

Disclaimer: *This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.*

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NCI CTCAE = National Cancer Institute Common Terminology Criteria for Adverse Events
RTOG = Radiation Therapy Oncology Group

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INITIAL ASSESMENT

Patient anticipated to receive radiation therapy¹

- Initial skin assessment and documentation
- See [Appendix A](#) for considerations prior to or during radiation
- Patient education and reinforcement of skin care at each visit

Patient receives radiation

- Monitor skin changes at each visit:
- Location
 - Skin color
 - Size of the area
 - Drainage
 - Signs of infection
 - Changes affecting activity or performance level
 - Type of discomfort
 - Burning
 - Itching
 - Pulling
 - Tenderness
 - Dryness
 - Scaling
 - Flaking
 - Peeling

Any changes to skin?

Yes
No

Radiation toxicity, see [Appendix B](#) for NCI CTCAE/RTOG grading

See [Appendix C](#) for management of radiation dermatitis

Continue monitoring skin changes

NCI CTCAE = National Cancer Institute Common Terminology Criteria for Adverse Events
 RTOG = Radiation Therapy Oncology Group

¹ Patients on concurrent chemotherapy/biotherapy are at higher risk for radiation skin injury

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APPENDIX A: Considerations for Managing Patients Receiving Radiation Therapy

- Physical assessment and documentation
 - Patients on concurrent chemotherapy/biotherapy are at higher risk for radiation skin injury
- Patient education
- Prophylaxis treatments – to reduce severity of dermatitis
 - Emollients (see product list examples on [Appendix D](#))
 - For skin management, cream emollients and/or film forming silicone gel¹ may be used
 - Topical steroids² – may be applied within 1 week prior to radiation treatment, during, and 2 weeks after radiation. Do not apply to open skin.
 - Triamcinolone 0.1% cream³ twice daily
 - Mometasone furoate 0.1% cream³ once or twice daily
- Consider assessing more frequently for skin changes for those with high risk factors for radiation dermatitis (see below)

¹ For skin management of patients receiving head and neck, hematology, melanoma, sarcoma, and thoracic radiation therapy: Film forming silicone gel can be applied to irradiated skin at the onset of radiotherapy, twice a day until skin reaction subsides. StrataXRT[®] is preferred due to available published data and is available as prescription only. Other silicone gel formulations such as ScarAway[®] may be a more economical option and is available over the counter (OTC). OTC gel formulations should be washed off prior to radiation treatment.

² Prophylactic steroids are not used for melanoma, sarcoma, and gynecologic patients (given the propensity for yeast infection)

³ If patient experiences burning with cream, consider switching to ointment dosage form

Risk Factors for Radiation Dermatitis	
<p>Patient Related</p> <ul style="list-style-type: none"> • Age • Race • Area of treatment (more reactions with skin folds and moist areas) • Nutritional status • Smoking and alcohol use • Comorbidities • Chronic UV exposure • Obesity 	<p>Therapy Related</p> <ul style="list-style-type: none"> • Type of energy/beam (e.g., higher skin dose with electron beams and certain beam angles of proton) • Fractionation • Total dose • Dose per fraction • Treated volume and surface area • Use of bolus materials • Concurrent chemotherapy/biotherapy • Surgery or surgical history

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APPENDIX B: NCI CTCAE/RTOG Grading/Example Photos

Grading		Grade 0	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
NCI CTCAE V5.0 Dermatitis Radiation		No changes in skin	Faint erythema or dry desquamation	Moderate to brisk erythema; patchy moist desquamation, mostly confined to skin folds and creases; moderate edema	Moist desquamation in areas other than skin folds and creases; bleeding induced by minor trauma or abrasion	Life-threatening consequences; skin necrosis or ulceration of full thickness dermis; spontaneous bleeding from involved site; skin graft indicated	Death
RTOG		No changes in skin	Follicular, faint or dull erythema; epilation; dry desquamation; decreased sweating	Tender or bright erythema, patchy moist desquamation; moderate edema	Confluent, moist desquamation other than skin folds, pitting edema	Ulceration, hemorrhage, necrosis	Death
Example Photos	Head and Neck	No changes in skin				N/A	Death
	Thoracic	No changes in skin				N/A	Death
	Breast	No changes in skin					Death

