

# Abstract

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## Micronutrient deficiencies after bariatric surgery.

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**OBJECTIVE:** It has been estimated that approximately 220,000 people with morbid obesity underwent bariatric surgery in 2008. Modification of the gastrointestinal tract affects absorption and health care professionals counseling bariatric patients need to be aware of possible micronutrient deficiencies and their symptoms.

**METHODS:** A systematic review of several databases and bariatric surgery center websites on the Internet was conducted from January 1980 to July 2009 to identify literature related to micronutrient deficiencies occurring after bariatric surgery. Keywords used individually or in combination were bariatric surgery, obesity, vitamin/mineral deficiencies, altered gastrointestinal function, nutrient absorption, nutrient supplementation, and metabolic complications, and were variously combined in the search list.

**RESULTS:** Based on this review, all patients scheduled for bariatric surgery should receive daily multivitamin and multitrace mineral supplements. The literature suggests that bariatric surgery patients are at risk for deficiency of the following nutrients after surgery: vitamins B(12), B(1), C, folate, A, D, and K, along with the trace minerals iron, selenium, zinc, and copper. Over-the-counter multivitamin and mineral supplements do not provide adequate amounts of certain nutrients such as vitamin B(12), iron, or fat-soluble vitamins and patients will require additional doses of prophylactic supplementation life-long to maintain optimal micronutrient status. In addition, preconception care for adequate prenatal supplementation is critical for pregnant women who have undergone bariatric surgery, as iron, vitamin A, vitamin B(12), vitamin K, and folate deficiencies are associated with maternal and fetal complications, including severe anemia, congenital abnormalities, low birth weight, and failure to thrive.

**CONCLUSIONS:** All bariatric surgery patients would be best served by receiving regular monitoring of serum nutrient levels starting at 3 mo after surgery and periodically thereafter.

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