Lesioni cutanee da radioterapia: i dati epidemiologici

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Lesioni cutanee da radioterapia: i dati epidemiologici

371.000

nuovi casi di tumore, in Italia, stimati nel 2019

https://www.aiom.it/wp-content/uploads/2019/09/2019_Numeri_Cancro-operatori-web.pdf

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Lesioni cutanee da radioterapia: i dati epidemiologici

3,5MIL

pazienti vivi con tumore, in Italia, nel 2019

https://www.aiom.it/wp-content/uploads/2019/09/2019_Numeri_Cancro-operatori-web.pdf

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Lesioni cutanee da radioterapia: i dati epidemiologici

50%

dei pazienti con tumore,
va incontro ad un trattamento di radioterapia

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Lesioni cutanee da radioterapia: i dati epidemiologici

95% dei pazienti sottoposti a trattamento radiante, sviluppa radiodermite

1. Singh M, Alavi A, Wong R, Akita S. Radiodermatitis: A Review of Our Current Understanding. Am J Clin Dermatol. 2016 Jun;17(3):277-92. doi: 10.1007/s40257-016-0186-4.
2. Seité S, Bensadoun RJ, Mazer JM. Prevention and treatment of acute and chronic radiodermatitis. Breast Cancer (Dove Med Press). 2017 Nov 2;9:551-557. doi: 10.2147/BCTT.S149752.

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Lesioni cutanee da radioterapia: i dati epidemiologici

25%

dei pazienti presenta dermatite con desquamazione ed ulcere

Presta G,, Puliatti A, Bonetti L, Tolotti A, Sari D, Valcarenghi D.
Effectiveness of hyaluronic acid gel (Jalosome soothing gel) for the treatment of radiodermatitis in a patient receiving head and neck radiotherapy associated with cetuximab: A case report and review. Int Wound J. 2019 Dec;16(6):1433-1439. doi: 10.1111/iwj.13210. Epub 2019 Sep 2 .

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Lesioni cutanee da radioterapia: overview

Radiation-Induced Acute Dermatitis (RIAD) is the most common side effect of RT

It affects up to 95% of patients

Porock D, Eur J Cancer Care 2002
Salvo N, Curr Oncol 2010
Russi EG, Crit Rev Oncol Hematol 2015

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Lesioni cutanee da radioterapia

RIAD is the combination of:

Decrease in functional stem cells

Changes in skin's endothelial cells

Inflammation

Skin-cell necrosis and death

Iacovelli NA, Support Care Cancer 2017

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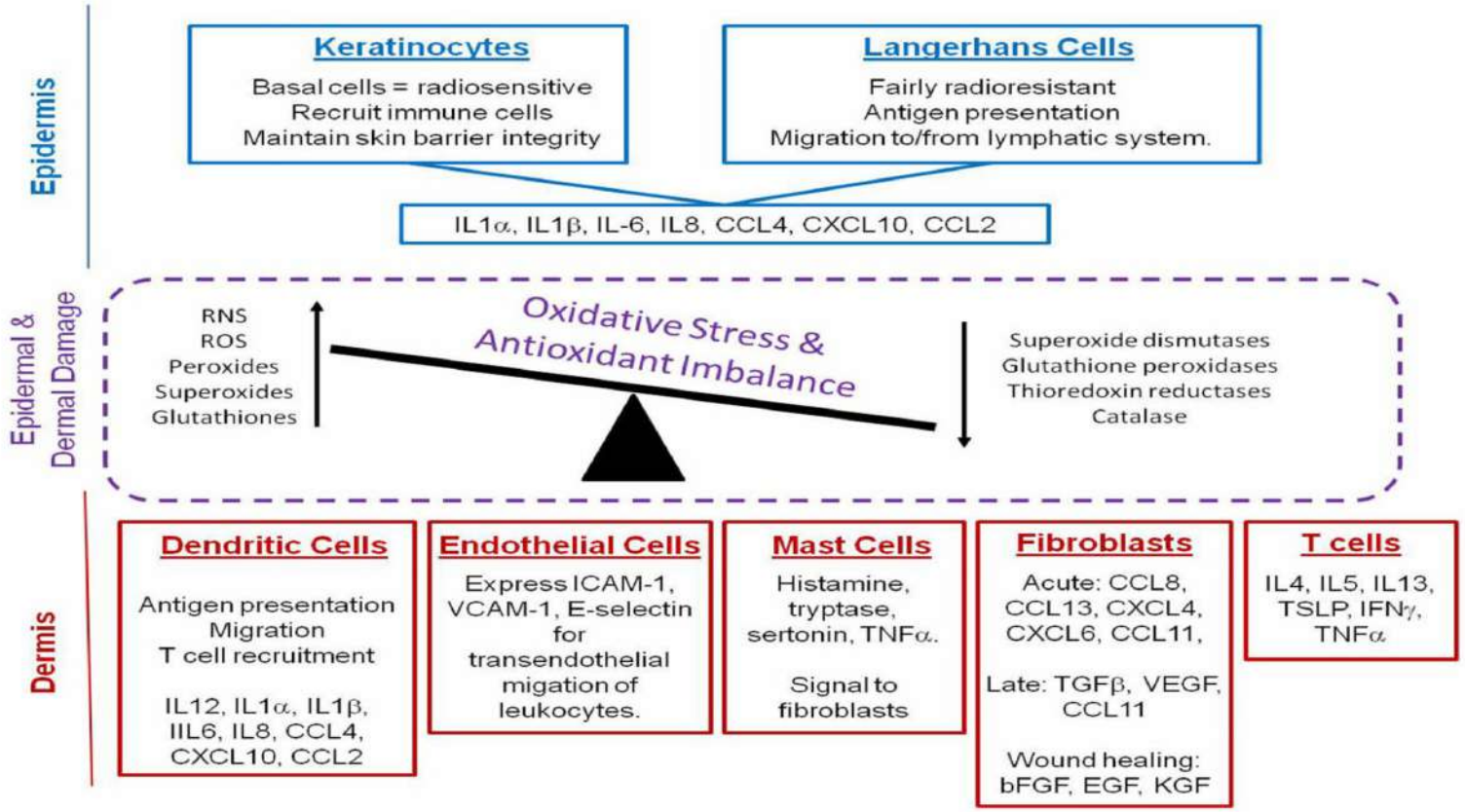
Lesioni cutanee da radioterapia