Glossary

Abrasion: a type of open wound that is caused by the skin rubbing against a rough surface

Desquamation: commonly called skin peeling and is the shedding of the outermost membrane or layer of a tissue

Edema: a condition characterized by an excess of watery fluid collecting in the cavities or tissues of the body

Erythema: superficial reddening of the skin, usually in patches, as a result of injury or irritation causing dilatation of the blood capillaries

Photos from MD Anderson Radiation Oncology resources

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APPENDIX B: NCI CTCAE/RTOG Grading/Example Photos - continued

Grading		Grade 0	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Example Photos	Melanoma /Sarcoma	No changes in skin				N/A	Death

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APPENDIX C: Skin Management - Head and Neck, Hematology, Melanoma, Sarcoma, and Thoracic

NCI/RTOG Grading	Basic Skin Care ¹	Dressings ²	Pharmacological Treatment
Grade 0	Emollients	Film forming silicone gel ³	Topical steroids ⁴ to reduce severity of dermatitis (apply on intact skin): <ul style="list-style-type: none"> • Triamcinolone 0.1% cream twice daily or • Mometasone furoate 0.1% cream once or twice daily
Grade 1	Emollients	Consider using protective, absorbent, non-adherent dressings <ul style="list-style-type: none"> • Film forming silicone gel³ 	Topical steroids ⁴ control itch or irritation (apply on intact skin): <ul style="list-style-type: none"> • Triamcinolone 0.1% cream twice daily or • Mometasone furoate 0.1% cream once or twice daily
Grade 2	<ul style="list-style-type: none"> • Emollients • Avoid moisturizers on areas with moist desquamation 	<ul style="list-style-type: none"> • For exudate <ul style="list-style-type: none"> ◦ Low: Mepilex[®] Lite or PolyMem[®] ◦ High: Mepilex[®] Transfer or PolyMem[®] MAX 	Topical astringent for skin irritation: Aluminum acetate (Domeboro [®]) dissolve ¼-1 packet in a large bowl of water. Soak washcloth and apply to affected skin for 10 minutes prior to air dry and application of cream emollient. If treating the foot, hand, or anogenital area, prepare as a sitz bath and soak affected areas as above. Perform application 1-4 times per day as needed.
Grade 3	<ul style="list-style-type: none"> • Emollients • Avoid moisturizers on areas with moist desquamation 	Consider using protective, absorbent, non-adherent dressings <ul style="list-style-type: none"> • Film forming silicone gel³ • For exudate <ul style="list-style-type: none"> ◦ Low: Mepilex[®] Lite or PolyMem[®] ◦ High: Mepilex[®] Transfer or PolyMem[®] MAX • For infection <ul style="list-style-type: none"> ◦ Silver dressings⁵: Mepilex[®] Ag or PolyMem[®] Silver 	Topical steroids ⁴ control itch or irritation (apply on intact skin): <ul style="list-style-type: none"> • Triamcinolone 0.1% cream twice daily or • Mometasone furoate 0.1% cream once or twice daily Signs and symptoms of infection: <ul style="list-style-type: none"> • Consider obtaining skin culture and sensitivity (C&S) • Consider empiric doxycycline 100 mg twice daily for 14 days (pending C&S)⁶ • Mupirocin 2% ointment 1-3 times daily, typically for 7-14 days depending on severity and clinical response; if no response after 3-5 days, re-evaluate treatment. For patients using silver dressings, apply for every dressing change (e.g., if dressing change is once a day, apply mupirocin once a day) • Silver sulfadiazine (Silvadene[®]) topical antibiotic apply twice a day to areas of skin that is not intact Topical astringent for skin irritation: Aluminum acetate (Domeboro [®]) dissolve ¼-1 packet in a large bowl of water. Soak washcloth and apply to affected skin for 10 minutes prior to air dry and application of cream emollient. If treating the foot, hand, or anogenital area, prepare as a sitz bath and soak affected areas as above. Perform application 1-4 times per day as needed.
Grade 4	Referral for Surgical Management (may require debridement or skin graft)		

¹ Free of alcohol, perfumes or other chemical irritants. See Appendix D for General Skin Care Product List Examples.

