BC Cancer Agency
CARE & RESEARCH
An agency of the Provincial Health Services Authority

Nutritional Guidelines for Symptom Management

MUCOSITIS

DEFINITION: Inflammation of the mucous membranes lining the mouth, throat and esophagus can result in complications including significant pain, xerostomia (dry mouth), taste alterations, and increased risk of oral infections. Ultimately, malnutrition, dehydration, and interrupted cancer treatment plans may result.

COMMON COMPLAINTS: "It hurts to eat", "even water hurts to swallow", "my mouth and throat are on fire", and "it feels like I'm swallowing razor blades".

POSSIBLE CAUSES

Tumor:

Patients with tumors of the head/neck and esophagus may complain of sensitivities to food post biopsy or prior to treatment. This may also be due to the location of the tumor itself.

Radiation:

External beam or internal radiation therapy can cause mucositis/esophagitis when the treatment field includes the mouth, throat or mediastinum. The lips, cheeks, soft palate and floor of mouth are at greater risk of mucositis. Radiation damage depends upon the radiation dose level, field size, fractionation, and individual tolerance. Radiation induced damage differs from that induced by chemotherapy in that tissues treated with radiation remain in jeopardy throughout the life of the patient; they are more easily damaged by subsequent toxic drug or radiation exposures, and normal physiologic repair mechanisms are compromised. Acute mucositis usually occurs one to two weeks into radiation treatment and persists two to four weeks post radiation treatment.

High-dose radiation to tooth-bearing bone causes hypoxia, reduction in vascular supply to the bone, and tissue breakdown leading to bone exposure, infection and osteoradionecrosis. Hyperbaric oxygen therapy has been shown to stimulate new capillary formation in affected tissues of patients with osteoradionecrosis and is being used as an adjunct to surgical debridement.

Chemotherapy:
Methotrexate, doxorubicin, 5-fluorouracil, bleomycin, vinblastine, docetaxel and paclitaxel are some examples of chemotherapeutic agents that are more commonly associated with oral mucositis. The risk of mucositis is exacerbated when these agents are given in high doses, in frequent repetitive schedules, or in combination with radiation.
These drugs affect rapidly proliferating cells such as the cells of the upper digestive tract. The lips, tongue, floor of mouth, buccal mucosa, and soft palate are more severely affected by drug toxicity than the hard palate and gingiva. Since these cells have a high turnover rate, mucositis secondary to chemotherapy is usually short lived.

Mucositis may appear as early as three days after exposure to chemotherapy but more typically within five to seven days. Progression to ulcerative mucositis typically occurs within seven days after the start of chemotherapy. If uncomplicated by infection, mucositis typically heals completely within two to four weeks.

Secondary Infections:
Chemotherapy -induced myelosuppression, and radiation therapy increase the risk of bacterial, fungal, and viral infections in the mouth and throat area. Loss of the oral epithelium as a protective barrier results in local infections and provides a portal of entry for microorganisms into the systemic circulation.

Other Medications:
Medications such as long-term high dose dexamethasone may cause ulcerative esophagitis.

Dental Extractions:
Removal of teeth, before starting radiation treatments to the oral cavity, will also result in a sore mouth and temporary eating difficulties.

NUTRITIONAL MANAGEMENT

Nutritional Goal:
Ensure adequate hydration and maintain or improve overall nutritional status by suggesting non-irritating, nutrient dense foods and fluids.

However, patients with severe ***mucositis*** of the mouth and throat and ***esophagitis*** may find it too painful and difficult to eat, and a more aggressive nutritional support is needed (Grade 4 toxicity).

Toxicity Grading:

0	1	2	3	4
No symptoms	Painless erythema Ulcers Mild soreness	Painful erythema Edema or ulcers Can eat	Painful erythema Edema or ulcers Cannot eat	Requires enteral or parenteral support

Strategies for Nutritional Management:

- Encourage good oral hygiene practices to promote comfort, enhance taste and stimulate appetite. A basic regime of oral care, including gentle teeth brushing, flossing and rinsing is essential to minimize the risk of developing oral complications.
- Encourage the use of bicarbonate rinses (½ tsp. baking soda dissolved in 2 cups of water), before and after meals.
- Discourage intake of known irritants such as:
    - Tart or acidic foods or fluids
    - Spicy, salty or very sweet foods or fluids
    - Dry or rough foods
    - Tobacco, alcohol, alcohol-based mouth washes, alcohol-based liquid
    - Vitamins
- Reinforce the use of pain medications as prescribed by physician- see "Medications Often Prescribed".
- Encourage adequate fluid intake. Well-tolerated fluids include warm or cool milk based beverages, non-acidic fruit drinks- (diluted if necessary), "flat" carbonated beverages, cream soups, blended or calorie and/or protein fortified broth based soups.
- Alter the consistency and temperature of foods to suit individual tolerances (for example cool or lukewarm temperature, soft solids, mashed solids, pureed solids, baby foods, thick or thin liquids).
- Recommend dunking or moistening dry foods in liquid.
- Recommend small, frequent energy and protein dense meals or snacks.
- Ensure vitamin and mineral needs are met if nutrition modifications are to be long term.
- If nutrient supplementation is necessary, suggest:
    - Crushing a multivitamin/mineral tablet and taking it with liquid
    - Using a blender to crush the tablet when making a blenderized drink/meal
    - A low alcohol liquid vitamin supplement (ask pharmacist for examples)
    - A children's chewable multivitamin/mineral supplement
- Individualize a daily meal plan to help patient visualize his/her needs.
- Provide recipe ideas to minimize a monotonous diet.

