Oral Mucositis: Chemotherapy Patients

Site Applicability

PHC

Practice Level

Basic Skill: RN, RPN, LPN

Need to Know

Definition of Oral Mucositis (OM)

OM refers to mucosal barrier damage as a result of the cytotoxic effects of high-dose chemotherapy and radiation therapy. The mucosal lining of the gastrointestinal tract, from the mouth to the anus, is a prime target for treatment-related toxicity by virtue of its rapid rate of cell turnover. The focus of this nursing standard is the assessment and management of oral mucositis.

Risk Factors for Developing OM

OM occurs in approximately 20-40 per cent of patients receiving conventional antineoplastic drug therapy. Antineoplastic agents that are DNA cycle-specific are more stomatotoxic than those that are cell phase non-specific. Antineoplastic drugs that are administered at SPH/PHC that carry a risk for the development of OM include:

- Azacitidine
- Bendamustine
- Bleomycin
- Cisplatin*
- Cyclophosphamide*
- Doxorubicin
- Etoposide
- Methotrexate*
- Vincristine

*highest risk for OM

Other OM risk factors related to antineoplastic chemotherapy include:

- The risk of OM is increased when rituximab is added to the protocol
- Certain drugs (methotrexate, etoposide) may be secreted into the saliva, further increasing the potential for stomatotoxicity.
- Higher doses and/or particular combinations of drugs
- Risk increases with increasing cycles of therapy (there may be a cumulative effect)

- Other medications may increase the degree of OM, particularly those that dry oral mucosa

Patient-related risk factors:

- Previous cancer treatment
- Age older than 50 years
- Female
- Elevated creatinine
- Pre-existing periodontal disease
- Poor baseline oral hygiene
- Poor baseline nutrition (decreased body mass index)
- Oxygen use
- Alcohol use
- Tobacco use

Onset

The progression of changes in the oral cavity due to chemotherapy is reasonably predictable:

- Usually begins 3 to 4 days after therapy and peaks between days 7 and 14
- The initial clinical manifestation is soft tissue erythema of the buccal mucosa or soft palate with a burning sensation in the mouth. The hard palate and gingiva appear to be not susceptible to chemotherapy-induced mucositis.
- Lasts approximately 1 week and generally heals spontaneously by 21 days after the initiation of chemotherapy. Resolution coincides with the recovery of neutrophil counts.

OM moves through 5 stages (it is important to note that different stages can occur simultaneously in different sites of the oral cavity):

1. Initiation
   - DNA damage to both cancer and to healthy cells from antineoplastic drug resulting in cell death
2. Upregulation/activation
   - Inflammatory cytokines are released, causing further cell damage and resulting in thinning, erythema, and pain
3. Signal amplification
   - Further tissue injury and cell death caused by the accumulation of pro-inflammatory cytokines and feedback loops
4. Ulceration
   - Development of deep oral ulcerations
   - Oral bacteria colonize the ulcers
   - Possibility of sepsis is present
5. Healing

Signs and Symptoms

Initial clinical manifestation is soft tissue erythema of the buccal mucosa or soft palate with a burning sensation in the mouth.

The progression of oral mucositis continues with patchy erythema and edema that progresses to confluent erythema, edema, and white patches that develop into painful ulcers, leading to active bleeding and necrosis in some patients.

Clinical *Signs* of OM:

- Oral edema
- Erythema (red, shiny)
- Ulceration
- Dry mouth
- Thick, stringy saliva
- Coated tongue
- Cracked lips
- Oral bleeding
- Difficulty with mouth care

Symptoms of OM:

- Oral pain
- Difficulty:
  - Chewing food
  - Swallowing
  - Speaking
- Dysgeusia (distortion of taste)
- Sensitivity to hot and/or cold foods or fluids
- Mood disturbances: anxiety; depression
- Sleep disturbances
- Fatigue

Negative Outcomes of OM

- Severe oral pain/discomfort leading to dehydration, malnutrition, cardiovascular compromise
- **Infection** (particularly worrisome in the setting of neutropenia)
- Airway obstruction, respiratory distress
- Decreased quality of life (e.g. psychological distress, problems eating, drinking, swallowing)
- Chemotherapy dose delays, reductions, discontinuation of treatment
- Negative influence on survival (3-fold increase in risk for infection-related death during myelosuppression) including the potential for remission and cure

Protocol

Assessment

A comprehensive baseline assessment of the patient's oral cavity should be completed and documented before chemotherapy is initiated and regularly thereafter. Assessment tools provide evidence-based guidance when assessing the patient's oral cavity for toxic changes related to chemotherapy.