² See Appendix E for Dressing Product List and Appendix F for Dressing Product Guidance. Product brands are examples and are based on MD Anderson's product stock.

³ Film forming silicone gel can be applied to irradiated skin at the onset of radiotherapy, twice a day until skin reaction subsides. StrataXRT[®] is preferred due to available published data and is available as prescription only. Other silicone gel formulations such as ScarAway[®] may be a more economical option and is available over the counter (OTC). OTC gel formulations should be washed off prior to radiation treatment.

⁴ Typically used within 1 week prior to radiation treatment, during radiation treatment, and 2 weeks after radiation treatment. Apply on intact skin. If patient experiences burning with cream, consider switching to ointment dosage form.

⁵ Silver sulfate targets wound related pathogens and reduces odor

⁶ For head and neck patients, empiric doxycycline is considered for severe dermatitis that requires systemic treatment even without a culture and sensitivity (C&S)

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APPENDIX C: Skin Management – Breast - continued

NCI/RTOG Grading	Basic Skin Care ¹	Dressings ²	Pharmacological Treatment
Grade 0	May consider emollients	Consider using protective, absorbent nonadherent dressings (e.g., Mepitel®)	Consider topical steroids for prophylaxis; apply topical steroid ³ twice daily
Grade 1	Emollients	Consider using protective, absorbent, non-adherent dressings <ul style="list-style-type: none"> • Gel dressing as indicated • For exudate <ul style="list-style-type: none"> ◦ Low: Mepilex® Lite ◦ High: Mepilex® Transfer or CoolMagic™ dressing 	Topical steroids for follicular dermatitis or itching; apply topical steroid ^{3,4} twice daily
Grade 2	<ul style="list-style-type: none"> • Emollients • Avoid moisturizers on areas with moist desquamation • Clean with 3% hydrogen peroxide and sterile water (1:1 dilution) 	Consider using protective, absorbent, non-adherent dressings <ul style="list-style-type: none"> • Gel dressing as indicated • For exudate <ul style="list-style-type: none"> ◦ Low: Mepilex® Lite ◦ High: Mepilex® Transfer or CoolMagic™ dressing 	Topical steroids for follicular dermatitis or itching; apply topical steroid ^{3,4} twice daily <u>For exudate:</u> Mupirocin 2% ointment 1-3 times daily, typically for 7-14 days, depending on severity and clinical response; if no response after 3-5 days, re-evaluate treatment For pain control as needed: Mix lidocaine and prilocaine (EMLA™) cream or lidocaine 5% with Aquaphor® (1:1)
Grade 3	<ul style="list-style-type: none"> • Emollients • Avoid moisturizers on areas with moist desquamation • Clean with 3% hydrogen peroxide and sterile water (1:1 dilution) 	<ul style="list-style-type: none"> • Gel dressing as indicated • For exudate <ul style="list-style-type: none"> ◦ Low: Mepilex® Lite ◦ High: Mepilex® Transfer or CoolMagic™ dressing • For Infection <ul style="list-style-type: none"> ◦ Silver dressings⁵: Mepilex® Ag 	<ul style="list-style-type: none"> • Topical steroids: triamcinolone 0.1% cream twice daily or mometasone furoate 0.1% cream once or twice daily or hydrocortisone 1% or 2% cream twice daily as indicated • For pain control as needed: Mix lidocaine and prilocaine (EMLA™) cream or lidocaine 5% with Aquaphor® (1:1) • Signs and symptoms of infection <ul style="list-style-type: none"> ◦ Obtain skin culture and sensitivity (C&S) ◦ Consider empiric doxycycline 100 mg twice daily for 14 days (pending C&S) ◦ Mupirocin 2% ointment 1-3 times daily, typically for 7-14 days depending on severity and clinical response; if no response after 3-5 days, re-evaluate treatment. For patients using silver dressings, apply for every dressing change (e.g., if dressing change is once a day, apply mupirocin once a day)
Grade 4	Referral for Surgical Management (may require debridement or skin graft)		

¹ Free of alcohol, perfumes or other chemical irritants. See Appendix D for General Skin Care Product List Examples. Consider emollients daily after radiation for at least 6 months to 1 year.

