBA, is the Bariatric Program Director for Centennial Center for the Treatment of Obesity in Nashville, Tenn. Ms. Davis is a Registered Nurse, Certified Bariatric Nurse and the Integrated Health President-elect for the American Society for Metabolic and Bariatric Surgery. Ms. Davis also serves on the National Board of Directors for the Obesity Action Coalition. In 2001, Ms. Davis had laparoscopic Roux-en-Y gastric bypass surgery at Centennial and has since developed a passion for working with others living with obesity.

Bariatric-Formulated Vitamins

Bariatric Advantage EA Multi*		Bari-Life Multi Tablet**	
	Amount/Percent Daily Value		Amount/Percent Daily Value
Vitamin A (from 75% Beta Carotene and 25% Palmitate)	10,000 IU 200%	Vitamin A (as Retinyl Acetate)	10,000 IU 200%
Vitamin C (from Sodium Ascorbate and Ascorbic Acid)	90 mg 150%	Vitamin C (Ascorbic Acid)	120 mg 200%
Vitamin D (as Cholecalciferol)	3,000 IU 750%	Vitamin D (as Cholecalciferol)	6,000 IU 1500%
Vitamin E (from d-alpha Tocopherol, d-alpha Tocopheryl Polyethylene Glycol 1000 Succinate and Mixed tocopherols)	150 IU 500%	Vitamin E (as DI-Alpha Tocopherol Acetate)	200 IU 667%
Vitamin K (as Phytonadione)	300 mcg 375%	Vitamin K (as Phytonadione)	240 mcg 300%
Thiamin (from Thiamin Mononitrate)	12.5 mg 833%	Thiamin (as Thiamine HCL)	6 mg 200%
Riboflavin (Vitamin B2)	3.4 mg 200%	Riboflavin	8 mg 471%
Niacin (as Niacinamide)	20 mg 100%	Niacin	40 mg 200%
Vitamin B6 (from Pyridoxine Hydrochloride)	4 mg 200%	Vitamin B6 (as Pyridoxine HCl)	8 mg 400%
Folic Acid	800 mcg 200%	Folate (as Folic Acid)	400 mcg 100%
Vitamin B12 (as Cyanocobalamin)	1,000 mcg 16667%	Vitamin B12 (as Cyanocobalamin)	1,000 mcg 1667%
Biotin	600 mcg 200%	Biotin	600 mcg 200%
Pantothenic Acid (as Calcium D-Pantothenate)	20 mg 200%	Pantothenic Acid (as Calcium-D-Pantothenate)	40 mg 400%
Calcium (from Dicalcium Phosphate)	150 mg 15%	Calcium (as Calcium Citrate)	1,500 mg 150%
Iron (from Ferrous Fumarate)	45 mg 250%	Iron (as Ferrous Fumarate)	45 mg 250%
Iodine (from Potassium Iodide)	150 mcg 100%	Iodine (as Potassium Iodine)	225 mcg 150%
Magnesium (from Magnesium Amino Acid Chelate)	50 mg 13%	Magnesium (as Manganese Sulfate)	800 mg 200%
Zinc (from Zinc Amino Acid Chelate)	15 mg 100%	Zinc (as Zinc Oxide)	30 mg 200%
Selenium (from Selenomethionine)	70 mcg 100%	Selenium (as L-Selenomethionine)	140 mcg 200%
Copper (from Copper Citrate)	2 mg 100%	Copper (as Copper Oxide)	2 mg 100%
Manganese (from Manganese Amino Acid Chelate)	2 mg 100%	Manganese (as Manganese Sulfate)	4 mg 200%
Chromium (from Chromium Amino Acid Chelate)	120 mcg 100%	Chromium (as Chromium Picolinate)	240 mcg 200%
Molybdenum (from Sodium Molybdate Dihydrate)	50 mcg 67%	Molybdenum (as Sodium Molybdate)	200 mcg 267%
Sodium	15 mg <1%		
Mixed Tocopherols (including Gamma, Delta, and Beta Tocopherols)	30 mg *		
Choline (from Choline Bitartrate)	20 mg *		
Coenzyme Q10 (as Ubiquinone)	10 mg *		
Boron (from Boron Citrate)	2 mg *		
Dosage for Sleeve and Bypass Patients	Per 2 chewable tabs	Dosage for Sleeve and Bypass Patients	Per 6 tabs