- ***Esophagitis***, specifically: as above plus
    - Suggest the use of an antacid with a local anaesthetic before meals (Refer to "Medications Often Prescribed")
    - The nutrition recommendations for gastric reflux may be useful for symptoms similar to heartburn.

Patient Education Resources:

Some recipes may be too spicy for patients with mucositis.

Easy to Chew Easy to Swallow Ideas (BC Cancer Agency)

Good as an initial handout, for someone who is expected to get mucositis during treatment or who finds soft/moist foods and fluids easier to tolerate but needs ideas to increase variety, calories and/or protein. Depending upon the location of mucositis, the mouth care section may or may not be appropriate.

High Protein, High Energy Full Liquid Sample Menu (BC Cancer Agency)

Good for patients requiring a liquid diet, especially those who do not want/like nutritional supplements. Several recipes are also included in this handout.

Easy to Chew Recipes

This booklet is designed to provide food ideas and recipes for soft and blenderized foods.

Non-Chew Cookbook

Another resource to recommend to patients who want more variety in a soft diet.

The following multi-cultural education resources will need to be modified on an individual basis to highlight softer food choices:

Chinese Weight Maintenance Guidelines (BC Cancer Agency)

Chinese Meal and Snack Ideas (BC Cancer Agency)

Indo Canadian Weight Maintenance Guidelines (BC Cancer Agency)

Indo Canadian Meal and Snack Ideas (BC Cancer Agency)

Useful for Punjabi speaking clients who require general advice regarding weight maintenance and soft, high protein, high calorie ethnic food choices.

MEDICATIONS OFTEN PRESCRIBED

Pain Management:

In general, topical analgesics provide rapid but temporary relief to a localized area. Oral opioids and opioid-containing combinations may be necessary for more moderate or persistent pain. Analgesics should be given around the clock for moderate and severe pain.

Topical analgesics/anesthetics		
Medication	**Recommended Dose Regimen**	**Comments**
benzydamine HCl (Tantum®)	Rinse or gargle, using 15 mL (diluted with water if stinging occurs) every 1½–3 hours as required.	Local analgesic for relief of mucositis
oxethazaine-aluminum/ magnesium hydroxide (Mucaine®)	5 – 10 mL QID (taken 15 minutes before meals and at bedtime)	Analgesic/antacid combination; useful for esophagitis
Lidocaine HCl 2% (Xylocaine Viscous®)	5 – 10 mL swished in mouth for up to six times daily.	May be swallowed slowly if pharyngeal involvement; can impair swallowing reflex.
Systemic analgesics		
acetaminophen-codeine (Tylenol No. 1,2,3 ®)	1-2 tablets every 4-6 hr	Opioid containing analgesic in tablet form
acetaminophen-codeine (Tylenol with codeine elixir®)	10-20 mL every 4-6 hr	Opioid containing analgesic in liquid form
morphine sulfate	Taken every 4 hr	Potent opioid in tablet or liquid form
Hydromorphone HCl (Dilaudid®)	Taken every 4 hr	Potent opioid available as small tablets
Fentanyl skin patch (Duragesic®)	Apply patch to skin every 72 hr	Opioid analgesic used for stable and chronic pain

Oral Infection Management:

Depending on causative organism, an antifungal, antiviral, or antibacterial is used. Either topical or systemic route can be employed. The systemic route is useful for patients at risk of serious infections (eg. patients with myelosuppression)

Antifungal/antiviral/antibacterial		
Medication	**Recommended Dose Regimen**	**Comments**
Ketoconazole tablet (Nizoral®)	Taken daily with a meal	Systemic treatment of fungal infections
Fluconazole tablet (Diflucan®)	Taken daily	Systemic treatment for fungal infections
Nystatin Oral Suspension (Nilstat®)	Swish in mouth for 5 minutes then spit out or swallow. Refrain from eating for at least 30 min.	Used to prevent and treat candidiasis in the mouth and esophagus.
Acyclovir Ointment (Zovirax®)	Apply sparingly to affected areas 4-6 times daily for up to 10 days	Topical therapy for herpes labialis; used for lesions on the lips.
Chlorhexidine gluconate mouth rinse	Swish 15 mL for 30 seconds, then spit our. Do not swallow. Do not ingest food for 2-3 h following treatment.	Suppresses oral microflora and prevents dental plaque formation. Can stain teeth.
Neomycin cream or ointment	Topical- apply a thin film 2 to 3 times daily to affected area.	Used to superficial bacterial infections outside of the mouth.

Xerostomia Management:

Medication	**Dose/Regimen**	**Comments**
Saliva Substitutes (eg. Moi-Stir®)	Available as spray or swabs to be used as needed.	
Lanolin based lip balms	Apply as needed	For external use (lips)
Water soluble lubricants (eg K-Y Jelly ®)	Apply as needed	Used if a water-based product is needed for the lips.

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