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ORIGINAL ARTICLE

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NECOM Skincare Algorithm for Patients With Cancer and Survivors

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ABSTRACT

Background: Cancer treatment-related cutaneous adverse events (cAEs) frequently occur, which can interfere with anticancer treatment outcomes and can severely impact quality of life for patients.

Methods: The Nordic European Cutaneous Oncodermatology Management (NECOM) project aims to improve cancer patient outcomes by offering tools for preventing and managing cAEs. The first NECOM paper explored clinical insights in cAEs and focused on skincare regimens involving hygiene, moisturization, sun protection, and camouflage products.

A skincare algorithm for patients with cancer and survivors follows this article to promote healthy skin and reduce cancer treatment-related cAEs.

Results: The NECOM panel discussed and reached a consensus on an evidence- and opinion-based practical algorithm for oncology skin care to support all stakeholders in the Nordic European health care setting. The oncology nurse is central in coordinating individual patient's cancer care and performing triage for cAEs, seeking urgent care via an oncologist and/or the emergency department if needed. The care organization of the presented cAEs depends on the patient's general health and skin condition and the health care system.

Conclusion: Communication on state-of-the-art treatment in the fast-evolving area of oncology is necessary to provide tailored general measures and skin care for cAEs supported by evidence and practice-based expert recommendations.

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INTRODUCTION

The 4 most commonly diagnosed cancers in the Nordic European countries in 2020 were lung, breast, prostate, and colorectal, accounting for almost half of all cancer diagnoses (175,925).[1] The estimated global incidence of cancer per 100,000 population in 2020 in Denmark was 350; Norway, 325; Sweden, 285; Finland, 270; and Iceland, 260.[2]

According to the Swedish National Cancer Register, these statistics exclude skin cancer, which comes in third place after breast and prostate cancers.[2] Basal cell cancer accounts yearly for more than breast and prostate cancers for over 50,000 new cases versus 10,000 and 9,000 cases, respectively.[2] Increasingly, more patients live with or survive cancer due to an early diagnosis and an improved quality of cancer treatment.[3]

In the Nordic European countries in 2010, the relative 5-year cancer survival percentage of males and females in Sweden was 70% and 69%; in Finland, 65% and 68%; Denmark was 62% and 65%; respectively, and in Norway for either gender, 69%.[3]

More people live with or survive cancer and have cancer treatment-related cAEs or sequelae.[4-9,13-29] Cancer treatment-related cutaneous adverse events (cAEs) frequently occur, interfering with anticancer treatment outcomes and severely impacting quality of life (QoL) for patients.[4,5,21-23,30-39] However, cAEs may indicate a therapeutic response.[36]

Patients most frequently report dermatologic adverse events as negatively impacting their QoL.[6] The cAEs were unanticipated before therapy, and 67% of patients reported that cAEs were worse than their initial belief before starting cancer treatment despite the information given by health care providers.[6] Another study showed that 58% of patients rated chemotherapy-induced alopecia as their therapy's most traumatic side effect, and 8%

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of patients would decline chemotherapy because of fear of hair loss.[7]

A study of patients with breast cancer receiving radiation therapy reported that cAEs induced by radiotherapy negatively impact physical wellbeing, body image, emotional wellbeing, functional wellbeing, and treatment satisfaction.[8] Scars resulting from oncologic surgical procedures can lead to psychological problems in 15% of survivors of childhood cancers.[9]

The aim of the skincare algorithm for patients with cancer and survivors is to promote healthy skin and reduce cancer treatment-related cAEs.

