

Best Practice Statement ~ *April 2004*

Skincare of Patients Receiving Radiotherapy

© NHS Quality Improvement Scotland 2004

ISBN 1-84404-260-X

First published April 2004

NHS Quality Improvement Scotland (NHS QIS) consents to the photocopying, electronic reproduction by 'uploading' or 'downloading' from the website, retransmission, or other copying of the contents of this best practice statement, for the purpose of implementation in NHSScotland and educational and 'not-for-profit' purposes. No reproduction by or for commercial organisations is permitted without the express written permission of NHS QIS.

Copies of this best practice statement, and other documents produced by NHS QIS, are available in print format and on the website.

www.nhshealthquality.org



Contents

Introduction	i
Key Principles of Best Practice Statements	ii
Use of Evidence in Best Practice Statements	iii
Who Was Involved in Developing the Statement?	iv
Best Practice Statement on Skincare of Patients Receiving Radiotherapy	vii
Introduction	vii
Anatomy and Physiology of the Skin	viii
Section 1: The Effects of Radiotherapy on the Skin	1
Section 1a: Risk Factors for Radiotherapy Skin Reactions	3
Section 1b: Basic Skincare Guideline	6
Section 2: Skincare whilst on Treatment and for up to 3 Weeks post Treatment	7
Section 3: Delayed Skin Reactions to Radiotherapy	11
Section 4: Combined Modality Treatment	12
Section 5: Radiation Recall Reaction	13
Section 6: Communication of Best Practice for Radiotherapy Skincare	14
Appendix 1: Communication Pathways	15
Appendix 2: RTOG Skin Assessment Tool	16
Glossary of Terms	17
Bibliography/Further Reading	19

Introduction

NHS Quality Improvement Scotland (NHS QIS) was established as a Special Health Board on 1 January 2003 as a result of bringing together the Clinical Resource and Audit Group (CRAG), Clinical Standards Board for Scotland (CSBS), Health Technology Board for Scotland (HTBS), Nursing and Midwifery Practice Development Unit (NMPDU) and the Scottish Health Advisory Service (SHAS).

The purpose of NHS QIS is to improve the quality of healthcare in Scotland by setting standards and monitoring performance, and by providing NHSScotland with advice, guidance and support on effective clinical practice and service improvements.

One of the key aims of the former NMPDU was to identify areas of nursing and midwifery practice amenable to the development of best practice statements. A series of best practice statements designed to offer guidance on good practice, relating to specific areas of practice and to encourage a consistent and cohesive approach to care, has been produced.

Background to Best Practice Statements

While many examples of clinical guidelines exist there are few reliable statements focusing specifically on nursing and midwifery practice. The development of best practice statements reflects the current emphasis on delivering care that is patient-centred, cost-effective and fair, and will attempt to reduce existing variations in practice. The common practice that should follow their implementation will allow comparable standards of care for patients wherever they access services.

What is a Best Practice Statement?

A best practice statement is a statement to describe best and achievable practice in a specific area of care. The term 'best practice' reflects the commitment of NHS QIS to sharing local excellence at national level. Best practice statements are underpinned by a number of shared principles (page ii).



Key Principles of Best Practice Statements

- Best practice statements are intended to guide practice and promote a consistent and cohesive approach to care.
- Best practice statements are primarily intended for use by registered nurses, midwives and the staff who support them, but they may contribute to multidisciplinary working and other members of the healthcare team may find them helpful.
- Statements are derived from the best available evidence at the time they are produced, recognising that levels and types of evidence vary; where a statement is developed in the absence of research evidence and is predominantly based on consensus this will be noted.
- Information is gathered from a broad range of sources in order to identify existing or previous initiatives at local and national level, incorporate work of a qualitative and quantitative nature and establish consensus.
- Statements are targeted at practitioners, using language that is accessible and meaningful.
- Consultation with relevant organisations and individuals is undertaken.
- Statements are reviewed and updated every 3 years.
- Responsibility for implementation of statements will rest at local level.
- Key sources of evidence and available resources are provided.

Use of Evidence in Best Practice Statements

The need to embrace evidence in its broadest sense has been acknowledged by NHS QIS in the development of best practice statements. Best practice statements represent a unique synthesis of research evidence, evidence complemented by audit, patient surveys and evidence derived from expert opinion, professional consensus and patient/public experience.

The process for developing these statements adopts a rigorous, transparent and consistent 'bottom-up' approach to articulating best practice that involves professionals and patients, and is based on all types of available evidence.

The following stages describe the process of identifying and reviewing evidence for inclusion in statements:

1. Define question
2. Gather evidence from a range of sources including published literature, grey literature and other relevant sources, eg patient groups, manufacturers, professional groups
3. Evaluate evidence using recognised methods of evidence appraisal
4. Integrate evidence with patient-related factors, eg issues of access, equity and ethics
5. Develop recommendations
6. Evaluate process and impact of recommendations.

Who Was Involved in Developing the Statement?

