Wound Dressings During Radiotherapy for Cancer: A Survey of Practice

Siby Elizabeth J. Thomas, MSN, RN, Sheryl Reimer-Kirkham, PhD, RN, and Rosemary Kohr, PhD, RN

Background: Patients undergoing radiotherapy may experience changes to the skin that require dressings. Recommendations regarding radiating through wound dressings have been variable and relate to the concern regarding surface dose increase or bolus effect.

Objectives: The purpose of this article is to identify current evidence and practice through literature review and a national environmental scan.

Methods: Nurses from 18 radiation oncology centers in Canada were surveyed about current practice. In-depth telephone interviews were conducted with four nurse participants to further understand the context of this issue within the nursing practice environment.

Findings: The integrated results of the study were reviewed with five clinical experts to make recommendations for research, practice, leadership, and policy. Implications for clinical practice included the involvement of radiation oncology nurses in the treatment planning team, development of clinical practice tools, and the relevance of the Person-Centered Nursing framework for wound management during radiotherapy.

Wounds are common among patients with cancer undergoing radiotherapy. The management of these wounds, such as the standard removal of wound dressings prior to daily fractionated radiotherapy, can be a source of discomfort for patients and a challenge for the nurses involved. At a patient’s request and with the approval of the radiation oncologist, very thin dressings have been left in place during the radiation treatment in some settings. However, little evidence exists to inform whether removing the dressing alters the wound bed and affects the healing process or whether the radiation dose changes when delivered through a dressing. As suggested by Hollinworth and Mann (2010), “Further consideration could be given to leaving the product in place and the radiotherapy dose recalculated on an individual patient basis... during the initial radiotherapy planning stage” (p. 63). In this article, the authors present the results of a study that examined current evidence and practice in relation to wound dressings during cancer radiotherapy.

Literature Review

Radiation-induced dermatitis is one of the most common side effects of external beam radiotherapy (Harris et al., 2012) and has the potential to affect an individual’s quality of life. Patients with dermatitis may suffer in a variety of ways: changes in body image, physical discomfort such as pain and itching, and difficulty with activities of daily living (McQuestion, 2006). If the resulting wounds require a dressing, clinicians have to choose from a plethora of dressing products. Dressings are chosen taking into account goals of care such as managing exudate, facilitating a moist wound environment, and minimizing pain and bleeding. These products often include antimicrobial dressings—silver being the most common or popular among...
Topical agents (Sibbald, Woo, & Ayello, 2008)—and this type of dressing is removed prior to radiation treatments. Hydrocolloid dressings also have been used but may melt and leak if left in place during radiation (Mak et al., 2005).

Common practice is to remove the dressing before daily treatment, but this removal may cause more desquamation and pain (Sparks, 2007). Although a number of authors have cited the use of dressings in the management of moist desquamation, few studies have evaluated the effectiveness of dressings (Chan, Larsen, & Chan, 2012; McQuestion, 2006, 2011). For example, Thilmann et al. (1996) used thermoluminescent dosimetry to quantify the changes in surface dose from four types of dressings: a silicone-coated polyamide (Mepitel®), silk acetate (Cuticerin®), hydrocolloid (Varihesive®, extra thin), and calcium-sodium-alginate (Kalostat®). MacNally and Woodings (2012) conducted a study using Allevyn® average, Mepilex® border, Mepilex® lite, Duoderm®, and Fixomull®. The investigations concluded that wound dressings could be used during electron beam irradiations with no significant change to skin dose; however, only very thin dressings could be used during high-energy photon irradiations. For most dressings, no clinically significant changes in delivered dose at depths were found.

Butson, Cheung, Yu, and Metcalfe (2002) measured skin dose variations produced by a silicone-based polyamide dressing (Mepitel), and the effective thickness of the dressing was calculated to be 0.5 mm water equivalence. Semipermeable film dressings such as Mepitel were recommended for moist desquamation (Adamietz et al., 1995; Blackmar, 1997; Dunne-Daly, 1995; Gallagher, 1995) on the basis that the film may be applied to areas of low or no exudate, may reduce pain and discomfort, can be left in place during radiotherapy, and is easily removed.

