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Practice Guideline: Symptom Management

Part 4. Management of Acute Radiation-Induced Skin Toxicities

Part 4 of a 5 Part Series:

Evidence Based Recommendations for the Assessment and Management of Radiation-Induced Skin Toxicities in Breast Cancer

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CancerCare Manitoba Guideline

Symptom Management – Methodology for Radiation-Induced Skin Toxicities in Breast Cancer Series

Developed by: Clinical Practice Guideline Adaptation Working Group

Table of Contents

Preface 3
Guideline Recommendations 4
Table 1. Management of Erythema, Pruritus and Dry Desquamation Promote Cleanliness 4
Table 2. Management of Erythema, Pruritus and Dry Desquamation Manage Pruritis 4
Table 3. Management of Erythema, Pruritus and Dry Desquamation Promote Comfort 5
Table 4. Management of Erythema, Pruritus and Dry Desquamation Prevent Infection 5
Table 5. Management of Erythema, Pruritus and Dry Desquamation Protect From Trauma 6
Table 6. Management of Erythema, Pruritus and Dry Desquamation Promote Skin Health 7
Table 7. Management of Erythema, Pruritus and Dry Desquamation Protect From Environment 8
Table 8. Management of Moist Desquamation Promote Cleanliness 9
Table 9. Management of Moist Desquamation Treat the Wound 10
Table 10. Management of Moist Desquamation Promote Comfort 11
Table 11. Management of Moist Desquamation Prevent Infections 11
Table 12. Management of Moist Desquamation Protect From Trauma 12
Table 13. Management of Moist Desquamation Promote Skin Health 13
Table 14. Management of Moist Desquamation Protect From Environment 13
Table 15. Management of Ulceration and Necrosis due to Radiation Treatment Treat the Wound 14
Background 17
Discussion 20
Patient Self-Management 28
Research Implications 29
Guideline Contacts and Contributors 30
Appendices 33

1. Appendix 1 – How to Cleanse a Wound
2. Appendix 2 – Recipe for Saline Cleansing Solution
3. Appendix 3 – How to Culture a Wound
4. Appendix 4 – Application of Silver Sulfadiazine Cream (Flamazine®)
5. Appendix 5 – Levels of Evidence
6. Appendix 6 – Basic Skin Care
7. Appendix 7 – Erythema and Dry Desquamation
8. Appendix 8 – Moist Desquamation
9. Appendix 9 – Late Skin Effects

Preface

At CancerCare Manitoba (CCMB) the Clinical Practice Guidelines Initiative seeks to improve patient outcomes in terms of survival and quality of life through the development, dissemination, implementation, and evaluation of guidelines for the management of common clinical scenarios encountered by cancer patients throughout the province.

This practice guideline was created through the collective efforts of a dedicated group of front-line staff, guideline methodologists, and researchers from: CCMB, University of Manitoba's Faculty of Nursing, Queen's University School of Nursing in Kingston Ontario, and the Canadian Guideline Adaptation Study Group—an initiative of the Canadian Partnership Against Cancer Guidelines Advisory Group.

The content of this guideline was in large part adapted from guidelines produced by: the British Columbia Cancer Agency (2006), the Cancer Care Ontario Program in Evidence-Based Care (2005), and the Winnipeg Regional Health Authority (WRHA, 2005).

The CCMB Department of Nursing and Radiation Oncology Program will review and update this document once every 3 years, unless emerging evidence from scientific research, or practice issues requiring urgent resolution dictate a need for a more immediate change in content.

Purpose

This document is intended as a guide to facilitate a shared, evidence-based approach to the clinical assessment and management of radiation-induced skin toxicities in adults with breast cancer.

For this purpose, it may be used by qualified and licensed healthcare practitioners involved with the care of oncology patients, which may include (but is not limited to): physicians, surgeons, nurses, radiation therapists, pharmacists, dieticians and psychosocial oncology professionals at CancerCare Manitoba's tertiary sites in Winnipeg, the Western Manitoba Cancer Centre in Brandon, and CCMB Community Oncology Program sites throughout the province.

Disclaimer

This guideline document should be viewed as an evidence-based practice tool, and as such, it does not represent an exhaustive text on the subject of radiation-induced skin toxicities. Clinicians are advised to use the guideline in their practice concomitantly with information from other evidence-based sources.

Use of this guideline in any setting should not preclude use of the practitioner's independent judgment, nor should it replace consultation with the appropriate oncology specialty when indicated (e.g. Radiation or medical oncology, nursing, pharmacy, radiation therapy, psychosocial oncology, spiritual care, nutritional therapy). Clinicians are expected to apply the recommendations within the boundaries of professional standards and scope of practice, and according to their personal level of training and experience.

It is the responsibility of the practitioner to develop an individualized disease or symptom management plan for each patient under his/her care, and ideally this should take place within the context of an inter-professional team. The needs and preferences of the patient and the family should always be reflected in the plan of care.

Management of Acute Radiation-Induced Skin Toxicities – Guideline Recommendations

Management of Erythema, Pruritus and Dry Desquamation

Good skin hydration, hygiene, and protection should be encouraged and reinforced with the patient throughout the management of erythema, pruritus, dry desquamation, and moist desquamation. (See Appendix 7)

Table 1. Management of Erythema, Pruritus and Dry Desquamation Promote Cleanliness

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Continue to follow the skin hygiene recommendations in Part III. Skin Health Promotion – Health Promotion Interventions	Skin hygiene promotes healthy skin	***Ia-IV***	

Table 2. Management of Erythema, Pruritus and Dry Desquamation Manage Pruritis

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Apply hydrocortisone cream 0.5% or 1% sparingly/thinly to itchy areas up to 4 times per day. Do not apply to ***non***-intact skin	Clinical experience has found that this reduces pruritis[1,2]	***IV***	Do not apply to open skin as impairs healing. Instruct patients to wash hands after application.
Oral antihistamine may be beneficial for pruritis[1]	Decrease itch	***IV***	Best is diphenhydrAMINE, but can try others if drowsiness not acceptable.

Table 3. Management of Erythema, Pruritus and Dry Desquamation Promote Comfort

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Analgesics as ordered by oncology practitioner (physician or nurse practitioner)	Clinical experience has shown analgesia to promote comfort[1]	*IV*	
Topical analgesics may be an option for pain not well controlled with oral analgesics	Clinical experience has shown this to be beneficial[1]	*IV*	Consult with Compounding Pharmacy or CCMB Pain and Symptom Clinic.
Wear loose fitting non-binding clothing (e.g. soft breathable fabric like cotton)	To promote comfort. Cotton is a breathable fabric[1,4]	*IV*	
Consider cool clean cloths or normal saline compresses applied to areas of severe erythema 2-3 times per day for comfort	May be soothing and promote comfort. No evidence to suggest decreases inflammation[1, 4]	*IV*	

Table 4. Management of Erythema, Pruritus and Dry Desquamation Prevent Infections

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Good hand washing. Family, nurses and physicians doing dressings are to use non-sterile gloves to remove outer dressing and sterile gloves for dressing changes	Basic principle of infection control		
Avoid petroleum based products on treatment area	Hydrophobic water repelling products such as petroleum do not moisturize and can have bolus effect[1]	*IV*	
Avoid using talcum, baby powder, and cornstarch especially on treatment areas	Talcum, baby powder and cornstarch do not moisturize. These products promote fungal growth and secondary infections in moist areas, especially axillae and breast folds[1]	*IV*	
Skin in treatment field should be clean and product-free at time of treatment	To minimize potential for bolus and irritant effect[1,4]	*IV*	On treatment days consider: Do not freshly apply products to skin in treatment field within a 2-hour period before treatment (allow for absorption). If this is not possible, gently wash off medicated products prior to treatment.

