Ontario Health
Cancer Care Ontario

Symptom Management Algorithm

Oral Care for Hematopoietic Cell Transplantation (HCT)

In Adults with Cancer

About This Document

The Oral Care for Hematopoietic Cell Transplantation (HCT) document provides guidance to healthcare professionals on:

- Risks of oral complications arising from HCT
- Prevention of oral complications arising from HCT
- Oral care strategies for patients before, during, and after HCT
- Treatment of oral complications arising from HCT
- While this document refers to HCT patients, cancer patients on non-HCT chemotherapy and radiation may also have oral symptoms. Please see the oral care symptom management algorithms for further guidance for non-HCT patients.

Risks of Oral Complications Arising from HCT

Oral Mucositis[1]

Oral mucositis (OM) is an acute inflammation and/or ulceration of the oral mucosal membranes. It can cause pain and discomfort, and can interfere with eating, swallowing, and speech. Risks factors include:

- Frequency and severity in blood or bone marrow transplantation patients related to:
  - Intensity of conditioning regimen
  - Use of prophylactic methotrexate to prevent Graft versus Host Disease

Signs and symptoms of OM include:

- Erythema
- Bleeding
- Altered Taste
- Oral pain
- Odynophagia (painful swallowing)

Graft versus Host Disease

Graft versus Host Disease (GvHD) is a condition that occurs when donated stem cells or bone marrow see the healthy tissues in the patient's body as foreign and attack them. Risk factors include:

- Human leukocyte antigen disparity
- Gender mismatch
- Donor type
- Stem cell source
- Conditioning regimen
- GvHD prophylaxis regimen

Signs and symptoms of GvHD include:

- Dry mouth
- Mouth ulcers
- Infections
- Lichenoid pattern on oral mucosa and attached gingiva
- Mucoceles
- Trismus[2]

Infections[3]

HCT patients are at high-risk for infectious diseases caused by fungi, bacteria, and viruses. Risk factors include:

- Neutropenia
- Poor oral hygiene
- Dry mouth
- Malnutrition
- Dehydration
- Denture use
- Antibiotic course
- Inhaled corticosteroids
- Tobacco use
- Previous history of herpes labialis, oral herpes simplex virus, or herpes zoster

Signs and symptoms of infections include:

- Swelling
- Pus
- Redness
- Fever
- Fetid odor
- Prodrome (numbness, tingling, and/or burning prior to onset of lesions)

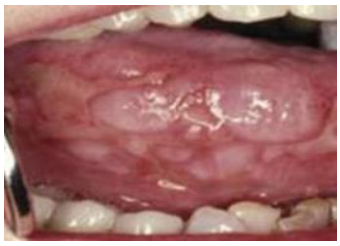

Figure 1: Oral graft versus host disease

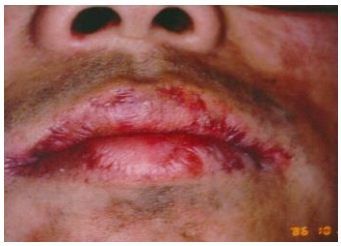

Figure 2: Chronic graft versus host disease

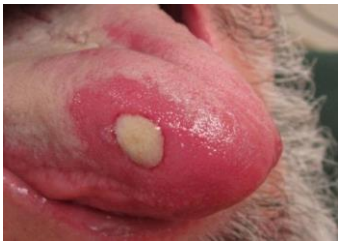

Figure 3: Necrosis of gingivae neutropenia

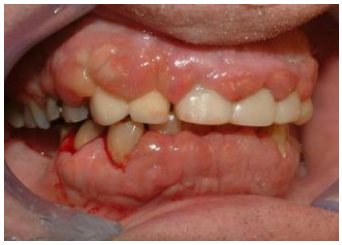

Figure 4: Leukemic infiltration of the gingiva

[1] See the Oral Mucositis algorithm for more information
[2] See the Trismus algorithm for more information
[3] See the Oral Infections algorithm for more information

