

Development of an oral care guide for patients undergoing autologous stem cell transplantation

By Prisco T. Salvador

Abstract

Nurses identified oral mucositis as a recurring issue in clinical practice. To meet this challenge, a group of nurses took a leadership role in developing an oral care guide. The University Health Network Nursing Research Utilization Model and the Neuman Systems Model served as conceptual frameworks. A flowchart was developed to ensure a coordinated and continuous provision of oral care. Educational presentations were conducted to familiarize nurses and members of the multidisciplinary team of the practice changes. The introduction of the oral care regimen as primary prevention, plus systematic oral assessment and monitoring had the potential to reduce the occurrence and severity of oral mucositis in patients undergoing autologous stem cell transplantation.

Background

Oral mucositis is a painful and debilitating side effect of high-dose chemotherapy (HDC) as a conditioning regimen in autologous stem cell transplantation (ASCT). It occurs in approximately 80% in hematopoietic stem cell transplants as a result of two major mechanisms: direct effects of chemotherapy on the mucosal surfaces of the mouth, and indirect effects of chemotherapy on bone marrow functions (National Cancer Institute [NCI], 2003).

The impact of oral mucositis on a patient's physical and psychological well-being and quality of life is significant (Bellm et al., 2000; Borbasi et al., 2002). Oral mucositis can leave a patient with an extremely painful mouth, throat, and esophagus that makes eating, drinking, or even talking very difficult. Often times, a patient may require systemic analgesia, that is, patient-controlled analgesia for comfort measures. In addition, developing a break in the integrity of the oral mucosa could be a life-and-death situation in patients who are myelosuppressed and neutropenic, making them vulnerable to systemic infection, bleeding, severe pain, and altered nutrition. Patients who have systemic infection as a result of ulcerative oral mucositis are less likely to survive (Berger & Eilers, 1998).

The economic impact of oral mucositis is also of utmost concern. Patients with severe mucositis are most likely sicker, requiring longer hospital stays, which could mean additional costs for therapeutic care. More specifically, patients with ulcerative oral mucositis are three times as likely to develop bacterial infections and stay in hospital six days longer than patients without oral ulcerations (Sonis et al., 2001; Ruescher et al., 1998).

Over the last decade, nurses in a transplant unit have witnessed advancement in treatment protocols (i.e., use of growth factors and oral antibiotics) and yet, the severity of oral mucositis in ASCT patients remains an ongoing concern in clinical practice. Cognizant of the adverse effects of oral mucositis in ASCT patients, nurses in an acute care oncology hospital located in a metropolitan city in southern

Ontario took a leadership role to better manage or prevent the occurrence and severity of oral mucositis. The purpose of this article, therefore, is to describe the activities of a group of nurses (three staff nurses – one with a Master's degree in oncology nursing, two with more than 15 years of clinical experience) that led to the development of a unit-based oral care guide that can be used in any oncology setting.

Conceptual framework

The group used two models as conceptual framework: the University Health Network Nursing Research Utilization Model (UHN/NRUM, 2002) and the Neuman Systems Model (Neuman & Fawcett, 2002). The UHN model was used to identify a recurring issue that affects patient care and review and validate pertinent evidence from literature. The Neuman Model was used to guide the group in developing recommendations for nursing practice changes in oral care. The three concepts of the model relevant in the development of the practice changes included stress, reaction to stress, and primary prevention as intervention. Patients undergoing high-dose chemotherapy plus autologous stem cell transplantation (identified stress) may develop oral mucositis (reaction to identified stress) as a side effect to treatment. Consequently, nurses have to institute a plan of action (primary prevention as intervention) to maintain systems stability, that is, integrity of the oral mucosa to prevent or minimize secondary complications of treatment, such as systemic infection, severe pain, bleeding, and altered nutrition. This approach to oral care emphasizes the importance of patient education, oral assessment and monitoring and evaluation to determine the effectiveness of the intervention.

Problem identification and assessment

The UHN/NRUM process starts when questions related to patient care, education, or research are raised in nursing practice. To assist with problem identification, the group conducted a survey that asked two questions: what is the one issue you would like to be addressed in your nursing practice? and what kind of intervention do you suggest to achieve this? The sample included 32 full-time, part-time, and casual nurses from hematology and autologous stem cell transplant (ASCT) inpatient unit. Results indicated that oral mucositis was a recurring issue, an issue that was confirmed in a retrospective study conducted by the author (Salvador, 2005) indicating the incidence rate of oral mucositis at 90% (126/140) in ASCT patients. Additionally, nurses suggested the need for a comprehensive strategy or nursing intervention to effectively manage and prevent the occurrence of oral mucositis.

