

Oncology Nutrition Overview

a report by

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In the US, the lifetime probability of cancer is one in two for men and one in three for women. An estimated 1,368,030 new cases of invasive cancer are expected to occur in 2004 and approximately 563,700 people will die of cancer during this year as well. The important role of nutrition, both as a causative factor and in the treatment and management of cancer, cannot be overstated. It is widely accepted that up to 40% of all cancers occurring in the US today are due to poor nutrition habits. Some health experts believe this number could be much higher.

Nutrition status becomes even more critical after a cancer diagnosis. It is estimated that 20% of cancer patient deaths are related to cancer-induced or treatment-related malnutrition. Some studies indicate this number may be as high as 40% in certain oncology patient populations. This is an unacceptably high rate of mortality due to a factor to which inadequate attention has been paid in the oncology population. Recent data indicates that even among individuals being treated palliatively, nutrition is a limiting factor influencing survival, and supportive nutrition care can protect and preserve metabolic function in patients with cachexia secondary to malignant disease.

In addition to mortality, the issue of quality of life must be addressed. A 1989 Eastern Co-operative Oncology Group (ECOG) study in a mixed cancer patient population demonstrated high prevalence of nutrition-related symptoms. Sixty-one per cent of patients experienced abdominal fullness, 46% experienced taste changes, 41% complained of constipation, 40% experienced dry mouth, 39% complained of nausea, and 27% experienced vomiting. These figures illustrate the need for close involvement of a qualified nutrition practitioner in the management of cancer cases, in particular for those deemed to be at high risk of malnutrition.

Provision of Medical Nutrition Therapy

Medical nutrition therapy (MNT) involves the assessment of the nutritional status of patients with a condition, illness, or injury that puts them at nutritional risk. This includes review and analyses of medical and dietary history, laboratory values, and anthropometric

measurements. Based on the assessment, those nutritional modalities most appropriate to managing the condition or treating the illness or injury are chosen. These include diet modifications and counseling leading to the development of a personal dietary plan to achieve nutritional goals and desired health outcomes, as well as specialized nutrition therapies including supplementation with foods specifically modified to meet the needs of patients unable to obtain adequate nutrition through usual food intake alone. The registered dietitian (RD) is the member of the healthcare team who most commonly provides MNT. The RD is responsible for the nutrition care of the oncology patient before, during, and after treatment for cancer. Specific types of cancer may place an individual at substantial nutrition risk. These cases require close and detailed nutrition care and, in these instances, the RD becomes an indispensable part of the healthcare team. Ideally, the RD should see the patient at the initial and all follow-up visits, along with the physician and nursing staff, and other essential care providers such as social workers, mental health therapists, and spiritual/religious counselors.

Goals of Conventional Nutrition Intervention

The primary goals of conventional nutrition intervention for oncology cases are presented in *Table 1*. These goals are the number one priority of the RD when managing the nutrition status of oncology patients. Given the limited time with each case, and the heavy caseloads carried by most oncology dietitians, secondary goals, including evaluation of the risks and benefits of nutrition-related complementary and alternative medicine (CAM), promotion of nutrition habits to improve long-term health, education on nutrition to minimize risk of cancer recurrence, and education on nutrition to minimize risk of other chronic diseases should be addressed after weight stabilization and restoration of adequate nutritional status is achieved.

Nutrition Screening and Assessment

Two steps are required to ensure appropriate nutrition care and follow-up. These two steps are screening and



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Table 1: Primary Nutrition Goals

Primary Nutrition Goals
<i>Prevent or correct nutritional deficiencies</i>
<i>Improve tolerance to treatment</i>
<i>Minimize short-term and long-term treatment side effects</i>
<i>Achieve and maintain optimal body weight</i>
<i>Enhance quality of life during treatment</i>
<i>Educate family members about special nutrition needs of client</i>