Ryan JL, J Invest Dermatol 2012

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Lesioni cutanee da radioterapia: i dati epidemiologici

Table 1 Dose-dependent acute cutaneous findings after local radiation exposure [7]

Observed acute skin reaction	Radiation dose (Gy)	Onset of findings
Transient erythema	2	Hours
Faint erythema and epilation	6–10	7–10 days
Defined erythema and hyperpigmentation	12–20	2–3 weeks
Dry desquamation	20–25	3–4 weeks
Moist desquamation	30–40	4 weeks or more
Ulceration	>40	6 weeks or more

Bray FN, Dermatol Ther 2016

Lesioni cutanee da radioterapia: risk factors

Treatment-related:

- RT parameters
- Systemic therapies

Patient-related:

- Individual susceptibility/Genetic background
- Demographic and behavioral factors
- Comorbid disease
- Inherited disorders

Sourati A, Acute Side Effects of Radiation Therapy 2017

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Lesioni cutanee da radioterapia: RT parameters

Total dose

Dose per fraction

Bolus

Type of radiation and energy

Size of treatment field

Site treated

RT technique

Sourati A, Acute Side Effects of Radiation Therapy 2017

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Lesioni cutanee da radioterapia:
Patient-related predisposing factors for RIAD

Demographic and behavioral factors	Comorbid disease	Inherited disorders
Black race Obesity Female gender Advanced age Breast implant Smoking Poor nutrition	Actinic skin lesions Seroma aspiration after breast surgery Systemic lupus erythematosus Systemic sclerosis Juvenile rheumatoid arthritis HIV infection Diabetes mellitus Hypertension	Basal cell nevus disease Fanconi anemia Bloom syndrome Xeroderma Pigmentosum Ataxia-telangiectasia

Sourati A, Acute Side Effects of Radiation Therapy 2017

Lesioni cutanee da radioterapia

How is riad graded?

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Lesioni cutanee da radioterapia

There are no commonly shared rigorous classification systems

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Lesioni cutanee da radioterapia

Table 5. Comparison between RTOG/EORTC and CTCAE v.4.03 scales for acute radiation dermatitis.		
Grade	**RTOG/EORTC**	**CTCAE v.4.03**
0	No change from baseline/no symptoms	Nonchange over baseline/no symptoms
1	Follicular, faint or dull erythema, epilation, dry desquamation, decreased sweating	Faint erythema or dry desquamation
2	Tender or bright erythema, patchy moist desquamation, moderate edema	Moderate to brisk erythema, patchy moist desquamation, mostly confined to skin folds and creases, moderate edema
3	Confluent moist desquamation other than skin folds, pitting edema	Moist desquamation other than skin folds and creases, bleeding induced by minor trauma or abrasion
4	Ulceration, hemorrhage necrosis	Life-threatening consequences, skin necrosis or ulceration of full thickness dermis, spontaneous bleeding from involved site, skin graft indicated
5		Death
CTCAE: Common terminology criteria for adverse events; RTOG/EORTC: Radiation Therapy Oncology Group/European Organization for Research and Treatment of Cancer.		