Project Leaders

Gill Chadwick	Cancer Nursing Development Co-ordinator, NHS Quality Improvement Scotland
Janice Fletcher	Macmillan Clinical Nurse Specialist (Radiotherapy & Oncology), Ninewells Hospital, Dundee

Working Group

Mo Beange	Senior Therapy Radiographer, Raigmore Hospital, Inverness
Carole Hornsby	Treatment Superintendent Radiographer, Ninewells Hospital, Dundee
Irene Loch	Out Patient Sister, Beatson Oncology Centre, Glasgow
Sheila MacBride	Lecturer in Cancer Nursing, University of Dundee, formerly Macmillan Senior Clinical Nursing Facilitator, Edinburgh Cancer Centre
Anne McIntyre	Breast Care Specialist Therapy Radiographer, Beatson Oncology Centre, Glasgow
Ann McLinton	Practice Development Facilitator, Beatson Oncology Centre, Glasgow
Lynn Magro	District Nurse & Palliative Care Link Nurse, Tayside Primary Care NHS Trust
Julie Mencharowski	Staff Nurse, Treatment Floor, Edinburgh Cancer Centre
Anne Moffat	District Nurse, Lothian Primary Care NHS Trust
Jillian Moses	Practice Development Radiographer, Aberdeen Royal Infirmary
Patricia Simpson	Out Patient Sister, Edinburgh Cancer Centre
Lynne Watret	Clinical Nurse Specialist: Tissue Viability, Greater Glasgow Primary Care NHS Trust
Mary Wells	Clinical Research Fellow, School of Nursing & Midwifery, University of Dundee

Wider Reference Group

Margaret Craig	General Practitioner, Greater Glasgow
Pearl Elliot	Patient representative, Borders
Anna Gregor	Clinical Oncologist, on behalf of SCAN and Lead Cancer Clinician for Scotland
Maggie Grundy	Macmillan Lecturer, Robert Gordon University, Aberdeen
Susan Jackson	Lecturer, Paisley University
Cathy Macinnes	Patient representative, Western Isles
Mary MacLean	Regional Cancer Care Pharmacist, on behalf of Scottish Oncology Pharmacy Group
Liz McNiven	Community Palliative Care Nurse, on behalf of the Community Palliative Care Team, Marie Curie Centre, Fairmile, Edinburgh
Cathy Meredith	Lecturer, Glasgow Caledonian University
Gaye Paterson	Cancer Care Research Team, Department of Nursing & Midwifery, University of Stirling
Nick Reed	Clinical Oncologist, on behalf of WoSCAN
Ann Marie Rice	Lecturer, Macmillan Education Unit, University of Glasgow
Leslie Samuel	Clinical Oncologist, on behalf of NoSCAN
Jenny Whelan	on behalf of CancerBACUP, Scotland



NHS Quality Improvement Scotland Support Team

Bette Baillie	Secretary
Penny Bond	Senior Nurse
Gillian McCracken	Communications & Information Officer (until October 2003)

Further Information

For further information about NHS QIS, or to obtain additional copies of this best practice statement, please contact:

NHS Quality Improvement Scotland
Edinburgh Office
Elliott House
8-10 Hillside Crescent
Edinburgh
EH7 5EA

Tel: 0131 623 4300
Fax: 0131 623 4299

comments@nhshealthquality.org
publications@nhshealthquality.org

Copies of all NHS QIS publications can also be downloaded from the website (www.nhshealthquality.org).

Using the Best Practice Statement

A glossary can be found at the end of the document. Words/phrases within the glossary are highlighted in the text using *italics*.

Best Practice Statement on Skincare of Patients Receiving Radiotherapy

Introduction

Cancer Incidence

Cancer was newly diagnosed in nearly 26,000 people in Scotland each year between 1995-1997. It is predicted that by 2010-2014, that number will rise to 33,500 per annum, an increase of approximately 28% (Cancer Scenarios, 2001). The expected increase in cancer incidence is due, in part, to the increased proportion of older people in the population.

Scotland, along with the rest of the UK, has an ageing population. Cancer is more common in later life. Around one-third of all cancers are diagnosed in people over 75. Currently these individuals form only around 7% of the population, but between 2000-2031, the number of people aged over 65 is expected to rise from 787,000 to 1,200,000; and those aged over 85 from 84,000 to 150,000 (Adding Life to Years, 2002).

Radiotherapy

Radiotherapy, along with surgery and chemotherapy, is a major modality in the management of cancer. Most commonly, radiotherapy is delivered by a *linear accelerator* with the beam directed to the tumour. This is termed external beam therapy and accounts for more than 95% of all radiotherapy delivered to cancer patients.

In the context of current treatment methods and practice, approximately half of those diagnosed with cancer will receive radiotherapy at some stage of their illness. Radiotherapy can offer cure but, in 1999/2000, 56% of the total number of treatment courses delivered was for palliative rather than curative intent (Cancer Scenarios, 2001).

Radiotherapy and Skincare

All patients receiving external beam radiotherapy are at risk of skin damage. It is essential that this damage is minimised as far as possible by ensuring that the best available advice is given to patients, by staff who are following evidence-based guidelines. Where skin damage does occur, staff must offer appropriate interventions to promote healing.

There have been few randomised controlled trials to evaluate prophylactic skincare procedures and few relating to the treatment of radiation damaged skin. The guidance provided within this best practice statement has been drawn from research evidence which has been published, but much of it has relied on expert opinion from specialists within each of Scotland's cancer centres, and others.

This statement identifies best and achievable practice that is patient-centred. Implementation of the statement will promote comparable standards of care for patients wherever and from whomever they access the service, ie in the community, in hospitals and specialist cancer centres.

For the purpose of this document, the term 'cancer' encompasses leukaemias and lymphomas as well as solid tumours.

Anatomy and Physiology of the Skin

The skin is the largest vital organ in the body. It has five main functions: protection; temperature regulation; sensory perception; excretion; and vitamin production. Regeneration of the skin is a normal physiological process which takes approximately 28 days, but with advancing age can take longer.

The skin has two main layers: the outer epidermis and the underlying dermis. The epidermis is comprised of five layers. The epidermis constantly produces new cells (stem cells), which have a major role in forming new epithelial tissue. This happens through a process of proliferation, maturation, cell division and destruction. The process commences at the innermost basal cell layer (stratum germinativum) and progresses to the outer layer (stratum corneum). In their migration the cells from the basal cell layer lose their nuclei and gradually push to the skin surface as keratinocytes.