NECOM Project Status

The Nordic European Cutaneous Oncodermatology Management (NECOM) project initiated by La Roche-Posay and with the help of 2 members of the Canadian Skin Management in Oncology Group (CaSMO) explored clinical insights in cAEs and focused on skincare regimens involving hygiene, moisturization, sun protection, and camouflage products.[4]

The NECOM group (advisors) discussed and reached a consensus on evidence- and opinion-based best practice recommendations for oncology skincare programs to support all stakeholders in the Nordic European health care setting working with oncology patients throughout the entire continuum of care to achieve optimal outcomes and improve QoL for patients.[4] The next step in the project was to develop an algorithm to assist with the management of cAEs, possibly reduce their incidence or severity, recommend optimal therapies, and maintain healthy skin using general measures and nonprescription skin care based on the information in the NECOM consensus paper.[4]

Even though the current algorithm is adapted to Scandinavian countries, it could be applied worldwide to support all health care providers treating oncology patients, including physicians, nurses, pharmacists, and advanced providers.

METHODS

The NECOM project used a modified Delphi technique for interactive decision-making for medical projects following the AGREE II instrument.[10,11]

The process entailed preparing the project, selecting the panel, and conducting systematic literature searches. Followed by a panel meeting on March 23, 2022, to discuss the systematic literature review results addressing nonprescription skincare for prevention, treatment, and maintenance of cAEs and to discuss and adopt statements based on the evidence and coupled with the expert opinion and experience of the advisors. An online process was used to fine-tune the evidence- and opinion-based best practice recommendations for oncology skincare programs and to prepare and review the publication.

LITERATURE REVIEW

The first NECOM paper[4] searched for publications in the English language published from 2010 to November 2020 on PubMed, and using Google Scholar as secondary source. The searches were conducted on January 12 and 13, 2021. Searches identified the literature on current best practices in cAEs using nonprescription skin care. The selected literature was clinically relevant to oncodermatology in the Nordic European countries and addressed efficacy, safety, quality of life aspects, handling and comfort, adherence to treatment, and availability of the skincare regime. For the current algorithm, the same dermatologist and physician/scientist who conducted the previous systematic literature review[4] searched for publications from December 2020 to February 14, 2022, on February 15 and 16, 2022. Guidelines, consensus papers, reviews, clinical trials describing current best practices in cAEs using over-the-counter skin care, and clinical research studies published in English were selected. Excluded were articles with no original data (unless a review article was deemed relevant), those not dealing with skin care for prevention and treatment of cAEs, and those published in a language other than English. Search terms used included: *Radiation treatment and cAEs; OR chemotherapy and cAEs; OR targeted therapy and cAEs; OR immunotherapy and cAEs; OR Hormonal treatment and cAEs; OR Health-related quality of life and cAEs; OR cAEs skincare and prevention; OR cAEs skincare and treatment; OR cAEs and adjunctive skincare; OR cAEs and nonprescription skincare; OR cAEs and skincare adherence, concordance; OR cAEs skincare and efficacy, safety, tolerability, skin irritation OR cAEs and staff and patient education.*

The results of the searches were evaluated independently by the 2 reviewers. The initial searches yielded 146 publications. After excluding duplicates (n = 61) and articles deemed irrelevant, 85 remained (12 guidelines/algorithms, 24 reviews [of which 15 were systematic reviews], 39 clinical studies [of which 10 were randomized controlled trials], and 10 other papers).

Clinical evidence from topical treatments on the efficacy of cAEs was graded using a pre-established grading system (American Academy of Dermatology evidence-based guideline development process).[12] This grading system rates study type (level A [clinical double-blind RCT of high quality], B [RCT of lesser quality], or C [Comparative trial with severe methodologic limitations]). Additionally, the reviewers graded the likelihood of changing confidence in the measured effect (1 [unlikely] to level 4 [the effect is very uncertain]) of the study.[12] The chosen grading system is relevant for clinical algorithm development and considers knowledge development in a fast-evolving field (Table 1).

The reviewers drafted an algorithm based on the selected literature before the meeting. During the meeting, the NECOM group set and fine-tuned the algorithm and revised it online after the meeting. The NECOM panel defined the final algorithm

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TABLE 1.