Iacovelli NA, Future Oncol. 2018

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Lesioni cutanee da radioterapia

RISRAS (total scores between 0 and 36)[a]					
Researcher component (total scores between 0 and 24)					
Erythema (E)	0 Normal skin	1 Dusky pink	2 Dull red	3 Brilliant red	4 Deep red-purple
Dry Desquamation (DD)	0 Normal skin	1 (<25%)[b]	2 (25%–50%)	3 (50%–75%)	4 (>75%)
Moist Desquamation (MD)	0 Normal skin	1.5 (<25%)	3.0 (25%–50%)	4.5 (50%–75%)	6 (>75%)
Necrosis (N)	0 Normal skin	2.5 (<25%)	5.0 (25%–50%)	7.5 (50%–75%)	10 (>75%)
Patient component (total scores between 0 and 12)					
Symptoms		**Not at all**	**A little**	**Quite a bit**	**Very much**
Do you have any *tenderness*, *discomfort* of *pain* of your skin in the treatment area?		0	1	2	3
Does your skin in the treatment area *itch*?		0	1	2	3
Do you have a *burning sensation* of your skin in the treatment area?		0	1	2	3
To what extent has your skin reactions and your symptoms affected your *day to day activities*?		0	1	2	3

[a]Individual scores for each item are added up to give a total score for the researcher and patient components of the scale. Adding the researcher and patient component scores together gives the total combined RISRAS score.
[b]Percentage of surface area of affected skin.

Sutherland AE, Eur J Cancer Care 2017

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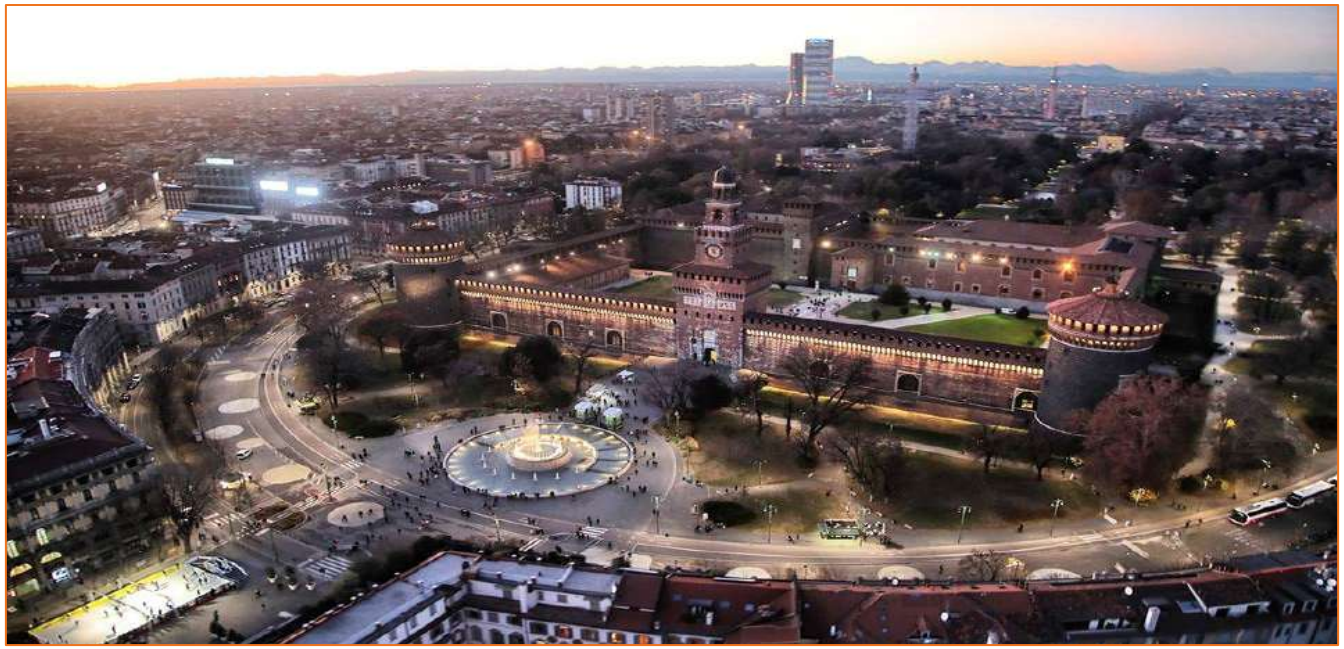
Table 6. Advantages and limitations of most used radiation dermatitis scales.