Keratinocytes are surrounded by a lipid layer, which protects the surface of the skin against water loss and helps maintain the skin in a soft, supple and odour-free state. Together with water, salt and oil from the underlying sweat and sebaceous glands, the skin is maintained at pH5.5. The surface keratinocytes flatten, dehydrate and eventually shed as dead cells, thus starting the entire process all over again. Keratinocytes also secrete a variety of *cytokines* in response to tissue injury or in certain skin diseases. They therefore have a role to play in immune function, cutaneous function and tissue repair. The basal cell layer also contains melanocytes, which protect against UV irradiation.

The underlying dermis is comprised of a matrix of collagen and elastin (connective tissue), hair shafts, blood vessels and sebaceous glands. The upper layer of the dermis is ridged, valleyed and meshed, and the under surface of the epidermis is pitted; this provides a large surface area where the two join together (Rete ridges). As ageing progresses, the ridges flatten giving rise to increased risk of skin tears.

Some patients may have underlying skin conditions such as psoriasis or eczema. It is therefore important to identify what is the normal condition for each individual and devise the care plan accordingly. Patients with underlying skin conditions may need an urgent referral to a dermatologist for advice with regard to medication prior to commencing radiotherapy treatment.

How Radiotherapy Affects the Skin

The biological effect of radiation commences with the absorption of energy from ionising radiation. Radiobiological damage affects regeneration of the skin and the process of *repair, redistribution, repopulation* and *reoxygenation*. The inflammatory response activated is a normal physiological response to radiation therapy. Despite improved delivery techniques, healthy tissue within the radiation *treatment field* may still be damaged. Subsequently the most vulnerable layer of the epidermis to sustain damage is the basal cell layer (stratum germinativum).

Any skin damage resulting from radiotherapy treatment would be expected to manifest itself approximately 10-14 days following the first *fraction* of radiation, coinciding with the time when damaged basal cells migrate to the skin surface. The skin compensates by increasing mitotic activity in an attempt to replace damaged cells. Cells produced tend to be immature and are vulnerable to normal wear and tear on the skin surface. If the new cells reproduce faster than the old cells can shed, the skin becomes scaly and thickened (*dry desquamation*). Alternatively, if the dead cells shed before new cells have replaced them, the skin will appear thin, eroded, broken or atrophic (*moist desquamation*).

When skin is exposed to low doses of radiation the rate of mitosis initially decreases, which may result in minimal disruption to the basal cell layer. Intermediate doses may result in some basal cells being destroyed and, as a result, *dry desquamation* occurs. When radiation associated damage is severe enough, stem cells undergo *apoptosis* and die, the epidermis sloughs off, producing *moist desquamation*. With advanced techniques in treatment delivery, patients should no longer experience the final stage of skin necrosis, referred to in some classifications of radiation skin toxicity.

Initially, radiotherapy stimulates melanocyte production, which may give the skin a darker appearance. Skin appendages such as hair, sebaceous glands and sweat glands in the *treatment field* are also affected; their functions may lessen or cease altogether.

Thereafter skin that has been irradiated will be changed permanently. A previously irradiated site takes on a typical appearance, with loss of pigmentation (due to destruction of melanocytes), indentation (due to fibrosis of collagen and supporting structures in the dermis) and occasionally *telangiectasia*, which appears as spidery red lines across the skin surface (due to fibrosis of the blood vessels). These fibrotic changes will result in the area being permanently prone to poor healing.

Section 1: The Effects of Radiotherapy on the Skin

Key Points -

1. *Patients undergoing radiotherapy may experience skin changes.*
2. *Individual patients' skin may react differently to radiotherapy and each patient should be made aware of possible changes.*
3. *Patients should have their skin formally assessed prior to and during radiotherapy.*

Statement	Reasons for Statement	How to Demonstrate Statement is Being Achieved
All healthcare professionals involved in the management of patients receiving radiotherapy should have access to resources which provide education on the anatomy and physiology of the skin.	It is essential to understand normal skin physiology in order to identify skin changes which may occur during radiotherapy.	All healthcare professionals involved in the management of patients receiving radiotherapy can identify where to access resources, which provide education on the anatomy and physiology of the skin.
Before radiotherapy begins, a comprehensive assessment of the patient's current skin condition should be made and documented.	It is essential to have baseline information to allow changes during the course of radiotherapy to be identified.	Skin assessment will be documented and there will be evidence of an individualised radiotherapy skin care plan included in the patient's notes.
All involved healthcare professionals can identify the potential effects of radiotherapy on a patient's skin and the impact on skin regeneration.	There are risk factors (Section 1a) which predispose to loss of skin integrity whilst undergoing radiotherapy which enable healthcare professionals to identify patients at risk of skin damage and to plan skincare accordingly.	All involved healthcare professionals will document risk factors for individual patients.
During radiotherapy, a comprehensive assessment of the patient's skin should be made by healthcare professionals within the radiotherapy treatment area, using a valid and reliable assessment tool, eg RTOG (see Appendix 2).	To identify the grade of damage and initiate prompt skincare management.	Skin assessment will be documented and there will be evidence of an individualised radiotherapy skincare plan included in the patient's notes.