Table 5. Management of Erythema, Pruritus and Dry Desquamation Protect From Trauma

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Avoid tape or adhesive bandages in treatment field	To avoid possible skin trauma[1, 4]	***IV***	
Avoid scratching	Avoid trauma to skin, can result in infections[1]	***IV***	
Avoid wearing jewellery over treatment area	Avoid trauma to skin[1] *Panel consensus decision*	***IV***	Clinical experience has found that wearing of jewellery over treatment area can result in skin reactions due to rubbing on skin.
Protect from temperature extremes in treatment area (avoid ice packs, heating pads, hot water bottles)	Avoid thermal injury to skin[1]	***IV***	
Avoid swimming in pools and lakes	Chlorinated pools can cause drying and irritation of skin. Lakes and chlorinated pools expose those with skin breakdown to increased risk of infection[1, 4, 5]	***IV***	
Avoid hot tubs and saunas, especially if there is a skin reaction	Hot tubs and saunas expose skin to risk of chemical and heat irritation and can increase risk of infections in non-intact skin[1,4]	***IV***	
Avoid shaving (or use an electric shaver instead) in treatment area	To avoid skin irritation from friction and prevent cuts[1,4]	***IV***	
Use of deodorant or antiperspirant on intact skin only[5-9]		***Ib-IV***	Use of deodorants or antiperspirants on non-intact skin could result in chemical irritation.
Avoid products containing alcohol, alpha hydroxy acids, perfumes or other drying agents in treatment area	Can result in a drying effect and increase skin reactions[1,4]	***IV***	

Table 6. Management of Erythema, Pruritus and Dry Desquamation Promote Skin Health

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Ensure adequate oral hydration. Females should drink approximately 2.2 litres (9 cups) and males 3 litres (13 cups) per day limiting caffeine containing beverages to 237-300 mL or 400 mg of caffeine per day	Good hydration promotes healthy skin[10,11]	***IV***	
Follow Canada's Food Guide for good nutrition. Ensuring adequate protein intake	Being well nourished promotes healing and helps the body fight infection. Protein is essential for healing and provides the building blocks to new cells and tissues[12,13]	***IV***	Sources of protein are included in the Meat and Alternatives, and Milk and Alternatives food groups.
Multivitamin/mineral supplement will ensure the recommended intakes are achieved	To ensure recommended intake are achieved[11, 12]	***IV***	Check with Oncologist before start.
It is important that patients with diabetes maintain good blood glucose control[17]	Poorly controlled diabetes can affect healing	***IV***	
Aloe vera gel should not be used to provide skin moisture. Can use if skin is intact for the purpose of cooling and soothing only	Aloe vera gel has no moisturizing effect , but may provide some relief by cooling and soothing affected area[2,3]	***Ib-IV***	
Avoid smoking	Interferes with healing[1,5]	***IV***	

Table 7. Management of Erythema, Pruritus and Dry Desquamation
Protect From Environment

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Protect treatment area from direct sun and wind exposure. For example, cover area being radiated with clothing and wear wide-brimmed hat	Prevent trauma to skin.[1,4] "Destruction of melanocytes in the irradiated dermis and slower melanin production following irradiation reduce the skin's ability to protect itself from UV rays"[14]	***IV***	
If exposure to the sun cannot be prevented, use sunscreen on intact skin (SPF 30 or higher). Remove sunscreen completely after sun exposure and before radiation treatment as the sunscreen may contain metals that could cause a reaction	Standard skin cancer prevention recommendations for all persons recommend sunscreen with SPF 30 with both UVA and UVB protection. As treated skin is more sun sensitive recommend SPF 30 or higher be used[1,4,21]	***IV***	Apply sunscreen liberally to exposed skin 15-30 minutes before going out in the sun and reapply 15-30 minutes after sun exposure begins. Should also reapply sunscreen after vigorous activity that could remove product, such as swimming, towelling or excessive sweating and rubbing.[15]
Avoid tanning lamps/salons	Standard skin cancer prevention recommendations for all persons. Could increase skin reaction[1]	***IV***	

Management of Moist Desquamation

Table 8. Management of Moist Desquamation
Promote Cleanliness

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Shower as tolerated[1,4]		***Ib***	Patients may find showers and soapy water irritating and painful on open areas.
Avoid scrubbing and use of soap on open areas	Soap and scrubbing can irritate wounds[1,4]	***Ib***	See patient education sheet for management of moist desquamation. To be given to patient once problem occurs. *(See Appendices 6 to 9)*

Table 9. Management of Moist Desquamation
Treat the Wound

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Cleanse wound with normal saline daily after bathing, prior to radiation to remove any topical agents and post radiation treatment when applying a new dressing	Normal saline is an effective low cost and low toxicity solution for wound cleansing. Minimizes risk of infection[1,2,4, 16]	***IV***	Dressings should be changed daily post radiation. On weekends or ***non***-radiation treatment days, consider need for dressing change based on amount of exudates. Refer to Home Care as appropriate.
Apply non-adherent initial contact dressing (e.g. Mepitel®) as initial primary contact dressing	Non adherent contact dressing minimizes pain, and is easily removed without causing trauma to the wound[17, 18]	***III-IV***	Dressings such as Mepitel® (various sizes), Telpha™, and burnet recommended in this guideline must be available both in CCMB clinics and on radiation floor. Refer to *Appendix* 1 How to cleanse a wound. Normal saline can be made at home (*Appendix 2)* or commercial preparation can be purchased. If patient is immunocompromised, use of commercially prepared solution is best. Prior to discharge, determine whether or not patient can access recommended dressings from his/her local Health Authority/Home Care Program. If patient has completed radiation treatment, Mepitel® can be left in place for 3 days with changing of cover dressings as needed. If ointments or other topical agents are needed, these can be applied over top of or under Mepitel® as they will be absorbed through this dressing.
Use low adherent cover dressing (e.g. Telfa™) to further minimize dressing sticking to wound	Recommended use of low adherent cover dressings to avoid sticking of dressing which could enhance discomfort[1]	***IV***	Avoid use of gauze dressings as increases risk of dressing sticking.
If excessive drainage use absorbent cover dressing (e.g. abdominal pad) over low adherent dressing[1]		***IV***	Consider referral to Home Care nursing services if patient unable to self-manage dressing changes.
Avoid use of adhesive tape in treatment area. Secure dressings with burnet or clothing. If tape must be used, consider Mepitac® tape as it is less adhesive	Tape can cause skin tears[1, 4]	***IV***	Many patients do not require burnet to hold Mepitel® in place unless patient is very active. Mepitel® adheres to skin and is held in place by clothing or skin folds.
If infection is present, consider use of antibiotic products (e.g. Polysporin®, Flamazine®) or oral antibiotics	Common practice for management of infections[1]	***IV***	

Table 10. Management of Moist Desquamation Promote Comfort

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Analgesics as ordered by oncology practitioner (physician or nurse practitioner)	Clinical experience has shown analgesia to promote comfort[1]	***IV***	
Topical analgesics may be an option for pain not well controlled with oral analgesics	Clinical experience has shown this to be beneficial[1]	***IV***	Consult with compounding Pharmacy or CCMB Pain and Symptom Clinic.
If skin is open use saline compresses 2-3 times per day to relieve areas of severe redness, burning, itching and discomfort. Do not apply to open skin areas/skin breakdown			
Wear loose fitting non-binding clothing (e.g. soft breathable fabric like cotton)	To promote comfort. Cotton is a breathable fabric[1,4]	***IV***	

Table 11. Management of Moist Desquamation Prevent Infections

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Avoid using talcum, baby powder and cornstarch especially in treatment areas	Talcum, baby powder and cornstarch do not moisturize. These products promote fungal growth and secondary infections in moist areas, especially in axillae and breast folds[1].	***IV***	
Regularly assess for signs of infection - fever, odour, purulent discharge, swelling, and/or increased pain[1]	Open skin areas are at increased risk for infection.	***IV***	Obtain wound cultures when signs and symptoms of infection are present.
If infection is suspected, culture wound after cleansing with normal saline	Basic infection control practice	***IV***	*See Appendix 3:* How to Culture a Wound
Topical (e.g. Flamazine®, Polysporin®) or systemic antimicrobials should be considered if infection/positive culture	To prevent/manage infection	***IV***	*See Appendix 3:* How to Culture a Wound
Good patient hand washing prior to dressing change if the patient is doing the dressing. Nurses and physicians to use sterile gloves for dressing changes and non-sterile gloves for removal of dressing	Basic infection control practice	***IV***	