Scale	Description	Pros	Cons
Radiation Therapy Oncology Group (RTOG)/ European Organization for Research and Treatment of Cancer (EORTC)	Evaluate severity of skin reaction Ordinal scale 0–4	Quickly rates dermatitis by observation of skin changes Frequently used in clinical trials	Do not report on symptoms/quality of life/activity of daily living Few data on validity/reliability
Common Terminology Criteria for Adverse Events (CTCAE v.4.03)	Evaluate severity of skin reaction Ordinal scale 0–5	Quickly rates dermatitis by observation of skin changes Frequently used in clinical trials	Do not report on symptoms/quality of life/activity of daily living No study on validity/reliability
Radiation-induced Skin Reaction Assessment Scale (RISRAS)	Evaluate severity of skin reaction and patient's symptoms Numerical score 0–36	Assigns a score to researcher component (evaluation of dermatitis) and to patient component (report on symptoms and their impact on activity of daily living) Data on reliability and validity available	Not frequently used in clinical trials

Iacovelli NA, Future Oncol. 2018

Lesioni cutanee da radioterapia



What impact on patient's QoL?

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Lesioni cutanee da radioterapia

Discomfort

Itching

Burning

Varying degrees of somatic pain

Risk of infections

Negative impact on adherence to treatment

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Lesioni cutanee da radioterapia
Skindex-16

Negli ultimi 7 giorni, quanto spesso le ha/hanno dato fastidio:	Non mi ha mai dato fastidio ↓						Mi ha sempre dato fastidio ↓
1. Il **prurito** dovuto al suo problema di pelle	☐0	☐1	☐2	☐3	☐4	☐5	☐6
2. Il **bruciore** o il **pizzicore** dovuti al suo problema di pelle.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
3. Il **dolore** dovuto al suo problema di pelle	☐0	☐1	☐2	☐3	☐4	☐5	☐6
4. L'**irritazione** dovuta al suo problema di pelle	☐0	☐1	☐2	☐3	☐4	☐5	☐6
5. La **persistenza/ricomparsa** del suo problema di pelle	☐0	☐1	☐2	☐3	☐4	☐5	☐6
6. La **preoccupazione** per via del suo problema di pelle (Per es. che si possa estendere, peggiorare, lasciare segni, essere imprevedibile, ecc.)	☐0	☐1	☐2	☐3	☐4	☐5	☐6
7. L'**aspetto** del suo problema di pelle	☐0	☐1	☐2	☐3	☐4	☐5	☐6
8. La **frustrazione** per via del suo problema di pelle	☐0	☐1	☐2	☐3	☐4	☐5	☐6
9. L'**imbarazzo** per via del suo problema di pelle	☐0	☐1	☐2	☐3	☐4	☐5	☐6
10. **Essere seccato/a** per via del suo problema di pelle	☐0	☐1	☐2	☐3	☐4	☐5	☐6
11. **Sentirsi depresso/a** per via del suo problema di pelle	☐0	☐1	☐2	☐3	☐4	☐5	☐6
12. Le conseguenze del suo problema di pelle sui suoi **rapporti con gli altri** (Per es.: rapporti con famigliari, amici, rapporti intimi, ecc.)	☐0	☐1	☐2	☐3	☐4	☐5	☐6
13. Le conseguenze del suo problema di pelle sul suo **desiderio di stare con gli altri**.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
14. La difficoltà di **manifestare il suo affetto** a causa del suo problema di pelle	☐0	☐1	☐2	☐3	☐4	☐5	☐6
15. Le conseguenze del suo problema di pelle sulle sue **attività quotidiane**	☐0	☐1	☐2	☐3	☐4	☐5	☐6
16. La difficoltà di **lavorare o fare quello che le piace** a causa del suo problema di pelle	☐0	☐1	☐2	☐3	☐4	☐5	☐6

Symptom: 1–5

Emotion: 6–11

Function: 12–16

3 domains

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How is riad managed?

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Goals

- Preventing RIAD
- Delaying RIAD onset
- Minimizing symptoms
- Promoting healing
- Preventing infections

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The management of acute dermatitis is not standardized due to the lack of evidence-based prevention and treatment guidelines.

