



# Potential Benefits of Oral Cryotherapy for Chemotherapy-Induced Mucositis

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Mucositis is a common side effect of cancer therapies that causes painful, erythematous lesions to develop in the gastrointestinal tract. These lesions can lead to malnutrition, increased risk for serious infection, prolonged hospital stays, and reduced quality of life. Oral cryotherapy, or the use of ice chips to cool the mucous membranes during bolus chemotherapy infusions (e.g., 5-fluorouracil [Adrucil®] and melphalan [Alkeran®]), is the most readily accessible and cost-effective intervention available. Although many factors may contribute to the development of mucositis during cancer treatment, studies have found a reduction in the incidence and the severity of mucositis with the use of oral cryotherapy.

## At a Glance

- Chemotherapy-induced mucositis often occurs following most standard doses of chemotherapy.
- Current mucositis prevention techniques vary in cost, effectiveness, and accessibility.
- Oral cryotherapy is a low-cost, low-risk intervention that has been shown to reduce the severity of chemotherapy-induced mucositis.

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Oral mucositis is a common side effect of cancer treatments, such as radiation and chemotherapy, with a high degree of symptom burden that decreases quality of life, prolongs hospital stay, and may require dose limitation of future therapies (Lalla, Saunders, & Peterson, 2014). Chemotherapy-induced mucositis occurs in 40% of patients who receive standard dose therapies and in almost all patients who receive high doses in preparation for hematopoietic stem cell transplantation (HSCT) (Stringer, 2013). Most patients undergoing HSCT cite oral mucositis as the most debilitating complication (Lalla, Saunders, & Peterson, 2014). The

presence of mucositis often has negative effects on the patient's tolerance of cancer treatments, and complications arising from mucositis can have a significant impact on survival. Because of this, many randomized, controlled trials have been devoted to finding the most effective mechanisms of mucositis prevention.

## Mucositis Development and Assessment Tools

Mucositis presents in varying degrees of severity, often progressing from mild to severe. Al-Dasooqi et al.

(2013) describes the manifestations of oral mucositis as part of a continuum ranging from mild erythematous atrophic lesions to ulcerative lesions that extend to the mucosa. The grading of mucositis is determined by a combination of visual inspection of the oral mucosa, pain assessment, and evaluation of functional status in terms of nutritional intake. Two grading scales, one from the National Cancer Institute (NCI) and one from the World Health Organization (WHO), are widely used in oncology practice (see Table 1). The NCI scale is more favorable because it includes a functional and pain assessment with each grade of mucositis, which prompts oncology nurses to consider the need for nutritional or pain-relieving interventions.

Understanding the pathophysiology of mucositis development is essential for oncology nurses to best determine how to incorporate techniques of oral mucositis treatment and prevention. Georgiou, Patapatiou, Domoxoudis, Pistevou-Gompaki, and Papanikolaou (2012) best summarized the evolution of mucositis by describing the five steps of mucositis development, which consist of initial injury to cells by chemotherapy via direct DNA damage or reactive oxygen species, a series of enzyme and transcription factor activation, the upregulation of inflammatory cytokines, inflammation and tissue damage, and the eventual healing of the extracellular matrix. This process can last 3–12 days if induced by chemotherapy and much longer if mucositis is a result of radiation therapy (Georgiou et al., 2012). A more in-depth understanding of this pathogenesis aids in the prediction of toxicity risk with cancer therapies and helps nurses to implement