Table 2: Indications and Contraindications For Enteral Feeding

Indications	Contraindications
<i>Inability to meet 50% or greater of required nutrient needs orally for seven or more days</i>	<i>Uncorrectable severe malabsorption</i>
<i>Expected inability to meet 50% or greater of required nutrient needs site orally for seven or more days</i>	<i>Intestinal obstruction distal to feeding</i>
<i>Presence of a functioning GI tract (to some degree)</i>	<i>High output enterocutaneous fistula</i>
<i>Patient willing to accept enteral feeding method</i>	<i>Gastric/Esophageal aspiration</i> <i>Severe acute pancreatitis</i>

assessment. The purpose of nutrition screening is to detect the possibility of nutrition risk. Screening is not intended to allow formulation of a detailed nutrition care plan, it simply provides information to determine if nutrition follow-up is required. Typical components of a nutrition screen include age and gender, weight history and per cent weight change, food intake, symptoms, functional status, disease and stage, metabolic demand, and quick visual examination by medical care staff. An ideal tool for screening is the patient-generated subjective global assessment (PG-SGA).

Assessment is more intensive and thorough than screening. It includes intervention and follow-up, along with additional intervention and additional follow-up, as needed, to correct malnutrition. Typical components of nutrition assessment include:

- age and gender;
- weight history and per cent weight change;
- ideal body weight;
- appearance, behavior and mental health status;
- functional status (e.g. Karnofsky Score or ECOG Score);
- detailed information on cancer type and location;
- detailed intake assessed by 24-hour recall and diet history;
- examination of biochemical parameters such as albumin, prealbumin, transferrin, hematocrit, hemoglobin, retinol-binding protein (RBP), glucose, c-reactive protein (CRP), and serum creatinine;
- information on medications and planned treatment;
- psychosocial status; and
- financial resources and limitations.

For the more detailed assessment, many RDs find that development of their own forms to address the unique needs of the clinical settings in which they practice is the best approach. Regardless of the tools used, information from screening and assessment must be made part of the permanent medical record.

Enteral Versus Oral Feeding

Screening and assessment will identify which individuals require more intensive nutrition intervention and from this information an individualized nutrition care plan can be formulated. While a large majority of oncology patients in the outpatient clinical setting can meet nutrition needs orally, some will require enteral feeding. In particular, individuals with tumors of the upper aero-digestive tract (head and neck cancers) are ideal candidates for enteral feeding.

The majority of head and neck cancer cases will receive radiation therapy at a minimum, and many undergo concurrent radiation and chemotherapy protocols. Early effects of radiation include xerostomia, superficial ulceration in the field of radiation, bleeding, pain, and mucositis. Chemotherapy may lead to symptoms that affect oral intake including nausea, vomiting, weakness, and fatigue. Of additional concern is that while the rate of mucositis during chemotherapy alone is approximately 40%, it is nearly 100% in patients receiving chemoradiation. It is important to note that when undergoing concurrent chemoradiation, patients must cope with both the local side effects of radiation and the systemic side effects of chemotherapy. The effect of these symptoms on dietary intake is profound. One study indicated that approximately 57% of head and neck cancer patients lost weight upon commencement of treatment, with an average loss of 6.5kg, representing 10% of body weight. For all of these reasons, early initiation of enteral feeding is typically the most appropriate nutrition care plan.

The best route for enteral feeding is placement of a tube via percutaneous endoscopic gastrostomy (PEG) or via radiologic percutaneous gastrostomy (RPG), for enteral access. Data indicate that PEG and RPG tubes have significant advantages over nasogastric (NG) tubes, and that pre-treatment placement of a feeding tube results in better outcomes in this population of oncology patients.

Placement of a PEG tube pre-treatment may be ideal; however, this may not be what occurs in practice. If clients are not offered this option, or decline early placement of a feeding tube, specific criteria are used to determine when tube placement can no longer be

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delayed. *Table 2* details these criteria, the indications and contraindications for placement of a feeding tube.