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Standard of care (SOC) from MASCC

- Washing with lukewarm water and a mild pH-neutral or non-alkaline soap
- Shaving with a sharp, disinfected wet razor or with non-traumatizing electric razor
- Avoiding the use of metallic-based topical products (zinc oxide creams or deodorants with an aluminum base, for instance) and the use of tapes and adhesives
- Wearing loose-fitting clothes in order to prevent friction injuries over the irradiated area
- Avoiding extreme temperatures

Wong RKS, Support Care Cancer 2013

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Critical Reviews in Oncology/Hematology 96 (2015) 167–182

CRITICAL REVIEWS IN
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Hematology
Incorporating Geriatric Oncology
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Acute skin toxicity management in head and neck cancer patients treated with radiotherapy and chemotherapy or EGFR inhibitors: Literature review and consensus

Elvio G. Russi [a,*], Francesco Moretto [b], Monica Rampino [b], Marco Benasso [c], Almalina Bacigalupo [d], Vitaliana De Sanctis [e], Gianmauro Numico [f], Paolo Bossi [g], Michela Buglione [h], Antonino Lombardo [i], Mario Airoldi [j], Marco C. Merlano [k], Lisa Licitra [g], Nerina Denaro [k], Stefano Pergolizzi [l], Carmine Pinto [m], Renè- Jean Bensadoun [n], Giampiero Girolomoni [o], Johannes A. Langendijk [p]

Consensus conference on supportive care in concurrent chemo-radiation of head and neck cancers

5 maggio 2014

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Systematic Review

Future ONCOLOGY

Prevention and treatment of radiation-induced acute dermatitis in head and neck cancer patients: a systematic review

Nicola Alessandro Iacovelli[‡,1], Marco Galaverni[‡,2], Anna Cavallo[3], Simona Naimo[1], Nadia Facchinetti[1], Cinzia Iotti[4], Carlo Fallai[1] & Ester Orlandi[*,1]

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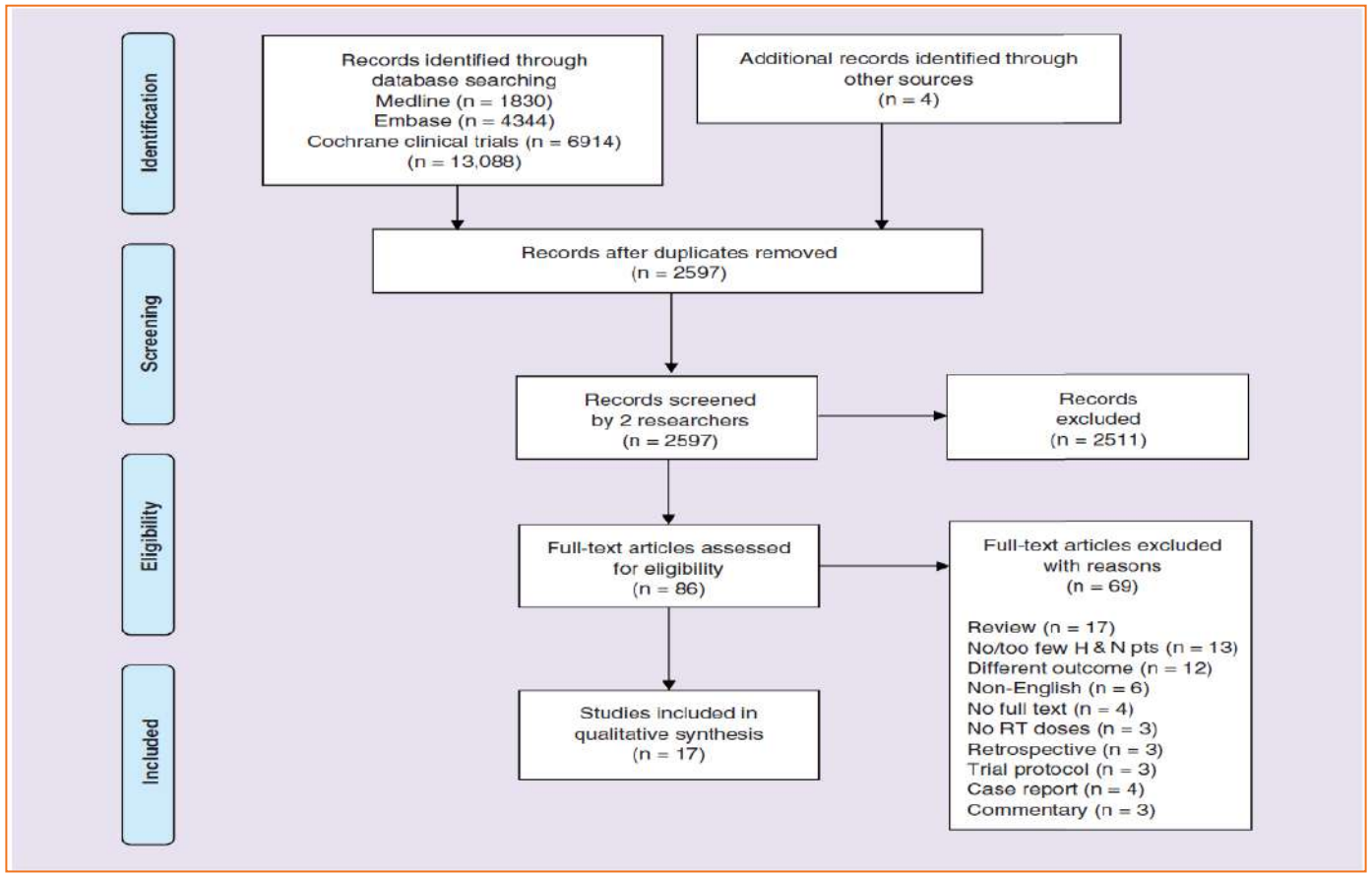