Prevention of Oral Complications Arising from HCT

Before HCT	• Referral to dentist with expertise in HCT dental management. Oral dental examination inclusive of:
	  ○ Full mouth series x-rays
	  ○ Full periodontal assessment
	  ○ Sialometry, range of motion
	  ○ Elimination foci of infection or trauma such as extractions, ill-fitting dentures, orthodontic brackets, broken or lost fillings/teeth, mobile teeth

During HCT Chemotherapy	Oral Hygiene • Encourage optimal oral care and minimize risk of bleeding • Review dry mouth (xerostomia[1]) care and intensified oral care with patient • Prophylaxis as per institution protocol for candidiasis and viral infections • If patient is completing an allogeneic HCT, the patient should see a dental specialist for any dental emergencies and care Pain Control • Systemic analgesia (i.e., oral, parenteral, or transdermal opioids) may be required for patients with mucositis Prevention of Oral Mucositis[2] • Starting 5 minutes before chemotherapy administration, swish ice chips in mouth. Continue for duration of chemotherapy infusion, and for 5 minutes after drug administration is completed • Oral cryotherapy is recommended to prevent oral mucositis in patients undergoing autologous HCT when the conditioning includes high-dose melphalan • Intra-oral photo-biomodulation (PBM) therapy using low level laser therapy in adults receiving HCT conditioned with high-dose chemotherapy, with or without total body irradiation is recommended. See Table 2 for recommended PBM therapy protocols (page 6)
After HCT Chemotherapy Until First Follow-Up with Specialist Dentist	• Prophylaxis as per institution protocol for candidiasis and viral reactivation • Consult dental specialist team for pain of dental origin • Patients should be assessed after HCT within 90 days by a trained dentist and again at 6-12 months • Frequency and follow up should be adjusted based on clinical scenario • Sialometry and trismus[3] measurements should be repeated • A decision to carry out elective dental procedures should be based on clinical need and based on hematological status Graft Versus Host Disease (GvHD) • Assess for symptoms of GvHD, including: xerostomia[1], mouth ulcers, infections[4], gingival overgrowth, risk for oral cancer, tobacco intervention, and trismus[3] • Chronic GvHD (mucosa, salivary gland): consult with an oral medicine specialist/dentist for current treatment recommendations, and motivate patient to keep routine surveillance (risk for squamous cell carcinoma) • Systemic therapies for acute and chronic GvHD may be indicated for symptom management • Consider referring to a multidisciplinary clinic for rapid assessment and management of oral lesions where available

[1] See the Xerostomia algorithm for more information
[2] See the Oral Mucositis algorithm for more information
[3] See the Trismus algorithm for more information
[4] See the Oral Infections algorithm for more information

Oral Care Strategies for Patients Before, During, and After HCT

Flossing

Before HCT	• Continue to floss based on hematological status • Patients with trismus, dysphagia, and/or dysgeusia may not be able to floss; use of interproximal brushes can replace flossing • Waxed floss may be easier to use and minimize trauma to the gingivae
During HCT Chemotherapy	• Continue with before HCT plan
After HCT Chemotherapy Until First Follow-Up with Specialist Dentist	• Continue with before HCT plan

Discontinue flossing if:
- Gums bleed for longer than two minutes

Restart flossing if:
- Platelet count is >20x10^9 cells/L, or as instructed by cancer care team
- In neutropenic patients where counts are less than 1>10^6 cells/L, interdental cleaning can be considered in patients with good oral hygiene but may not be advisable in patients with poor oral hygiene

Brushing

Before HCT	• Use a small, ultra-soft-headed, rounded-end, bristle toothbrush (an ultrasonic toothbrush may be acceptable) • Use an over-the-counter prescription strength fluoride toothpaste, such as a 1% or greater concentration of fluoride toothpaste. Spit out the foam but do not rinse mouth for 30 minutes • Use a fluoridated toothpaste and re-mineralizing toothpaste containing calcium and phosphate • Brush tongue gently from back to front • Rinse brush after use in hot water and allow to air dry • Change toothbrush when bristles are not standing up straight • Brush within 30 minutes after eating and before bed. Ensure the gingival portion of the tooth and periodontal sulcus (where the tooth meets the gum) are included
During HCT Chemotherapy	• Continue with before HCT plan • Encourage patient to continue brushing and oral hygiene as tolerable • If there has been an oral infection, use a new toothbrush after infection has resolved
After HCT Chemotherapy Until First Follow-Up with Specialist Dentist	• Continue with before and during HCT plan