Statement	Reasons for Statement	How to Demonstrate Statement is Being Achieved
<p>Treatment centres will have primary responsibility for educating and preparing patients and carers, both prior to and during radiotherapy, with both verbal and written information.</p>	<p>Inappropriate skincare management may exacerbate radiation skin damage.</p> <p>Preparing patients and their carers prior to commencing radiotherapy is critical to alleviate fears and anxieties, and to promote self-care with therapeutic skincare measures.</p> <p>To enable best supportive care, the information and education needs of patients, carers and healthcare professionals must be identified and met.</p>	<p>Patient/carer questionnaires may be used to elicit the opinion of any value of information provided.</p> <p>Provision of written and verbal information for each patient is documented.</p>

Key Challenges ~

1. *Provision of educational resources for staff relating to potential effects of radiotherapy on skin.*
2. *Provision and use of a valid and reliable skin assessment tool, eg RTOG.*
3. *Development of appropriate information packs to prepare patients and their carers for potential skin reactions and for necessary skincare during and after radiotherapy.*

Section 1a: Risk Factors for Radiotherapy Skin Reactions

There are direct and indirect factors that influence the risk of skin reactions.

Key Points ~

1. *Patients and their carers should be aware of preventative skincare measures and contact points for further information.*
2. *There are direct and indirect factors that influence the risk of skin reactions.*

The best treatment plan for each individual patient will deliver a high dose to the tumour while minimising the dose to the surrounding normal tissue. In order to achieve this, it is necessary to irradiate the skin, thus risking an acute skin reaction. Other factors will also influence the risk of skin reactions, as detailed below.

Age	The epidermal turnover decreases with age resulting in extended healing times, and ageing results in atrophy of the dermis. Age is also often linked with co-existing diseases.
Chemical irritants	Application of chemical irritants such as deodorant, perfume and aftershave to the treatment field should be avoided as they can dry skin and increase skin reactions.
Chemotherapy	Some chemotherapeutic agents may cause increased skin reactions (see Section 4).
Co-existing disease	Illness or medication can have a direct effect on the skin healing process, eg diabetes and steroids. Most co-existing diseases are linked with an increase in age as well as with body weight and/or nutritional status.
Energy of beam	Megavoltage photon energies (energies above 1MV) deliver maximum dose underneath the skin surface. Orthovoltage beams (energies below 1MV) will deliver maximum dose to the skin surface, thus causing an increased skin reaction.
Entry and exit sites	It is worth noting that apparently 'unrelated' skin reactions may be due to the exit site dose of the beam, eg a skin reaction on the back of the shoulder which is the result of an anterior supraclavicular fossa field treated on a breast patient.

Ethnic origin/skin diversity

There is insufficient evidence to support the theory that the risk of skin reaction increases in different ethnic groups. Ethnic origin can often be linked with previous exposure to ultra violet (UV) light and to genetic predisposition. It is known that chronic UV exposure may impair healing within the skin.

Fractionation of treatment

Hyperfractionated radiotherapy, ie radiotherapy given in more than one fraction per day is associated with increased skin toxicity as compared to conventional treatments of one fraction per day, due to increased daily dose.

Infection

Any bacterial and/or fungal infection can damage basal layer cells and impede healing.

Inherited radiosensitivity

Some genetic disorders such as ataxia-telangiectasia can increase sensitivity to radiation therapy. There are also theories that mutations in genetic material can predispose individuals to an increased risk of skin reactions, although there is no firm evidence to date.

Mechanical irritants

Friction, eg clothing and shaving, can increase skin reaction and cause delayed healing.

Modality or type of radiation beam

The 'skin sparing' effect of a megavoltage photon beam will result in the maximum dose delivery underneath the skin surface. An electron beam will generally deliver a higher dose at the skin surface, which will tend to cause an increased skin reaction than if the same dose is given using a megavoltage photon beam.

Nutritional status

The intake of adequate nutrients is required for optimum repair of tissue damage. Intake of such nutrients may be influenced or directly linked with co-existing diseases and/or stage of cancer. Absorption of such nutrients may be inhibited by disease, chemotherapy or other drug therapy. Fatigue and socio-economic factors can also influence the nutrient balance or intake of an individual.

Obesity

Having excess adipose tissue can compromise healing due to poor vascularity and is linked with extra skin folds, friction, moisture and warmth. This increase in moist warm folds can also lead to a greater risk of fungal infections.

Previously irradiated areas

These areas may be more at risk of acute skin reactions.

Site of treatment

Some sites of the body will tend to show an increased skin reaction following radiotherapy. In general, areas of the body most at risk include underneath the breast, axilla, head and neck, perineum and groin.

Smoking

Inhaling nicotine through smoking can impair the body's response to infection and healing. It also limits the oxygen-carrying capacity by replacing oxygen with carbon monoxide.

Thermal irritants

Direct application of extremes of temperature, ie icepacks or heat (heat pads, hot water bottles or sun lamps), onto the treatment field can cause skin irritation and thus delay healing.

Total radiation dose

Higher dose will lead to a greater risk of skin reaction.

Use of build-up material (also known as 'bolus')

Where tissue equivalent build-up material is used in the treatment field, the dose to the skin is intentionally increased as part of the treatment plan, and therefore the skin reaction is likely to be worse.

Volume of tissue irradiated

Increased irradiated volume will lead to a greater risk of skin reaction.

Key Challenges ~

1. *Provision of educational resources for staff to identify potential risk factors.*
2. *Provision of appropriate information and support to patients and their carers related to individual risk factors.*
3. *Provision of appropriate information and support to patients and their carers where risk factors could be reduced and/or eradicated.*

Section 1b: Basic Skincare Guideline

All patients receiving radiotherapy, regardless of treatment field, should be advised of the following skincare guidelines.

THIS GUIDELINE ONLY APPLIES TO THE AREA BEING TREATED, INCLUDING BOTH THE ENTRY AND EXIT SITES.

When washing/bathing/showering on a daily basis:

- Use warm/tepid water, with unperfumed soap if desired.
- Do NOT use perfumed products.
- Avoid the use of a washcloth.
- Use a soft towel to pat the area dry (avoiding friction).