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Selected studies

- A total of 17 papers (950 overall patients) met the inclusion/exclusion criteria:
- 12 randomized controlled trials (RCT)
- 5 nonrandomized observational and prospective studies (NRSs)
- 13 studies took into consideration pre-emptive interventions in order to delay and minimize RIAD appearance: 10 RCTs and 3 NRSs.
- 6 studies took into consideration curative interventions in order to treat high grades of RIAD: 4 RCTs and 2 NRSs.

Study (year)	Observation period	Number of H&N patients	Study type	Prevention/ treatment	Treatment arms	RT technique	Concomitant chemotherapy	Dose/ fractionation	Dermatitis scale, frequency evaluation, outcome assessors	Outcome assessed (skin reaction)	Ref.
Imai *et al.* (2014)	2011–2012	34	RCT	P	HMB/Arg/Gln nutritional supplement (16) *No nutritional supplement (18)*	n.s. (x-rays)	Yes – all pts (cisplatin 100 or 80 mg/m^2 every 3 weeks)	66–70 Gy (1.8–2 Gy/fr)	CTCAE v 4.0, daily, oncologists	No difference in incidence of ≥G3 dermatitis (primary outcome). Incidence of ≥G2 was lower and the duration of ≥G1 and ≥G2 was shorter in nutritional supplement group (secondary outcome)	[28]
Cui *et al.* (2015)	2013–2014	94	RCT	P	Topical olive oil thrice daily (47) *General skin care regimen (placebo) (47)*	IMRT	Yes – all pts (weekly cisplatin 25–30 mg/m^2 and docetaxel 25–30 mg/m^2)	70 Gy (2 Gy/fr)	RTOG/EORTC and VAS score, weekly, dermatologist and radiologist	Decrease in the intensity of acute dermatitis in olive oil pts	[35]
Palatty *et al.* (2014)	2010–2011	50	RCT	P	Vicco® turmeric cream (25) *Johnson's® baby oil (25)*	n.s. (x-rays)	Yes – 23 pts in the treatment group, 21 in control group (carboplatin 70 mg/m^2 once week)	70 Gy (2 Gy/fr)	RTOG/EORTC, twice weekly, physician	Significant reduction in grades of dermatitis in Vicco® pts at all time points	[30]
Wang *et al.* (2008)	2006–2007	51	RCT	P	Trolamine emulsion (Biafine®) (25) *Usual care without any ointment (26)*	3D-CRT	Yes – all pts (capecitabine 750–1500 mg/m^2 from day 1 to 14 and from day 28 to 42)	60–70 Gy (n.s.)	SOMA scoring, n.s., n.s.	Lower grade of dermatitis and delayed emergence in Biafine group	[37]
Abbas *et al.* (2012)	2008–2009	30	RCT	P	Trolamine emulsion (15) *Usual supportive care (15)*	3D-CRT	Yes – all pts (weekly cisplatin 40 mg/m^2)	≥66 Gy (2 Gy/fr)	RTOG/EORTC, n.s., n.s.	Trolamine significantly reduces the intensity of acute dermatitis (primary end point)	[38]
Garibaldi *et al.* (2009)	2007	12	RCT	P	Restitutio Reconstructing Cream produced in two formulations: *'A formulation' based on alginates (6)* *'B formulation' based on alginates, hyaluronic acid and beta-glucan (6)*	n.s. (x-rays and sometimes electrons)	n.s.	66–70 Gy (1.80 Gy/fr)	RTOG/EORTC, n.s., n.s	Same toxicity profile in both group. Same time to full regression of skin lesions until 'ad integrum restitutio' in both groups	[31]
Chan *et al.* (2014)	2012–2013	65	RCT	P	NOCA cream (natural oil-based emulsion containing allantoine) (33) *Aqueous cream (32)*	3D-CRT or Tomotherapy	n.s.	More than 50 Gy (n.s.)	CTCAE v.4.0 and Skindex-16 and BPI, weekly, research nurse	NOCA has similar effects for managing skin toxicity compared with aqueous cream up to week 5; however less effective at later weeks. Overall, aqueous cream seems to be a more preferred option	[39]