Table 12. Management of Moist Desquamation
Protect From Trauma

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Avoid tape or adhesive bandages in treatment field	To avoid possible skin trauma[1, 4]	***IV***	
Avoid scratching	Avoid trauma to skin, can result in infections[1]	***IV***	
Avoid wearing jewellery over treatment area	Avoid trauma to skin[1] *Panel consensus decision*	***IV***	Clinical experience has found that wearing of jewellery over treatment area can result in skin reactions or irritation due to rubbing on skin.
Protect treatment area from temperature extremes (avoid ice packs, heating pads, hot water bottles)	Avoid thermal injury to skin[1]	***IV***	
Avoid swimming in pools and lakes	Chlorinated pools can cause drying and irritation of skin. Lakes and chlorinated pools expose those with skin breakdown to increased risk of infection[1, 4, 5].	***IV***	
Avoid shaving (or use an electric shaver instead) in treatment area	To avoid skin irritation from friction and prevent cuts[1,4]	***IV***	
Avoid hot tubs and saunas, especially if there is a skin reaction	Hot tubs and saunas expose skin to risk of chemical and heat irritation and can increase risk of infections in non-intact skin[1,4].	***IV***	

Table 13. Management of Moist Desquamation Promote Skin Health

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Ensure adequate oral hydration. Females should drink approximately 2.2 litres (9 cups) and males 3 litres (13 cups) per day limiting caffeine containing beverages to 237-300 mL or 400 mg of caffeine per day	Good hydration promotes healthy skin[10,11]	***IV***	
Follow Canada's Food Guide for good nutrition. Ensure adequate protein intake	Being well nourished promotes healing and helps the body fight infection. Protein is essential for healing and provides the building blocks to new cells and tissues[12, 13]	***IV***	Sources of protein are included in the Meat and Alternatives, and Milk and Alternatives food groups.
Multivitamin/mineral supplement will ensure the recommended intakes are achieved	To ensure the recommended intakes are achieved[11, 12]	***IV***	
It is important that patients with diabetes maintain good blood glucose control[17]	Poorly controlled diabetes can affect wound healing[17]	***IV***	
Avoid smoking	Interferes with healing[1, 20]	***Ib***	
Aloe vera gel should not be used to provide skin moisture. Can use if skin is intact for the purpose of cooling and soothing only	Aloe Vera gel has no moisturizing effect, but may provide some relief by cooling and soothing affected area[2,3]	***Ib-IV***	
Report moist desquamation to therapist, nurse and doctor. These wounds usually require a dressing		***IV***	

Table 14. Management of Moist Desquamation Protect From Environment

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Protect treatment area from direct sun and wind exposure (e.g. cover area being radiated with clothing and wear a wide-brimmed hat)	Prevent trauma to skin.[1,4] "Destruction of melanocytes in the irradiated dermis and slower melanin production following irradiation reduce the skin's ability to protect itself from UV rays"[14]	***IV***	
Avoid tanning lamps/salons	Standard skin cancer prevention recommendations for all persons[1]	***IV***	

Management of Ulceration and Necrosis due to Radiation Treatment

Table 15. Management of Ulceration and Necrosis due to Radiation Treatment
Treat the Wound

Recommendations	Rationale	Level of Evidence	Clinical Considerations/Comments
Refer to Radiation Oncologist or Radiation Nurse for guidance on wound care	May require discontinuation of radiation as per oncologist	***IV***	A complicated wound is one that involves delayed healing, infection and cannot be closed without complex intervention.[17]
Refer to WRHA Wound Care Guideline for management if patient no longer receiving radiation		***IV***	
Manage those with malignant wounds as per WRHA Malignant Wound Care Guidelines		***IV***	
Refer to Infection Control Services, CCMB if required		***IV***	
Consider skin grafting if malignant wound absent. Refer to Plastic Surgery if malignant wound absent		***IV***	

Unresolved Issues

Future research is required comparing wound contact dressings for moist desquamation for speed of healing, comfort, ease of application, and use by patient.

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Symptom Management Recommendations

Management of Acute Radiation-Induced Skin Toxicities

I. Background

The occurrence of acute radiation-induced skin reactions can be problematic to the patient and can lead to negative health outcomes. Appropriate management of these skin reactions is necessary to minimize patient distress, promote healing, and prevent infections. Breast radiation skin reactions are often more severe in areas where skin touches skin, such as the breast folds or axillae. Several patient specific factors may increase the risk of radiation skin reactions. These include compromised lymphatic drainage (lymphedema), chronic sun exposure, personal and/or family history of radiosensitive conditions, the use of certain medications, age, smoking, alcohol use, body habitus, nutritional status, etcetera.[1-3]

Current wound care practices support the principle of moisture-balanced wound healing. This principle outlines that optimal wound healing is best promoted by ensuring the wound is neither too moist nor too dry.[4]

Types of Radiation-Induced Skin Reactions

Common acute radiation-induced skin reactions include erythema (pruritus), dry desquamation, and moist desquamation, typically progressing in that order.

- Erythema and pruritus occur from the release of histamine-like substances from germinal cells damaged during radiation. Erythema presents as pink to dusky discoloration of the radiated skin. This discoloration may also be accompanied by mild local edema, burning, itching and discomfort. Onset of erythema is usually after 2 - 3 weeks of standard fractionated radiation treatment.

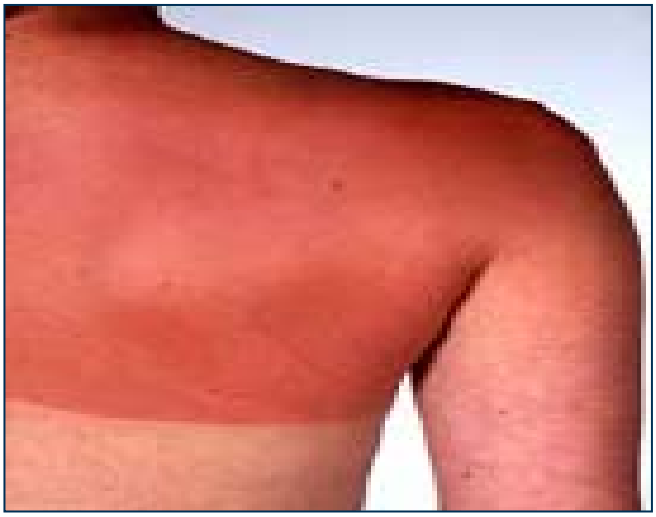

Figure 1. Erythema. *Photo credit: BC Cancer Agency

- Dry desquamation occurs when the production from sweat and sebaceous glands has been impaired through partial loss of the epidermal basal cells from radiation treatment. It may result in dryness, itching, scaling, flaking, peeling, and hyper-pigmentation within the radiation treatment area.

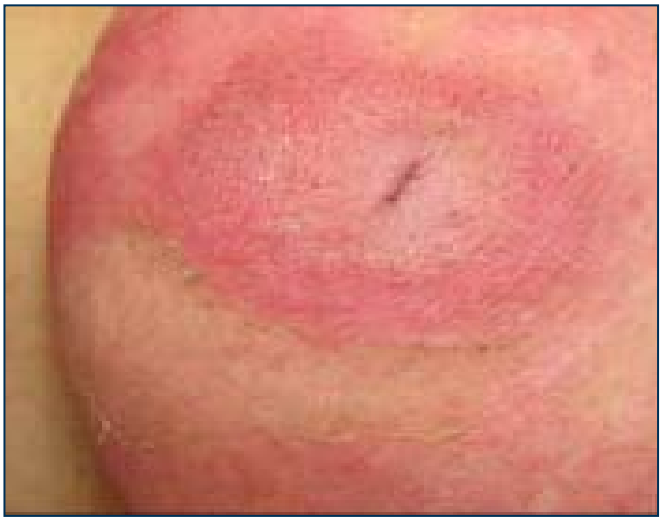

Figure 2. Dry Desquamation. *Photo credit: BC Cancer Agency

- Moist desquamation, one of the most severe of the potential acute skin reactions, is caused by radiation damage to the basal cell layer of the skin. It presents as cutaneous blistering or vesicle formation resulting in serous discharge. This can lead to nerve exposure and pain.[2, 3] Moist desquamation can progress to open wounds, thus requiring close monitoring and interventions to promote wound healing.