Studies have found that Mepilex lite had no effect on skin temperature, causes a very small bolus effect of 0.5 mm, promotes comfort, and reduces subjective symptoms of acute radiodermatitis (Bennett et al., 2013; Diggelmann et al., 2010; Paterson, 2012; Perez, Medina, Perez, & Garcia, 2011). However, in these studies, all dressings were removed prior to treatment for the sake of clinical trial consistency, as some patients had their dressings positioned on top of reference marks.

This review reflects a fairly consistent opinion that thin dressings (as thick as 2 mm) may be left in place during radiotherapy. The actual type of dressing used in the reviewed studies varied, but evidence suggests that a few wound care products such as Mepitel and Mepilex lite may be left in place during radiotherapy. The extent to which current practice aligns with this evidence is not clear.

**Methods**

The questions addressed in the current study focused on exploring the existing evidence regarding radiation through dressings, current practice in regard to wound dressing removal (or not removing) during radiation treatments, how radiation oncology nurses (RONs) saw their role in clinical decision making and interprofessional relationships in this matter, and what recommendations could be made regarding best practice for wound management during radiotherapy.

To answer these questions, a mixed-methods design was used. Following the review of current literature, an online survey for RONs was developed and deployed across 42 Canadian radiation oncology centers. In-depth telephone interviews with four nurses (respondents from the survey) were then conducted. Finally, five experts from the field of radiation oncology and wound management were invited to review the study findings from the survey and telephone interviews, validate the results, and provide consensus input regarding recommendations (see Figure 1).

**Survey**

The survey explored current practices in relation to clinical decision making and wound care management during radiotherapy. The survey was developed based on the literature review and was piloted at a local cancer center. The target population was RONs at the 42 English-language radiation oncology centers in Canada, with the aim of one nurse respondent from each center as the representative sample (Polit & Beck, 2012). The national survey was administered electronically, and 18 responses were received, of which 16 were complete, for a response rate of 38% (see Table 1). The limitation of the study’s small sample size was offset by the triangulated data gathered through interviews with nurses and expert consultants.

**Telephone Interviews**

Four survey respondents who indicated interest on the survey were contacted for the telephone interviews, which allowed for more extensive discussion using open-ended questions and provided additional material regarding clinical decision making and interprofessional practice. Each interview lasted 20–30 minutes and was audio-recorded and transcribed verbatim.

**Expert Consultants**

An executive summary of findings was presented to five expert consultants who reviewed the findings and responded via
email or phone to several questions, such as: “Can you comment on the assumption that removing wound dressings prior to daily radiation treatment is best practice?” “How can the practice of removing or radiating through dressings be effectively evaluated?” “What evidence is needed to develop a practice guideline?” and “How can consistency in wound assessment and dressing management be facilitated?”

Synthesis

A mixed-method synthesis was undertaken that was comprised of survey data, qualitative telephone interviews, and the expert stakeholder consultation. The data analysis features from the electronic survey provided the descriptive statistics for the survey and content analysis was applied to the interview data. Themes from all data sources were inter-related to provide an overall interpretation of wound management and nurses’ professional role in supporting patient-centered care.

Research ethics board approval was obtained from the university and local health authority. Subject consent and confidentiality followed standard protocol, as did management of interview transcripts and research materials. The expert consultants agreed to have their names disclosed as acknowledgement of their expertise.

Findings

Data generated by the survey and the interviews revealed inconsistencies in current practice, the complexity of the nursing role in regard to clinical decision making and interprofessional practice, and the possibilities for patient-centered care in the area of wound management during radiotherapy. As a last phase in the study, expert consultations validated and extended the survey and interview findings, and were particularly helpful in generating study recommendations.

Survey Findings: Report of Current Practice

From the survey, data were collected on common skin assessment tools used in daily practice for the management of radiation dermatitis, frequency of these assessments, and whether radiating through dressings was standard practice. Twelve respondents used the National Cancer Institute’s Common Terminology Criteria for Adverse Events (http://evs.nci.nih.gov/ftp1/CTCAE/About.html), seven respondents used the Radiation Therapy Oncology Group criteria (www.rtog.org/Home.aspx), and two used the Radiation-Induced Skin Reaction Assessment Scale (Noble-Adams, 1999a, 1999b).

