

Neha D. Shah, MPH, RD, CNSC, CHES, Series Editor
Elizabeth Wall, MS, RDN-AP, CNSC, Series Editor

Nutrition Care for Patients with Upper GI Malignancies: Part 1 – Head and Neck Cancer



Jill Bice

Patients with head and neck cancer (HNC) often present to their first oncology appointment with malnutrition. The various HNC treatments frequently exacerbate their malnutrition; if patients are not malnourished initially, they are at high risk for developing it while undergoing treatments. Practitioners who are able to navigate through nutrition related side effects of treatment can play a key role in helping patients successfully complete their therapy and recover to a state of good health. During the recovery phase, as side effects eventually subside, patients may require assistance to transition back to their normal diet and lifestyle. This article will review the background of HNC, the nutrition-related side effects of treatments, and it will provide recommendations for providers to guide their patients through various treatment complications.

INTRODUCTION

Globally there are an estimated 900,000 new cases of head and neck cancer (HNC) and 400,000 deaths from this disease annually.¹ Approximately 3% of malignancies in the United States are diagnosed as HNC.¹ Common risk factors associated with HNC include Human papillomavirus infection (HPV), smoking, alcohol use, and the Epstein-Barr virus.¹

Head and neck cancers originate in the oral cavity, pharynx, larynx, nasal cavity, paranasal

sinuses, or the major salivary glands.² Due to the location of these cancers, a tumor can impede patients' ability to chew or swallow leading to decreased dietary intake. When this is the case, patients may present with malnutrition to an initial oncology evaluation; 25-50% of patients present with involuntary weight loss.³ Cancer treatments such as surgery or radiation, that target the tumor site, as well as the systemic side effects of chemotherapy and immunotherapy make eating/drinking more difficult for HNC patients and thus, increase the risk of sarcopenia, frailty and malnutrition.^{4,5} The purpose of this review is to

Jill Bice, MS, RD, CSO, CNSC Outpatient
Oncology Dietitian The University of
Chicago Medical Center Chicago, IL

provide guidance to clinicians on how to help HNC patients navigate treatment symptoms to improve outcomes and quality of life (QoL).

Nutrition Related Side Effects

Maintaining good nutritional status throughout HNC treatment, by preventing weight loss, plays an important role in ensuring optimal outcomes.^{3,6,7} Patients often need assistance coping with the side effects that occur with HNC treatments. The Registered Dietitian Nutritionist (RDN) is vital to help patients subsist despite the side effects that develop.

Sarcopenia is a skeletal muscle disorder characterized by low muscle strength, quality, quantity, and function.⁴ HNC patients are more prone to sarcopenia than some other cancers due to swallowing disabilities from the primary tumor, comorbidities associated with HNC risk factors (habitual drinking/smoking, old age), and cancer-induced catabolism.⁴ Sarcopenia is associated with reduced overall survival.⁵ This may be due to the fact that patients with low skeletal muscle mass experience more toxicities of cisplatin and radiotherapy, thus necessitating dose reductions and breaks from treatment.⁸

Frailty is a cumulative decline across multiple physiologic systems leading to increased risk of adverse health outcomes; it is preventable and/or treatable with nutrition and physical activity interventions.^{9,10} If frailty and malnutrition are not reversed, and patients remain malnourished during treatments, they are at high risk of body tissue catabolism and wound healing disorders.¹⁰

Odynophagia and *mucositis* are common injuries of radiation and chemotherapy, with up to 89% of patients reporting mucositis.^{3,11,12} Although variable, odynophagia onset often arises during the 3rd week of radiation therapy (RT).¹³ Soft, smooth, and moist foods pass more easily through the inflamed oral cavity and throat, opposed to hard or crunchy foods that feel like “grit” and often irritate mucosal sores. Acidic foods (citrus foods and vinegars) also irritate mouth sores and should be avoided.