Grading of Clinical Studies

No*	Reference	Clinical Study Type	Grading
6	Gandhi M, Oishi K, Zubal B, Lacouture ME. *Support Care Cancer.* 2010;18(11):1461-1468. doi: 10.1007/s00520-009-0769-1	Quantitative study	C-3
8	Schnur JB, Quellette SC, Dilorenzo TA, Green S, Montgomery GH. *Psychooncology.* 2011;20(3):260-268. doi: 10.1002/pon.1734.	Qualitative analysis	C-3
14	Ostwal V, Kapoor A, Mandavkar S, et al. *Oncologist.* 2020;25(12): :e1886-e1892. doi: 10.1634/theoncologist.2020-0698.	Non-crossover phase III double-blinded clinical trial	A-2
15	Murugan K, Ostwal V, Carvalho MD et al. *Support Care Cancer.* 2016;24(6):2575-2581. doi: 10.1007/s00520-015-3061-6.	Clinical evaluation	C-2
16	Yu Z, Dee EC, Bach DQ, Mostaghimi A, LeBoeuf NR. *JAMA Dermatol.* 2020;156(10):1079-1085. doi: 10.1001/jamadermatol.2020.1795.	Clinical evaluation	C-3
20	Aizman L, Nelson K, Sparks AD, Friedman AJ. *J Drugs Dermatol.* 2020;19(5):477- 482	Cross sectional survey	C-3
21	Chen ST, Molina GE, Lo JA, et al. *J Am Acad Dermatol.* 2020;82(4): 994-996. doi: 10.1016/j.jaad.2019.09.026.	Retrospective cohort	C-3
22	Barrios DM, Phillips GS, Feites-Martinez A, et al. *J Eur Acad Dermatol Venereol.* 2020;34(6):1340-1347. doi: 10.1111/jdv.16159.	Retrospective study	C-3
23	Barrios DCK, Phillips G, Lucas AS, et al. *J Am Acad Dermatol.* 2017;76(6):AB45. doi: 10.1016/j.jaad.2017.04.196.	Retrospective cohort study	C-3
31	Berger A, Regueiro C, Hijal T, et al. *Breast Cancer (Auckl).* 2018;12:1178223417752772.. doi: 10.1177/1178223417752772.	Open label study	C-3
32	Wohlrab J, Lueftner D, Johne A, et al. *Onkologie.* 2011;34: 62	Randomized cross-over study	B-2
34	Baumann BC, Verginadis II, Zeng C, et al. *JAMA Oncol.* 2018;4(12):1742-1748. doi: 10.1001/jamaoncol.2018.4292.	Clin study	C-3
40	Phillips GS, Wu J, Hellmann MD et al. *J Clin Oncol.* 2019;37(30):2746-2758. doi: 10.1200/JCO.18.02141.	Retrospective analysis	C-3
43	Ferreira MN, Ramseier JY, Leventhal S. *Int J Women Dermatol.* 2019;5(5):285-307. doi: 10.1016/j.ijwd.2019.10.003.	Double-blind RCT	A-2
44	Friese CR, Harrison JM, Janz NK, et al. *Cancer.* 2017;123(11):1925-1934. doi: 10.1002/ cncr.30547.	Survey	C-3
47	Lee J, Lim J, Park JS, et al. *Cancer Res Treat.* 2018;50(4):1186-1193. doi: 10.4143/crt.2017.435.	Cross-sectional study	C-3
50	Lacouture ME, Mitchell EP, Piperdi B, et al. *J Clin Oncol.* 2010; 28(8): 1351-1357. doi: 10.1200/JCO.2008.21.7828.	Open-label randomized trial	B-2
53	Fucà G, Galli G, Poggi M, et al. *ESMO Open.* 2019;4(1):e000457. doi: 10.1136/esmoopen-2018-000457.	Clin study	C-3
54	Rzepecki A, Birnbaum M, Ohri N, et al. *J Am Acad Dermatol.* 2022;86(1):161-163. doi: 10.1016/j.jaad.2019.03.011.	Prospective survey-based study	C-3