Dressing removal prior to radiotherapy: Half of the centers responding to the survey indicated that wound dressings were always removed prior to radiation treatments; at the other 50% of the centers, dressings were often left in place. The conditions when wound dressings were left in place were explained in open text responses, for example: “Depends upon the treatment plan and the oncologist; on the type of energy used for radiation—some dressings can be maintained.” In addition, for patients receiving palliative care, the patient preference or prognosis also affected the decision to leave the dressing intact. The rationale provided for always removing dressings prior to radiation treatment were, “Except when dressing is used as a bolus.” It was clear that the reasons for leaving intact or removal of dressings prior to radiotherapy were related to the purpose of the treatment or clinical assessment of the wound and the condition of the dressing.

Management of open wounds: The most common method of managing moist desquamation was antimicrobials such as silver sulfadiazine (n = 11). Survey results revealed that gauze or saline compresses were widely used for the radiation dermatitis and malignant wounds. The most commonly used products were preferably nonadherent and helped to control bleeding, exudate, and odor.

Decision making to remove or radiate through dressings: Findings from the survey revealed that the decision to remove or radiate through dressing is generally made by the radiation oncologist (n = 5), the team (n = 5), or the radiation therapist (n = 3). Of note, none of the respondents indicated that nurses made the decision. Ten centers do not have a reference document for when to remove dressings prior to radiotherapy. However, survey respondents indicated that they were consistent in how they assessed skin and wound or dressing changes. The responses indicated that the interpretation of consistency was based on individual perspective and personal practices rather than standardized institutional policy.

Clinical Decision Making and Interprofessional Practice

The interviews provided further detail regarding the context in which RONs manage wounds and, in particular, provided insight into their clinical decision making and interprofessional practice in relation to wound management. These RONs participated in clinical research and drew on a variety of sources of knowledge to inform clinical decision making (e.g., evidence derived from research, anecdotal evidence, practice experience, in-service learning, expert opinions). The nurses emphasized keeping the patient at the center of decision making and described how interprofessional care delivery was vital toward this end. However, despite these aspects of the role of the RON, inconsistency in clinical practice remains in relation to radiating through dressings during radiotherapy.

| TABLE 1. Demographic Distribution of Radiation Oncology Nurse Respondents (N = 18) |
|--------------------------------|------|
| Variable                      | n    |
| Responses                     |      |
| Complete                      | 16   |
| Incomplete                    | 2    |
| Academic background           |      |
| Diploma                       | 3    |
| Bachelor’s                    | 9    |
| Master’s                      | 6    |
| PhD                           | –    |
| Nursing role or position      |      |
| Staff                         | 7    |
| Educator                      | 6    |
| Leader                        | 4    |
| Other                         | 1    |
Consensus-Building: Recommendations for Best Practice

Although the literature suggests that thin dressings may be left in place during radiation treatment, this is not standard practice. The main reasons given from the survey and interviews for not radiating through dressing were (a) standard practice to never radiate through dressings, (b) beyond the RON’s scope of practice and other team members (i.e., radiation oncologists) are the decision makers, (c) individual patient’s comorbidities or preference, (d) goals of care (curative or palliative), and (e) not clear of best practice.

Given the results in the literature, which were not consistently used in practice, it was important to determine what the best practice approach should be. To establish an understanding of clinically relevant best practices, the experts were asked to review and then comment on the study findings, with a view to developing consensus, which would lead to recommendations for best practice.

Regarding daily removal of wound dressings prior to radiotherapy not being best practice in relation to wound management, one of the expert consultants stated,

Automatic removal of dressing prior to treatment is not best practice. Situations where dressings could be left in place during treatment include: (a) dressings that are thin (i.e., less than 3–5 mm), (b) dressing that adhere well to the skin or wound without gaps, (c) when an absorbent dressing is not saturated with fluid (in that case, changing the dressing but keeping one in place would be preferred), (d) patient factors (malignant wounds where healing is not expected with treatment, pain associated with dressing removal, cost of supplies to the patient), and (e) treatment factors.

In the context of clinical inquiry, examining current practice is crucial in gathering any other existing evidence. Experts also were asked to comment on study findings that revealed inconsistency in practice across Canada in relation to radiating through dressings, with no standard policy in place regarding when to remove or radiate through dressings. One expert commented,

I believe that we are a long way from having sufficient evidence to develop an evidence-based practice guideline. However, further research in this area could support (or not) some of the existing perceptions of best practice.