Other skincare products:

- Do NOT apply perfume, aftershave or deodorant to the treatment field.
- Only use products advocated by the radiotherapy treatment centre.
- All gels, creams or lotions for skin application should be used at room temperature even if stored in a refrigerator.

Hair removal:

- Use an electric shaver instead of a wet razor when shaving the face.
- If the axilla is within the treatment field, shaving should be avoided.
- Do NOT use wax or other hair removing creams within the treatment field.

Use of swimming pools:

- Caution should be taken as chlorinated water can have a drying effect on the skin.
- Care should be taken regarding the use of showers particularly where there is no temperature control or where jets are very powerful.

General advice:

- Avoid direct application of heat or cold to the area.
- Friction will be reduced with the avoidance of scratching, rubbing and massaging the skin.
- Loose natural fibre clothing will help avoid friction.
- Following mastectomy, if a permanent prosthesis causes increased moisture and/or friction, a soft prosthesis should be worn.
- Use of a mild detergent (fragrance-free if possible) for washing clothing to be worn next to the skin may reduce irritation.
- Adhesive tape should always be avoided within the treatment field during treatment and until any reaction has settled.
- Avoid sun exposure or cover the area during treatment and until any skin reaction has settled.
- Use sunscreen, eg sunblock of at least SPF 15, for one year following treatment. (Health promotion advice advocates that nothing less than SPF 15 should be used by anyone at anytime, regardless of skin type or past medical history.)

Section 2: Skincare whilst on Treatment and for up to 3 Weeks post Treatment

Key Points ~

1. *During this time it is acknowledged that there will be a certain amount of radiotherapy-induced skin damage (Section 1).*
2. *For the purposes of this document, the RTOG Skin Assessment Tool will be used (Appendix 2). This is a nationally accepted, validated tool.*

Statement	Reasons for Statement	How to Demonstrate Statement is Being Achieved
<p>Patients care for the treated area in accordance with the basic skincare guideline.</p> <p>Daily washing of the treatment area is recommended.</p>	<p>To maintain soft, supple, clean, odour-free and intact skin.</p>	<p>Prior to treatment, patients will be given written and verbal guidelines regarding skincare.</p> <p>Skin is soft, supple, clean, odour-free and intact on examination during treatment.</p>
<p>An assessment tool should be used to assess the degree of radiation toxicity.</p>	<p>For comparability, reliability and audit.</p>	<p>The stage of toxicity is documented in the case notes using a validated assessment tool.</p>
<p>RTOG 0 (No visible change):</p> <p>(a) Patients will continue to follow the skincare guideline as above.</p> <p>(b) Patients may use aqueous cream or similar unperfumed proprietary preparation if they wish.</p>	<p>To maintain soft, supple, clean, odour-free and intact skin.</p> <p>To promote comfort in those who wish to use cream.</p>	<p>Skin is soft, supple, clean, odour-free and intact on examination during treatment.</p> <p>Use of cream will be documented in the notes.</p> <p>RTOG grade is documented.</p>
<p>RTOG 1 (Faint or dull erythema):</p> <p>(a) Patients will continue to follow the skincare guideline as above.</p> <p>(b) Patients may use aqueous cream or similar unperfumed proprietary preparation if skin is irritated.</p>	<p>To maintain soft, supple, clean, odour-free and intact skin.</p> <p>To reduce irritation and promote comfort.</p>	<p>Skin is soft, supple, clean and odour-free on examination during treatment.</p> <p>RTOG grade is documented.</p> <p>Documentation of daily assessment of skin whilst on treatment by patient and staff.</p> <p>Comfort is acknowledged by the patient.</p>

Statement	Reasons for Statement	How to Demonstrate Statement is Being Achieved
<p>RTOG 2 (a) (Tender or bright erythema with/without dry desquamation):</p> <ul style="list-style-type: none"> (a) Patients will continue to follow the skincare guideline as above. (b) Patients may use aqueous cream unless there is evidence that it no longer is keeping the patient comfortable. (c) A change of topical agent may be necessary if comfort is not achieved. <p>There is some evidence to support the use of topical agents (eg topical mild steroid cream such as hydrocortisone 1%) to reduce itching. This should not be a routine therapy and should only be prescribed following medical advice.</p>	<p>To maintain soft, supple, clean and odour-free skin.</p> <p>To reduce irritation and promote comfort.</p>	<p>Check that advice is understood and patient is adhering to guidelines.</p> <p>RTOG stage is documented.</p> <p>Itching ceases and the topical agent is no longer required. Should not be used for more than 7 days.</p>
<p>Avoid topical mild steroid cream if skin is broken or there are any signs of infection.</p>	<p>Delays healing and may mask symptoms of infection.</p>	<p>Rationale for the use of topical agents is documented.</p>
<p>RTOG 2 (b) (Patchy moist desquamation; moderate oedema):</p> <p>The integrity of the skin is now compromised:</p> <ul style="list-style-type: none"> (a) Patients may continue to follow the skincare guideline as above. (b) Previous creams may still be used in non-moist areas. (c) The principles of moist wound healing should apply to promote a healing environment, prevent infection and control pain. 	<p>Optimum healing is at body temperature in a moist environment.</p> <p>Pain is reduced when nerve endings are moist. This may be achieved by the use of dressings (eg hydrogels, siliconised gel dressings).</p>	<p>Check that advice is understood and patient is adhering to guideline.</p> <p>RTOG grade is documented.</p> <p>Use of dressings is documented.</p>