2D-RT: Two-dimensional radiation therapy; 3D-CRT: Three-dimensional conformal radiation therapy; BPI: Brief pain inventory; CRT: Chemoradiotherapy; CTCAE: Common terminology criteria for adverse event; G: Grade; H&N: Head and neck; HMB: Beta-hydroxy-beta-methylbutyrate; IMRT: Intensity-modulated radiotherapy; NRS: Nonrandomized study; NRS-11: Numerical rating scale-11; n.s.: Not specified; P: Prevention; pt: Patient; QOL: Quality of life; RCT: Randomized controlled trial; RISRAS: Radiation-induced skin reaction assesment scale; RT: Radiotherapy; RTOG/EORT: Radiation Therapy Oncology Group/European Organization for Research and Treatment of Cancer; SOMA: Subjective, Objective, Management, Analytic; T: Treatment; VAS: Visual analog scale; VMAT: Volumetric modulated arc therapy.

Study (year)	Observation period	Number of H&N patients	Study type	Prevention/ treatment	Treatment arms	RT technique	Concomitant chemotherapy	Dose/ fractionation	Dermatitis scale, frequency evaluation, outcome assessors	Outcome assessed (skin reaction)	Ref.
Manas *et al.* (2015)	n.s.	19	RCT	P	Topical Lactokine-based R1 and R2 system *Standard topical treatment (5% urea lotion)*	3D-CRT	Yes - all pts (platinum-based)	More than 50 Gy (2 Gy/fr)	CTCAE v.4.03 and EORTC QOL questionnaires, 3–4 week after the start of CRT/end of CRT/2 week after the end of CRT, n.s.	R1 and R2 system was more effective in preventing, reducing the onset and the grade of dermatitis compared with standard treatment	[32]
Ma *et al.* (2007)	2000–2005	42	RCT	P/T	Prevention group lianbai liquid (14) *Routine nursing (10)* Treatment group lianbai liquid (9) *Norfloxacin powder (9)*	n.s. (x-rays and/or electrons)	n.s.	50–68 Gy (1.8/2 Gy/fr)	CTCAE v. 2.0, weekly, n.s.	Prevention: lower incidence and grade of dermatitis in lianbai group Treatment: wound healing time shorter in lianbai group	[33]
Schneider *et al.* (2015)	2011–2012	51	RCT	P/T	Calendula officinalis oil (24) *Essential Fatty Acid (EFA) oil (27)*	n.s. (Cobalt-60)	Yes - 51.85% in EFA group and 54.17% in Calendula group (n.s.)	69.77 ± 4.38 Gy average dose in EFA group; 68.12 ± 4.59 Gy average dose in in Calendula group	RTOG/EORTC, every five sessions, trained researchers	Lower proportion of radiodermatitis G2 and G3 in Calendula than EFA group	[36]
Kang *et al.* (2014)	2010–2012	148	NRS (single-arm prospective observational study)	P	EGF-based cream (148)	n.s. (x-rays and/or electrons)	n.s.	More than 50 Gy, median dose 60 Gy (n.s.)	RTOG/EORTC, weekly, radiation oncologists	EGF-cream is effective in preventing radiation dermatitis with tolerable toxicities	[43]
Iacovelli *et al.* (2017)	2015	41	NRS (prospective historically controlled study)	P	Xonrid® gel	IMRT (VMAT)	Yes - 32 pts (platinum-based)	54–72 Gy (1.8/2.12 Gy/fr)	CTCAE v. 4.0 and Skindex-16 and skin reflectance spectra, weekly, radiation oncologists	Xonrid® was associated with a decrease in the incidence of G3 toxicity and a delay in development of G2 toxicity compared with historical control	[22]
Matceyevsky *et al.* (2007)	n.s.	54	NRS (non-randomized controlled trial)	P	Moisturizing cream Solaris® (24) *Trolamine emulsion (Biafine®)(30)*	n.s. (x-rays and electrons)	Yes - 12 pts in the treatment group, 9 in control group (carboplatin AUC-2 or cisplatin 40 mg/m^2 weekly)	56–70 Gy treatment group (1.8/2 Gy/fr) 50–75 Gy controls (1.8/2 Gy/fr)	CTCAE v. 2.0, once a week, n.s.	Trend of less G3-4 dermatitis in treatment group (without statistical significance)	[40]

