Provincial Clinical Knowledge Topic
*Mouth Care to Prevent and Treat Mucositis, Pediatric – Inpatient*

V 1.0
## Revision History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date of Revision</th>
<th>Description of Revision</th>
<th>Revised By</th>
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Important Information Before You Begin

The recommendations contained in this knowledge topic have been provincially adjudicated and are based on best practice and available evidence. Clinicians applying these recommendations should, in consultation with the patient, use independent medical judgment in the context of individual clinical circumstances to direct care. This knowledge topic will be reviewed periodically and updated as best practice evidence and practice change.

The information in this topic strives to adhere to Institute for Safe Medication Practices (ISMP) safety standards and align with Quality and Safety initiatives and accreditation requirements such as the Required Organizational Practices. Some examples of these initiatives or groups are: Health Quality Council Alberta (HQCA), Choosing Wisely campaign, Safer Healthcare Now campaign etc.

This topic is based on the following guidance:

1. **Pediatric Oncology Group of Ontario (POGO) Supportive Care Clinical Practice Guideline.**

Rationale

Mouth Care is defined as the care of the oral or oropharyngeal mucosa in children with cancer and blood disorders to prevent and treat mucositis.

Mucositis is an acute inflammation and/or ulceration of the mucous membranes of the oral cavity and gastrointestinal tract. It is a common complication in Hematology–Oncology patients undergoing chemotherapy, radiation therapy (RT) and hematopoietic stem cell transplantation (HSCT). Mucositis can also occur in immunocompromised patients caused by inherited or acquired bone marrow failure.

Mucositis occurs when cancer and hematological break down the rapidly dividing epithelial cells lining the gastro-intestinal tract leaving the mucosal tissue open to ulceration and infection. Mucositis causes: pain/discomfort; nutritional problems due to inability to drink, eat or swallow; and an entry point for infections.

The severity of the mucositis depends on preexisting oral hygiene, intensity of chemotherapy or radiation therapy, baseline nutritional status and the extent of myelosuppression. Oral mucositis generally begins 5-10 days following treatment and lasts anywhere from one week to six weeks or more. Resolution (in the case of myelosuppression chemotherapy and HSCT) coincides with recovery of the white blood cell count, specifically when the absolute neutrophil count becomes greater than 500 cells/µL.

Table 1.0 Common Chemotherapy Drugs that Cause Mucositis

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Incidence/ Timing</th>
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<tbody>
<tr>
<td>actinomycin D (dactinomycin)</td>
<td>mucositis occasional (5-20%), occurs within 2-3 weeks</td>
</tr>
<tr>
<td>bleomycin</td>
<td>mucositis common (&gt;20%), occurs within 2-3 weeks</td>
</tr>
<tr>
<td>CARBOplatin</td>
<td>rare mucositis, occurs within 1-2 days</td>
</tr>
<tr>
<td>CISplatin</td>
<td>mucositis rare (&lt;5%), occurs within 1-2 days</td>
</tr>
<tr>
<td>cyclophosphamide</td>
<td>mucositis (frequency not reported)</td>
</tr>
<tr>
<td>cytarabine</td>
<td>mucositis (&gt;15%)</td>
</tr>
<tr>
<td>DAUNOrubicin</td>
<td>mucositis occasional (5-20%), occurs within 2-3 weeks</td>
</tr>
<tr>
<td>DOXOrubicin</td>
<td>mucositis occasional (5-20%), occurs within 2-3 weeks</td>
</tr>
<tr>
<td>etoposide</td>
<td>mucositis (1-6%)</td>
</tr>
<tr>
<td>5FU fluorouracil</td>
<td>mucositis occasional (5-20%), occurs within 2-3 weeks</td>
</tr>
<tr>
<td>methotrexate</td>
<td>mucositis (5-20%), occurs within 2-3 weeks</td>
</tr>
<tr>
<td>thioguanine</td>
<td>rare &lt;5%, occurs within 2-3 weeks</td>
</tr>
</tbody>
</table>

*NOTE: This is not an exhaustive list, other drugs may cause mucosal disease*
Decision Making

Initial Assessment

1. History of Present Illness:
   - When did it start?
   - Symptoms
     - Ulcers
     - Bleeding
     - Burning
     - Pain
     - Unable to speak, eat, swallow or drink
     - Associated fever and chills
     - Gingivitis
   - Assess pain using standard age appropriate pain scales (see examples in Appendix A)

2. Past History:
   - Underlying diagnosis
   - Date and agents of last chemotherapy
   - Dose and location of radiation therapy (RT)
   - Date of hematopoietic stem cell transplantation (HCST)
   - Most recent absolute neutrophil count (ANC)

