

Appraising the Evidence for Avoiding Lotions or Topical Agents Prior to Radiation Therapy

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This project aimed to determine whether avoiding the use of lotions or topical agents for four hours prior to radiation therapy is supported by evidence. A comprehensive literature review, interviews with clinical experts, benchmarking with international cancer centers, and consultation with professional nursing organizations were conducted. Results showed limited evidence as well as variation in practice.

Lotion and topical agents often are used by patients receiving radiation therapy to decrease the discomfort of skin reactions, prevent infection, and maintain personal hygiene. The traditional belief has been that the presence of lotions or topical agents in the treatment field can increase the risk for and severity of skin reactions (e.g., erythema, desquamation) by inducing a bolus effect (or increased surface dose) of radiation because of an increase in skin thickness (Aistars, 2006; Burch & Parker, 1997; McQuestion, 2006).

Skin reactions are a general side effect of radiation and can range from erythema to dry desquamation to moist desquamation (see Figure 1). Skin reactions can cause skin breakdown; increase risk for infection, discomfort, pain, and pruritus; and reduce quality of life (Pignol et al., 2008; Theberge, Harel, & Dagnault, 2009). Moderate to severe skin breakdown may necessitate an interruption in the treatment course to allow the skin to heal, prevent infection, and increase comfort. Interruptions can last from days to weeks depending on the severity of the reaction and can result in the undesirable effect of allowing malignant cell repair and repopulation while skin cells are healing.

Many patients express concern and anxiety about how to care for their skin during radiation therapy. If patients forget to avoid lotion or deodorant prior to their treatment, they may become fearful that the radiation therapy will not be effective. In addition, patients may miss opportunities to properly moisturize their skin before or

after treatment to help promote comfort and decrease desquamation depending on the time of the therapy appointment. For example, patients receiving morning treatments avoid applying lotion beforehand because of the four-hour restriction. They often receive treatment and continue with their day and do not use recommended lotion until before bed or not at all.

The practice at the authors' institution prior to this project was to instruct patients to avoid application of lotions or topical agents in the treatment field for at least four hours before radiation therapy. The institution used the time frame based on historical practice, physician preference, and the National Cancer Institute's (NCI's) *Radiation Therapy and You* (2007). This project aimed to determine whether the rationale for avoiding the use of lotions or topical agents for four hours prior to radiation therapy is supported by evidence.

Methods

A comprehensive literature review was performed to determine the current standards of care related to the use of lotions or topical agents on the skin in the radiation treatment field. Interviews with clinical experts, benchmarking with international cancer centers, and

consultation with professional nursing organizations also were conducted.

Results

A review of the literature using the search terms *radiation skin reactions*, *radiodermatitis*, *lotions*, and *topical agents* in articles published from 1992–May 2009 yielded five relevant articles. In a study by Burch and Parker (1997) that used a phantom model measuring surface area dose of radiation to test 15 skin care products, no bolus effect or increased surface dose was seen with normal application of deodorants, creams, or powders. Meegan and Haycocks (1997) also found no statistically significant difference between women who maintained their usual skin care regimen (N = 64) versus women who only used warm water (N = 92) in the radiation field. As a result of the study, Meegan and Haycocks (1997) changed their practice to allow the use of skin care products prior to radiation therapy.

McQuestion (2006) and Aistars (2006) published review articles exploring the evidence behind skin care recommendations in radiation oncology. McQuestion (2006) described a lack of evidence for management of skin reactions; Aistars (2006) also found no evidence to support

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Note. The top image shows erythema, the center image shows dry desquamation, and the bottom image shows moist desquamation.

Figure 1. Radiation-Associated Skin Reactions

Note. Photos courtesy of University of Rochester Medical Center. Used with permission.

restricting lotions and topical agents for four hours prior to radiation therapy. In addition, Theberge et al. (2009) found no evidence to support restricting nonaluminum-containing deodorants in women undergoing radiation for breast cancer.