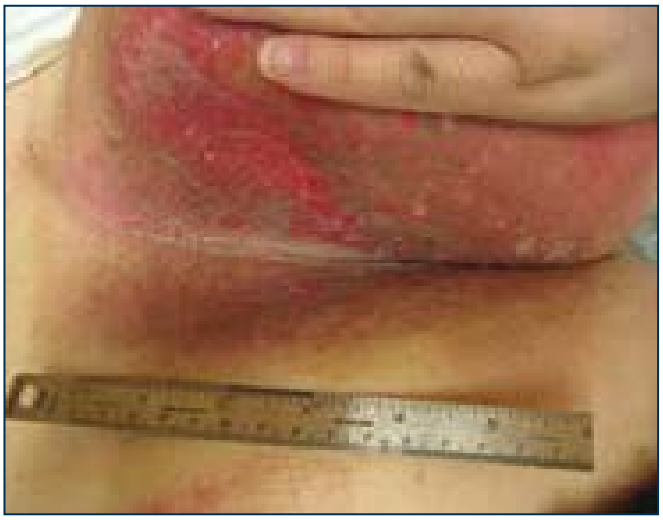

Figure 3. Moist Desquamation. *Photo credit: BC Cancer Agency

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II. Discussion

Despite the limited evidence directing clinical practice, optimal management of radiation-induced skin reactions requires a consistent and systematic approach. Recommendations have therefore been made through consideration of evidence from selected guidelines, additional literature searches, clinical practice experience and consensus of the panel, cost of potential interventions, and patient comfort and preference.

Additional literature searches were conducted to supplement information for the interventional recommendations this guideline. PubMed and Google Scholar were selected as the data sources of most of the literature searches in an attempt to capture literature available in full publication (PubMed, Google Scholar) and abstract (Google Scholar) form. In PubMed, the "breast neoplasms" Medical Subject Heading (MeSH) was used to isolate literature pertaining to our selected patient population. See Part I. Methodology of this series for complete methodology.

The following agents, or interventions, were the subject of further literature searches:

Antihistamines

The mechanism of pruritus is thought to be an inflammatory process causing release of histamine. Therefore, use of antihistamines for the management of pruritus is often employed in clinical practice. Clinical experience has shown that first generation antihistamines (e.g., diphenhydrAMINE) may have greater effect on pruritus versus second generation antihistamines (e.g., loratadine, cetirizine.), but are generally more sedating than second generation antihistamines. Antihistamine selection may be at the preference of the patient and with other patient specific factors taken into consideration (i.e., concurrent medical conditions, medications). No compelling evidence was found to support or refute the use of antihistamines for treatment of breast radiation-induced pruritus. **However, the panel agreed there may be a role for the use of antihistamines in this clinical scenario based on the clinical experience of its members**.

Level of Evidence IV

Framycetin Dressing (Sofra-tulle®)

Framycetin is an antimicrobial available in a variety of products. Framycetin dressings have been employed in wound care to minimize scarring after wound healing. The role of framycetin dressings in the management of radiation-related skin reactions was not addressed in the guideline source documents. The panel identified interest in assessing the role of framycetin dressings in management of radiation-related skin reactions, however no literature was found to support or refute its use. **The consensus of the panel was to consider this product as a treatment option only in the presence of infection.**

Level of Evidence IV

Gramcidin/Polymyxin B (Polysporin®) and Bacitracin/Polymixin B/Neomycin (Neosporin®)

A variety of topical antimicrobial products are readily available to patients without the requirement of a prescription. The panel reported that these products are used regularly in clinical practice, often recommended to patients when erythema first presents as infection prophylaxis. No literature was found to support or refute the

use of gramicidin, polymyxin B, bacitracin, or neomycin based products for infection prophylaxis of radiation skin reactions. **Due to concerns regarding potential for antibiotic resistance, the consensus of the panel was to reserve use of topical antimicrobials to situations only when infection is present.**

Level of Evidence IV

Hyaluronic Acid

Hyaluronic acid is a natural component of the dermal extracellular matrix and is distributed throughout connective tissues.[1,2] These natural properties are considered favorable in wound healing, especially for the treatment of superficial wounds.[1,2] The use of hyaluronic acid is common in clinical practice for the treatment of radiodermatitis due to the ease of application and colourless appearance, which does not mask the wound or erythema.[2] A review of the evidence was completed due to conflicting results regarding the effectiveness of hyaluronic acid for the treatment of radiodermatitis. Three studies looked at the efficacy of hyaluronic acid in the reduction of radiation dermatitis after radiation therapy for breast cancer compared to the best supportive care.[1-3] Results were varied. Pinnix et al. found no benefit for the prophylactic use of hyaluronic acid gel in the reduction of Grade 2 or greater dermatitis compared to a petrolatum-based gel.[1] In fact, they found that hyaluronic acid gel resulted in a significantly higher rate of Grade 2 or greater radiodermatitis.[1] The efficacy of using hyaluronic acid to treat radiodermatitis was investigated by Kirova et al. They found no significant difference between the use of hyaluronic acid compared to a simple emollient cream for breast cancer patients presenting with Grade 1-2 radiodermatitis during postoperative radiotherapy.[2] In contrast, an observational study suggests that hyaluronic acid is beneficial both prophylactically and as a treatment for radiation dermatitis.[3] This study revealed that intensive use doubled the likelihood that radiodermatitis would *not* develop in breast cancer patients, as well as found effects of lower incidence of radiodermatitis, lower grade of toxicity and lower proportion of radiodermatitis.[3] Furthermore, two studies found an improvement in symptoms of pain and skin colorimetry when hyaluronic acid was used intensively.[1,3] Consideration of clinical experience and current evidence was important to the development of any recommendation. **At this time the panel does not recommend the use of hyaluronic acid for the treatment of radiodermatitis due to the variability found in clinical evidence.**

Hydrocolloids

"Hydrocolloids are occlusive and adhesive wafer dressings which combine absorbent colloidal material with adhesive elastomeres to manage light to moderate amount of wound exudate."[4] A protective gel-like covering is formed when most hydrocolloids react with wound exudates.[4] Although hydrocolloids do not have the absorptive capacity of other dressings they are known to assist in wound debridement by maintaining a moist wound environment.[4,5] An evidence review was necessary to determine the proven effectiveness of hydrocolloids in the treatment of moist desquamation. A systematic review concluded that there is variable and conflicting evidence to support the use of hydrocolloids in the treatment of radiodermatitis during breast radiation treatment.[6] Mak et al. suggest that the use of hydrocolloid dressings does not significantly reduce wound healing times, but this effect may be influenced by a small sample size (n=18).[5] This is in contrast to anecdotal experience and conventional wisdom which support the use of hydrogels and hydrocolloids in an aim to manage moist desquamation and improve comfort by promoting moist wound healing.[5,7] Positive results from a study evaluating the effectiveness of hydrocolloid dressings in the treatment of radiation-induced moist skin desquamation support its use.[8]

However, the authors stress the importance of studies to compare hydrocolloid use to other practices.[8] The BC Cancer Agency guideline recommended the use of hydrocolloids such as duoDERM® in moist desquamation with moderate exudates to maintain a moist wound bed and support autolytic debridement.[4] **The guideline panel felt that the use of hydrocolloids should only be considered post treatment in cases of moist desquamation with moderate exudates and no infection.**

Level of Evidence IV

Hydrogels

Hydrogels can come in the form of gels or as sheets of cross-linked polymer gels. Both are used to help create and maintain a moist wound environment and can provide absorption, desloughing and debriding capacities to necrotic and fibrotic tissue.[4] Hydrogels can have a cooling effect and are thought to promote comfort.[9, 10] A literature review was required to establish panel recommendations related to the use of hydrogel in the management of moist desquamation caused by radiation therapy. Very little evidence was available to support or refute the use of hydrogels in the management of moist desquamation.[6] A large randomized study done in 2007 compared dry dressings to hydrogel application and found no evidence to support the routine use of hydrogels in moist desquamation after radiation.[9] Furthermore the authors suggest that healing times may have been prolonged, without any improvement in patient comfort.[9] These results were supported by a study completed in 2012 indicating that hydrogel dressings offered no benefit in the treatment of radiodermatitis.[11] Conversely, a randomized controlled trial completed in 2008 demonstrated a significant advantage of hydrogels over standard care (gentian violet) in thirty patients undergoing radiotherapy who had developed moist desquamation within the radiation field. [12] The results showed that hydrogel dressings were more likely to heal radiation-induced moist desquamation, led to a faster healing rate, and were better tolerated by patients.[12] However, this study is at risk for potential bias due to the small sample size, premature study closure due to non-concordance resulting from physician- and patient-observed healing advantage, and the lack of a no-treatment arm due to ethical reasons.[12] The BC Cancer Agency guideline recommends hydrogels could be used on moist desquamation with minimal discharge. Hydrogels should not be used for infected wounds, moderate to heavily exudating wounds, and areas that need to be kept dry.[4] **The guideline group agreed that use of hydrogels may be beneficial in non-infected ulcerating and necrotic wounds post-radiation treatment but not during radiation treatment.**