55	Ho PH, Lin IC, Yang X, Cho YT, Chu CY. *J Eur Acad Dermatol Venereol.* 2019;33(1):204-212. doi: 10.1111/jdv.15121.	Clin study	B-2
56	Wu J, Freitez-Martinez A, Hellmann MD, et al. *J Clin Oncol.* 2018;36(15_suppl):e2209. doi: 10.1200/JCO.2018.36.15_suppl.e22093.	Outcome study	C-3
57	Min Lee CK, Li S, Tran DC, et al. *J Am Acad Dermatol.* 2018;79(6):1047-1052. doi: 10.1016/j.jaad.2018.05.035.	Retrospective case-controlled	C-3
58	Coens C, Suciu S, Chiarion-Sileni V, et al. *Lancet Oncol.* 2017;18(3):393-403. doi: 10.1016/S1470-2045(17)30015-3.	RCT	A-2
59	Freeman-Keller M, Kim Y, Cronin H, Richards A, Gibney G, Weber JS. *Clin Cancer Res.* 2016;22(4):886-894. doi: 10.1158/1078-0432.	Retrospective analysis	C-3
60	Rosen AC, Case EC, Dusza SW, et al. *Am J Clin Dermatol.* 2013;14(4):327–333. doi: 10.1007/s40257-013-0021-0.	Clin survey	C-4
68	Chan RJ, Blades R, Jones L, et al. *Radiother Oncol.* 2019;139:72–78. doi: 10.1016/j.radonc.2019.07.014.	RCT	A-2
69	Herst PM, Bennett NC, Sutherland AE, Peszynski RI, Paterson DB, Jasperse ML. *Radiother Oncol.* 2014;110:137-143. doi: 10.1016/j.radonc.2014.01.005.	RCT	A-2
70	Jensen JM, Gau T, Schultze J et al. *Strahlenther Onkol.* 2011;187(6):378-384. doi: 10.1007/s00066-011-2224-8.	RCT	A-2
71	Zenda S, Yamaguchi T, Yokota T, et al. *BMC Cancer.* 2018;18(1):873. doi: 10.1186/s12885-018-4763-1.	RCT	A-1
72	Belum VR, Benhuri B, Postow MA, et al. *Eur J Cancer.* 2016;60:12-25. doi: 10.1016/j.ejca.2016.02.010	RCT	A-2
73	Ho AY, Olm-Shipman M, Zhang Z, et al. *Int J Radiat Oncol Biol Phys.* 2018;101(2):325–333. doi: 10.1016/j.ijrobp.2018.02.006.	RCT	A-1
74	Wooding H, Yan J, Yuan L, et al. *Br J Radiol.* 2018;91(1081):20170298. doi: 10.1259/bjr.20170298.	Feasibility study	C-3
75	Cruceriu D, Balacescu O, Rakosky E. *Integr Cancer Ther.* 2018;17(4):1068-1078. doi: 10.1177/1534735418803766.	Cohort	C-3
77	Sharp L, Finnilä K, Johansson H, Abrahamsson M, Hatschek T, Bergenmar M. *Eur J Oncol Nurs.* 2013;17(4):429-435. doi: 10.1016/j.ejon.2012.11.003.	Randomized blinded study	C-3
78	Schneider F, Danski MTR, Vayego SA. *Rev Esc Enferm USP.* 2015;49(2):221-228. doi: 10.1590/S0080-623420150000200006.	Double-blind RCT	A-2
79	Graham PH, Plant N, Graham JL, et al. *Int J Radiat Oncol Biol Phys.* 2013;86(1): 45-50. doi: 10.1016/j.ijrobp.2012.12.009.	RCT	A-2
80	Chan RJ, Mann J, Tripcony L, et al. *Int J Radiat Oncol Biol Phys.* 2014;15;90(4):756-764. doi: 10.1016/j.ijrobp.2014.06.034.	RCT	A-2
81	Lam AC, Yu E, Vanwynsberghe D, et al. *Cureus.* 2019;11(6):e4807. doi: 10.7759/cureus.4807.	Phase III randomized pair comparison	B-2