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To have a better understanding of the problem, the group interviewed a few experienced nurses in the unit to assess current clinical practice on oral care and identify factors or barriers that may be contributory to the prevalence of oral mucositis in ASCT patients. Although nurses may have the added skill of oral assessment and monitoring and the knowledge on the prevalence of oral mucositis in ASCT, nurses relied on secondary prevention as intervention (72.92%) as shown in a study by the author (Salvador, 2005). Secondary prevention as intervention involves the treatment of signs and symptoms of oral mucositis as they emerge (Neuman & Fawcett, 2002). Nurses also revealed that tradition, patient preference, and physician orders predominantly guided nurses in their approach on oral care. A written oral care regimen (when oral care should start, frequency of rinsing, brushing, or flossing, and what kind of mouthwash to use) was non-existent, which meant inconsistency and confusion in the delivery of oral care and patient education.

Literature review

The next stage in the UHN NRUM process involves review of published studies and other forms of evidence related to the identified problem and validation of their applicability, significance, and usefulness in nursing practice. Preliminary literature search from the hospital's virtual library for electronic resources yielded two journal articles on oral care standard (Yeager, Webster, Crain, Kasow, & McGuire, 2000) and oral care clinical practice guidelines (Stricker & Sullivan, 2003). Both articles were excellent resources in the development of the oral care guide due to similarities in patient population. Some of the content items (i.e., dental consult, oral assessment, use of toothettes and sodium bicarbonate mouthwash for mouth care) were already in place in the unit's clinical practice. However, their application in ASCT patients was limited due to variability of oral care agents used and there were no significant indications of their effectiveness in the prevention of oral mucositis.

Start	Day one of chemotherapy
Frequency	Brushing – use disposable toothette soaked in sodium bicarbonate mouthwash four times a day, that is, after each meal and at bedtime.
	Rinsing – every 3 to 4 hours (initially), then 1 to 2 hours after receiving your own stem cells or when you feel mouth dryness, while awake. Rinse mouth liberally with sodium bicarbonate mouthwash.
	Flossing – if routinely flossing once a day, you may continue until your platelet count is 50,000.
Reminders	1. If you have dentures, remove them every time you perform mouth care; when you experience pain and/or bleeding, do not wear them.
	2. Remind your nurse to provide a new bottle of the mouthwash every day.
	3. Your physician may prescribe, as needed, lip and mouth moisturizer, topical anesthetic, and systemic analgesia for comfort measures.
<i>Note: Based on information from Stricker & Sullivan, 2003; Yeager, Webster, Crain, Kasow, & McGuire, 2000; Kenny, 1990; Borowski, Benhamou, Pico, Laplanche, Margainaud, & Hayat, 1994; Dodd, Dibble, Miaskowski, MacPhail, Greenspan, Paul, et al., 2000).</i>	

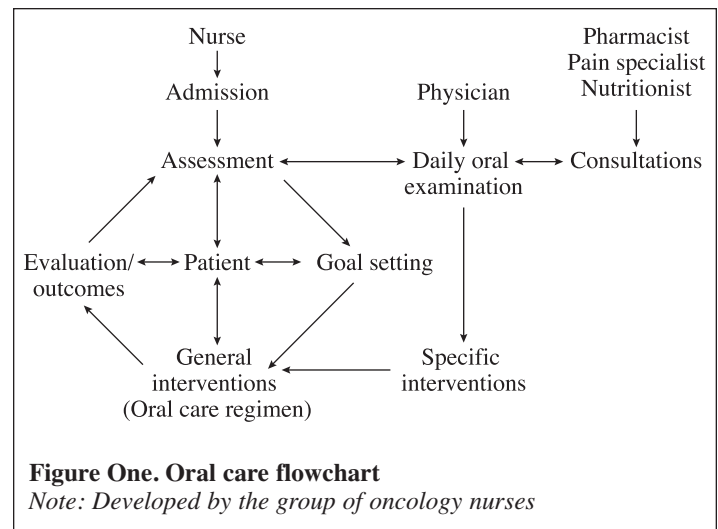
Subsequently, the group conducted a more comprehensive literature search in Medline, CINAHL, and the ProQuest Nursing Collection with assistance from an information specialist. The search resulted in the identification of a few research articles (Borowski, Benhamou, Pico, Laplanche, Margainaud, & Hayat, 1994; Kenny, 1990; Dodd, Dibble, Miaskowski, MacPhail, Greenspan, Paul, et al., 2000). Then, the group analyzed each article using the UHN NRUM criteria for evaluation and validation of quantitative research. All other forms of evidence (e.g., review articles, clinical articles) were also identified and retained for later use in the development of the oral care guide.