Level of Evidence IV

Initial Contact Dressing

Mepitel® dressings incorporate a soft silicone adhesive technology (Safetac®) to allow the dressing to adhere to dry intact skin but not to moist wounds.[6] In Canada no other comparable product was available with this technology when this guideline was written. Patients and radiation nurses have found that it enhances comfort and shortens healing time compared to other initial contact dressings. It is also highly recommended in an article by Glover and Harmer (2014) summarizing best evidence-based practices for assessment and management of radiotherapy-induced skin reactions.[7]Mepitel® has a low shear factor and causes less sticking of dressing to wound bed.[6] Benefits of Mepitel® are that it can be left on during treatment and can be used for several days (maximum 7 days) once radiation treatment is finished. Other products (i.e., Adaptic®, Jelonet®) can be used when Mepitel® is not available; however these require more frequent dressing changes, and may lead to increased patient

discomfort, increased healing time, and increased difficulty with the management of patient dressings. For example, Adaptic® must be changed daily and Jelonet® gauze must be changed every 12 hours as it has been known to quickly dry out and stick to areas, causing damage to fragile new skin. **Mepitel® is recommended by the guideline panel as the choice product for an initial contact dressing for moist desquamation skin toxicity based on clinical experience. As other products become available the panel advises they be given consideration for use.**

Level of Evidence IV

Low Adherent Cover Dressing

Inexpensive and widely available, low adherent cover dressings maintain a moist wound bed and allow exudate to pass through into a secondary dressing.[13] Clinical experience supports low adherent cover dressings to gauze dressings which stick to wounds and increase patient discomfort and bleeding. **Due to minimized adherence to the wound bed we recommend the use of a low adherent cover dressing (e.g. Telpha™) instead of gauze dressings.**

Level of Evidence IV

No-Sting Barrier Film

The application of a barrier film may minimize desquamation by maintaining moist healing and reducing the effects of abrasion.[14] Although the use of a retentive protective barrier ointment is recommended by BC Cancer Agency, no other guidelines support its use. Clinical experience suggests that No-Sting Barrier Film is difficult to use and may not offer significant benefits to the patient. The panel felt that a review of the evidence was necessary prior to forming any recommendations. One trial was identified which compared to 3M™ Cavilon™ No-Sting Barrier Film to sorbolene cream during post-mastectomy irradiation.[14] The trial reported that while the No-Sting Barrier Film provided an improvement in the duration and frequency of radiation-induced moist desquamation versus sorbolene cream, there was no difference in patient-reported pain or pruritus. A meta-analysis suggests that there is limited evidence to suggest that prophylactic use of No-Sting Barrier Film reduces the rate of moist desquamation.[15] The clinical experience of the panel was that patients often do not allow this product to dry appropriately and that this may exacerbate pain if skin adheres in areas of folds or friction. **The panel does not recommend the use of this product due to difficulties experienced with previous use.**

Level of Evidence IV

Silver Sulfadiazine/Silver Products

Silver sulfadiazine is a prescription product used topically as an antibacterial.[16] Both the BC Cancer Agency and WRHA guidelines recommended use of silver sulfadiazine for prophylaxis and treatment of infection in open wounds due to radiation.[4,17] Clinical expert opinion cautioned that silver sulfadiazine creates a pseudo membrane over the wound that often requires debridement to encourage healing. A burns specialist at Health Sciences Centre, Winnipeg, commented that additional concern exists for inappropriate use which may encourage antibiotic resistance.[18] There was limited evidence to support or refute the use of silver sulfadiazine for infection prophylaxis of radiation skin reactions. One randomized controlled study showed that silver sulfadiazine cream was able to reduce the severity of radiodermatitis compared to general skin care regimens alone.[19] However, the

authors indicate that the inability to provide a double-blind placebo-controlled methodology limits the generalizability of the results.[19] They also do not define general skin care regimens. **Due to concerns regarding potential for antibiotic resistance, the consensus of the panel was to reserve use of silver sulfadiazine and silver products for when infection is present only.**

Level of Evidence IV

Topical Corticosteriods

In the presence of dry desquamation, topical corticosteroids are frequently employed in current clinical practice. The use of these agents for prevention of radiation-induced skin reactions is also a common clinical practice. Since there are potential concerns with overuse of topical corticosteroids (e.g. impairment of wound healing, skin atrophy), the panel wished to evaluate the role of topical corticosteroids for prevention of radiation-induced skin reactions. A meta-analysis from 2010 indicates that there is limited evidence to support prophylactic management of radiodermatitis with topical corticosteroids.[15] Several trials were identified which employed prophylactic topical corticosteroids for prevention of radiation-induced skin reactions.[20-28] These trials used different topical corticosteroids of different comparative potencies, making comparisons between the trials somewhat challenging. There were similar outcomes of these available trials, reporting that radiation-induced skin reactions were not prevented by prophylactic use of topical corticosteroids, however, the severity and duration of skin reactions were lessened. A systematic review supports these results and suggests that further randomized controlled trials are necessary as no preferred corticosteroid has been indicated.[29] **The consensus of the panel was to recommend that topical corticosteroids are beneficial for reducing erythema and pruritus. The panel further recommended that the lower potency corticosteroids should be preferentially selected as first choice, with change to higher potency corticosteroids if there is an inadequate relief of symptoms. Topical corticosteroid usage was recommended to be limited to a 3 to 5 day period**. Long term use of topical corticosteroid may be associated with skin atrophy, appropriate duration of corticosteroid use should be determined by clinical effect.[30] Hydrocortisone 0.5% cream is available without a prescription and would be a reasonable first option, with betamethasone 0.1% cream being a reasonable consideration for a more potent, prescription strength product. **Further recommendation was to discontinue topical corticosteroid in the presence of or progression towards skin breakdown, since corticosteroids may impair healing.**

Level of Evidence IV

Wound Cleansing

The Cancer Care Ontario guideline recommended there be no restrictions on bathing in patients receiving radiation.[31] Despite this recommendation, the panel identified variability in common clinical practice in the provision of this recommendation to patients. Additionally, the panel wanted to verify the optimal solution to use for wound cleansing. A recent Cochrane Collaboration review was identified.[32] This review determined that cleansing acute wounds using tap water (high quality drinkable water) did not increase the infection rate in adults; however there was insufficient evidence for tap water to replace normal saline as the solution of choice for wound cleansing.[32] **The consensus of the panel was to recommend no restriction to bathing during radiation therapy. An additional recommendation was to use normal saline for wound cleansing, both after bathing and prior to application of dressings, for minimizing risk of infection and enhancing healing.** ***Level of Evidence Ia-IV***

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III. Patient Self-Management

The panel supports fostering patient independence with regards to wound care and dressing management. This recommendation has potential to minimize costs and resource utilization, as well as promote patients being active in their own care. The panel encourages that patients be educated regarding optimal wound care management, including management of their own dressing changes. When the patient is unable to manage this, family members or referral to regional home care services may be considered as alternatives.

- ***Radiation wound dressing*** - Should be changed each time dressing is removed (e.g. for radiation treatment or bathing/showering). For days not requiring dressing removal (e.g. no radiation and not bathing) then consider amount of exudate and risk for infection to determine frequency of dressing changes required. Mepitel® can be left in place for several days before it requires changing.
- ***Gramicidin/Polymyxin B (Polysporin®) and Bacitracin/Neomycin/Polymyxin B (Neosporin®)*** - If used, apply with dressing changes. Do not use if allergy to gramicidin, polymyxin, bacitracin zinc or neomycin. Gently remove with water/normal saline prior to radiation due to risk of irritation and bolus effect.
- ***Silver Sulfadiazine (Flamazine®)*** - Apply with dressing changes if prescribed. Silver sulfadiazine should not be used if patient has allergy to sulfonamides, or is pregnant. Caution if G6PD deficiency, or severe renal or hepatic disease. Refer to Appendix 4: Application of Silver Sulfadiazine Cream (Flamazine®) for instructions on application. Gently remove with normal saline prior to radiation due to risk of irritation and bolus effect.
- ***Topical Corticosteroids*** - Patients should be instructed to apply with clean hands a very thin layer of hydrocortisone cream up to four times per day.[1] Advise patient to wash hands after application. Do not apply to non-intact skin.