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reaching consensus established as a 100% agreement through blinded reiterations and votes.

THE ALGORITHM

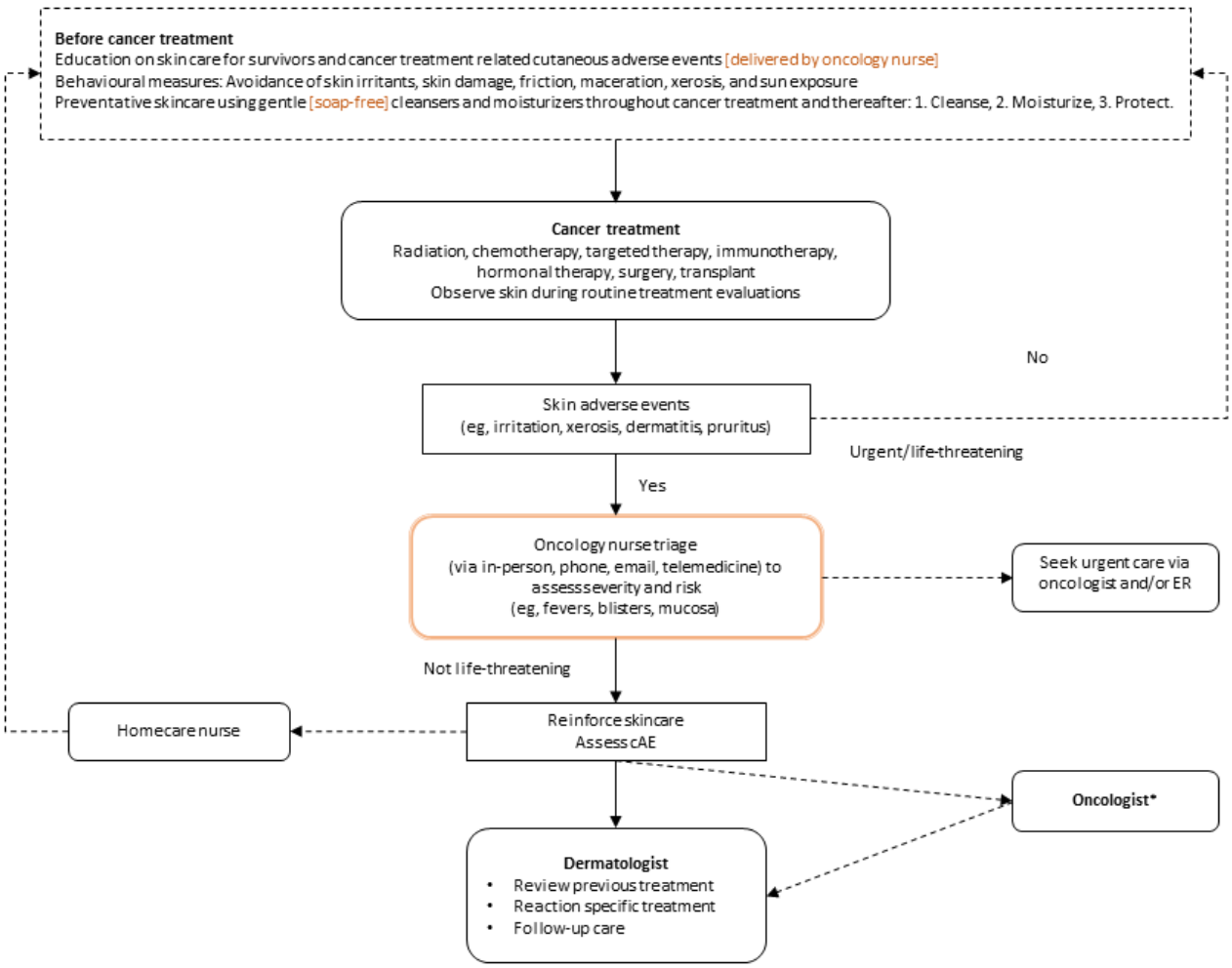
The algorithm is organized as follows: Before cancer treatment (education, skin care, and behavioral measures), cancer treatment, evaluation of cAEs by the oncology nurse-led triage, determining the condition (life threatening, severe, or not severe), followed by a tailor-made approach to treatment (Figure 1).