2D-RT: Two-dimensional radiation therapy; 3D-CRT: Three-dimensional conformal radiation therapy; BPI: Brief pain inventory; CRT: Chemoradiotherapy; CTCAE: Common terminology criteria for adverse event; G: Grade; H&N: Head and neck; HMB: Beta-hydroxy-beta-methylbutyrate; IMRT: Intensity-modulated radiotherapy; NRS: Nonrandomized study; NRS-11: Numerical rating scale-11; n.s.: Not specified; P: Prevention; pt: Patient; QOL: Quality of life; RCT: Randomized controlled trial; RISRAS: Radiation-induced skin reaction assesment scale; RT: Radiotherapy; RTOG/EORT: Radiation Therapy Oncology Group/European Organization for Research and Treatment of Cancer; SOMA: Subjective, Objective, Management, Analytic; T: Treatment; VAS: Visual analog scale; VMAT: Volumetric modulated arc therapy.

Study (year)	Observation period	Number of H&N patients	Study type	Prevention/ treatment	Treatment arms	RT technique	Concomitant chemotherapy	Dose/ fractionation	Dermatitis scale, frequency evaluation, outcome assessors	Outcome assessed (skin reaction)	Ref.
MacMillan *et al.* (2007)	2006–2007	30	RCT	T	Hydrogel plus dry dressing as a secondary dressing (10) *Simple dry dressings (20)*	n.s. (x-rays and/or electrons)	n.s.	Mean dose 57.1 Gy (mean 2.53 Gy/fr) in treatment group; mean dose 56.8 Gy (mean 2.58 Gy /fr) in control group.	RTOG/EORTC, researchers, n.s.	Healing time of moist desquamation prolonged with the use of hydrogel (primary end point)	[34]
Zhong *et al.* (2013)	2010 and 2012	88	RCT	T	Mepilex® lite dressing (43) *Usual care (wound care and cleansing with salted water) (45)*	2D-RT, 3D-CRT, IMRT (no significant differences in groups)	Yes – all pts (cisplatin 40 mg/m² weekly)	66–70 Gy (2–2.27 Gy/fr)	RISRAS and VAS score, every 2 days, n.s.	Shorter time-to-wound healing in Mepilex® pts (primary end point). Mepilex® significantly decreased the extent of dermatitis	[29]
Franco *et al.* (2014)	2013–2014	28	NRS (single-arm prospective observational study)	T	Hypericum perforatum and neem oil	IMRT (VMAT)	Yes – 14 pts (weekly cisplatin 30 mg/m² or weekly carboplatin AUC2)	60–70 Gy (2 Gy/fr)	RTOG/EORTC, weekly, physician	Management of ≥G2 skin toxicity (primary end point): G3 events were reconverted to G2 in 100% of cases after a median time of 7 days, G2 converted to G1 in 23% cases after a median time of 14 days	[42]
Zenda *et al.* (2013)	2009–2010	113	NRS (single-arm prospective observational study)	T	Dermatitis control program (DeCoP), a systematic program consisting of a three-step ladder: gentle wash, moistening of wound environment, infection prevention	3D-CRT, IMRT, proton beam therapy	Yes - 43 pts (platinum-based)	54–70 Gy (n.s.)	CTCAE v.3.0, n.s., physicians or nurses	Incidence of G4 dermatitis (primary end point) was 0%. G3 dermatitis rate was 9.7%	[41]

2D-RT: Two-dimensional radiation therapy; 3D-CRT: Three-dimensional conformal radiation therapy; BPI: Brief pain inventory; CRT: Chemoradiotherapy; CTCAE: Common terminology criteria for adverse event; G: Grade; H&N: Head and neck; HMB: Beta-hydroxy-beta-methylbutyrate; IMRT: Intensity-modulated radiotherapy; NRS: Nonrandomized study; NRS-11: Numerical rating scale-11; n.s.: Not specified; P: Prevention; pt: Patient; QOL: Quality of life; RCT: Randomized controlled trial; RISRAS: Radiation-induced skin reaction assesment scale; RT: Radiotherapy; RTOG/EORT: Radiation Therapy Oncology Group/European Organization for Research and Treatment of Cancer; SOMA: Subjective, Objective, Management, Analytic; T: Treatment; VAS: Visual analog scale; VMAT: Volumetric modulated arc therapy.

Conclusions

- No strong evidence to support the superiority of any specific preventive or therapeutic intervention
- For what concerns curative treatments, all products investigated need more research before their extensive usage could be recommended.
- Need of well designed large randomized studies, having PROs and QoL measures as main outcome measures

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