



program in  
evidence-based care  
a cancer care ontario program

programme de soins  
fondé sur des preuves  
un programme de action cancer ontario

## Evidence-Based Series #13-7: Section 1

# The Prevention and Management of Acute Skin Reactions Related to Radiation Therapy: A Clinical Practice Guideline

*A. Bolderston, N.S. Lloyd, R.K.S. Wong, L. Holden, L. Robb-Blenderman, and members of the Supportive Care Guidelines Group*

A Quality Initiative of the  
Program in Evidence-Based Care (PEBC), Cancer Care Ontario (CCO)

**February 21, 2005**

### Guideline Questions

1. What are the optimal methods to prevent acute skin reactions (occurring within the first six months of irradiation) related to radiation therapy?
2. What are the optimal methods to manage acute skin reactions related to radiation therapy?

### Target Population

The recommendations apply to adult patients with cancer of any histology who are undergoing radiation therapy.

### Recommendations

#### ***Prevention of Acute Skin Reaction***

- Skin washing should not be restricted in patients receiving radiation therapy. Recommended washing practices include gentle washing<sup>1</sup> with water alone or gentle washing with mild<sup>2</sup> soap and water.
- Patients receiving radiation therapy to the head should be advised to follow gentle washing practices with mild shampoo.
- Limiting personal hygiene practices is not recommended as this may lead to psychosocial distress for the patient.
- Limited evidence suggests that calendula ointment may decrease the occurrence of  $\geq$ Grade 2 radiation dermatitis in breast cancer patients. Its application in other types of cancer is unknown at this time.

---

<sup>1</sup> "Gentle washing" involves using lukewarm water and taking care not to scrub the skin. Showers should also be lukewarm and low-pressure.

<sup>2</sup> "Mild soap" is defined as a pH-balanced, non-scented product that does not contain lanolin. There is no evidence to suggest that one type of mild soap is preferable to another. However, in one study that rated the irritant quality of 18 soaps, "Dove" was the only soap classified as mild and may therefore be considered (1).

- There is insufficient evidence to support or refute other specific topical agents (i.e., corticosteroids, sucralfate cream, Biafine, ascorbic acid, aloe vera, chamomile cream, almond ointment, polymer adhesive skin sealant) for the prevention of acute skin reaction.
- There is insufficient evidence to support or refute specific oral agents (i.e., enzymes, sucralfate) or intravenous agents (i.e., amifostine) for the prevention of acute skin reaction. The side effects of these agents were more oppressive than those reported in the trials assessing topical agents, and therefore the benefits do not outweigh the risks.

### ***Management of Acute Skin Reaction***

- There is insufficient evidence to support or refute topical agents such as corticosteroids, sucralfate cream, or specific dressings for the management of acute skin reaction.

### **Opinions of the Supportive Care Guidelines Group**

- In the opinion of the Supportive Care Guidelines Group, clinical experience suggests that initial use of a plain, non-scented, lanolin-free hydrophilic cream is helpful in preventing radiation skin reactions. This type of cream attracts and traps moisture at the skin surface to increase the skin's moisture and maintain skin pliability. The cream should be discontinued when skin breakdown occurs.
- In the opinion of the Supportive Care Guidelines Group, clinical experience suggests that low-dose (i.e., 1%) corticosteroid cream may be beneficial in the reduction of itching and irritation. There does appear to be an inflammatory process associated with radiation-induced erythema (2) that may be alleviated somewhat by corticosteroid creams. More evidence is needed to support firm recommendations.

### **Qualifying Statements**

- Given the evidence for skin washing, it would seem likely that the same recommendations would follow for hair washing with shampoo for patients receiving radiation therapy to the head, but there is limited evidence to support this.
- Only one trial compared calendula ointment to Biafine cream. The promising results of this large trial (n=254) in breast cancer patients suggest that calendula ointment may be beneficial to cancer patients undergoing radiation therapy. However, administration difficulties may lead to treatment discontinuation for some patients. No trial compared calendula to no treatment or placebo. It is currently unclear if calendula is superior to placebo or no treatment or whether these results can be generalized to cancer patients undergoing radiation therapy for other types of malignancies.
- Caution must be used to avoid the overuse of corticosteroid cream (3); however, there is limited evidence to suggest that skin thinning would pose a problem for normal corticosteroid use during an average course of treatment (up to eight weeks). The practitioner must also be aware of potential patient allergies to topical corticosteroids and discontinue use if an allergic reaction occurs.