The change process

The process of changing the unit's approach to oral care was partly attributed to one of the study findings of the author (Salvador, 2005) that ASCT patients who used secondary prevention as intervention had a higher incidence and more severe oral mucositis than ASCT patients who used primary prevention as intervention. Therefore, primary prevention as intervention (Neuman & Fawcett, 2002) was recommended to better manage or prevent oral mucositis in ASCT patients.

In developing the first draft of the oral care guide, the group synthesized information derived from clinical practice review and evidence from literature. The resultant oral care guide constituted the following components: oral assessment, documentation, and reporting; goals of oral care; recommended mixture of the sodium bicarbonate mouthwash; oral care regimen (Table One), and patient education. Draft copies of the oral care guide were disseminated to members of the multidisciplinary team – nurse manager, oncology nurses, transplant physician, clinical pharmacists, social worker, and nutritionist – to review the content. The group also presented the oral care guide in a clinicians' meeting. Suggestions to improve the draft copy were incorporated into the final draft. The inclusion of the unit's current clinical practice and inputs from the multidisciplinary team not only enhanced the overall content structure of the oral care guide but also, most importantly, guaranteed successful implementation of the practice changes.

The choice of sodium bicarbonate mouthwash as a single rinsing agent was based on patient preference (Salvador, 2005) and a physician prescription was not required for its use in the clinical area. The use of sodium bicarbonate mouthwash dilutes and loosens thickened plaque, neutralizes oral pH, and promotes mucosal tissue healing (Barker, 1999). In addition, sodium bicarbonate and sterile water were readily available in the unit, easy to mix, and least costly, but equally effective compared to other oral care agents (Dodd et al., 2000). The recommended mixture of the mouthwash was two teaspoons of sodium bicarbonate powder added in a 500 ml. bottle of



sterile water. Patients started the oral care regimen on day one of chemotherapy and may use disposable toothettes for brushing and continue flossing once a day until their platelet counts drop to 50,000/cu.mm. More frequent rinsing of the mouth was recommended with the onset of signs and symptoms (e.g., dryness) of oral mucositis to keep the mouth moist and free from debris and to promote comfort (Stricker & Sullivan, 2003; Yeager, Webster, Crain, Kasow & McGuire, 2000; Kenny, 1990; Borowski, Benhamou, Pico, Laplanche, Marginaud, & Hayat, 1994).

Successful implementation of the oral care guide required the services of a dedicated and knowledgeable team of health care providers. To better achieve this end, the group developed an oral care flowchart (Figure One) to ensure a coordinated and continuous delivery of oral care and other services for ASCT patients. Nurses played a pivotal role in the management and prevention of oral mucositis that started on admission day by: (1) assessing the patients' knowledge and self-care skills, (2) setting the goals of oral care with the patient and family members, (3) implementing the oral care regimen (general intervention) that includes coordinating and connecting ASCT patients to other health care providers (specific interventions) throughout the oral mucositis trajectory, and (4) evaluating the effectiveness of the interventions or measuring oral care outcomes. Examples of specific interventions were: changing of diet consistency, changing of oral medications to intravenous infusions, and starting of systemic analgesia.

As part of the implementation strategy, the group conducted a series of educational presentations – 30 minutes long, over a two-week period – involving nurses and other health care providers. Topics included in the presentation were: brief overview of the UHN nursing research utilization model and Neuman systems model, components of the new oral care guide, goals of oral care, choice of sodium bicarbonate mouthwash and recommended mixture, and patient education. The goals of the oral care guide included: (1) maintenance of a clean, moist, and infection-free mouth, (2) adherence, and (3) adequate hydration, nutrition, and oral comfort.