Bariatric Fusion Multi Tablet***			Celebrate Multi Complete 60 ****		
	Amount/Percent Daily Value			Amount/Percent Daily Value	
Vitamin A	7,500 IU	148%	Vitamin A (as retinyl palmitate and 50% as beta-carotene)	10,000 IU	200%
Vitamin C	180 mg	300%	Vitamin C (as ascorbic acid)	180 mg	300%
Vitamin D	3,000 IU	750%	Vitamin D (as cholecalciferol)	3,000 IU	750%
Vitamin E	30 IU	100%	Vitamin E (as d-alpha-tocopheryl acetate)	60 IU	200%
			Vitamin K (as phytonadione)	120 mcg	150%
Thiamine	12 mg	800%	Thiamin (as thiamin mononitrate)	12 mg	800%
Riboflavin	1,700 mcg	100%	Riboflavin	12 mg	706%
Niacin	20 mg	100%	Niacin (as niacinamide)	40 mg	200%
Vitamin B6	2,000 mcg	100%	Vitamin B6 (as pyridoxine HCl)	4 mg	200%
Folic Acid	800 mcg	200%	Folate (as folic acid)	800 mcg	200%
Vitamin B12	560 mcg	93.32%	Vitamin B12 (as methylcobalamin and cyanocobalamin)	1,000 mcg	16.667%
Biotin	600 mcg	200%	Biotin	600 mcg	200%
Pantothenic Acid	10 mg	100%	Pantothenic acid (as D-calcium pantothenate)	20 mg	200%
Calcium	1,200 mg	120%			
Iron	45 mg	250%	Iron (as ferrous fumarate)	60 mg	333%
Iodine	150 mcg	100%	Iodine (as potassium iodide)	150 mcg	100%
Magnesium	400 mg	100%	Magnesium (as magnesium citrate and magnesium oxide)	100 mg	25%
Zinc**	30 mg	100%	Zinc (as zinc amino acid chelate)	30 mg	200%
Selenium**	70 mcg	100%	Selenium (as selenium amino acid chelate)	140 mcg	200%
Copper**	2 mg	100%	Copper (as copper citrate)	3 mg	150%
Manganese**	2 mg	100%	Manganese (as manganese amino acid chelate)	2 mg	100%
Chromium**	120 mcg	100%	Chromium (as chromium amino acid chelate)	200 mcg	167%
Molybdenum**	75 mcg	100%	Molybdenum (as molybdenum amino acid chelate)	75 mcg	100%
Dosage for Sleeve and Bypass Patients	Per 4 chewable tabs		Dosage for Sleeve and Bypass Patients	Per 2 chewable tabs	

Non Bariatric-Formulated Vitamins

[illegible]



ABOUT THE OBESITY ACTION COALITION (OAC)

The Obesity Action Coalition (OAC) is a National non-profit organization dedicated to giving a voice to individuals affected by obesity and helping them along their journey toward better health. Our core focuses are to elevate the conversation of weight and its impact on health, improve access to obesity care, provide science-based education on obesity and its treatments, and fight to eliminate weight bias and discrimination.



VIBRANT COMMUNITY



NATIONAL AWARENESS CAMPAIGNS



ANNUAL CONVENTION



ADVOCACY



PUBLIC EDUCATION

LEARN, CONNECT, ENGAGE

The OAC knows that the journey with weight can be challenging but we also know that great things happen when we learn, connect and engage. That is why the OAC Community exists. Our Community is designed to provide quality education, ongoing support programs, an opportunity to connect, and a place to take action on important issues.

Through the OAC Community, you can get access to:

- Weight & Health Education • Community Blogs
 - Community Discussion Forum
 - Ongoing Support • Meaningful Connections
- AND MUCH MORE**



JOIN TODAY: GO TO [OBESITYACTION.ORG/JOIN](https://obesityaction.org/join)

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