

Medical Nutrition Therapy for Short Bowel Syndrome

Ke (Claire) Luo, MS – Nutrition Student & Dietetic Intern, UW Nutritional Sciences Program



SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON
excellent science, shared passion, enduring impact

Patient Background Information

Patient is a 63-year-old obese female (BMI 42.6 kg/m²) diagnosed with stage IIIC ovarian cancer in the right ovary. On diagnosis, cancer cells have spread to the omentum, small and large bowel. The following procedures were conducted at an outside hospital in January, 2014:

- Tumor debulking surgery
- Right salpingo-oophorectomy (removal of the right fallopian tube)
- Right hemicolectomy (removal of the right side of the colon)
- Omentectomy (removal of part or all of the abdominal lining)
- Resection of small bowel to the remaining colon
- Colostomy

Review of the operative report suggests that there is approximately 91 cm of remaining small bowel.

Addition History of Present Illness

- Presumable short gut syndrome
- Received 3 cycles of chemotherapy: Taxotere and Carboplatin; presumable chemotherapy-related toxicity
- History of C-difficile colitis (May, 2014), treated with antibiotics
- Complained of loose and increased ostomy output, cramping, abdominal pain, and fatigue
- Currently on TPN since hospitalization at the University of Washington Medical Center in May 2014, for fluid and electrolyte replacement

Short Bowel Syndrome (SBS)

Patients with SBS typically experience severe diarrhea, steatorrhea, nutrient deficiencies, electrolyte disturbances, dehydration, malnutrition, and weight loss [1]. Resection of the ileum would result in decreased water absorption and delivery of excess fluid to the colon; the right hemicolectomy and colostomy may further reduce water absorption in the colon [1]. Absence of ileum puts patients at risk for:

- Vitamin B₁₂ deficiency
- Calcium, magnesium, zinc and iron deficiencies
- Bile acid malabsorption
- Fat-soluble vitamins (vitamins A, D, and E) malabsorption [1]. Oxalate restriction is also recommended [1].

Enteral Nutrition (EN) support is preferable to Parenteral Nutrition (PN) for increasing absorption of macronutrients in patients with short bowel syndrome [2]. In addition, EN is less expensive and has lower overall risks than PN [2].

Medical Nutrition Therapy for Short Bowel Syndrome [1, 2]

Nutrient	Recommendation for Patients with Colon Present
Carbohydrates	50-60% of total energy; complex carbohydrates, including soluble fiber
Proteins	20-30% of total energy
Fats	20-30% of total energy
Fluids	Minimize fluids with meals, sipping of fluids between meals
Vitamins	Daily multiple vitamin with minerals; possibly B12; possibly vitamins A, D, E supplements
Minerals	500 mg calcium with meals; possibly iron, magnesium, and zinc supplements; reduced oxalate
Meals	3 small meals plus 2-3 snacks

Assessment

Labs: hypokalemia, low vitamin D

Nutrition Requirements:

Energy Need: 1550-1860 kcal (30-35 kcal/kg x Adjusted Body Weight)

Protein Need: 62-81 g (1.0-1.3 g/kg x Adjusted Body Weight)

Fluid Need: 2475 mL (BSA x 1500)

3-Day Intake Record:

Patient's intake	Date	Calorie (kcal)	Protein (g)
Oral Intake	7/4/2014	1270	55
	7/5/2014	559	15
	7/6/2014	1420	47

Typical Diet:

Breakfast: one egg omelet with ¼ cup ham and ½ string cheese

Lunch: ½ ham sandwich (1 slice ham and 1 slice cheese), ½ banana

Dinner: 1 cup pasta with meat sauce

Snack: chocolate

Patient was also receiving 1313 kcal of energy and 110 grams of protein per day through home TPN infusion.

Diagnosis

Altered GI function related to history of hemicolectomy, resection of small bowel, omentectomy, colostomy, and chemotherapy-related toxicity as evidenced by loose and frequent ostomy output (~2 full bags of ostomy output per day).

Intervention

1. Consume 3 small meals plus 2-3 snacks per day.
2. Take probiotics – VSL#3 is a probiotic containing 125 billion CFU counts, including four strains of lactobacillus, three strains of bifidobacterium, and one strain of streptococcus thermophilus.
 - Double-blind and placebo-controlled study in patients undergoing pelvis radiation [4] found:
 - Development of radiation enteritis: 32% in the intervention group, 52% in the control group
 - Bowel movement frequency: control group had 3 times more bowel movement per day as did the intervention group
3. Increase soluble-fiber intake through food sources and supplements.
 - Food sources: applesauce, banana, oatmeal, carrots, sweet potatoes, onion, squash, etc.
 - Supplement example: Heather's Tummy Fiber
4. Increase fruit and vegetable intake for potassium and phytonutrients. Recommend more soluble-fiber, such as from root vegetables, rather than insoluble-fiber. Experiment with fruits to test tolerance.
5. Increase protein intake by mouth to meet protein need.
6. Vitamin D supplementation: 4000 IU per day.
7. Track intake at least 3 times per week.

Monitoring and Evaluation

- Monitor serum vitamin B₁₂, calcium, iron, magnesium, zinc, and fat-soluble vitamins routinely
- Monitor weight status and oral food intake

Summary

Patient continues to be on TPN support. However, the above recommendations are intended to help patient increase oral food intake and decrease reliance on TPN, while managing the symptoms of malabsorption from SBS. Patient's need for TPN should be re-assessed because of the overall risks of TPN.

References

- 1) Matarese, L. E. "Nutrition and Fluid Optimization for Patients With Short Bowel Syndrome." *Journal of Parenteral and Enteral Nutrition* 37.2 (2013): 161-70.
- 2) Wall, Elizabeth A. "An Overview of Short Bowel Syndrome Management: Adherence, Adaptation, and Practical Recommendations." *Journal of the Academy of Nutrition and Dietetics* 113.9 (2013): 1200-208.
- 3) Vaughan S, Coward JI, Bast RC, Berchuck A, Berek JS, Brenton JC. Rethinking ovarian cancer: recommendations for improving outcomes. *Nat Rev Cancer*. 2011;11(10):719-725
- 4) Delia P, Sansotta G, Donato V, Frosina P, Messina F, De Renzis C, et al. Use of probiotics for prevention of radiation-induced diarrhea. *World J Gastroenterol*. 2007;13(6):912-915.