Oral care is important for patients with mucositis; a salt water and baking soda rinse should be encouraged (Table 1).¹³ Mouthwashes that contain topical anesthetics combined with

Table 1. Baking Soda & Salt Water Mouth Rinse Solution Recipe¹⁸

Ingredients
<ul style="list-style-type: none"> • 1 quart of water • ¾ teaspoon salt • 1 teaspoon baking soda
Directions
<ul style="list-style-type: none"> • Mix all ingredients together until the salt and baking soda dissolve. • Rinse mouth with the solution and spit. • Do not drink the solution.

an antacid suspension and/or diphenhydramine, with or without nystatin, may be prescribed to help patients manage the pain of mucositis.¹⁴ Some patients require pain medications prior to meals in order to consume a diet.³

Patients receiving fluorouracil, paclitaxel and docetaxel are at high risk of mucositis.¹³ One means to reduce the incidence of mucositis is to reduce the blood flow to the mouth, and thus the chemo-toxic medication, by having patients melt ice chips in their mouth for 10-15 minutes before, during, and 10-15 minutes after infusion of fluorouracil; this is not recommended for those with tumors within the oral cavity.¹⁴ The combination of chemotherapy and RT can increase the duration and severity of mucositis, though narrowed RT treatment fields reduce affected areas.^{3,15}

Xerostomia results from damage to the parotid glands and it is reported to be the most common side effect of HNC therapies with one study reporting an incidence of 93%.^{12,13,16} Xerostomia contributes to dysphagia and decreased oral intake resulting in malnutrition.¹⁷ Patients with xerostomia should carry fluids with them and learn to sip often. Alternating between bites of foods and sips of liquids, and adding broths, gravies, and sauces to moisten foods will help patients consume more food. As with odynophagia and mucositis, those with xerostomia should maintain good oral hygiene to reduce their risk of dental caries.³ Alcohol-containing beverages and mouthwashes have a drying effect that exacerbates xerostomia and should be avoided.³ Alcohol free mouthwash can be used throughout the day.^{3,18}

Dysphagia is caused by the tumor placement, surgery or deconditioning.^{13,19} It affects ≤ 30%

of patients prior to treatment, but the incidence increases to 38-46% after treatment.²⁰ Altered swallowing can lead to aspiration, pneumonia, pneumonitis, atelectasis, empyema, bronchitis, acute lung injury and adult respiratory distress syndrome.²¹ Any suspicion of dysphagia should trigger an immediate referral to a speech language pathologist (SLP) who will perform a swallow evaluation and make recommendations for food consistency and fluid viscosity; recommended texture modifications are based on the International Dysphagia Diet Standardization Initiative (IDDSI).²² Table 2 highlights the IDDSI system.

To maintain swallow function through treatment, HNC patients are encouraged to eat solid foods as much as possible. Patients should focus on eating soft/moist or pureed, high protein, high calorie foods. Frequent, small meals (every 2 hours), opposed to 3 large meals daily, are often better tolerated. Oral nutrition supplements can help to bridge gaps between calories/protein consumed and estimated nutrition needs.

Dysgeusia is a cancer treatment side effect plaguing up to 76% of patients undergoing combined modality treatment.²³ Simple interventions to combat dysgeusia are to avoid metallic silverware and use a mouth rinse/brushing prior to eating.²⁴ Radiation therapy often results in ageusia which can continue for weeks to months post RT, but will slowly start to return to a “new normal” for each patient.²³ Dysgeusia/ageusia inhibits appetite. Patients with some taste sensation can enhance food flavor with heavy seasonings.²⁴ The tart flavor is sensed more easily so using lemon flavored foods or vinegar marinades/dressings may help patients who are not plagued by mucositis.²⁵

Nausea/vomiting - Patients receiving emetogenic chemotherapy agents will likely experience nausea/vomiting.¹² Up to 50-80% of patients may report nausea at some point during HNC treatment.²³ Nausea can lead to dehydration, electrolyte imbalances (with vomiting), and malnutrition.²³ Patients with mild to moderate nausea may tolerate small, frequent meals. Those with more severe nausea often require antiemetic medications to control their nausea and allow for oral intake. Warm foods tend to be odorous and trigger nausea more than cold or room temperature foods, thus cold foods may be better tolerated when nauseous is a