Statement	Reasons for Statement	How to Demonstrate Statement is Being Achieved
<p>Treatment area should not be covered during treatment delivery with a dressing unless treatment has been planned with the dressing in place.</p> <p>Avoid adhesive and adherent dressings and the use of tape to secure dressings.</p> <p>Consider the use of tubular bandages or body stockings.</p>	<p>Dressings will alter the radiation dose to the treatment field unless treatment has been planned with a dressing in place.</p> <p>Dressings with adhesive borders may cause epidermal stripping and cause pain to the patient.</p> <p>Any dressing that sticks to the wound bed and requires soaking to remove is the wrong dressing.</p>	<p>Any dressing covering the treatment area during treatment delivery is documented.</p> <p>There are no signs or symptoms of trauma on dressing removal.</p> <p>Surrounding skin remains intact.</p>
<p>RTOG 3 (Confluent moist desquamation; pitting oedema):</p> <p>(a) Patients may continue to follow the skincare guideline as above.</p> <p>(b) Painful moist areas are present which will be treated daily with, for example, hydrofibre or silicone dressings.</p> <p>(c) The area will be observed for infection (particularly in the skin folds).</p> <p>(d) If there are signs of localised clinical infection, ie exudate which may be yellow/green and sticky, increased exudate and malodour developing with oedema and redness, topical anti-microbial dressings may be used, eg activated silver or iodine based. Manufacturer's information must be checked before use to ensure the silver stays within the dressing. If these dressings are used, they MUST be removed before treatment. Dressings, containing silver known to be taken up into tissue, must be avoided.</p> <p>(e) Patients may be immuno-compromised and may not exhibit classic signs of infection (eg raised temperature, white blood cell count or ESR).</p>	<p>Topical anti-microbials will reduce the bacterial burden and reduce the risk of systemic infection developing. Dressings, which can be removed without leaving any residue on the wound, are preferred. They will not interfere with the treatment field and will not cause pain or trauma on removal.</p>	<p>Condition of area will be assessed daily, non-adherent dressings renewed and any changes documented.</p> <p>Patient comfort is documented.</p> <p>Use and removal prior to treatment of activated silver or iodine-based dressings is documented.</p> <p>Changes in the patient's general condition is documented.</p>

Statement	Reasons for Statement	How to Demonstrate Statement is Being Achieved
Signs of spreading cellulitis (redness beyond the treatment field) may indicate the onset of systemic infection and either oral or intravenous antibiotics should be commenced (as clinically indicated). These may be used in conjunction with topical anti-microbials.	In all instances of spreading cellulitis, antibiotics are required to prevent life threatening septicaemia.	Resolution of signs of clinical infection.
Use of bacteriology wound swabs should not be routinely used.	Bacteriology wound swabs are only necessary if antibiotics are being commenced.	Rationale for the use of swabs is documented.
If pyrexia (temperature > 38° C) or clinical signs of systemic infection are apparent, bacterial swab and blood cultures may be indicated.	If systemic infection is suspected, antibiotics based on advice of oncologist and microbiologist should be commenced immediately to avoid septicaemia. Swabbing or blood cultures may be required to confirm the strain of bacteria to allow adjustment or continuance of antibiotic.	Resolution of signs of clinical infection.
On completion of radiotherapy treatment, the patient will be referred on to their local practice/district nurse or arrangements will be made for the patient to attend the nursing staff at their treatment centre.	To provide continuity and to establish a partnership of care for the patient.	Referral is documented in the casenotes. Any intervention to the wound is documented in the casenotes and discharge letter.

Key Challenges ~

1. *Provision of appropriate written and verbal guidance relating to skincare for all patients and their carers prior to starting treatment.*
2. *Provision of appropriate dressings if moist desquamation occurs.*
3. *Development of local communication pathways to ensure all healthcare professionals involved in an individual's care are aware of necessary skincare guidance and interventions.*

Section 3: Delayed Skin Reactions to Radiotherapy (more than 3 Weeks after Radiotherapy has been Completed)

Key Points ~

1. *Skin reactions may develop after treatment has been completed.*
2. *Permanent skin changes may occur following treatment.*

Statement	Reasons for Statement	How to Demonstrate Statement is Being Achieved
At the end of treatment, patients will be reminded about potential skin reactions which may follow treatment.	Reduction of patient anxiety. Prompt reporting of significant reactions.	Documentation that information has been delivered.
Patients, carers and relevant staff will be aware of potential delayed skin reactions following radiotherapy such as ulceration (uncommon), dermal necrosis, dermal atrophy and telangiectasia (all rare).	Recognition and prompt management if applicable.	Documentation that information has been delivered. Staff have access to specialist advice.
Patients will be aware of any permanent radiotherapy-related side-effects to the skin, eg dryness of skin, reduction of skin elasticity, increased skin sensitivity.	Reduction of patient anxiety.	Documentation that information has been delivered.

Key Challenges ~

1. *Provision of educational resources for healthcare staff relating to skin reactions and changes occurring after treatment has been completed.*
2. *Local communication pathways are established for access to expert advice.*

Section 4: Combined Modality Treatment

Key Point ~

1. *Combined modality treatment may include concurrent or sequential/consecutive therapy with radiotherapy, chemotherapy and/or surgery.*

Statement	Reasons for Statement	How to Demonstrate Statement is Being Achieved
Healthcare professionals within treatment centres should be aware that combined modality treatment may lead to an increased risk of skin reactions. This information must be shared with the primary care team if relevant for an individual patient.	Early recognition leads to prompt management.	Prompt treatment of skin reactions is documented.
Healthcare professionals within treatment centres should be aware of potential radiosensitisers used in their area, and this information must be shared with the primary care team if relevant for an individual patient.	Early recognition leads to prompt management.	Risk of reaction due to combined modality treatment is documented.

