

MONTHLY NUTRITION HIGHLIGHTS

Pre-Operative Nutrition

It is increasingly recognized that even prior to bariatric surgery, there are nutritional issues that can impact both patient health and surgical outcomes. At Bariatric Advantage, our goal is to be able to support patients through their entire weight loss surgery journey, and starting before surgery can often make sense.

Pre-Surgical Weight Loss

Non-Alcoholic Fatty Liver Disease (NAFLD), which includes Non-Alcoholic Steatohepatitis (NASH), is common in patients presenting for bariatric surgery. **Risk factors for NAFLD include obesity, diabetes, and insulin resistance. Incidence of NAFLD in patients with obesity or type 2 diabetes can be as high as 80-90 percent (1) and in those presenting for bariatric surgery 90% (2). The enlargement of the liver due to fatty infiltration and, in the case of NASH, inflammation, can significantly interfere with the surgical field in weight loss surgery procedures such as Roux-en-Y Gastric Bypass (RYGB) and Laparoscopic Adjustable Gastric Banding (LAGB).** Obscuring of the surgical field, especially the upper portion of the stomach, can prolong surgical times, impair visibility, increase surgical difficulties, and increase risk to the patient. **Inability to adequately retract the liver in a laparoscopic procedure is cited as the single most common cause for conversion to an open procedure, accounting for roughly half of such conversions according to some reports (3).** For this reason, it is increasingly common that surgeons may ask patients to undergo short-term, pre-operative weight loss.

Studies done in pre-operative bariatric surgery patients have indicated that short duration, acute weight loss may be very effective for **sufficiently reducing liver volume to make surgery easier, safer and faster.** Lewis, et al assessed liver volume in 18 patients undergoing placement of a LAGB. Patients were instructed to use a VLED for 6 weeks. **After 6 weeks there was a 14.7% reduction in mean liver volume and a 43% reduction in mean liver fat (4).** More recently, Colles, Dixon, et al examined the impact of a VLED on liver volume and abdominal fat in patients preparing for weight loss surgery. A group of patients, all with significantly large livers and significant steatosis, had their liver volume measured serially during a 12-week course of a VLED (<800 kcal/day). The reduction in the liver volume was rapid with 80% of the total liver volume reduction occurring in the first 2 weeks of therapy (5).

More recently, we conducted a small study with our own meal replacement. 15 subjects (2 men and 13 women) with a mean ± SD age of 46.7 ± 7.6y and BMI of 50.5 ± 7.3 kgm² consumed the Bariatric Advantage High Protein Meal Replacement for 2 weeks. 13 completed the intervention and the other 2 stopped because surgery was canceled. Liver volume reduced from 2.8 ± 0.5 L to 2.4 ± 0.6 L, a reduction in 15.9%. Body weight decreased by 5.4 (3.4-

7.5) % and waist circumference by 4.7 (3.1-6.2) %, (p<0.001 for all). There were no adverse biochemical changes, and the product was well tolerated (6).

Pre-Operative Nutritional Status

The more that we study obesity, the more we find that many patients preparing for bariatric surgery have both subclinical and frank nutritional deficiencies. **Studies increasingly demonstrate significant deficiencies in many nutrients in the morbidly obese.** These include, but are not limited to Vitamin E (11), Vitamin A and the Carotenoids (12), Zinc (7), Selenium (8) and Thiamine (8). The most recent data from the Third National Health and Nutrition Examination Survey (NHANES III: 1988–1994) showed that higher BMI was associated with **deficiency of vitamins, A, E, C, D, selenium, folate and carotenoids. (10) Vitamin D deficiency is so common in morbid obesity that it should most likely be considered a comorbidity. (11)**



Bariatric Advantage® Pre-Operative Multivitamin

Bariatric Advantage Pre-Operative Multi-Formula is a comprehensive vitamin and mineral product designed to help you get started on the path towards better health. Many studies have shown that obesity is commonly associated with poor vitamin and mineral status. While your doctor may check for and even treat some problems before surgery, many nutrients are simply too difficult and costly to screen. A comprehensive vitamin and mineral product taken before surgery can help to build and support healthy nutrient levels. Healthy nutrient status is associated with better immune function and wound healing, which can be important after surgery. Also, starting your vitamins now – before your surgery – helps you to learn part of the routine you will have to adopt after your surgery.



Bariatric Advantage® Meal Replacements

High Protein Meal Replacement – 27 Grams Protein!

The Bariatric Advantage High Protein Meal Replacement comes in an economic 35-serving bag with a measured scoop to make accurate dispensing easy. Each 150 to 160 calorie serving provides a full 27 grams of protein, with only 7 grams of carbohydrate (of which 5 grams are fiber, and only 1 gram is sugar) and 1.5 gram of fat. They are also lactose-free to best meet the needs of weight loss surgery patients. One hundred percent of the protein is from a high quality whey protein isolate (There is no soy protein, only a small amount of soy lecithin to mask aftertaste). Fortified with between 15 and 50 percent of the DV for 23 essential vitamins and minerals, this product makes a perfect pre-operative weight loss shake or post-operative meal replacement for bariatric surgery patients. Our meal replacement also comes in a great variety of flavors (chocolate, vanilla, strawberry, banana) as well and an unflavored shake that can be mixed with soup, yogurt, fruit or home-purchased flavorings.

Pre-Operative Multivitamin Dose = 2 Tablets per Day Two compressed tablets contain:	
Vitamin A (from Beta Carotene)	5,000IU
Vitamin C	120mg
Vitamin D3	1000IU
Vitamin E (as d-alpha Tocopheryl Acetate)	30IU
Vitamin B1 (from Thiamine Mononitrate)	3mg
Vitamin B2 (as Riboflavin)	3.4mg
Niacin	50mg
Vitamin B6 (from Pyridoxine HCl)	4mg
Folic Acid	800mcg
Vitamin B12 (as Cyanocobalamin)	50mcg
Biotin USP/FCC	300mcg
Pantothenic Acid (from Calcium D-Pantothenate)	10mg
Calcium (from Citrate)	600mg
Magnesium (from C itrate)	50mg
Iron (Ferrous Fumarate USP)	18mg
Zinc (from Zinc Citrate)	15mg
Selenium (from L-Selenomethionine)	55mcg
Copper (from Copper Citrate)	2mg
Manganese (from Maganese Sulfate)	2mg
Chromium (Chromium Picolinate)	120mcg
Molybdenum (Sodium Molybate)	75mcg
Vanadium (Vanadium Citrate)	25mcg
Choline (Choline Bitartrate FCC)	5mg
Inositol USP/FCC	5mg

Meal Replacement A single serving contains:			
Calories	150 to 160	Iodine	75mcg
Protein	27g	Iron	6.3g
Carbohydrate	7g	Magnesium	100mg
Fiber	5g	Phosphorus	150g
Sugar	1g	Zinc	7.5mg
Lactose	0	Potassium	200mg
Fat	1.5g	Sodium	290mg
Cholesterol	0		
Vitamin A	2500IU		
Vitamin D	15IU		
Vitamin E	300mcg		
Vitamin C	30mg		
Thiamine (B1)	0.75mg		
Riboflavin (B2)	0.85mg		
Pydroxine (B6)	1mg		
Vitamin B12	3mcg		
Niacin	10mg		
Biotin	150mcg		
Pantothenic Acid	5mg		
Folic Acid	200mcg		
Calcium	150mg		
Chromium	60mcg		
Copper	1mg		
Molybdenum	37.5mcg		

Reference: Pre-Operative

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