Table 2. International Dysphagia Diet Standardization Initiative (IDDSI) Diets²²

Level	IDDSI Diet
7	Regular
7	Easy to Chew
6	Soft and Bite Sized
5	Minced and Moist
4	Pureed
3	Liquidized
2	Moderately Thick
1	Slightly Thick
0	Thin

problem.²⁶ A common cause for nausea/vomiting is delayed gastric emptying. Avoidance of foods that are slow to empty from the stomach (e.g., high fat/fried or high fiber) is recommended.²⁷ Also, head elevation for at least 30 minutes after eating can help to prevent nausea.¹³

Nutrition Screening and Assessment

All oncology patients should be screened for risk of malnutrition using a valid screening tool; screening should be repeated throughout the treatments.¹³ Both the Malnutrition Screening Tool (MST) and the Patient-Generated Subjective Global Assessment (PG-SGA) are validated for outpatients.^{28,29} The MST is relatively quick to administer, though the PG-SGA is recommended for cancer patients.³⁰ Table 3 highlights the criteria for each screening tool. All patients found to have risk for malnutrition should be referred to the RDN for a complete assessment and interventions.

Head and neck cancer patients typically have high calorie, protein and fluid needs, often requiring 35-40 kcal/kg/day and 1.5 g protein/kg/day.¹³ Patients with severe malnutrition, or protracted nausea and vomiting, may be at risk of refeeding syndrome or Wernicke’s encephalopathy with initiation of nutrition interventions; cautious introduction of calories with multivitamins and thiamine supplementation may be warranted. Close monitoring by the RDN should continue until the therapies are completed and the patients are nutritionally stable; for some patients this may

Table 3. Tools to Screen for Malnutrition^{28,29}

Malnutrition Screening Tool (MST) (Completed by clinician)	Patient-Generated Subjective Global Assessment (PG-SGA) (Completed by patient (P) or clinician (C))
<ul style="list-style-type: none"> • Have you lost weight without trying? • If yes, how much weight have you lost? • Have you been eating poorly because of a decreased appetite? 	<ul style="list-style-type: none"> • Weight and weight change - P • Changes in food intake - P • Nutrition impact symptoms - P • Changes in activity and function - P • Percent weight change - C • Disease and its relation to nutrition requirements - C • Metabolic demand - C • Physical exam - C
Positive findings are assigned points that are tallied. Referrals to the RDN are based on point scales for each tool.	

Table 4. Enteral Nutrition Tube Placement³¹

Prophylactic Tube Placement	Reactive Tube Placement
<ul style="list-style-type: none"> • Severe weight loss prior to diagnosis <ul style="list-style-type: none"> ➢ ≥5% over previous 1 month or ➢ ≥10% over previous 6 months • Persistent dehydration, dysphagia, anorexia, pain interfering with oral intake • Significant comorbidities that may be aggravated by malnutrition and/or dehydration • Aspiration risk • Concern for long-term swallowing disorders 	<ul style="list-style-type: none"> • Inadequate food intake anticipated for more than 10 days (< 60% of estimated nutrition needs) • Weight loss of >5% in 1 month • Severe mucositis, odynophagia, dysphagia (grade 3+) or aspiration • Age over 60 years

mean long term follow-up with a dietitian.³¹ In particular, a RDN certified as an oncology nutrition specialist (CSO) is trained to help navigate nutrition related side effects that cancer patients may encounter.