Discussion

The guideline panel's goal regarding choice of dressings was to promote optimal healing, minimize patient discomfort, and promote patient independence with dressing changes. Costs were also considered.

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IV. Research Implications

The guideline panel would like to see further research comparing healing, patient comfort and quality of life issues (e.g. ease of application), and product comparisons between Jelonet® /Adaptic® and Mepitel®.

- ***Ulceration and necrosis*** - Ulceration and necrosis due to radiation are rare occurrences, and typically would involve discontinuation of treatment.[1]

Ulceration and necrosis represent significant complications of radiation treatment. Should ulceration and/or necrosis occur during radiation treatments, it is likely that radiation treatment will be interrupted or discontinued. Timely referral to appropriate individuals for management is important for optimal outcomes. The management of ulceration and necrosis due to radiation treatment is beyond the scope of this guideline. For management of ulceration and necrosis due to malignant wounds, please refer to the WRHA Wound Care Guidelines.[1]

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Guideline Contacts and Contributors

Contact

Pam Johnston, RN, MN, NP, CONC *Radiation Oncology, Pain & Symptom Management*

Panel Members

Pam Johnston, RN, MN, NP, CONC *Radiation Oncology, Pain & Symptom Management*	**Bob Moroz, RT** *Radiation Therapist*
Cathy Coates, RN *CCMB Staff Nurse*	**Michele Morton, RN** *CCMB Staff Nurse*
Linda Davidson, RN *CCMB Staff Nurse*	**Rebecca Pritchard, RN** *CCMB Staff Nurse*
Gina Ginski, RT *Clinical Resource Educator*	**Deb Scott, RN** *CCMB Staff Nurse*
Michelle Lobchuk, RN, PhD *Expert Methodologist*	**Tamara Szajewski, RN** *CCMB Staff Nurse*
Erin Mattson, RN *CCMB Staff Nurse*	**Danica Wasney, BSc (Pharm), ACPR, BCOP** *Clinical Pharmacist*

Clinical Practice Guidelines Initiative

Pamela Johnston, RN, BA *Senior Coordinator*	**Jaymie Walker, MSc** *Guidelines Analyst (2015-2016)*
Daile Unruh-Peters, MA *Implementation Facilitator*	**Morgan Murray, MSc** *Guidelines Analyst (2014-2015)*
Susan Friedenberger *Research Assistant*	**Carrie O'Conaill, MPH** *Research Assistant (2013-2014)*
	Sonia E Tsutsumi, BA *Administrative Assistant (2009 – 2011)*

Other Contributors

Kristi Hofer, BSc (Pharm) *CCMB Pharmacy*	**Catherine Russell, BPT** *WRHA Breast Health Centre*
Dr. Sarvesh Logsetty, MD, FRCS(C), FACS *Burn Unit, Health Sciences Centre*	**Beth Szuck, BA, HEc, CACE** *WRHA*
Angela Martens, RD *CCMB Patient and Family Support Services*	**Dr. Marni Wiseman, MD, FRCPC** *CCMB Department of Medical Oncology/Hematology*
Ruth Holmberg *CCMB Medical Librarian*	**Steve Jones, Language Specialist** *St. Boniface Hospital Research*
Kathleen Klassen, RN, MN, GNC(C), IIWCC *WRHA*	

Reviewers

Dr. Rashmi Koul, *Radiation Oncologist, CancerCare Manitoba*

Dr. William Hunter, *Radiation Oncologist, Western Manitoba Cancer Centre*

Jordana Jones, *RT Nurse, Western Manitoba Cancer Centre*

Tamara Wells, *Clinical Nurse Specialist Palliative Care, Winnipeg Regional Health Authority*

Kathleen Klassen, *Acting Director of Centralized Operations, WRHA Home Care Program, Winnipeg Regional Health Authority*

Approved By

Rashmi Koul, MBBS, DNB, MD, FRCPC, CCPE
Head, Department of Radiation Oncology, Medical Director, Radiation Oncology Program, CCMB

Pam Johnston, RN, MN, NP, CONC
Nurse Practitioner, Radiation Oncology, and Pain and Symptom Management, CCMB

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Margaret B. Harrison RN, PhD
Community Health and Epidemiology
Director, Queen's Joanna Briggs Collaboration
Senior Scientist Practice and Research in Nursing (PRN) Group Queen's University

Joan Van den Hoek BNSc
Practice and Research in Nursing (PRN) Group
Queen's University Kingston

Elizabeth J. Dogherty PhD
Queen's University, School of Nursing

Meg Carley BA
Data Manager, Queen's University, School of Nursing
Data Manager, Canadian Partnership Against Cancer

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V. Appendices

Appendix 1 – How to Cleanse a Wound

Wound cleansing facilitates healing by removing exudate and necrotic tissue and by reducing bacterial burden.

- Cleanse wound with sterile water or low-toxicity solutions (such as normal saline or a commercially prepared wound cleanser)
- Gently irrigate with 100-150 mL of solution
- Use fluid that is at least at room temperature for cleansing (colder solutions can slow down cellular repair)
- Cleanse wound at each dressing change
- Do not use skin cleansers or antiseptic agents (e.g. povidone iodine, sodium hypochlorite solution, hydrogen peroxide, acetic acid) to clean wounds

Note: Topical antiseptic solutions should be reserved for wounds that are non-healable (e.g. povidone iodine) or those in which the local bacterial burden is a greater concern than the stimulation of healing (e.g. aqueous chlorhexadine 0.05%).

Methods of Cleansing

Use enough irrigation pressure to enhance wound cleansing without causing trauma to the wound bed. Safe and effective wound irrigation pressures range from 4-15 pounds per square inch (psi).

Method 1

Irrigate wound with a 30 mL syringe and an 18 or 20 gauge venous access device (i.e. angiocath) held 4-6 inches from the wound bed. (The use of an angiocath rather than a needle is suggested to reduce the danger from needle stick injuries). A mask with eye protection and a gown is recommended to protect against splash-back; this method exerts about 15 psi and is used for wounds that:

- Have moderate/copious exudate
- Contain slough or eschar (necrotic tissue)
- Are critically colonized or infected
- Have increased depth and/or tunneling or undermining

Method 2

Irrigate wound with a single-use 100 mL squeeze bottle of saline or water; this method exerts approximately 4 psi of pressure and is used for wounds that:

- Are shallow
- Have minimal exudate
- Have little or no slough or eschar (necrotic tissue)
- Are not critically colonized or infected

Method 3

- Irrigate wound with a commercially prepared low toxicity spray wound cleanser (follow manufacturers' instructions)
- Commercially prepared wound cleansers contain surfactants which may facilitate the removal of adherent material from the wound bed

Method 4

- Soak or compress wound with moist saline gauze
- May be done after irrigation & prior to application of a new dressing for additional cleansing and loosening wound debris

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Appendix 2 – Recipe for Saline Cleansing Solution[1]

Stove Top Directions

1. In a clean pot, add 2 teaspoons of table salt to 1 litre of water, mix thoroughly
2. Cover saucepan and bring to a full boil. Boil for 5 minutes
3. Keep cover on pot and allow solution to cool in the pot completely prior to using
4. Once the solution has been used, it must be discarded. If any item falls into the solution before it has been used, it must be discarded
5. Solution can be kept for up to 24 hours if left covered. Thereafter it should be discarded and a fresh solution should be made
6. Wash the pot in warm soapy water and rinse before reuse
7. Do not dry the inside of the pot with a cloth. Allow to drip/air dry

Microwave Directions

1. In a clean microwaveable container, add 2 teaspoons of table salt to 1 litre of water, mix thoroughly
2. Add an additional 2 teaspoons of water to offset the effects of evaporation
3. Bring to a full boil. Boil for 5 minutes
4. Keep the container covered and allow solution to cool completely prior to using
5. Once the solution has been used, it must be discarded. If any item falls into the solution before it has been used, it must be discarded
6. Solution can be kept for up to 24 hours if left covered. Thereafter it should be discarded and a fresh solution should be made
7. Wash the container in warm soapy water and rinse before reuse
8. Do not dry the inside of the pot with a cloth. Allow to drip/air dry

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Appendix 3 – How to Culture a Wound

Use the Levine technique to obtain a wound culture swab to guide the use of appropriate antibiotic agents. It is recommended for use as it detects significantly more organisms, as it samples a greater concentration of microorganisms from both the surface and slightly below the surface of the wound (National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance, 2014).