3. Medications & Allergies:
   - Any mouth care products or analgesia used?

4. Physical Examination:
   - Careful physical examination to determine condition of mouth and throat (use flash light and gloves) and grade mucositis (see Table 2):
     - Color, pallor or erythema, white patches, or discolored lesions/ulcers. Red, shiny, or swollen mouth and gums
     - Moisture – assess accumulation of debris or coating, discoloration of teeth, bad odor. Assess mucous membranes, skin turgor, capillary refill, white patches, pus, white coating on entire mouth and tongue
     - Integrity – assess presence of cracks, fissures, ulcers, blisters, bleeding, in mouth or throat, or on gums or tongue
     - Ability to swallow, speak, xerostomia (decreased saliva)
     - Assess daily intake and output, weight

5. Laboratory Investigations:
   - Complete blood count with differential
   - Swab if viral (e.g. Herpes Simplex Virus) or fungal (e.g. Candida) infection suspected
Table 2.0 Summary of World Health Organization (WHO) and National Cancer Institute—Common Terminology Criteria (NCI-CTC) Oral Mucositis Scales

<table>
<thead>
<tr>
<th>Grade</th>
<th>WHO Scale</th>
<th>NCI-CTC Clinical</th>
<th>NCI-CTC Functional</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oral soreness, erythema</td>
<td>Erythema</td>
<td>Minimal symptoms, normal diet; minimal respiratory</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>symptoms but not interfering with function</td>
</tr>
<tr>
<td>2</td>
<td>Ulcers but able to eat solids</td>
<td>Patchy ulcerations or</td>
<td>Symptomatic but can eat and swallow modified diet;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pseudomembranes</td>
<td>respiratory symptoms interfering with functions but</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>not interfering with activities of daily living</td>
</tr>
<tr>
<td>3</td>
<td>Oral ulcers and able to take liquids</td>
<td>Confluent ulcerations or</td>
<td>Symptomatic and unable to adequately aliment or</td>
</tr>
<tr>
<td></td>
<td>only</td>
<td>pseudomembranes; bleeding</td>
<td>hydrate orally; respiratory symptoms interfering with</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with minor trauma</td>
<td>activities of daily living</td>
</tr>
<tr>
<td>4</td>
<td>Oral alimentation impossible</td>
<td>Tissues necrosis;</td>
<td>Symptoms associated with life-threatening</td>
</tr>
<tr>
<td></td>
<td></td>
<td>significant bleeding;</td>
<td>consequences</td>
</tr>
<tr>
<td>5</td>
<td>N/A</td>
<td>Death</td>
<td>Death</td>
</tr>
</tbody>
</table>

Algorithm 1.0 Mouth Care to Prevent and Treat Mucositis

Chemotherapy, Hematopoietic stem cell transplantation (HSCT), Radiation Therapy, Bone Marrow Failure

See Mucositis Prevention Order Set
- Routine Mouth Care
  - Antiseptic Oral Rinse
  - Soft Tooth Brush after meals and before bed
  - Mild Toothpaste (pea size amount)
  - Flossing as appropriate
- Cryotherapy

Continue Routine Mouth Care

Mucositis?

YES

See Mucositis Treatment Order Set
- Assess
- Grade Severity
- CBCD (if fever and neutropenia present see Fever and Neutropenia topic)

Pain
- Topical Rinses
- Akabutu’s mouthwash

Oral or IV Opioids (morphine, HYDROmorphe)
- Intake / Output
- Calorie Count
- Modify diet as appropriate
- Consider dietitian consult
- Oral nutritional supplements

Infection
- Culture any lesions where fungal or viral infection is suspected
- Initiate prophylaxis and treatment as appropriate
- Consult Infectious Disease when necessary

Decrease oral intake

Decreased weight

IV Fluids
- Enteral nutrition
- TPN
Name of Order Set: Mucositis Prevention Pediatric Order Set
Order Set Keywords: Mouth care, oral care

Patient Care
☐ Assess mouth ______times a day and PRN
☐ Mouth Care: Post meals and at bedtime (Use soft tooth brush, mild toothpaste, and floss as appropriate)

Consider cryotherapy in age appropriate, cooperative children on chemotherapy with short administration times or short half-life:
☐ Clinical Communication: Cryotherapy-Hold ice cubes or ice chips (small so not irritating and can be moved around more easily), popsicles, or cold water in mouth five minutes prior, during, and for 30 minutes after the chemotherapy infusion PRN

Consider inserting an enteral feeding tube prior to treatment for patients at high risk of developing mucositis, such as hematopoietic stem cell transplant recipients
☐ Enteral Feeding Tube - Insert

Medications
Antiseptic rinses
☐ chlorhexidine gluconate 0.12% oral rinse 10 mL swish and spit
  ☐ four times daily
  ☐ PRN

Consider for young child unable to use oral rinse:
☐ chlorhexidine gluconate 0.12% swab entire mouth surface
  ☐ four times daily
  ☐ PRN
☐ Oral rinse: other ____________swish and spit
  ☐ four times daily
  ☐ PRN
Name of Order Set: Mucositis Treatment Pediatric Order Set

Order Set Keywords: mouth care, mouth pain, oral pain, mouth sores, stomatitis
Order Set Requirements: Weight

If patient has a fever please refer to Fever and Neutropenia, Pediatric – Acute Care for further guidance on management.