Key Challenge ~

1. *Provision of guidance within treatment centres relating to increased risk of skin reactions due to other treatments.*

Section 5: Radiation Recall Reaction

Key Point ~

1. *Use of certain drugs may cause a radiation recall reaction.*

Statement	Reasons for Statement	How to Demonstrate Statement is Being Achieved
Healthcare professionals within treatment centres and patients who are receiving relevant drugs should be aware of the phenomenon of radiation recall.	Reduction of patient anxiety. Early recognition leads to prompt management, if appropriate.	Protocols are available to identify drugs with the potential of causing these reactions.
Healthcare professionals within treatment centres should assess each individual patient in relation to past radiotherapy reactions and planned drug treatments.	Early recognition leads to prompt management, if appropriate.	Assessment of risk is documented for each individual patient.

Key Challenge ~

1. *Provision of protocols that identify drugs with a potential to induce radiation recall reactions.*

Section 6: Communication of Best Practice for Radiotherapy Skincare

Key Points ~

1. *Patients and their carers should be aware of preventative skincare measures and contact points for further information.*
2. *Healthcare professionals in all care settings may be involved with patients receiving radiotherapy and should have ready access to expert advice.*

Statement	Reasons for Statement	How to Demonstrate Statement is Being Achieved
Patients are aware of possible skin reactions from radiotherapy both during and after completion of treatment, including the type of reaction, self-care measures and sources of more advice and information.	To ensure patient co-operation with their skincare policy throughout treatment. To minimise skin reactions and to ensure appropriate use of interventions.	Evidence of availability of appropriate patient information, eg booklets or intranet site accessible by all patients. Documentation that verbal and/or written information has been delivered.
Each radiotherapy department should implement a strategy to ensure communication of best practice to the appropriate healthcare professionals: those involved before, during and after radiotherapy.	To ensure appropriate use of this best practice statement. To ensure continuity of care for the patient throughout the patient pathway. To ensure all patients with skincare problems are dealt with in the appropriate way.	Evidence of availability of appropriate information for healthcare professionals (see Appendix 1). Evidence of documentation of communication between healthcare professionals.
A communication pathway is implemented for healthcare professionals between all care settings.	Ensure appropriate skincare is continued during and after completion of radiotherapy.	Documentation of referral between all care settings.

Key Challenges ~

1. *Provision of appropriate patient information.*
2. *Provision of appropriate information for all healthcare professionals caring for an individual receiving radiotherapy.*
3. *All healthcare professionals caring for an individual receiving radiotherapy will have access to expert advice.*

Appendix 1 Communication Pathways

Local communication policies should be put in place to ensure equity of care for all patients.

1. To deliver the best quality care for patients receiving radiotherapy, teamwork among healthcare professionals is essential.
2. The following table represents the healthcare professionals who should be included in local policy and communication policy implemented for the dissemination of the best practice statement.
3. The table also suggests a list of healthcare professionals who may be involved along the patient's treatment pathway.

Healthcare Professionals	Pre Radiotherapy	During Radiotherapy	Post Radiotherapy
Hospital Staff, eg			
Medical staff	✓	✓	✓
Therapy radiographers	✓	✓	
Site specific clinical nurse specialist/therapy radiographer	✓	✓	✓
Review team		✓	
In-patient/out-patient nurses	✓	✓	✓
Clinical pharmacists	✓	✓	✓
Community Staff, eg			
GP	✓	✓	✓
District nurse	✓	✓	✓
Practice and treatment room nurses		✓	✓
Community pharmacists	✓	✓	✓
Other Specialists, eg			
Tissue viability		✓	✓
Dermatology team	✓		✓
Allied Health Professionals, eg			
Dietitian	✓	✓	✓

Appendix 2

RTOG Skin Assessment Tool

'Summary of intervention for acute radiotherapy induced skin reactions in cancer patients'.

This is a clinical guideline recommended for use by the College of Radiographers and is available free to healthcare professionals (see below). This leaflet contains descriptions and photographs of radiotherapy skin reactions.

Score	Description
<i>RTOG 0</i>	No visible change
<i>RTOG 1</i>	Faint or dull <i>erythema</i>
<i>RTOG 2 (a)</i>	Tender or bright <i>erythema</i> with/without <i>dry desquamation</i>
<i>RTOG 2 (b)</i>	Patchy <i>moist desquamation</i> ; moderate <i>oedema</i>
<i>RTOG 3</i>	Confluent <i>moist desquamation</i> ; <i>pitting oedema</i>

Further information may be sought from:

The College of Radiographers
207 Providence Square
Mill Street
London
SE1 2EW

Tel: 020 7740 7200
website: www.sor.org

(The website is only fully accessible to members of the Society of Radiographers.)

Glossary of Terms

All words below appear in the text in *italics*.

apoptosis	Intracellular process leading to programmed death of the cell.
bolus	Tissue equivalent material, eg wax, used to therapeutically increase the dose to the skin.
combined modality treatment	Radiotherapy, chemotherapy and/or surgery used together to treat an individual patient.
cytokine	A substance secreted by certain cells of the immune system.
dermal atrophy	Contraction of previously irradiated area causing thinning of the dermis.
dermal necrosis	Vascular insufficiency causing necrosis of the dermis.
dry desquamation	Flaking or peeling of the skin.
entry and exit sites	'Entry site' is the area through which the radiation beam enters the body. 'Exit site' is the area through which the radiation beam leaves the body. Radiation beams travel in straight lines so the exit site should be predictable.
erythema	Reddening of the skin.
fraction	Total dose of radiation is divided over a treatment period; each of these divisions is termed a 'fraction'.
immuno-compromised	Patients whose disease and/or treatment has rendered them susceptible to infection.
linear accelerator	Radiotherapy machine which delivers external beam therapy.
moist desquamation	Flaking or peeling of the skin revealing moist areas.
oedema	Abnormal infiltration of tissues with fluid.
pitting oedema	Moderate/severe oedema which can be demonstrated by pressure from a finger.
radiation recall	Development of an inflammatory reaction throughout a previously irradiated area, precipitated by the administration of certain drugs.