The algorithm starts with the oncology nurse's education before cancer treatment on behavioral measures and skin care for cancer survivors and cAEs.[4,13-16] The following section focuses on cancer treatment interventions and observation of skin conditions during routine treatment evaluations. The oncology nurse is central in coordinating the individual cancer patient's care and performing triage of the cAEs, seeking urgent care via an oncologist and/or emergency department (ER) if needed.[4,13-16]

The care organization of the presented cAEs depends on the patient's general condition and skin conditions and the health care system.[4] For example, whether an oncology nurse proactively contacts a dermatologist or consults with an oncologist first depends on the health care system of the different countries.

The role of the interdisciplinary oncology team members is to drive the organization of care and delivery.[4,13-26] The structure of an interdisciplinary team can differ from country to country, but the minimal requirements (the core of the team) are oncologists, including medical, surgical, and radiation, as well as oncology nurses.[4] If there is an available dermatologist, this strengthens the interdisciplinary care team.[18-26] Each team member's role should be clear and must be accepted by all team members and health care providers involved in the patient's cancer care.[4] The algorithm highlights the oncology nurse's central role in patient education and triage of cancer treatment-related AEs including cAEs and skin concerns.[4,24-26]

FIGURE 1. NECOM skincare algorithm for cancer patients and survivors.



*Whether an oncology nurse proactively contacts dermatology or consults with an oncologist first depends on the health system.

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Therefore, outreach from nurses to oncologists is critical.[4] There is an opportunity to engage with oncology nurses, who are most heavily involved in patient education and typically serve as a point of contact among the various health care providers.[4,24-26] For instance, in Sweden, patient coordinators are usually specially trained oncology nurses who are essential in guiding the journey for the patient with cancer. A non-profit cancer association funds the position of these oncology nurses.

Education and the Role of Oncology Nurses

Communication in the fast-evolving area of oncology is necessary to provide tailored general measures and skin care supported by evidence and practice-based expert recommendations.[4,17-40] Patients and caregivers need to understand that cAEs can often be managed effectively, especially when they are identified early.[4,24-26,39]

Although data is scarce to support the prevention of severe cAEs for patients with cancer and survivors, the NECOM advisers agreed that early education on behavioral measures, skin care, and sunscreen use is beneficial to patients.[4] Communication with other health care professionals on best practices enables optimal care delivery.[17-25] For instance, radiation oncologists, typically advise their patients not to put any products on their treatment areas, resulting in severely compromised skin.[4] However, studies have shown that using a barrier cream decreases cutaneous skin side effects.[4]

Pharmacists are also important multidisciplinary cancer care team members and often provide patient education that may or may not align with the oncologist's or dermatologist's recommendations.[4,17-40,53] Many cancer treatments are photosensitizing; oncology nurses must enthusiastically educate patients about the risks of sun exposure.[4,13,12,54-62] Oncologists can discontinue anticancer therapies due to cAEs; involving dermatologists, especially early on, can reduce or prevent treatment interruption or discontinuation.[4,17-53] Educating oncologists on accurately grading skin toxicities may also help reduce avoidable dosage changes or even treatment interruption.[4,13,17-39] According to the NECOM advisors, patient education on skin care should occur *before* initiation of cancer treatment; nurses should assess whether patients are compliant with their skincare regimens in case of skin concerns and check-in regularly.[4,13,27,54-62]

The preemptive role of skin care in improving QoL for patients and helping to avoid cancer treatment interruption deserves attention from health care providers who treat patients with cancer.[4,24-26] Healthy and sufficiently moisturized skin prior to initiating anticancer treatment will reduce the incidence and severity of cAEs.[4,24-26]