Patients with dentures:
- It is important to leave dentures out as much as possible during transplantation phase

Rinsing

Before HCT	• Rinsing the oral cavity with bland rinse vigorously helps maintain the moisture in the mouth, removes the remaining debris and toothpaste, and reduces the accumulation of plaque and infection • Use a bland rinse to increase oral clearance which may be helpful for maintaining oral hygiene and improving patient comfort. Club soda should be avoided, due to the presence of carbonic acids • Following emesis, rinse with bland rinse immediately to neutralize the mouth
During HCT Chemotherapy	• Perform in place of brushing if patient is absolutely unable to brush • Rinse after meals, and 30 minutes after brushing • If unable to clean using gauze or swishing (or tilting head), syringe a bland rinse into different areas of mouth
After HCT Chemotherapy Until First Follow-Up with Dental Specialist	• Continue with before and during HCT plan

Patients with dentures:
- After removing dentures rinse mouth thoroughly with rinse solution
- Brush and rinse dentures after meals and at bedtime
- Rinse with a bland rinse before placing in mouth
- Remove from mouth nightly (at least 8 hours per 24 hours) and soak in a bland rinse

Bland rinse:
- 1 teaspoon salt, 1 teaspoon baking soda, 4 cups of water

Moisturizing the Oral Cavity

Before HCT	• Moisturize the mouth with water, artificial saliva products, or other water-soluble lubricants for use inside the mouth • Avoid glycerin or lemon-glycerin swabs as they dry the mouth and do not moisturize • Apply lubricant after each cleaning, at bedtime, and as needed • Water-based lubricant needs to be applied more frequently • Frequent rinsing as needed with bland rinse
During HCT Chemotherapy	• Continue with Before HCT plan
After HCT Chemotherapy Until First Follow-Up with Specialist Dentist	• Continue with Before HCT plan • May use a cool mist humidifier at night, but use should be weighed against the risk for fungal infection

Bland rinse:
- 1 teaspoon salt, 1 teaspoon baking soda, 4 cups of water

Lip Care

Before HCT	• To keep lips moist and to avoid chapping and cracking use water-soluble lubricants, lanolin (wax-based), or oil-based (mineral oil, cocoa butter) lubricants • Water-soluble lubricants should be used inside and outside the mouth, and may also be used with oxygen, e.g., products compounded with Glaxal base or Derma base • Apply lubricant after each cleaning, at bedtime, and as needed • Water-based lubricants need to be applied more frequently • Patients should be encouraged not to touch any lip lesions
During HCT Chemotherapy	• Continue with Before HCT plan
After HCT Chemotherapy Until First Follow-Up with Specialist Dentist	• Continue with Before HCT plan, with increased frequency and intensity as needed

Avoid:
- Oil based lubricants on the inside of the mouth
- Petroleum based products

Treatment of Oral Complications Arising from HCT

Brushing

Before, During, After HCT	• If bleeding occurs, encourage gentler brushing • If unable to continue brushing, clean teeth with a clean, moist gauze or foam swab • Consider topical anesthetics (e.g., viscous lidocaine 2%, or viscous xylocaine 2%, 2- 5mL) before brushing and eating to minimize pain • All medicated rinses should be separated by 20 minutes • With continuous pain, a regularly prescribed oral analgesic allows for more thorough tooth brushing • Use of a non-flavoured, non-alcoholic chlorhexidine gluconate (CHX) 0.12% rinse to aid in plaque control • Discontinue use of toothpaste if it is too astringent and dip toothbrush in bland rinse

Discontinue brushing if:
- Gums bleed for longer than two minutes

Restart brushing if:
- Platelet count is >20x10^9 cells/L, or as instructed by cancer care team

Lidocaine alternative:
- Dyclonine 0.5% or 1% rinse (5mL every 6 to 8 hours, swish and swallow) as needed for pain