Note: Z technique is not recommended. Angel, D.E., Lloyd, P., Carville, K., & Santamaria, N. (2011); Spear, M. (2014).

The Levine technique for performing quantitative swab cultures:

1. Cleanse the wound with normal saline
2. Remove/debride non-viable tissue
3. Wait two to five minutes
4. If the ulcer is dry, moisten the swab with sterile normal saline
5. Culture the healthiest looking tissue in the wound bed
6. Do not culture exudate, pus, slough, eschar, or heavily fibrous tissue
7. Rotate the end of a sterile applicator over a 1 cm2 area for 5 seconds
8. Apply sufficient pressure to the swab to cause tissue fluid to be expressed
9. Insert swab into collection device
10. Label and send to laboratory promptly, do not leave in a warm place or the culture will deteriorate

References

1. Winnipeg Regional Health Authority (WRHA). Wound Bed Preparation, Evidence Informed Practice Tools. December 2017. www.wrha.mb.ca/ebpt Accessed January 7, 2017. ***Level of Evidence IV***

Appendix 4 – Application of Silver Sulfadiazine Cream (Flamazine®)[1]

Please follow the steps below when applying silver sulfadiazine to your skin:

1. Gently cleanse wound area with normal saline if area is small and dressing is easily removed
2. Cleanse with tap water if area is large, difficult to cleanse or adherence of dressing is problem
3. It is important to gently remove all residual cream from previous applications (saline compresses may be required)
4. Apply a thin layer of cream to area of affected skin only
5. Apply Mepitel® with appropriate cover dressing
6. Apply appropriate secondary dressing. Telfa™ is appropriate if minimal exudates
7. Change dressing at least once daily

References

1. BC Cancer Agency. Care of radiation skin reactions. Available online at: www.bccancer.bc.ca Updated on 23 October 2006. Accessed on 22 May 2014. ***Level of Evidence IV***

Appendix 5 – Levels of Evidence

Levels of Evidence	
Ia	Evidence obtained from meta-analysis of randomised controlled trials
Ib	Evidence obtained from at least one randomised controlled trial
IIa	Evidence obtained from at least one well-designed controlled study without randomisation
IIb	Evidence obtained from at least one other type of well-designed, quasi-experimental study, i.e. studies without planned intervention, including observational studies
III	Evidence obtained from well-designed, non-experimental descriptive studies. Evidence obtained from meta-analysis or randomised controlled trials or phase II studies which is published only in abstract form
IV	Evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities.

References

1. Shekelle PG, Woolf SH, Eccles M, et al. Clinical guidelines: Developing guidelines. *Brit Med J* 1999;318(7183):593.

Appendix 6 – Basic Skin Care

Radiation Therapy Breast or Chestwall — Basic Skin Care

CancerCare Manitoba
ActionCancerManitoba

There are things you can do every day to take care of your skin during radiation.

You should start the following recommendations on the first day of your treatment and continue them until you are finished radiation and completely healed.

Promote Skin Hygiene — *keep radiated skin clean*

- Short, gentle, low pressure showers or baths with lukewarm Water.
- Mild soap may be used gently, if desired.
- Do not scrub the skin in the treatment area.
- Pat skin dry. Do not rub.
- Do not use a wash cloth in treatment areas.
- Deodorants and antiperspirants can be used on intact skin. Patients may continue to use deodorants and antiperspirants (includes aluminum based) if they wish. There is no evidence that skin reactions will be any worse. **Stop use if a skin reaction develops**.
- Do not freshly apply deodorant/antiperspirant on the day of your treatment until after treatment.

Promote Comfort

- Wear loose fitting non-binding clothing (e.g. soft breathable fabric like cotton; sports bra with wide band).

Reminder!

Do not freshly apply moisturizer within a ***two hour period*** before treatment.

Do not freshly apply deodorant/antiperspirant ***on the day of your treatment until after treatment***.

Prevent Infections

- Good hand washing.
- Do not use talcum, baby powder or cornstarch in treatment areas.

Protect from the Skin from Injury

- Do not use tape or bandages in treatment field.
- Do not scratch (e.g. keep your nails short).
- Do not wear jewelry over treatment area.
- Avoid using ice packs, heating pads and hot water bottles on the treatment area. You may not be able to feel extreme temperature changes in the radiated areas and you may cause an injury.
- Do not swim in lakes or pools if you have a radiation skin reaction. If the treatment area is intact, swimming in pools or lakes is permissible. After swimming immediately remove swimsuit and rinse the skin.
- Do not use hot tubs and saunas.
- Do not shave in treatment area (if necessary use an electric shaver instead).
- Do not use products containing alcohol, alpha hydroxyl acids, perfumes or other drying agents in treatment areas.
- Do not use petroleum based products.
- Do not freshly apply moisturizers within a two hour period before treatment.
- Do not use tanning lamps/salons.
- Avoid vigorous rubbing in the treatment area.

Evidence Based Recommendations for the Assessment and Management of Radiation-Induced Skin Toxicities in Breast Cancer **Guideline** — Basic Breast or Chestwall Radiation Skin Care Version 1.0

Protect from Environment

- Treatment area should not be exposed to the sun.
- Cover treatment area with clothing and wear a wide brimmed hat to protect from the sun and wind.
- Use a sunscreen (SPF 30 or higher) if the treatment area cannot be kept out of the sun and as long as the skin is not open. Wash off the sun screen after being in the sun.
- Do not freshly apply sunscreen within a two hour period before treatment.

Keep Your Skin Healthy

- Drink enough fluids. Females should drink approximately 2.2 litres (9 cups) and males 3 litres (13 cups) total fluids per day.
- Limit how many drinks with caffeine you have each day. This includes coffee, tea and colas. It is recommended not to have more than 237-300 mL or 400 mg of caffeine per day. Having more caffeine can lead to dehydration.

Moisturizers should be non-scented, lanolin free, and alcohol free.
Use at least 2—3 times per day.

STOP using moisturizers if your skin becomes open **AND** call a member of your Radiation Oncology team!

- Follow Canada's Food Guide for good nutrition. Make sure you are eating enough protein. This can help your skin to heal.
- If you are having trouble eating and/or are experiencing weight loss, talk to your Radiation Oncology Team; they may refer you to see a dietician. You can take a multivitamin/mineral supplement to help you meet your nutritional needs.
- For diabetics, it is important to keep your blood sugar levels within your recommended range. If the blood sugar is too high, there may be delayed healing of the radiated skin or an increased risk for infection.
- Use a non-scented, lanolin free, alcohol free moisturizer (e.g. glaxal base cream) on your skin at least 2-3 times per day throughout treatment. **If your skin becomes open, stop using the moisturizer and call your Radiation Oncology Team.** Remember, do not freshly apply moisturizers within a two hour period before treatment.
- Aloe Vera gel can be used to cool the skin. It does not moisturize skin.

Additional Notes:

Advice is available at any time!

JUST ASK a member of your Radiation Oncology Team!

Appendix 7 – Erythema and Dry Desquamation

Radiation Therapy Breast or Chestwall — Skin Changes/Reactions: Erythema and Dry Desquamation

CancerCare Manitoba
ActionCancerManitoba

Important

If you notice that you have Erythema or Dry Desquamation talk to a member of your Radiation Oncology Team.

Erythema — the radiated skin becomes pink to red in colour. There may also be mild swelling, burning, itching and pain. Usually occurs 2—3 weeks after starting treatment.

Dry Desquamation — dryness of the radiated skin, itching, scaling, flaking and peeling. These skin changes cause a break in the skin. Open skin can increase the risk of infection.

Continue to follow the guidelines laid out on the Radiation Therapy Breast or Chestwall — Basic Skin Care sheet that you were given. In addition:

Promote Skin Hygiene — *keep radiated skin clean*

- Continue to bath or shower if possible using recommended soaps, as tolerated.
- If you take baths, do not soak the open skin under the water. This water is dirty and can cause an infection.
- Deodorants and antiperspirants can be used on intact skin. Patients may continue to use deodorants and/or antiperspirants if they wish. There is no evidence that skin reactions will be any worse. **Stop use if a skin reaction develops.**
- Do not freshly apply deodorant/antiperspirant on the day of your treatment until after treatment.

