

Acute Radiotherapy Skin Reactions: Promoting Comfort

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The skin is a dynamic organ, in a constant state of renewal. New skin cells form at the basal layer of the epidermis and work their way up to the outermost layer, where they are shed. This process can take four to six weeks in total. Radiotherapy hastens the shedding process, and the cells at the basal layer may or may not be able to be produced fast enough to replace the lost cells. It is this disruption in the skin renewal process that results in acute radiation induced skin reactions and the associated discomfort.

Acute radiotherapy skin reactions commonly seen are mild erythema, dry desquamation and moist desquamation. Occasionally, confluent wet desquamation is encountered. The severity of skin reactions may be related to several factors, such as the total dose of radiation, the daily treatment dose, the size of the treatment field, the area being treated, the energy delivered, previous sun exposure, the nutritional status of the patient, systemic medications, and concurrent chemotherapy. In addition, there are differences in skin tolerance for each individual.

Linear accelerators (LINAC) used for treatment delivery have a skin sparing capacity. The photons produced by the LINAC penetrate the tissue deeper, therefore there is less dose to the skin. However, electrons produced by the LINAC have less penetration, with a greater dose to the skin, and may result in a brisk skin reaction. In addition, the use of bolus (tissue-equivalent material) during treatment delays the penetration of the x-ray beam, therefore increasing the dose to the skin, which produces a greater skin reaction.

Erythema

Pain associated with acute radiotherapy skin reactions is classified as nociceptive. The loss of the epidermis exposes nerve endings, which results in varying degrees of discomfort and pain. Usually discomfort is first noted with the development of erythema, which occurs about 2 to three weeks into treatment. Erythema may appear red, rashy, and warm to touch. The patient usually complains that the skin feels taut and is tender to touch. Moisturizing the skin at this time will provide comfort. Patients should be instructed to cleanse the skin gently with warm water, mild non-deodorant unscented soap, pat dry, and to wear loose-fitting cotton clothing. Avoiding chlorinated water whenever possible will help prevent further drying of the skin.

Dry desquamation

Dry desquamation may accompany or follow erythema. Its appearance is that of dry, flaky skin that itches. Dry desquamation usually appears around three to four weeks into treatment. Comfort measures are aimed at reducing itching, scratching and maintaining skin integrity. Patients should follow the same instructions above for erythema, with the addition of other skin care products. Skin care products that provide relief are aloe vera gels, corticosteroid creams, and cornstarch powder. Be advised that cornstarch should not be used in a skin fold area, as the moisture there can cause the starch to be converted to glucose and result in a yeast infection. If the itching persists, diphenhydramine 25 mg. every six hours may help, but can also produce drowsiness.



Moist desquamation

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Moist desquamation, which is red, sensitive, weeping skin, elicits the most discomfort ranging from mild to severe pain. It typically presents around four to six weeks into treatment. At this time, the ionizing radiation has damaged the basal layer, and there is a temporary interruption in the renewal process. Nursing interventions are aimed at preventing infection, promoting the healing process, and providing comfort. If there is exudate, cleanse the area gently with 1/4 strength hydrogen peroxide, rinse with normal saline (NSS), and pat dry.

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