Rinsing

Before, During, After HCT	• Debriding should only be done if absolutely necessary, if tissue is loose causing gagging or choking • Use CHX 0.12% non-alcoholic, non-flavoured rinse at the time of admission and continued for 12 months after HCT, if oral hygiene is impaired • CHX can enhance oral dryness and staining of teeth and dorsum tongue. Some patients will develop a taste disturbance after use, and therefore rinsing after meals is recommended

Avoid:
- Mouthwashes with hydroalcoholic base or astringent properties

Reference Tables

Opioid Use

- The opioid crisis has devastating consequences for individuals, families, and communities across Canada. Choosing Wisely Canada has launched Opioid Wisely, a campaign that encourages thoughtful conversation between clinicians and patients to reduce harms associated with opioids
- Visit Choosing Wisely Canada for more information and best practices on administering opioids

Prescription Step 1	Dispense	Dose and Route
Viscous lidocaine 2%	100mL	• Swish and spit as needed, can be swallowed. Maximum of 4.5mg/kg (or 300mg per dose) and no more than 8 doses per 24-hour period
Dyclonine 0.5% or 1% rinse	250mL	• Swish and swallow 5mL every 6 to 8 hours. Can be used in patients with allergy to amides (lidocaine)
Benzydamine 0.15% rinse	250mL	• Rinse and gargle the mouth and throat with 15mL (1 Tbsp.) 3 to 4 times a day, beginning the day prior to starting therapy • Continue use during therapy, and after discontinuing therapy until symptoms disappear • Maintain mouthwash in contact with the inflamed mucosa for at least 30 seconds. Spit the solution from mouth after use. Mouthwash should be used undiluted, but if stinging occurs it may be diluted with an equal volume of lukewarm water • For the symptomatic relief of treatment induced mucositis in cancer patients
Rx Step 2	**Dispense**	**Dose and Route**
Codeine phosphate 5mg/mL syrup	168mL	• 30mg/6mL, 4 times a day for 7 days, as needed
Tramacet (tramadol-acetaminophen) 37.5mg/325mg tablets	60 tablets	• Take 1 to 2 tablets every 6 hours, as needed
Doxepin suspension 5mg/ml containing 0.1% alcohol and sorbitol	200mL	• Rinse 5mL for 1 minute and then spit out. Repeat up to 6 times a day
Rx Step 3	**Dispense**	**Dose and Route**
Hydromorphone 1mg/mL liquid	60mL	• Take 1mL every 2 hours, as needed
Topical morphine 0.2% rinse	100mL	• Take 15mL, hold in mouth for 2 minutes and then spit, every 3 hours, as needed
Percocet (oxycodone 5mg, acetaminophen 325mg)	20 tablets	• Take 1 tablet 4 times a day, as needed
Fentanyl Transderm Patch 12mcg/ hour, 25mcg/hour, 50mcg/hour, 75mcg/hour	10 patches	• Apply new patch every 3 days.

Table 2: Intra-Oral Photo-biomodulation Therapy Protocols for the Prevention of Oral Mucositis (Adapted from Zadik, 2019[2])

Cancer Treatment Type	Wave-Length (nm)	Power Density (Irradiance mW/cm)	Time per Spot (sec)	Energy Density (Fluence J/cm^2)	Spot Size (cm^2)	# of Sites	Duration
HCT	632.8	31.25	40	10	0.8	18	From day after cessation of conditioning, for 5 days
	650	1000 +	2	2.0	0.04	54-70	From 1st day of conditioning till day + 2 post-HCT (for 7 to 13 days)
Radiotherapy (RT)	632.8	24	125	3.0	1	12	Entire RT course
Radiotherapy - Chemotherapy	660	417 +	10	4.2	0.24	72	Entire RT course
	660	625 +	10	6.2	0.04	69	Entire RT course

+Potential thermal effect. The clinician is advised to pay attention to the combination of specific parameters

Disclaimer

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Acknowledgements

A wide variety of health professionals were invited to participate in the development of this algorithm, as well as in the external review. Every effort was made to ensure as broad a professional and regional representation as possible.

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References

Published: January 2024
Content to be Reviewed in 2027