Reminder!

Only use deodorants and antiperspirants on intact skin.

STOP use if you develop a skin reaction.

Do not freshly apply deodorant/ antiperspirant ***on the day of your treatment until after treatment***.

Itchy Skin

- Talk to your Radiation Oncology Team about hydrocortisone cream and/or an oral antihistamine to relieve itchiness.

Promote Comfort

- Medications are available to treat pain. Talk to your Radiation Oncology Team.

Reminder!

Do not freshly apply moisturizer within a ***two hour period*** before treatment.

Prevent Infections

- Every day check for signs of infection (fever, odour, discharge, swelling or pain). Contact your Radiation Oncology Team if you have any signs of infection.

Protect the Skin from Injury

- Open skin is vulnerable to infection. Do not swim in pools or lakes. Chlorine can irritate and dry the skin. Lakes can contribute to skin infections.
- Do not freshly apply moisturizers within a two hour period before treatment.

Protect from Environment

- Continue to follow basic skin care guidelines.

Keep Your Skin Healthy

- Continue to follow basic skin care guidelines.

Evidence Based Recommendations for the Assessment and Management of Radiation-Induced Skin Toxicities in Breast Cancer Guideline — Erythema, Itch and Dry Desquamation Version 1..0

Appendix 8 – Moist Desquamation

Radiation Therapy Breast or Chestwall — Skin Changes: Moist Desquamation

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Moist Desquamation is when the skin peels, blisters and has clear yellow drainage. Open skin can be painful because the nerves in the skin are not protected. This can be worse in areas where the skin touches other skin. For example: in the armpit and side of chest being rubbed by the arm with movement.

If you notice that you have moist desquamation talk to a member of your Radiation Oncology Team. The area usually needs to have a dressing put on to keep it clean and prevent infection.

Continue to follow the guidelines laid out on the Radiation Therapy Breast or Chestwall — Basic Skin Care and Radiation Therapy Breast of Chestwall — Skin Changes: Erythema, Itch and Dry Desquamation sheets that you were given. In addition:

Promote Skin Hygiene — *keep radiated skin clean*

- Do not use soap on open skin.
- Do not use deodorants and antiperspirants on open skin.

Promote Comfort

- Medications are available to treat pain. Talk to your oncology doctor or nurse.
- Talk to your radiation nurse who will help you with dressings if needed.

Prevent Infections

- Every day check for signs of infection (fever, odour, discharge, swelling or pain). Contact your Radiation Oncology Team if you have any signs of infection.

Protect the Skin from Injury

- Continue to follow basic skin care guidelines.
- Open skin is vulnerable to infection. Do not swim in pools or lakes. Chlorine can irritate and dry the skin. Lakes can contribute to skin infections.

Protect from Environment

- Continue to follow basic skin care guidelines.

Keep Your Skin Healthy

- Continue to follow basic skin care guidelines.
- Do not use moisturizer on open skin.

You should check daily for infections.

Signs of infection are:
Fever
Odor
Discharge
Swelling or pain

Evidence Based Recommendations for the Assessment and Management of Radiation-Induced Skin Toxicities in Breast Cancer **Guideline** — Moist Desquamation Version 1.0

Appendix 9 – Late Skin Effects

Caring For Yourself After Radiation

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It is important to continue to follow the instructions given to you on the Radiation Therapy Breast or Chestwall — Basic Skin Care Information sheet; and any other additional sheets you may have been given (Radiation Therapy Breast or Chestwall — Skin Changes: Erythema, Itch, Dry Desquamation and/or Radiation Therapy Breast or Chestwall — Skin Changes: Moist Desquamation) until your side effects have gone away — usually within 6—8 weeks.

Skin Care

- Skin reactions (redness, itchiness, peeling and/or blistering) in the treated area may continue to increase for up to 7—10 days following the completion of your treatment. The reactions should then slowly start to improve. It may take up to 6—8 weeks before your skin is fully healed.
- Some patients have been given permanent tattoos, while others may have had marks drawn on their skin. Do not scrub off any skin marks—marks will disappear on their own.
- If your skin is peeling or blistering it is important that you follow the specific washing/cleaning instructions given to you by the nurse or therapist.
- Wait until the tenderness/redness and itchiness has gone away before resuming use of cosmetics or perfumes, and/or shaving in the treated area.
- Over time you may notice changes in the treated skin; it may appear slightly darker or tanned, or you might notice more freckles.
- The treated skin may always be more sensitive to the sun and cold. Keep treated areas well protected by covering up when outside. Use a sun block product with a SPF of at least 30; put it on 30 minutes before going out. Re-apply at least every two hours or after swimming or sweating. It is recommended to use sunscreen on sunny days in the winter. Remember to check sunscreen bottles for best before date—old sunscreen will not protect you.
- Do not use tanning beds.

Reminder!

You may experience fatigue for some time after the completion of treatment. Consider adjusting your life style for a few months (i.e. only return to work part-time).

Fatigue

- Tiredness and fatigue will continue while your body heals. Your energy levels will return with time, usually within 8—12 weeks after your last day of treatment. If fatigue persists see your physician. Follow *Canada's Food Guide* for recommendations of the amount and type of foods required to meet your nutritional and physical needs.

Follow Up Care

After your treatment is completed, a follow-up appointment will be scheduled. At this appointment you will be provided with a personalized follow-up care plan which will outline a follow-up schedule including necessary tests and appointments, what symptoms to watch for, and a summary of the treatments you received to treat your breast cancer. A copy of this follow-up plan will be provided to your family physician or nurse practitioner.

Additional information about available cancer and post treatment programs can be found by calling the **Breast & Gyne Cancer Centre of Hope** at 204-788-8014 or 1-888-660-4866 (toll free) or in a booklet entitled *Moving Forward after Cancer Treatment* is available online at movingforwardaftercancer.ca.

Important

If you do not receive a treatment summary/follow-up care plan from your Radiation Oncology Team please contact your clinic nurse ☺

Evidence Based Recommendations for the Assessment and Management of Radiation-Induced Skin Toxicities in Breast Cancer **Guideline** — Caring for Yourself and Late Skin Reactions Version 1.0

Late Effects

You may experience late effects from your radiation treatment. Late effects are side effects from radiation that may show up several months to years after the treatment has ended. Not everyone will have late effects, but it is important to know what to look for.

Within the treated area, the way your skin looks, feels and moves can change. It may be more severe for some people than others. These effects may be permanent or improve gradually over time. Late radiation skin changes may include:

- **Scaling** is when the skin peels and flakes. This dryness is caused by damage to the sweat/oil glands.
- **Atrophy** is when the radiated skin becomes thin **and** fragile. Skin may recover over time but it will never get back to the way it was before radiation.
- **Telangiectasia** is purplish-red spots on the skin surface that look like little spiders. This is caused by damage to tiny blood vessels in the skin. This can occur up to 8 years following radiation therapy.
- **Fibrosis** is when the skin feels hard, thick and uneven. This can cause tightness that limits movement of the area. Soft tissue under the skin can become hard and painful. Fibrosis can occur 4-6 months after treatment.
- An **ulcer** is an open sore that does not heal easily. An injury to the radiated area can cause the skin to become red, hot and painful. The skin may break open and cause an ulcer.
- **Hyperpigmentation** is a darkening of the skin. This often resolves in 3 months to a year after completion of radiation but may not go away. People with darker skin have more melanin and may experience more hyperpigmentation.
- **Hypopigmentation** is a lightening of the skin. This can be a permanent change that occurs following the resolution of hyperpigmentation.
- **Lymphedema** is a collection of fluids that causes swelling in the arms.

Please contact the **Breast and Gyne Cancer Centre of Hope** at 204-788-8014 or 1-888-660-4866 and ask to speak to the Breast Cancer Patient and Family Educator **as soon as possible** if you notice:

- Telangiectasia
- Severe fibrosis causing pain or which limits the ability to move the area and nearby limbs
- Tissue breakdown or ulceration
- Severe scaling
- Lymphedema

Additional Notes:

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CancerCare Manitoba
675 McDermot Avenue
Winnipeg, Manitoba, Canada
R3E 0V9
www.cancercare.mb.ca

CCMB Clinical Practice Guideline: Symptom Management
Management of Long-Term Effects of Radiation-Induced Skin Toxicities in Breast Cancer – A 5 Part Series
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