radiosensitisers	Drugs which enhance the effect of radiation.
repair, redistribution, repopulation and reoxygenation	Repair of intracellular sublethal damage by normal cells between fractions is one benefit of fractionation. Redistribution of cells as they move into different phases of the cell cycle within a course of radiotherapy is advantageous as more tumour cells become radiosensitive. Repopulation of normal tissues takes place through cell division at some time during a multi-fraction treatment course. Oxygenated cells are radiosensitive: fractionating the dose allows time between treatments for the tumour to reoxygenate leaving it more liable to cell damage and death.
RTOG	Radiation Therapy Oncology Group.
telangiectasia	Visible atypical dilation of the capillaries on skin.
treatment field	Area of skin through which the radiation beam passes to treat the tumour site.

Bibliography/Further Reading

- Alley E, Green R and Schuchter L. 2002. Cutaneous Toxicities of Cancer Therapy. *Current Opinion in Oncology*, 14 (2): 212-216.
- Bryant R and Wysocki A. 1992. Skin. in Bryant R, ed. *Acute and Chronic Wounds: Nursing Management*. St Louis: Mosby Year Book, 1-20.
- Camidge R and Price A. 2001. Characterizing the Phenomenon of Radiation Recall Dermatitis. *Radiotherapy and Oncology*, 59 (3): 237-245.
- Expert Group on Healthcare of Older People. 2002. *Adding Life to Years*. Edinburgh: Scottish Executive.
<http://www.scotland.gov.uk/library3/health/alty-00.asp> [full document]
URL accessed 01/03/04.
- Glean E, Edwards S, Faithfull S, et al. 2001. Intervention for Acute Radiotherapy Induced Skin Reactions in Cancer Patients: The Development of a Clinical Guideline Recommended for Use by the College of Radiographers. *Journal of Radiotherapy in Practice*, 2 (2): 75-84.
- Hilderley L. 1997. Radiotherapy. in Groenwald S, Frogge M, Goodman M, and Yarbrow C, eds. *Cancer Nursing: Principles and Practice*. 4th ed. Boston: Jones & Bartlett, 247-282.
- Korinko A and Yurick A. 1997. Maintaining Skin Integrity During Radiation Therapy. *American Journal of Nursing*, 97 (2): 20-44.
- Kumar P and Clark M, eds. 2002. *Clinical Medicine*. 5th ed. Edinburgh: WB Saunders.
- Macmillan M, MacBride S and et al. 2003. Management of Radiation Skin Reactions: A Randomised Controlled Trial. Edinburgh: Scottish Executive.
<http://www.show.scot.nhs.uk/cso/Publications/ExecSumms/MayJune03/McMillan.doc> [summary] URL accessed 02/02/04.
- Porock D. 2002. Factors Influencing the Severity of Radiation of Skin and Oral Mucosal Reactions: Development of a Conceptual Framework. *European Journal of Cancer Care*, 11 (1): 33-43.
- Porock D, Nikoletti S and Kristjanson I. 1999. Management of Radiation Skin Reactions: Literature Review and Clinical Application. *Plastic Surgical Nursing*, 19 (4): 185-192.
- Scottish Executive Health Department. 2001. *Cancer Scenarios: An Aid to Planning Cancer Services in Scotland in the Next Decade*. Edinburgh: Scottish Executive. <http://www.scotland.gov.uk/library3/health/csatp-00.asp> [full document] URL accessed 15/03/04.
- Wells M and MacBride S. 2003. Radiation Skin Reactions. in Faithfull S and Wells M, eds. *Supportive Care in Radiotherapy*. Edinburgh: Churchill Livingstone, 135-159.

Personal Notes/Local Contacts



Personal Notes/Local Contacts

Our Commitment

Our work will be undertaken in line with the following values:

- **patient and public focus**
 - ~ promoting a patient-focused NHS that is responsive to the views of the public
- **independence**
 - ~ reaching our own conclusions and communicating what we find
- **partnership**
 - ~ involving patients, carers and the public in all parts of our work
 - ~ working with and supporting NHS staff in improving quality
 - ~ collaborating with other organisations such as public bodies, voluntary organisations and manufacturers to avoid duplication of effort
- **evidence-based**
 - ~ basing conclusions and recommendations on the best evidence available
- **openness and transparency**
 - ~ promoting understanding of our work
 - ~ explaining the rationale for our recommendations and conclusions
 - ~ communicating in language and formats that are easily accessible
- **quality assurance**
 - ~ aiming to focus our work on areas where significant improvements can be made
 - ~ ensuring that our work is subject to internal and external quality assurance and evaluation
- **professionalism**
 - ~ promoting excellence individually and as teams and ensuring value for money in the use of public resources (human and financial)
- **sensitivity**
 - ~ recognising the needs, opinions and beliefs of individuals and organisations and respecting and encouraging diversity

This document can be viewed on the NHS Quality Improvement Scotland website. It is also available, on request, from NHS Quality Improvement Scotland in the following formats:

- Electronic
- Audio cassette
- Large print

NHS Quality Improvement Scotland

Edinburgh Office ~ Elliott House 8-10 Hillside Crescent Edinburgh EH7 5EA Tel 0131 623 4300

Glasgow Office ~ Delta House 50 West Nile Street Glasgow G1 2NP Tel 0141 225 6999

comments@nhshealthquality.org www.nhshealthquality.org