Two clinical experts in radiation oncology who are senior faculty members of a large academic medical center with many years of radiation oncology experience were interviewed. Experts were asked, “Does the use of lotion or topical agents prior to radiation therapy cause a bolus effect?” Both experts agreed that lotions or topical agents would not cause a bolus effect and that patients need not restrict their use for four hours prior to therapy.

The National Institutes of Health (NIH) public health educator was contacted about the evidence behind the recommendation in the text of the patient education publication *Radiation Therapy and You*,

which states, “If you use any skin products on days you have radiation therapy, use them at least four hours before your treatment session” (NCI, 2007, p. 41). Specific citations are not referenced for patient education materials, and the public health educator responded that “content was obtained from existing NCI resources, nursing text books, input from NIH experts, and those in the field” (personal communication, March 20, 2008). A request was sent to NCI recommending that the publication be re-evaluated during the next review process because of the absence of any supporting evidence in the literature. A response to the request was received, and the recommendation will be considered when the publication is revised.

A query was posted on the Oncology Nursing Society (ONS) Radiation Special Interest Group (SIG) Web site to obtain benchmarking information. Radiation oncology nurses at several institutions throughout the United States and Canada also were contacted directly via e-mail. Nurses were asked, “Do you restrict the use of lotion or deodorant in the treatment area for any time period prior to radiation?” and “Do you use any specific evidence-based guidelines?” Five responses were received from institutions that served 90–500 patients receiving radiation per day. Geographic location ranged from Canada to facilities in the midwestern, southern, and northeastern United States. Responses to the first question varied from no restrictions to the avoidance of any topical agent in the treatment field at any time during radiation treatment (see Figure 2). Two institutions restricted use for one hour prior to treatment, with one stating that most prescription lotions have a one-hour restriction on their package inserts. One institution restricted the type of deodorant to roll-on (i.e., no stick deodorants) based on physician preference, not evidence. Only one institution cited the use of evidence-based guidelines; the other four responded that their standards were based on historical practice.

Inquiry was made to the ONS national office requesting any evidence-based guidelines regarding avoidance of topical agents prior to radiation treatment. To date, none exist. Correspondence with the ONS Radiation SIG president was initiated to discuss developing a Putting Evidence Into Practice resource on radiation skin care. The response was enthusiastic, and a

project team has been assembled to create this important resource.

Discussion

This evidence-based project showed variation in practice related to the use of lotions and topical agents prior to radiation therapy. The investigation determined that limited research has been published, although some clinical evidence does exist to refute the current practice of educating patients to avoid the use of lotions or topical agents prior to radiation therapy. Results of benchmarking revealed wide variations in current practice, with some clinical experts reporting that patients may use lotions or topical agents prior to radiation therapy without risk for a bolus effect and others restricting their use entirely. In addition, ONS has no published evidence-based guidelines specific to the issue, and the Radiation SIG acknowledges that clinical practice varies across institutions and additional research is needed. Based on the limited amount of evidence available in the literature, additional research concerning the safe use of lotions or topical agents on irradiated skin is warranted. Studies to validate published research results with larger human subject enrollment across various diagnoses could be conducted on patients receiving radiation with new advances in equipment technology, such as tomotherapy and intensity-modulated radiation therapy.

As a direct result of the questions raised during this project, the radiation oncology department at the authors’ institution developed standardized skin

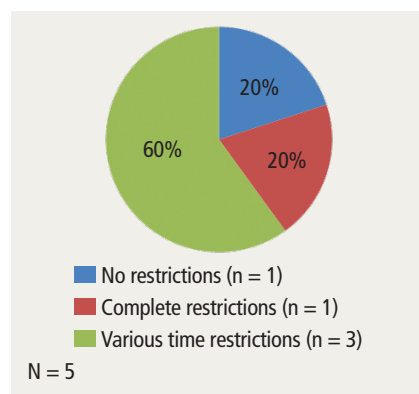


Figure 2. Benchmarking Results for Lotion and Topical Agent Restrictions

care guidelines, which have resulted in revision to patient education material. Staff now educate patients to avoid applying lotion or topical agents immediately rather than four hours prior to treatment. The practice allows the radiation therapist to touch up treatment marks easily on non-greasy skin while allowing patients to maintain control over their skin care regimen.

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