Nutrition Symptom Management – Meeting Needs Orally

Regardless of whether an oncology patient is meeting nutrition needs orally or through enteral feeding, symptoms that can affect nutrition status must be addressed. If enteral feeding is not in place and oral intake is expected to be the major route of providing nutrition, it becomes even more vital that aggressive symptom management is initiated. The presence of any nutrition impact symptoms can result in sub-optimal dietary intake, which may decrease treatment tolerance and increase treatment complications. A combination of pharmacologic and nutrition approaches is important for optimal symptom control. Patients must be told that nutrition management is not to take the place of medical management, but rather to complement it and allow for optimum symptom control and improved quality

of life during and after treatment. Suggested nutrition interventions for some of the more commonly experienced nutrition impact symptoms are presented in *Tables 3–6*.

Cachexia

Cachexia is a set of metabolic aberrations that can affect individuals with cancer and other inflammatory conditions including, but not limited to, HIV/AIDS, sepsis, other chronic infections, and other inflammatory conditions. This unique metabolic milieu must be addressed if positive outcomes are to be achieved in weight-losing cancer patients. It is important to note that anorexia or simple lack of appetite marked by an involuntary decline in food intake is an effect of cachexia, not the cause. Bearing this in mind, it becomes apparent that simple calorie feeding will not address the metabolic changes inherent in the cachexia syndrome and typically will not result in weight stabilization and/or weight regain.

Table 3: Nutrition Options for Sore Mouth and Mucositis

<i>Be fastidious with mouth care/cleanliness to prevent secondary bacterial infection of mouth lesions</i>
<i>Eat soft, bland foods such as creamed soups, cooked cereals, yogurt; pudding, mashed potatoes, eggs, custards, casseroles, smoothies and shakes</i>
<i>Drink liquids and semi-soft solids through a straw to bypass mouth areas with sores and lesions</i>
<i>Blend or moisten foods with yogurt, tofu, pudding, soft cereals such as oatmeal, cream of wheat, and malt-o-meal; warm water, juice, milk, soy milk, rice milk, etc.</i>
<i>Try non-acidic juices such as apple, apricot, peach or pear nectar, grape juice (do not use grape juice if diarrhea is present)</i>
<i>Avoid tart, acidic, or salty beverages and foods such as citrus, avoid pickled items, avoid tomato-based foods, avoid alcohol, caffeine, and tobacco</i>
<i>Try powdered glutamine dissolved in liquid at 10g three times daily (tid), swish and swallow, may be contraindicated if renal and/or hepatic function is severely impaired</i>
<i>Try anti-inflammatory approach such as capsaicin taffy recipe</i>
<i>Encourage inclusion of soft, probiotic containing foods such as yogurt and kefir (fermented milk), may be contraindicated if severe immunosuppression is present</i>

Table 4: Nutrition Options for Dry Mouth and Thick Saliva

<i>Drink eight to 12 cups (8oz cups) of non-caffeinated liquids each day. Use WHO fluid replacers if possible</i>
<i>Sip 100% pure, papaya juice to stimulate saliva and break up secretions</i>
<i>Use lemons and lemon juice to help increase production of saliva, contraindicated if mouth sores and mucositis are present</i>
<i>Use fluids other than water, such as non-acidic juices, to aid with hydration and increase calorie intake</i>
<i>Try stews and casseroles that contain plenty of liquid, such as those made with soups as the base ingredient</i>
<i>Try soft cooked chicken and fish, tofu, thinned cereals, such as oatmeal made with plenty of water or milk, popsicles, shakes, smoothies, and slushies, warm soups and stews, canned fruit in its liquid</i>
<i>Blend or moisten foods with yogurt, tofu, pudding, soft cereals such as oatmeal, cream of wheat, malt-o-meal, warm water, juice, milk, soy milk, rice milk, etc.</i>
<i>Add broth, sauces, gravy, or soup to soften and moisten foods</i>
<i>Use yogurt, juice, or jelly to make foods ‘slide’ down a dry throat easier</i>
<i>Avoid or limit caffeinated foods and beverages such as coffee, caffeinated tea, colas, and chocolate</i>
<i>Avoid alcoholic beverages including beer, wine, and mixed drinks – alcohol will dry the mouth further</i>
<i>Avoid dry foods including tough meats, raw vegetables, breads, pretzels, rice, chips, muffins, and cakes</i>
<i>Avoid commercial mouthwashes – these contain alcohol which will dry the mouth further</i>