Assessment of the patient's oral cavity should be completed:

- at baseline (admission and/or before chemotherapy is initiated)
- at the start of the patient's day
- before the patient goes to sleep
- PRN

Other considerations when conducting an oral assessment include:

- having proper lighting (i.e. a flashlight)
- timing – consider the impact of when the oral assessment is conducted (at the same day every day before or after oral care)

Assessment Tools

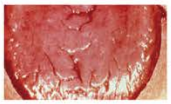
When assessing the oral cavity, a number of different tools exist to help measure the degree of toxicity to the oral mucosa, subjective pain experience of the patient, and the impact of the toxicity on the patient's ability to eat and drink – 2 commonly used scales are described below.

1. The National Cancer Institute's oral mucositis grading scale (Common Terminology Criteria for Adverse Events Grading Scale) is a 6 level scale that focuses primarily on changes to *function*.

Grade	Description
0 (normal)	-
Grade 1 (mild)	Asymptomatic or mild symptoms; intervention not indicated
Grade 2 (moderate)	Moderate pain or ulcer; not interfering with oral intake; modified diet indicated
Grade 3 (severe)	Severe pain; interfering with oral intake
Grade 4 (life-threatening)	Life-threatening consequences; urgent intervention indicated
Grade 5 (death)	Death

Common Terminology Criteria for Adverse Events Grading Scale v.5 (2017)

The Oral Assessment Guide focuses on the degree of changes to the oral physiology through examining the patient's lips, tongue, saliva, mucous membranes, gingiva, teeth, voice, and swallow.

Category	Methods of Measurement	Numerical and Descriptive Ratings		
		1 Normal	2 Moderate Dysfunction	3 Severe Dysfunction
Swallow	Observe while patient swallows, check gag reflex	Normal swallow	Pain or difficulty with swallow	Unable to swallow *(intubated, absent gag)*
Lips	Observe	 Smooth, pink	 Dry or cracked	 Ulcerated or bleeding
Tongue	Observe appearance of tissue	 Pink, moist, papillae present	 Coated or loss of papillae with shiny appearance, with or w/o redness	 Blistered, cracked, or bleeding
Saliva	Observe Use tongue blade, touching the center of tongue and floor of mouth *(optional)*	 Watery	 Thick or ropy	 Absent
Mucous Membranes	Observe appearance of tissue	 Pink, moist	 Red or coated, no ulcers	 Ulcers with or w/o bleeding
Gingiva	Observe Use tongue blade, may gently press tissue with tip of blade *(optional)*	 Pink, firm	 Edema, with or w/o redness; with or w/o bleeding	 Bleeds easily
Teeth or dentures	Observe appearance of teeth or denture	 Clean or no teeth	 Local debris (between teeth)	 General debris, decay
Odor	Smell	Normal	Slightly to moderately foul	Strong foul odor

Modified from: Eilers, et al. (1988) "Development, testing, and application of the oral assessment guide." Oncol Nurs Forum 15(3): 325-30.

Also see Appendix A for additional images of OM.

Management

Management of OM includes the following:

- Patient & family education
- Good oral hygiene practices
- Pain management, particularly, systemic narcotic analgesics

Please use the National Cancer Institute's Common Terminology Criteria for Adverse Events Grading Scale to help guide you through the management/interventions below.

ALL Patients

Patient and/or Family Teaching

- Before a patient starts chemotherapy, an assessment of the patient's learning needs should be completed. The following areas should be explored:
  - usual oral care practices
  - ability to perform oral care
  - understanding of the importance of oral care during cancer treatment
- Provide written instruction and education to patients - Please provide the patient and family with a copy of Oral Mucositis FJ.101.Or1.PHC – this can be printed off from the Patient Health Education Materials link in PHC Connect. Verify understanding with return explanation and demonstration.
- Ensure the patient/family are aware that regular oral pain assessment and management will be completed daily and as needed
- Create an individualized plan of care

Common Terminology Criteria for Adverse Events (CTCAE) Version 5 – Grades 0 & 1

Brushing

- **Brush** all tooth surfaces for at least **90 seconds** and at least **twice daily** using an extra-soft toothbrush
- **Brush tongue** from back to front
- To soften bristles, rinse toothbrush under warm water for about 30 seconds.
- Use non-abrasive, fluoride toothpaste with a neutral taste- flavoring agents may irritate gums
- Allow **toothbrush** to **air-dry**
- **Replace toothbrush regularly** - when bristles are no longer standing up straight