Monitoring
- Weigh Patient: Daily
- Intake and Output every 4 hours
- Calorie Count
- Vital Signs every ______ hours
- Pain Score Monitoring every ______ hours

Laboratory Investigations
- Hematology
  - Complete Blood Count with differential
- Microbiology
  - Mouth Candida/ Yeast Stain - mouth swab
  - Oral Infection Panel (Viral) - mouth swab (Panel includes testing for HSV, VZV, Enterovirus and Parechovirus)

Diet/ Nutrition
- Regular Diet: modify as tolerated (e.g. easy to chew)
- Nutritional oral supplements
- High Protein High Calorie - Peds

  If patient unable to eat or drink in consultation with dietitian consider enteral nutrition or Parenteral Nutrition (PN).
- Follow orders for Enteral Nutrition Peds. Refer to local institutional practices until provincial orders available.
- Follow orders for Parenteral Nutrition Peds. Refer to local institutional practices until provincial orders available.

Intravenous Therapy
  If patient unable to tolerate oral fluids
- potassium chloride 20 mmol/L in dextrose 5% - sodium chloride 0.9% at______ mL /hour
- _____________ (additive) in__________________________ (IV fluid) at______mL / hour

Medications
Oral Care
- chlorhexidine gluconate 0.12% oral rinse 10 mL swish and spit
  - four times daily
  - PRN
Consider for young child unable to use oral rinse:
- chlorhexidine gluconate swab entire mouth surface
  - four times daily
  - PRN

- Oral rinse: other_____swish and spit
  - four times daily
  - PRN

**Oral Care Analgesics**
- Akabutu’s mouthwash 5 to 10 mL swish and spit every_____ hours. (Each mL provides lidocaine 5 mg + nystatin 21,000 units + hydrocortisone 0.25 mg)
- Pink Lady _____mL swish and spit every_____hours. (15 mL lidocaine viscous 2% PLUS 15 mL Almagel [aluminum hydroxide/magnesium hydroxide 40-40 mg/mL])

Order additional oral and parenteral analgesia based on the severity of the patient’s pain. Refer to local institutional practices until provincial orders available.

**Consult**
- Dietitian Referral: Assess and Treat. Reason for consult__________________________.
- Consult Pediatric Infectious Diseases. Reason for consult__________________________.
- Consult Pain Service. Reason for consult__________________________.
Rural Considerations

Rural sites should consult with the pediatric oncologist on call at either the Stollery Children’s Hospital or the Alberta Children’s Hospital. In discussion with the pediatric oncologist a decision will be made to either:

1. Admit and treat patient at rural site
   a. Patient should be transferred to tertiary centre if remains febrile after 48 hours.
2. Discharge with appropriate follow-up instructions
3. Transfer to tertiary centre
Relevant Guidelines, Procedures, Protocols and Clinical Knowledge Topics

AHS Practice Support Documents

Oral Care Protocol for Dependent Patients

Patient and Family Education Resource

Mouth and Dental Care for Cancer Patients

Clinical Decision Support

- CDS Requirements:
  - References:
    - Please place a link to this Clinical Knowledge Topic within the following order set: Mucositis Prevention Pediatric Order Set and Mucositis Treatment Pediatric Order Set
### Analytics

#### Baseline Analytic – Outcome Measure #1

<table>
<thead>
<tr>
<th>Name of Measure</th>
<th>Order Set Usage for Topic: Mouth Care to Prevent and Treat Mucositis, Pediatric- Inpatient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>For all pediatric inpatients receiving chemotherapy, radiation therapy (RT) and hematopoietic stem cell transplantation (HSCT), number of times Mucositis Prevention Order Set is being used. Overall, by region, by sites, and by units</td>
</tr>
<tr>
<td>Rationale</td>
<td>Intended to measure if the order set cited in the knowledge topic is being used and with what frequency. May indicate areas with adoption issues or gaps in topic</td>
</tr>
<tr>
<td>Notes for Interpretation</td>
<td>Site capacity, roll out of provincial CIS</td>
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#### Baseline Analytic – Outcome Measure #2

