

# Nutrition Intervention for Malnourished Patient with a Non-Healing Surgical Incision and History of Bariatric Surgery: A Case Report

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## BACKGROUND

Medical nutrition therapy is necessary for individuals at risk of impaired wound healing, such as those with malnutrition, poor circulation, or advanced age. During the acute inflammatory response from wounds, the body enters a catabolic state, increasing energy and protein needs. Patients with wounds have increased energy needs and protein needs and the assessment and management of vitamins and minerals such as vitamins A, vitamin C, vitamin K, and zinc enhance tissue formation.<sup>1</sup> Early diagnosis and intervention for malnourished patients with chronic wounds are critical steps in providing effective patient care. This case report analyzes the care of a 74-year-old female with a non-healing surgical wound with a history of bariatric surgery who has been diagnosed with malnutrition.

## NUTRITIONAL CONSIDERATIONS

Nutriton Guidelines for Wound Care EPUAP/NPIAP/PPPIA Guidelines <sup>2</sup>	
Protein & Amino Acids	Important for growth and maintenance of cells Helps with inflammatory response, fibroblast proliferation, collagen production, angiogenesis  1.25-1.5 g/kg body weight for adults with pressure injury with malnutrition or at risk for malnutrition  Arginine (Amino acid) <sup>1</sup> -Promotes transport of amino acid into tissues and promotes synthesis of cellular proteins
Calories	Acute inflammaotry response increase energy needs, recommended guidelines are 30-35 kcal/kg body weight for adults with pressure injury for adults who are malnourished or at risk for malnutrition
Nutrition Supplements	Provide high kcal and high protein nutritional supplements in addition to the usual diet
Nutrition Support	Enteral nutrition is indicated if patient is unable to maintain adequate oral intake to meet metabolic demands, parenteral nutrition is indicated if enteral nutrition is contraindicated. Discuss the benefits or harm of enteral or parenteral feeding to support overall health in light of wounds and goals of care of patient
Micronutrient Needs	Vitamin A-maintains integrity of epithelial and mucosal surfaces, stimulates fibroblasts which increase collagen production Vitamin E-antioxidant Vitamin C- required for fibroblast maturation, and angiogenesis Vitamin K-cofactor for clotting factors Iron-oxygen transport to wounded tissue Zinc-component of many enzyme systems (growth factors, synthesis of fibroblasts, DNA & RNA) Copper-essential for collagen cross linking

## CASE REPORT

### CASE SUMMARY

**History:** Patient is 74-year-old female admitted for hip fracture from a fall in her home residence. Past medical history: Roux-en-Y gastric bypass, hypertension, hyperlipidemia, atrial fibrillation, congestive heart failure, and iron deficiency anemia. Gastric bypass surgery, such as Roux-en-Y, alters the gastrointestinal tract limiting the surface area where vitamins and minerals are absorbed. Additionally, it significantly reduces the size of the stomach.

**Clinical Course:** Over the course of her stay, the patient experienced multiple complications including surgical site infection, tachycardia, hematoma, DVT, hemorrhagic shock, and a transfusion.

### ASSESSMENT

- Decreased oral intake to less than 50% of meals were being consumed
- Patient complains of early satiety during meals and nausea after eating meals
- Low intake of nutrition supplements for wound healing due to flavor preference
- Patient requests ¼ portions due to inability to finish meals even with 1/2 portions
- Patient unable to drink two nutrition supplements in one day due to volume
- Anthropometrics: Ht: 5’2”, Wt: 120 lbs.
- Nutrition-focused physical exam: Moderate muscle wasting (temporalis, pectoralis, biceps, deltoids, gastrocnemius scapula), moderate subcutaneous fat loss (triceps, buccal, orbital).

### NUTRITION DIAGNOSIS

- Severe malnutrition related to inadequate oral intake, poor appetite, increased nutrient needs as evidence by moderate muscle wasting and subcutaneous fat loss.
- Increased nutrient needs related to history of Roux-en-Y gastric bypass and non healing wound as evidence by <75% intake, non-healing wounds, pressure injury.