### **Key Evidence**

#### ***Prevention of Acute Skin Reaction***

- A total of 23 trials (21 randomized trials and two non-randomized trials) evaluated various topical and oral agents for the *prevention* of acute skin reaction and were considered eligible for this review. The trials evaluated various creams (e.g., steroid, acid, sucralfate, Biafine, aloe vera, chamomile cream, calendula ointment), oral agents (e.g., enzymes, amifostine), washing practices, and dressings (e.g., polymer adhesive skin sealant).
- A significant benefit in terms of a reduction in the severity of skin reaction was detected in two trials that compared washing the skin to not washing in breast cancer patients.

- One randomized trial compared hair-washing practices in patients receiving cranial irradiation. No significant difference in the degree of erythema was detected in the non-washing group compared with the group that followed their normal hair washing routine.
- The largest randomized trial comparing topical skin care agents for the prevention of acute radiation dermatitis detected a significant advantage of calendula ointment compared to Biafine cream both in the reduction of  $\geq$ Grade 2 dermatitis and in pain response. However, there was also a significant difference in ease of administration, with calendula patients reporting significantly greater difficulty with application of the ointment.
- A significant reduction in the degree of skin reaction was detected in three randomized trials comparing oral enzymes to no treatment. However, none of the trials were blinded, and the side effects reported were more severe than those reported in the trials on topical agents.
- Sample populations were often small, and substantive heterogeneity in clinical outcomes and methodologies between trials made comparisons difficult. Furthermore, trials were of mixed tumour sites and variable radiation therapy regimens.

### **Management of Acute Skin Reaction**

- A total of four small randomized trials and one non-randomized trial aimed at the *management* of acute skin reaction were included in this review. The number of patients in these trials ranged from twelve to thirty-nine.
- Two of the trials assessed steroid creams, one trial assessed sucralfate cream, and two trials assessed various dressings for the management of acute skin reaction. None of the trials detected a significant advantage for any of the interventions assessed.

### **Future Research**

- Agreement among researchers on outcome assessment tools for degree of skin reaction, pain, itching, and quality of life would enable better synthesis of the evidence. Including quality of life as an outcome in future trials is important.
- Randomized double-blind trials evaluating the benefits of moisturizing cream or lotion in the prevention or management of acute skin reaction are needed.
- More trials aimed at assessing the efficacy of various dressings for the management of moist desquamation are also needed.
- Oral enzymes showed promising results in the prevention of radiation skin reactions. A large double-blind randomized trial is needed to confirm these results.
- More trials are needed on irradiated sites such as the perineum and areas of skin folds, where the risk factors and management may differ.

### **References**

1. Frosch P, Kligman A. The soap chamber: a new method for assessing the irritancy of soaps. *J Am Acad Dermatol.* 1979;1:35-41.
2. Simonen P, Hamilton C, Ferguson S, Ostwald P, O'Brien M, O'Brien P, et al. Do inflammatory processes contribute to radiation induced erythema observed in the skin of humans? *Radiother Oncol.* 1998;46:73-82.
3. Snyder DS, Greenberg RA. Radiographic measurement of topical corticosteroid-induced atrophy. *J Invest Dermatol.* 1977;69:279-81.

#### *Funding*

The PEBC is supported by Cancer Care Ontario (CCO) and the Ontario Ministry of Health and Long-Term Care. All work produced by the PEBC is editorially independent from its funding agencies.

*Copyright*

This evidence-based series is copyrighted by Cancer Care Ontario; the series and the illustrations herein may not be reproduced without the express written permission of Cancer Care Ontario. Cancer Care Ontario reserves the right at any time, and at its sole discretion, to change or revoke this authorization.

*Disclaimer*

Care has been taken in the preparation of the information contained in this document. Nonetheless, any person seeking to apply or consult the evidence-based series is expected to use independent medical judgment in the context of individual clinical circumstances or seek out the supervision of a qualified clinician. Cancer Care Ontario makes no representation or guarantees of any kind whatsoever regarding their content or use or application and disclaims any responsibility for their application or use in any way.

*Contact Information*

For further information about this series, please contact **Dr. Rebecca Wong**, Chair, Supportive Care Guidelines Group, Princess Margaret Hospital, 610 University Avenue, Toronto, Ontario, M5G 2M9; TEL 416-946-2126; FAX 416-946-4586;  
Email [rebecca.wong@mp.uhn.on.ca](mailto:rebecca.wong@mp.uhn.on.ca).

For information about the PEBC and the most current version of all reports, please visit the CCO Web site at <http://www.cancercare.on.ca/> or contact the PEBC office at:  
Phone: 905-525-9140, ext. 22055 Fax: 905-522-7681