² See Appendix E for Dressing Product List and Appendix F for Dressing Product Guidance. Product brands are examples and are based on MD Anderson's product stock.

³ Topical steroid options are hydrocortisone 1% cream twice daily as indicated, triamcinolone 0.1% cream twice daily, and mometasone furoate 0.1% cream once or twice daily

⁴ Typically started on the first day of radiation treatment, during radiation treatment, and 2 weeks after radiation treatment. Apply on intact skin. If patient experiences burning with cream, consider switching to ointment dosage form.

⁵ Silver sulfate targets wound related pathogens and reduces odor

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APPENDIX C: Skin Management – Gynecology (Vulvar) - continued

<p>Prevention</p>	<ul style="list-style-type: none"> • Clean and dry are most important • Minimize skin contact; recommend loose underwear, pants, dresses • No toilet paper; use hypoallergenic and fragrance-free wipes, peribottle or handheld shower. Gentle soap and water, pat dry or use fan/cool setting of hairdryer. • Do not use scented creams/lotions, over the counter Desitin[®], or medicated ointments • Aquaphor[®], Eucerin[®], Vaseline[®] are all good protective skin barriers for prevention. Ensure skin is dry before covering with cream.
<p>Basic Skin Care</p>	<p>Patients receiving treatment for vulvar cancer should have their skin examined weekly and/or when there is a change in their symptoms</p> <ul style="list-style-type: none"> • Nurses can assess skin reaction with the provider at patient's weekly appointment • Aluminum acetate (Domeboro[®]) sitz bath twice a day is the initial recommendation for skin erythema or dry desquamation. Nurses can provide education on its use. <ul style="list-style-type: none"> ◦ Baking soda sitz bath may be a less expensive and best alternative treatment to aluminum acetate (Domeboro[®]) • Nystatin powder can be used as prevention when dry desquamation is noted, or with large skin folds that remain moist • Lidocaine gel can be used for pain during urination. Do NOT use on open skin. • NDX (nystatin, zinc oxide, lidocaine) compound for painful dermatitis
<p>Dressings</p>	<ul style="list-style-type: none"> • Hydrogel dressings can be applied to areas of moist desquamation when skin is clean and dry • Diluted Hibiclens[®] soak 1-3 times weekly for moist desquamation or superinfection • Nurse-visit appointments twice weekly to monitor and educate on skin dressing needs (e.g., Mepilex[®], CoolMagic[™], Hibiclens[®]) • For open wounds: Hibiclens[®], non-adherent wound dressing (e.g., Vaseline[®] gauze), Remedy Clear-Aid[™]/Desitin[®], ABD pad, and Bioseal[®] for bleeding
<p>Pharmacological Treatment</p>	<p>Locations of skin reaction will influence treatment recommendations. Erythema within the treatment field before 30 Gy should be considered at high risk of including an infectious component.</p> <ul style="list-style-type: none"> • Diarrheal prevention is key since diarrhea increases risk of skin infection • Nystatin cream or powder can be applied to involved area. Skin should be clean and dry before application. Not first choice for vulvar cancers. • Yeast/fungal infection: <ul style="list-style-type: none"> ◦ For initial signs and symptoms: Fluconazole 150 mg once ◦ For complicated or severe infection: Fluconazole 150 mg every 72 hours for 2-3 doses. Check liver function tests (LFTs) prior to treatment. ◦ If progressive: Fluconazole 100 mg daily for 7 days. Check LFTs prior to treatment and weekly. • Bacterial infection: Coverage for <i>staphylococcus aureus</i>, consider sulfamethoxazole and trimethoprim or clindamycin. Consider swabbing for assessment of sensitivities. For gram positive or negative bacteria, consider levofloxacin or metronidazole. • Suspected herpetic infection: If blister is present, obtain viral cultures. If result is positive or high clinical suspicion, treat with valacyclovir 500 mg twice a day for 3 days.