Table 5: Nutrition Options for Constipation

Drink eight to 10 cups of non-caffeinated liquid each day, try water, prune juice, other warm juices, and non-caffeinated teas

Try drinking a warm liquid, such as soup or tea half an hour before normal time for a bowel movement

Add other sources of liquid to the diet such as soup and popsicles

Add two tablespoons ground flaxseed to daily diet

Slowly add high-fiber foods to the diet, try high-fiber foods such as whole-grain breads and cereals, raw and cooked fruits and vegetables with the skins and peels, and beans and peas

Snack on dried fruit such as apricots, raisins, prunes, and dates

Increase physical activity, even if by a small amount; try taking a short walk about one hour before your normal time for a bowel movement

Eat a good breakfast; include a hot drink and high-fiber foods

Mix three parts wheat bran cereal, two parts applesauce, and one part prune juice; eat this three times per day or more as needed, to promote a bowel movement, works well on toast.

If gas is a problem, avoid carbonated drinks, broccoli, cabbage, cauliflower dried beans and peas, onions, Brussels sprouts, Swiss chard, radishes, turnips, and watercress, limit talking at meals to avoid swallowing air, do not use a straw, avoid chewing gum

Table 6: Nutrition Options for Lack of Appetite, Nausea & Vomiting

Treat as indicated with anti-emetics and/or pro-motility drugs; educate patient to use exactly as prescribed (nausea/vomiting prevention is easier than treatment)

Educate patient on communication with health care team; encourage follow-up when symptom resolution is not achieved with current medication regimen

Ginger: chopped dried extracts as tea two to three times daily – 940mg powdered ginger root once daily for nausea prevention; 250mg root four times daily for nausea mgmt (may be contraindicated if coagulations parameters are abnormal)

Try small frequent snacks of bland foods such as oatmeal, plain pasta, rice, potatoes, broths (avoid 'empty stomach' which may worsen nausea)

Completely avoid food smells – avoid preparing food for oneself if possible, focus on foods with minimal odors and short cooking times

Avoid eating in a warm, stuffy room – avoid large quantities of fluids with meals/snacks, rinse out mouth before and immediately after meals

Sip warm, natural ginger ale (higher ginger content) – sip ginger tea, chamomile tea, or peppermint tea (avoid peppermint if reflux present)

Sit up to eat – do not lay down after eating for at least one hour; engage in relaxation activities after eating

Avoid fatty, greasy, fried, rich foods such as fatty meats, french fries, desserts (high fat will delay gastric emptying)

One potentially useful approach for addressing cachexia is the use of omega-3 fats. There is evidence that the metabolic alterations that contribute to cancer cachexia can be normalized by increased intake of eicosapentanoic acid (EPA). Research has indicated that amounts up to 18g per day of EPA are well tolerated. The most common dose-limiting symptom is diarrhea. However, a dose of 2.2g of EPA per day is believed to be effective and this lower dose is associated with minimal risk of side effects. EPA can be incorporated into the diet either through the use of specialized oral/enteral formulas such as Novartis Resource Support[®] and Ross ProSure[®] (two containers of supplement daily supply 2.2g) or EPA containing fish oil supplements. Generally, it has been recognized that food sources of EPA do not provide a dose that is sufficient to halt cachexia. For patients to derive true benefits from this intervention, the metabolic benefits of EPA must be described. This enables individuals to understand that the intervention is not simply 'food' or 'calories', but rather a

medication that needs to be incorporated as diligently as other medical interventions.

Conclusion

Cancer cases require close and consistent follow-up by a qualified nutrition professional. In particular, cancers involving the aero-digestive and gastrointestinal tracts require special attention. The oncology RD, in conjunction with the full, multi-disciplinary team approach, is the ideal individual to provide the specialized nutrition care required in this patient population. By working closely with the medical care team, collaborating to provide comprehensive nutrition care, and reinforcing the importance of medication management for optimal symptom control, the RD can improve both quality of life and outcome in the oncology patient population. ■

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