Enteral Nutrition

Treatment for HNC is rigorous and given the importance of maintaining proper nutrition during and after treatment, enteral nutrition (EN) may be necessary. While many providers prefer for patients to meet their nutrition needs without EN, some will benefit from a prophylactic enteral feeding tube placed beyond the affected area. Table 4 outlines the National Comprehensive Cancer Network guidelines on timing for enteral feeding tube placement.³¹

A standard, polymeric EN formula is appropriate for patients with HNC requiring EN. The use of

immunonutrition in HNC patients appears to reduce the severity of mucositis, however more research is needed before guidelines are developed.^{10,13,32,33} Study results of elemental diets in patients with HNC did not show significant benefit and therefore is not recommended.³²

Patients receiving EN can experience a variety of intolerance complications. The RDN can help to manage these complications in order to maximize EN tolerance to meet the patient’s nutrition needs.

Nausea/vomiting - First, test for improved tolerance by reducing the EN formula volume and rate of infusion. Next, evaluation for constipation as it can trigger nausea/vomiting symptoms. In severe cases, when adjustments to the EN regimen do not improve symptoms, then use of prokinetic agents, such as metoclopramide or erythromycin, may increase gastric motility and, in-turn, alleviate nausea.²¹

Table 5. Common Etiology of Diarrhea in HNC Patients²¹

Etiology	Common Underlying Causes
Infectious	<ul style="list-style-type: none"> • Clostridium difficile colitis
Inflammation	<ul style="list-style-type: none"> • Checkpoint inhibitor • Intestinal panniculitis • Inflammatory bowel disease • Ischemia
Medications	<ul style="list-style-type: none"> • Antibiotics • Sugar alcohols (sorbitol, lactulose, xylitol) • Hyperosmolar oral solutions or beverages
Fecal impaction	<ul style="list-style-type: none"> • Seepage of liquid stool around desiccated, impacted stool
Enteral formula characteristics	<ul style="list-style-type: none"> • Hyperosmolality • High fat content • High fiber content

Diarrhea is defined as stool volume greater than 500 mL every 8 hours or greater than 3 bowel movements (BM) per day for 2 consecutive days.²¹ When receiving EN, one liquid BM daily is not diarrhea. It is important to evaluate the possible causes of the diarrhea and not simply blame the EN. Table 5 lists possible causes of diarrhea. Once infection and fecal impaction are ruled out, patients can start an anti-diarrheal medication to help control stool output. The RDN can evaluate the patient and make recommendations for adjustments to the EN regimen.²¹

Constipation - Common causes of constipation are dehydration, insufficient or excess fiber intake, and the use of narcotic pain medications. Evaluation of hydration status with strict attention to intake and output data will help elucidate whether dehydration is contributing to constipation; ensure that the patient is receiving at least 1 mL of fluid per calorie and producing at least 1 liter of urine per 24 hours.²¹ If the patient is adequately hydrated, then the RDN can evaluate the fiber content of the enteral formula and make recommendations for adjustments.

Survivorship

HNC patients are at risk for chronic, nutrition-related complications throughout their treatments.

Weight loss in the weeks/months post treatment are a sign of compromised nutritional status and should be addressed as decreased nutritional status increases mortality risk and reduces QoL.³⁴ Long-term follow-up with a RDN is beneficial to help manage nutrition intake in the setting of the treatment side effects. Additionally, the RDN can help patients to transition from EN, or oral supplements, back to a more normal diet while closely monitoring weight, strength, and physical function.

CONCLUSION

HNC and its treatments can be harrowing, often leaving patients with physical disfigurements and long-term nutrition complications. Providers must arm themselves with the knowledge necessary to identify patients at nutritional risk, and the tools to help patients meet their nutritional needs, in order to successfully complete and recover from the treatments. In a perfect world, a patient would be able to eat throughout their treatments. However, that often is not the case so providers must be cognizant of the proper timing for EN access to bridge all nutritional gaps. The RDN will provide diet counseling, troubleshoot EN intolerances, and assist patients with their transition back to an oral diet when possible. The side effects of HNC treatments can be long lasting; awareness that treatment completion does not mean the patient will quickly progress back to their normal diet is important. An understanding of the salient issues and readiness to help patients navigate nutrition-related consequences of cancer treatments will improve clinical outcomes and help HNC patients lead a more fulfilling life. ■

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