Most centers (n = 10) did not have reference documents such as local policy, clinical practice protocols, or best practice guidelines for when to remove a dressing during radiotherapy. The consultants recommended some form of a guideline.

Should it be a clinical practice guideline where level one evidence is preferred, or would it be best to develop a clinical guide that encompasses other levels of evidence, consensus building . . . to develop a standard of practice in light of existing evidence?

The suggestion to develop a clinical guide is a valid point for consideration, but evidence must be stronger than what the current state of knowledge has revealed. However, until a sufficient body of evidence is developed through replicated empirical studies, expert consensus is invaluable. Of note, three consultants recommended further research—starting with the measurement of bolus effect when dressings are left in place—by collaborating with a clinical physics department.

Although the descriptive data from this study are unclear regarding who decides to remove or radiate through dressings, the RON is not often the sole decision maker in this aspect of patient care. The telephone interviews highlighted the hierarchical aspect of the model of care, referred to by one of the consultants as a “subordinated role.” All organizations consist of distinct yet interconnected parts that are envisioned to play complementary roles to best accomplish shared goals (Pfeffer, 1982). Although the RONs may perceive themselves as not the clinical decision makers in this case, the advanced practice nurses (APNs) in the study tended to present clinical decision making as more of a collaborative process. The expanded role of the APN offers considerable potential to radiotherapy nursing, such as involvement in the radiation treatment planning team.

Exploring interprofessional practice using nursing care as a frame of reference raises questions, such as: “How do nurses individualize care when working from standardized procedures?” “How do nurses hold their voice in an interprofessional work setting?” “What is the experience of the patient in all of this?” and, of particular relevance, “How is patient preference handled if they do not want a dressing removed?” Therefore, examining the role of nurses in interprofessional practice inevitably links to how nurses promote patient-centered care, an overarching theme evident in the data. One consultant suggested the following.

The voices of patients living with malignant wounds need to be heard to further understand their experiences. Qualitative research should address . . . reduction in pain, impression or impact of time to heal, frequent or daily dressing changes during treatment, of dressings left on during treatment, cost to patient (distress and financial) that may not be captured . . . in quantitative research.

The Person-Centered Nursing framework by McCormack and McCance (2010) is helpful in providing some insight around the questions that explore person-centeredness in radiation wound management practice. Three domains of influence for nursing that can be related to this study’s findings are (a) prerequisites—how the nurse obtains education, knowledge, and networking to develop competence; (b) the care environment—how the work setting is structured with shared governance supporting mutual respect, trust, communication, and information sharing for collaborative, inclusive clinical decision making; and (c) a person-centered processes to work with the patient’s values, beliefs, and preferences.
Conclusion

This study provides an initial image of radiation oncology nursing wound care practices in Canada. The findings revealed the paucity of evidence to direct practice regarding radiating through wound dressings during cancer radiotherapy. However, the evidence available in research literature did suggest that thin dressings could often be left intact during radiation treatment. In addition, the majority of survey respondents indicated that no evidence-based practice guidelines for when to remove a dressing for radiotherapy existed in their facility. Consistent wound dressing approaches are needed for patients with cancer experiencing radiation-induced dermatitis. However, in all cases, best practice must take into account patient preferences, contextual factors, and the goals of care (i.e., curative, palliative, or supportive).

Additional research is needed to determine whether any bolus effect is noted when dressings are left in place. In view of the interprofessional nature of radiation oncology wound management, the development of a clinical practice guideline such as an algorithm based on expert consensus regarding wound care products would be beneficial.

RONs are at the front line of these direct patient-care decisions and hold a broad interpretation of evidence-based practice to include empirical evidence, patient preference, clinical experience, and expert opinion. Finally, insights from this study point to the foundation of person-centeredness, empowerment through shared governance, and the need for continuous education to consistently manage wounds in radiotherapy. Finding the voice of nursing in organizational factors while working in interprofessional teams can pave the way to better patient outcomes during a difficult time.

The authors gratefully acknowledge the survey and interview participants, particularly expert consultants Anne Hughes, RN, BSN, MN, CON(C), Amanda Bolderston, MRT (T), MSc, FCAMRT, Maureen McQuestion, RN, BA, BScN, MSc, CON(C), and Stephanie Chadwick, CETN(c), MCISC-WH.

References