ABD = abdominal

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APPENDIX D: General Skin Care Product List Examples

Emollients	Head and Neck/Breast/ Thoracic/Melanoma/Sarcoma	Remedy® Intensive Skin Therapy		<ul style="list-style-type: none"> • Active ingredient: Dimethicone 1% • Silicone blended cream with olivamine
		CeraVe®		<ul style="list-style-type: none"> • Active ingredients: Ceramides 1,3 and 6-11, hyaluronic acid • Oil-free, non-comedogenic, hypoallergenic, fragrance-free
		Aveeno®		<ul style="list-style-type: none"> • Triple oat complex, ceramide and emollients • Fragrance-free and steroid-free • Non-comedogenic
	Breast/Thoracic	Vanicream™		<ul style="list-style-type: none"> • Free of dyes, fragrance, lanolin, parabens and formaldehyde • Non-comedogenic
	Head and Neck/Breast/ Melanoma/Sarcoma	Aquaphor®		<ul style="list-style-type: none"> • Uniquely formulated with 41% petrolatum; the ointment works by creating a protective barrier on the skin that allows flow of excess fluid and oxygen • The barrier also keeps in skin's own moisture to create an ideal healing environment
	Breast	Oil-based lotions and creams		<ul style="list-style-type: none"> • Free of dyes, fragrance, lanolin, parabens and formaldehyde • Non-comedogenic
	Melanoma/Sarcoma	La Roche-Posay® Cicaplast Baume B5		<ul style="list-style-type: none"> • Non greasy, moisturizing cream to prevent skin dryness • Heals dry, irritated skin • Do not use for open skin
		La Roche-Posay® Lipikar Lotion		<ul style="list-style-type: none"> • Moisturizing lotion with protective lipids • Heals and restores dry skin

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APPENDIX E: Dressing Product List Examples

For non to low exuding areas with dry and moist desquamation:

- Mepilex® Lite
- PolyMem®

For high exuding areas with moist desquamation:

- Mepilex® Transfer
- PolyMem® MAX

For skin with signs of infection of low to moderately exuding wounds:

- Mepilex® Ag¹
- PolyMem® MAX Silver¹

For keeping the wound bed clean and moisturized while absorbing excess fluid:

- PolyMem® WIC² – expands within the wound cavity to fill dead space

For maintaining skin integrity and reducing trauma and irritation to the affected site:

- StrataXRT® (preferred) – creates a protective silicone film that acts like a dressing. Ingredients: polydimethylsiloxanes, siloxanes, alkylmethyl silicones. Prescription only.
- ScarAway® gel – may be a more economical option. Ingredients: polysiloxanes, silicone dioxide. Available over the counter.

¹ Silver sulfate targets wound related pathogens and reduces odor

² Can be used with either Mepilex® or PolyMem®

APPENDIX F: Guidance on Using Dressing Product

Selecting Correct Size	<ul style="list-style-type: none"> • Choose a dressing size that is slightly larger than the affected skin area • Cut the dressing to fit the size and shape of the area
Applying Dressing to Skin	<ul style="list-style-type: none"> • Do not use microporous tape on the skin, only use on the dressing itself - if two dressings are required, overlap the dressings when taping them together to avoid the risk of the adhesive tape sticking to the skin • Where tape is needed to fix dressing to the skin, use silicone tape (e.g., Mepitac® - available in MDA stock), as this can be less traumatic on sensitive skin • Elastic net dressing retainers (e.g., Tubegauz® - available in MDA stock) can be used to keep dressings in place on difficult areas. Make sure the elastic net dressing retainer does not cause friction on the treated skin. • Poly-Mem® products need to be sprayed with sterile water/saline (e.g., Kendall™ Sterile Saline Spray - available in MDA stock) if applied on dry skin to activate the material
Resources	<p>Refer to manufacturer guidelines on specific types of dressings/products:</p> <ul style="list-style-type: none"> • Molnlycke (for Mepilex® products): https://www.molnlycke.com/education/wound-areas/wound-healing/cutting-guide-for-dressings/ • Ferris Mfg (for Poly-Mem® products): https://www.polymem.com/ed.html • Stratpharma (for StrataXRT®): https://us.strataxrt.com/full-prescriber-information/ • ScarAway® Silicone Gel: https://www.myscaraway.com/product/scaraway-scar-diminishing-gel/ • CoolMagic™: https://www.woundsource.com/product/coolmagic-gel-sheet

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SUGGESTED READINGS

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Disclaimer: *This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.*

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