<table>
<thead>
<tr>
<th>Name of Measure</th>
<th>Order Set Usage for Topic: Mouth Care to Prevent and Treat Mucositis, Pediatric-Inpatient</th>
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</thead>
<tbody>
<tr>
<td>Definition</td>
<td>For all pediatric inpatients receiving chemotherapy, radiation therapy (RT) and hematopoietic stem cell transplantation (HSCT), number of times Mucositis Treatment Orders is being used. Overall, by region, by sites, and by units</td>
</tr>
<tr>
<td>Rationale</td>
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#### Baseline Analytic – Outcome Measure #3

<table>
<thead>
<tr>
<th>Name of Measure</th>
<th>Prevention of Mucositis</th>
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<tbody>
<tr>
<td>Definition</td>
<td>What is the rate mucositis in pediatric oncology/hematology patients (on chemotherapy, HSCT, Radiation) that receive the Prevention of Mucositis Order Set vs those where it is not ordered?</td>
</tr>
<tr>
<td>Rationale</td>
<td>Patients that receive preventative mouth care should have lower incidence of mucositis.</td>
</tr>
<tr>
<td>Notes for Interpretation</td>
<td>Variation in complexity of patients, roll out of provincial CIS</td>
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### Baseline Analytic – Outcome Measure #4

<table>
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<tr>
<th>Name of Measure</th>
<th>Mouth Assessment in Pediatric Cancer patients</th>
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<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>What is the rate mucositis in pediatric oncology/hematology patients (on chemotherapy, HSCT, radiation) that have daily mouth assessment documented?</td>
</tr>
<tr>
<td><strong>Rationale</strong></td>
<td>Daily mouth assessment in patients should increase appropriate and timely treatment for mucositis.</td>
</tr>
<tr>
<td><strong>Notes for Interpretation</strong></td>
<td>Variation in complexity of patients, roll out of provincial CIS</td>
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### Keywords

- oral mucositis
- chemotherapy
- radiation
- treatment
- prevention
- management
- stomatitis
References


Additional Reading and General References


# Appendix A- Pain Scales

## Table 1: Pain Scales

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<thead>
<tr>
<th>Scale Type</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Numeric Pain Rating Scale</strong></td>
<td>Patient's rating of intensity of pain.</td>
</tr>
<tr>
<td><strong>Wong-Baker FACES Pain Rating</strong></td>
<td>Scale used for patients to rate the intensity of their pain.</td>
</tr>
</tbody>
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Top: Numeric scale for patient’s rating of intensity of pain.  
Bottom: Wong-Baker FACES Scale used for patients to rate the intensity of their pain.

Acknowledgements

We would like to acknowledge the contributions of the clinicians who participated in the development of this topic. Your expertise and time spent are appreciated.

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<th>Name</th>
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<tr>
<td><strong>Knowledge Lead</strong></td>
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<td></td>
</tr>
<tr>
<td>Sunil Desai</td>
<td>Clinical Knowledge Lead</td>
<td>Provincial</td>
</tr>
<tr>
<td>Tony Truong</td>
<td>Clinical Knowledge Lead</td>
<td></td>
</tr>
<tr>
<td><strong>Topic Lead</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shirley Perry</td>
<td>Nurse Practitioner</td>
<td>Edmonton Zone</td>
</tr>
<tr>
<td><strong>Working Group Members</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Andra Ramsundar</td>
<td>Registered Nurse</td>
<td>Edmonton Zone</td>
</tr>
<tr>
<td>Esther Jadusingh</td>
<td>Pharmacist</td>
<td>Calgary Zone</td>
</tr>
<tr>
<td>Brittany Campbell</td>
<td>Registered Dietitian</td>
<td>Calgary Zone</td>
</tr>
<tr>
<td>Catherine Corriveau-Bourque</td>
<td>Physician</td>
<td>Edmonton Zone</td>
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<tr>
<td><strong>Clinical Support Services</strong></td>
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<tr>
<td>Jennifer Jupp</td>
<td>Pharmacy Information Management Governance Committee (PIM-GC) on behalf of Pharmacy Services</td>
<td>Provincial</td>
</tr>
<tr>
<td>James Wesenberg</td>
<td>on behalf of Laboratory Services - Provincial Networks</td>
<td>Provincial</td>
</tr>
<tr>
<td>Bernice Lau</td>
<td>on behalf of Diagnostic Imaging Services</td>
<td>Provincial</td>
</tr>
<tr>
<td>Carlota Basualdo-Hammond &amp; Kim Brunet Wood</td>
<td>on behalf of Nutrition &amp; Food Services</td>
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</tr>
<tr>
<td><strong>Clinical Informatics Lead</strong></td>
<td></td>
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</tr>
<tr>
<td>Erin Hayward &amp; Sarah Searle</td>
<td>Registered Nurse</td>
<td>Provincial</td>
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Additional Contributors

Thank you to all the clinicians who participated in the colleague review process. Your time spent reviewing the knowledge topics and providing valuable feedback is appreciated.