Flossing

- If patient **floss**ed regularly prior to treatment, continue with usual practice or at least once daily. If no prior history of flossing, do not floss.
- Do not floss if flossing causes pain or bleeding that does not stop within 2 minutes

Oral Rinsing

- Rinses are used to remove loose debris and aid with oral hydration
- **Rinse mouth at least 4 times daily** with a bland mouthwash:

  Bland rinses include:
  - 0.9% saline (normal saline) OR
  - Sodium bicarbonate – reduces the acidity of oral fluids, dilutes accumulating mucous, and discourages yeast colonization
  - Or a combination of normal saline and sodium bicarbonate

Oral Rinse Recipes

Provide the patient with a sterile bottle of normal saline (orange capped) – date the bottle and replace it daily and PRN.
For outpatients, and those patients soon to be discharged, the recipes below are also outlined in the patient oral mucositis handout (FJ.101.Or1.PHC – this can be printed off from the Patient Health Education Materials link in PHC Connect).

Normal saline (NS) = ½ teaspoon (2.5 mL) of salt in 8 oz (240 mL) of water

NS/sodium bicarbonate mixture = ¼ teaspoon (1.25 mL) of salt and ¼ teaspoon (1.25 mL) baking soda in 8 oz (240 mL) of water.
For inpatients, add the sodium bicarbonate to the bottle of normal saline.

Sodium bicarbonate = ¼ to ½ teaspoon (1.25 to 2.5 mL) baking soda in 8 oz (240 mL) of water

- Swish with **30 mL of rinse solution for at least 30 seconds** then spit out
- Rinse after brushing teeth
- If ulcers are present, **frequent rinsing** with a non-irritating solution is extremely important and **may decrease** this risk of **septicemia**. However, patient compliance will most likely be dependent on the adequacy of the **pain control**.

NB: There are no clear benefits to the use of chlorhexidine and/or magic mouthwash as compared to bland oral rinses

Dentures

- Do not wear tight or loose fitting dentures
- Allow long periods without wearing dentures, at least 8 hours daily (e.g. overnight)
- If mouth sensitive, wear only during mealtime
- Remove dentures, plates, and/or prostheses before oral hygiene performed
- Brush and rinse dentures after every meal and at bedtime
- Soak dentures in oral rinse solution: rinse before placing in mouth

Prevention of Trauma and Irritation

- Soft-textured foods (such as puddings, mashed potatoes, cream of wheat), serve food at room temperature with avoidance of very hot foods - consider referral to dietitian
- Oral habits – instruct patients to avoid cheek and lip biting or chewing
- Avoid mouth breathing
- Avoid certain products/medications:
  - Oral rinses or medications containing alcohol
  - Highly flavored products (mint, cinnamon)
- Avoid alcohol, tobacco, and irritating foods

Miscellaneous

- Use water-based moisturizers to protect lips, can also be used inside of the mouth
- Maintain adequate hydration

See Appendix B for suggestions to manage xerostomia

Common Terminology Criteria for Adverse Events (CTCAE) Version 5 – Grades 2 & 3

Continue with basic care AND

- Increase frequency of oral rinsing to :
  - Every 1 to 2 hours while awake
  - Every 4 hours overnight (if awake)
  - Increase frequency as needed if symptom severity increases
- Apply water based lubricant to lips every 1 to 2 hours
- Ensure systemic analgesics are ordered to be administered regularly (around the clock) for oral pain
- If the patient has dentures: keep dentures out of mouth as much as possible until symptoms resolve

Collaborate with Physician

- Further evaluation & assessment
- Laboratory testing (i.e. culture & sensitivity of oral mucosa) may be necessary.

NOTE: If there has been an oral infection, use a new toothbrush after infection has resolved

Common Terminology Criteria for Adverse Events (CTCAE) Version 5 – Grade 4

Continue with previous and:

- No brushing, flossing or dentures until symptoms resolve
- NPO
- IV hydration and/or parenteral nutrition
- Modification or discontinuation of chemotherapy

Bleeding

- Rinse mouth with ice water and apply pressure (e.g. with frozen tea bag or wet gauze) to control bleeding. Do not remove any clots.
- If persistent bleeding, topical thrombin, aminocaproic acid, and/or platelet transfusion may be ordered

Documentation

1. Nursing documentation as per unit procedure: record assessment, nursing interventions, patient's response and vital signs
2. Medication Administration Record—any medications given

Patient and Family Education

Before a patient starts chemotherapy, an assessment of the patient's learning needs should be completed. The following areas should be explored:

- usual oral care practices

- ability to perform oral care
- understanding of the importance of oral care during cancer treatment

