

# Radiodermatitis in Patients With Cancer: Systematic Review and Meta-Analysis

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**PROBLEM IDENTIFICATION:** A systematic review and meta-analysis was conducted to inform the development of guidelines on the management of radiodermatitis among patients with cancer.

**LITERATURE SEARCH:** The authors updated a systematic review to include available literature published through September 30, 2019.

**DATA EVALUATION:** Two investigators assessed risk of bias using the Cochrane Collaboration risk-of-bias tool and certainty of the evidence using the GRADE (Grading of Recommendations Assessment, Development and Evaluation) approach.

**SYNTHESIS:** The use of deodorant/antiperspirant had no effect on development of radiodermatitis. Aloe vera and emu oil were equivalent or less effective than standard care. Oral curcumin had a minimal beneficial effect. Nonsteroidal topical interventions had a minimal beneficial effect on the development of moist desquamation and relief of itching while causing a small increase for grade 2 radiodermatitis. Topical calendula increased risk for the development of radiodermatitis. Topical steroids and dressings each showed benefits to minimize the development of radiodermatitis and moist desquamation while lowering rates of patient-reported symptoms, such as pain and pruritus.

**IMPLICATIONS FOR RESEARCH:** Symptom management strategies for radiodermatitis among patients with cancer that are likely to be effective include topical nonsteroidals, topical steroids, and dressings.

**KEYWORDS** radiodermatitis; radiation therapy; guideline; systematic review; meta-analysis

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Radiation therapy is one of the pillars of cancer treatment that has led to an increase in cancer survival rates in the United States. In 2000, about 24% of cancer survivors received radiation and, in 2020, that number was expected to increase to 29% (Bryant et al., 2017). This increase was seen across cancer sites, with the largest increases for patients being treated for breast or prostate cancer (Bryant et al., 2017). A prevalent side effect of ionizing radiation is radiodermatitis (also referred to as radiation dermatitis or radiation-induced skin reaction). An estimated 95% of patients who receive radiation therapy will develop some level of radiodermatitis (Singh et al., 2016). Because of this high risk, interventions for radiodermatitis are aimed at minimizing the severity or delaying progression to higher grades, rather than prevention.

Skin changes from radiation therapy are caused by disruption to the normal process of cell division and repair related to ionizing radiation therapy (Bray et al., 2016). Radiodermatitis can range from mild erythema to dry desquamation and moist desquamation (Singh et al., 2016). These skin changes usually manifest within two to three weeks of radiation initiation and can persist for as long as four weeks following the completion of treatment (Naylor & Mallett, 2001). Radiodermatitis can be painful and uncomfortable to patients and can have a negative effect on quality of life (Aistars, 2006; Vaz et al., 2007). If severe, it can also lead to changes in radiation treatment schedules (McQuestion, 2006).

Various products have been studied in the literature to minimize radiodermatitis with limited consensus to support a standard of care. Variation in products studied and research methodologies employed have led to inconsistency in practice recommendations, even within the same institution (Bieck & Phillips, 2010; Feight et al., 2011). An