Copies of the oral care guide were posted prominently in all transplant rooms. Copies of the oral care guide, goals of oral care, and recommended mixture of the mouthwash were posted in the nurses' lounge and medication room. A huge poster was also created and posted in an area in the hallway near the nursing station.

As agreed upon by members of the multidisciplinary team, the group was granted a month to implement the oral care guide on a test trial before an outcome research study could be conducted at a later date, if needed. All patients admitted during the implementation period were informed and instructed about the oral care regimen and nurses who cared for the patients were asked to implement the oral care guide. On admission, nurses assessed patients' level of knowledge and self-care skills, reviewed the oral care regimen and goals of oral care with patients and family members. Any teachings provided by nurses were documented in the patient teaching flowchart sheet for continuity of care.

During the implementation period, nurses continued to perform their routine care activities, such as oral assessment, documentation using the chemotherapy side-effect record sheet, and reporting of any changes on the oral mucosa to the patients and members of the multidisciplinary team for appropriate interventions. The only change that affected the nurses' routine at this time was the introduction of the oral care regimen to patients on day one of chemotherapy as a primary prevention rather than as secondary prevention as they used to.

The evaluation process coincided with the implementation of the practice change in oral care in the unit. Members of the group followed all patients admitted during the implementation period. The criteria for evaluation focused on the three goals of the oral care guide: maintenance of a clean, moist, and infection-free mouth, adherence, and adequate hydration, nutrition, and oral comfort. To determine whether the goals were met, a member of the group

assessed and monitored each patient from day one of chemotherapy and then every other day until cessation of signs and symptoms of oral mucositis or before discharge. In each visit, a patient's oral cavity was examined using a tongue depressor and good light source provided at the bedside. The patient was also asked four questions: 1) Did you receive information and instructions on the oral care guide?, 2) How often do you brush and rinse your mouth?, 3) Are you still eating and drinking?, and 4) Are you on medication for painful mouth or throat? Nursing documentation on patient teaching, oral assessment, and progress notes were audited by the group. A total of 10 patients used the oral care regimen. Six patients had either no symptoms of oral mucositis or mild mucositis, continued eating and drinking in varying amounts, and did not require pain medication. One patient stopped using the mouthwash after three days due to nausea and vomiting. Three patients developed moderate to severe mucositis, had difficulty eating or drinking, and used systemic analgesia (i.e., patient-controlled analgesia) for pain control. Most of the patients tolerated the mouthwash and even exceeded the recommended frequency of rinsing. Nurses were also asked whether the oral care guide addressed the recurring issue of oral mucositis. Nurses believed that the practice change on oral care from secondary prevention to primary prevention had a positive impact on quality of patient care and improved oral health outcomes. The results of the evaluation were presented to the members of the multidisciplinary team for appropriate action. They recommended the continued use of the oral care regimen not only for patients of ASCT, but also to newly-diagnosed patients with hematological malignancies for chemotherapy.

Conclusion

Nurses can play a pivotal role in improving oral health outcomes. This was clearly exemplified by a group of oncology nurses who took a leadership role in the development of a unit-based oral care guide. The process of transferring knowledge into practice was a daunting task at first. The use of appropriate models as conceptual framework proved to be effective in the development, implementation, and evaluation of the oral care guide.

Successful implementation of any practice changes in oral care necessitates the involvement of dedicated members of the multidisciplinary team. Patients undergoing ASCT remain vulnerable to the development of chemotherapy-induced oral mucositis. Active participation in their own oral care and adherence to an oral care regimen can result in meaningful realization of the goals of oral care. As new evidence, innovations, and advanced technologies become available, the oral care regimen has to evolve to reflect those changes. Moreover, primary prevention as intervention was an essential component of the oral care guide that provided a sense of direction, consistency, and continuity in the delivery of oral care by health care providers.

This project was limited by the strength of the patient outcome data due to small sample size. Therefore, further research is needed to determine the effectiveness of the practice change in oral care. A desired next step is the conduct of a randomized clinical trial study to test the effectiveness of primary prevention as intervention versus secondary prevention as intervention in the occurrence and severity of oral mucositis using a larger sample of ASCT patients. Both study groups – primary prevention and secondary prevention – will use an identical oral care regimen. An important component of the study is the utilization of an oral assessment guide (Eilers, Berger, & Peterson, 1988) with known reliability and validity. ♣

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