1. Provide written instruction and education to patients. Verify understanding with return explanation and demonstration. Please provide the patient and family with a copy of Oral Mucositis FJ.101.Or1.PHC – this can be printed off from the Patient Health Education Materials link in PHC Connect.
2. Ensure the patient/family are aware that regular oral pain assessment and management will be completed daily and as needed
3. Create an individualized plan of care

Review the following with the patient and family:

1. Explain what oral mucositis is
2. Explain what to expect over the coming days and weeks
3. Review the care that is required at home (if applicable) – provide mouth rinse recipes (recipes are provided in the Oral Mucositis FJ.101.Or1.PHC handout)
4. Ensure that they patient and/or family (if the patient is an outpatient) has contact information should there be any problems when at home
5. Consider a referral to TST for skin & wound care if appropriate

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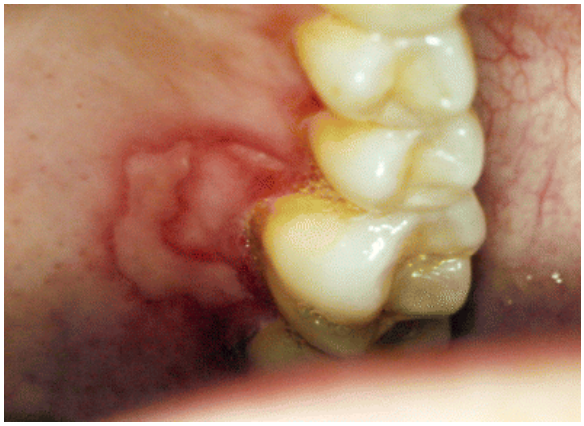
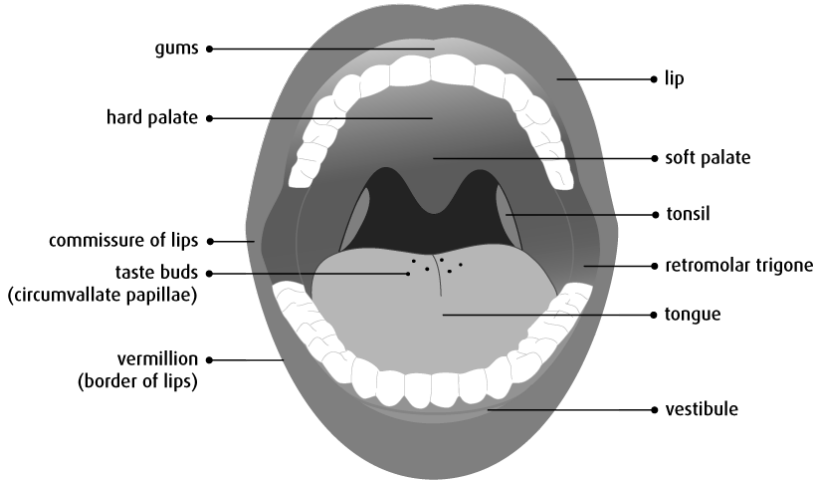
Appendix A Clinical appearance of oral mucositis:



Mouth (Oral Cavity)

Anatomy of the oral cavity:



Appendix B Management & Guidelines for Xerostomia

Patients should be encouraged to:

- Use non-drying lip balm
- Avoid chewing, biting dry skin from lips
- Use artificial saliva gels or sprays
- Avoid mouth breathing – ensure nasal passages are clear
- Suck on ice chips; sip fluids. Patients should be advised that excessively frequent sipping of water may actually reduce the mucus film in the mouth and may increase symptoms. If water consumption is excessive, especially in the evening, nocturia can occur, resulting in sleep disturbance that may worsen fatigue, cognitive difficulties, and pain
- Avoid acidic beverages, which may adversely affect dental enamel. Examples of common beverages and their relative acidity include:
    - Cola drinks — pH 2.6
    - Coffee — pH 5.0
    - Tea (herbal) — pH 3.2
    - Tea (black) — pH 5.7 to 7.0
    - Water from tap — pH 7.0 (but flavored waters are often acidic)
    - Energy drinks — usually acidic
- Stimulate salivary flow with:
    - Sugar-free hard candies or lozenges
    - Sugar-free chewing gums, containing various sweeteners such as aspartame, saccharin, and sorbitol
    - Xylitol-containing gum or candy, which may also reduce the carcinogenicity of the oral bacterial
    - Citrus flavored sugarless tablets or oral drops, which may also contain malic acid. This acid, which is normally found in fruits such as apples or pears, stimulates salivary flow.
    - Maltose lozenges
    - Dried fruit slices, such as peaches or nectarines