### INTERVENTIONS

#### Diet:

- Provided patient with 66-79 grams of protein per day and 1581-1841 kcal per day based on weight from length of stay day 67 (52.7 kg). Removed initial diet order of low-fat to increase variety of meals offered to increase oral intake. Changed diet order to half portions to encourage smaller more frequent meals to improve GI tolerance of meals, reducing symptoms of dumping syndrome. Diet Education: Educated patient on the importance of having a high kcal, high protein diet to provide the body with enough nutrients to support healing of her surgical incision. Discussed importance of prioritizing protein in meals over carbohydrates to meet protein needs and reduce symptoms of dumping syndrome where foods high in simple carbohydrates digest quickly through the stomach into the small intestine and cause nausea.

#### Supplements:

- Provided high protein nutrition supplement twice per day, then decreased to once per day due to her inability to consume two cartons in a day. Provided 150 kcal and 30g protein per carton. Also provided supplement that has been clinically shown to enhance wound healing, formulated with Arginine and micronutrients such as vitamin E, C, B12, and zinc. Patient must consume 2 packets dissolved in water or other beverage for maximum benefit. Provided 180 kcal and 5g protein in two packets.
- Provided patient with 1000 µg folic acid and 1000 µg B12

#### Medications:

- Often perscribed as an antidepressent but can be used to stimulate increased appetite. (Mirtazapine 15mg)
- Antiemetics (Zofran) to reduce nausea so patient could consume more of her meals.

#### Nutrition Support

- Initially started peripheral parenteral nutrition to provide immediate increased kcal and protein until patient could have a central line placed to receive total perepherial nutrition to meet all of kcal and protein needs.

Micronutrient Supplementation to Prevent Deficiency in Roux-En-Y Patients <sup>3</sup>	
Vitamin B1 (thiamin)	>12mg daily; 50-100mg from daily MV preferred
Vitamin B12	Orally: 350-1000ug daily
Folic Acid	400-800ug folate daily from MV 800-1000ug of folate for women of childbearing age
Iron	45-65 mg elemental iron daily, taken separately from calcium and acid-reducing agents
Calcium	Calcium1200-1500 mg/day
Vitamin D	3000 IU daily until blood levels of 25 (OH)D are >30 ng/mL
Zinc	8-22 mg/day, (100-200% of RDA)
Vitamin A	5,000-10,000 IU/day

## OUTCOME

Patient received a port for parenteral nutrition access to allow for long term parenteral nutrition. After placement, the patient was discharged to a long-term care facility to continue to recover and receive total parenteral nutrition and wound care. The parenteral nutrition formula provided 1669 kcal and 83 grams of protein which met 90% of the upper end of her estimated kcal needs and 105% of the upper end of her estimated protein needs.

## DISCUSSIONS AND PRACTICE IMPLICATIONS

- Patients with malnutrition are at risk for impaired wound healing. The body has increased kcal and protein demands due to the inflammation. Wounds will remain in the inflammation phase and will not heal until adequate metabolic demands are met.
- The patient’s history of bariatric surgery exacerbated her malnutrition status and risk of micronutrient deficiencies related to wound healing. The Roux-En-Y surgery contributed to challenges with maintaining adequate oral intake to meet the patient’s increased nutrient needs. Early identification and diagnosis of malnutrition is critical for reducing implications imposed by malnutrition and poor wound healing.

## CONCLUSION

This patient was initially admitted for a hip fracture but experienced complications leading to an extended stay at the hospital, including a surgical site infection that significantly delayed healing. Additionally, inadequate nutritional intake posed a major barrier to recovery. With a history of bariatric surgery, the patient was unable to meet intake needs due to her reduced stomach size. She experienced symptoms of early satiety and dumping syndrome which limited the volume of food she could intake. Various interventions were implemented, including dietary modifications, nutrition education, appetite stimulants, nutritional supplementation, and eventually the initiation of parenteral nutrition. Enteral nutrition was contraindicated due to her altered anatomy of the digestive tract. Delays in initiating parenteral nutrition due to interdisciplinary communication challenges further prolonged the patient's recovery. Eventually, a port was placed to facilitate long-term parenteral nutrition, allowing for discharge to a long-term care facility for continued rehabilitation.

## REFERENCES

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