Ontario Health
Cancer Care Ontario

Symptom Management Algorithm

Oral Care for Hematopoietic Stem Cell Transplantation (HSCT)

In Adults with Cancer

About This Document

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

- Risks of oral complications arising from HSCT
- Prevention of oral complications arising from HSCT
- Oral care strategies for patients before, during, and after HSCT
- Treatment of oral complications arising from HSCT

Risks of Oral Complications Arising from HSCT

Oral Mucositis*

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 regime
  - 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
- Gingival overgrowth
- Tobacco intervention
- Trismus**

Infections***

HSCT 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 3: Leukemic infiltration of the gingiva

*See the Oral Mucositis algorithm for more information
**See the Trismus algorithm for more information
***See the Oral Infections algorithm for more information

Prevention of Oral Complications Arising from HSCT

Before HSCT	• Referral to dentist with expertise in HSCT 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
	• All elective dental care should not be carried out for 12 months after HSCT

During HSCT Chemotherapy	<u>Oral Hygiene</u> • Encourage brushing and flossing two times a day with prescriptive fluoride and calcium phosphate toothpastes • Review dry mouth (xerostomia*) care and intensified oral care with patient • Prophylaxis as per institution protocol for candidiasis and viral reactivation <u>Pain Control</u> • See Table 1 for medications to manage pain (page 6) • Systemic analgesia (i.e. oral, parenteral, or transdermal opioids) may be required for patients with mucositis <u>Oral Mucositis**</u> • Starting 5 minutes before chemotherapy (CT) administration, swish ice chips in mouth. Continue for duration of CT infusion, and for 5 minutes after drug is completed • Oral cryotherapy is recommended to prevent oral mucositis in patients undergoing autologous HSCT when the conditioning includes high-dose melphalan • Patients receiving high dose CT and total body irradiation with autologous stem cell transplant, keratinocyte growth factor (palifermin) for 3 days before treatment and for 3 days after transplant • Intra-oral photobiomodulation (PBM) therapy using low level laser therapy in adults receiving HSCT conditioned with high-dose CT, with or without total body irradiation is recommended. See Table 2 for recommended PBM therapy protocols (page 6) <u>Graft Versus Host Disease (GvHD)</u> • Assess for symptoms of GvHD. See the GvHD risk factors (page 2) • 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)

After HSCT 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 transplant every 90 days by a trained dentist
	• If patient is completing an allogeneic HSCT, the patient should see a dental specialist for any dental emergencies and care. Sialometry and trismus*** measurements should be repeated
	• Elective procedures should not be carried out for 12 months after HSCT. This includes:
	  ○ Denture fabrication
	  ○ Elective restorative
	  ○ Asymptomatic endodontic treatment
	  ○ Extractions
	
	<u>Graft Versus Host Disease (GvHD)</u>
	• Assess for symptoms of GvHD, including: xerostomia*, mouth ulcers, infections****, gingival overgrowth, risk for oral cancer, tobacco intervention, and trismus***
	• 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)

*See the Xerostomia algorithm for more information
**See the Oral Mucositis algorithm for more information
***See the Trismus algorithm for more information
****See the Oral Infections algorithm for more information

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

Flossing

Before HSCT	• Floss at least once a day • 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 HSCT Chemotherapy	• Continue with Before HSCT plan
After HSCT Chemotherapy Until First Follow-Up with Specialist Dentist	• Continue with Before HSCT 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

Brushing

Before HSCT	• Use a small, ultra-soft-headed, rounded-end, bristle toothbrush (an ultrasonic toothbrush may be acceptable) • Use a prescription strength fluoride toothpaste. Spit out the foam but do not rinse mouth • Use a fluoridated tooth paste 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 HSCT Chemotherapy	• Continue with Before HSCT plan • Encourage patient to continue brushing through treatment phase even when it causes discomfort • If unable to tolerate brushing, seek assistance from nursing or dental staff • If there has been an oral infection, use a new toothbrush after infection has resolved
After HSCT Chemotherapy Until First Follow-Up with Specialist Dentist	• Continue with Before and During HSCT plan

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

Rinsing

Before HSCT	• Rinsing the oral cavity 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 HSCT Chemotherapy	• Perform in place of brushing if patient is absolutely unable to brush • Seek dental care where possible for removing plaque • Rinse after meals, and 30 minutes after brushing • If unable to clean using toothette, gauze or swishing (or tilting head), syringe a bland rinse into different areas of mouth
After HSCT Chemotherapy Until First Follow-Up with Specialist Dentist	• Continue with Before and During HSCT 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 HSCT	• 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 HSCT Chemotherapy	• Continue with Before HSCT plan
After HSCT Chemotherapy Until First Follow-Up with Specialist Dentist	• Continue with Before HSCT plan • Use a steam vaporizer at night • 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 HSCT	• 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 HSCT Chemotherapy	• Continue with Before HSCT plan
After HSCT Chemotherapy Until First Follow-Up with Specialist Dentist	• Continue with Before HSCT 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 HSCT

Brushing

Before, During, After HSCT	• 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 • 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 HSCT	• 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 HSCT, 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

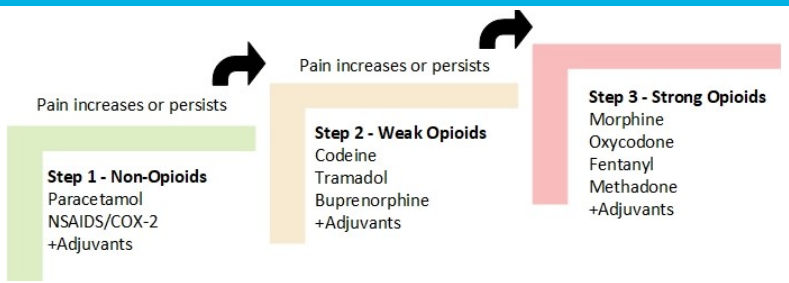
Avoid:
- Mouthwashes with hydroalcoholic base or astringent properties

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

Table 1: Medications for the Management of Pain—WHO Analgesic Ladder (Adapted from Christoforou et al. 2019[1])



Rx 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 • LU Code: 240 - 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. LU Code – 201

Table 2: Intra-Oral Photobiomodulation 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
HSCT	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-HSCT (for 7 to 13 days)
RT	632.8	24	125	3.0	1	12	Entire RT course
RT-CT	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

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