An American and European study assessed 95 patients with cancer who were treated with a 7-week course of panitumumab and received either preemptive or reactive skin care.[50] The preemptive skincare regimen started 1 day before the anticancer treatment, continued for 6 weeks, and comprised a moisturizer and a broad spectrum (SPF >15) sunscreen. The reactive skincare regimen had the same products but started at onset of cAEs. The authors found a reduced incidence of cAEs and lower patient-reported QoL impairment in the preemptive skin care regimen group compared with those who initiated the skin care regimen once the cAEs occurred.[50]

Conventional moisturizers contain occlusives, humectants, and emulsions.[4,70] Newer moisturizers include distinct ratios of lipids that resemble physiological compositions and are designed to restore skin barrier disruptions and deliver better efficacy.[31-33,39]

Cancer Treatment-Related cAEs

Anticancer treatments comprise surgery, radiation therapy, chemo, targeted immune and hormonal therapies, and transplants.[4,13,25,26,39] Frequently, a combination of these anticancer treatments are used.[4]

The current algorithm focuses on general and skin care measures before, during, and after cancer treatment to promote a healthy skin condition and reduce the severity of cAEs.

The NECOM review summarized cancer treatments and related cAEs.[4] The glossary[4] from the NECOM review is reproduced and modified by the advisors to discuss relevant cAEs for the algorithm (Figure 2).

cAE Triage

The oncology nurse should observe the patient's skin condition during routine cancer treatment evaluations.[4,25,26,39]

The Common Terminology Criteria for Adverse Events (CTCAE) grading system is a standardized classification of adverse effects of cancer therapies. Within the skin and subcutaneous tissue disorder section, there are gradings for specific toxicities such as alopecia, bullous dermatitis, eczema, pruritus, Stevens-Johnson Syndrome, etc., as well as a general category for skin toxicities without specific grading. All categories are graded 1 through 5 with 1 being mild and 5 indicating death. It was deemed that the CTCAE grading system is unsuitable for the current algorithm as the evaluation of the patient's condition and cAEs is oncology nurse-led and requires a tailor-made approach. Moreover, these evaluations are conducted via in-person, phone, email, or telemedicine contacts.[4,13,25,26,39] If it is difficult to get sufficient information via phone or email, a visit to the clinic may be needed.[4] Patients may underreport their cAEs as they may not recognize it as potentially serious or assume the condition is not cancer treatment-related.[4,25,26,39]

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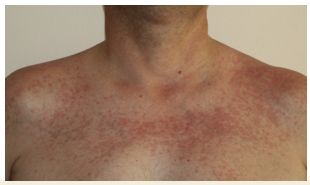
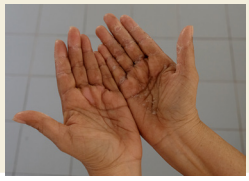
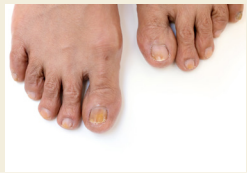
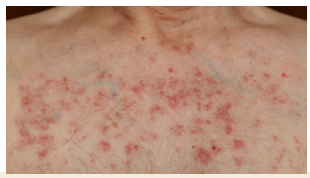
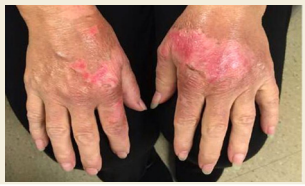
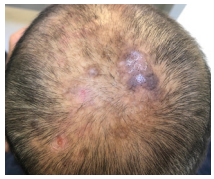
FIGURE 2. Glossary of terms. Photographs are courtesy of Jonathan Leventhal, MD, Yale School of Medicine, New Haven, CT. The photographs were used in the previous NECOM publication.[4] The figure was modified with the permission of the advisors and *Journal of Drugs in Dermatology.*

Treatment	Cutaneous adverse events
Radiotherapy	RD may present as dry or moist desquamation, erythema, pruritus, bleeding atrophy, necrosis, and ulceration Photo: Radiation dermatitis 
Traditional chemotherapy with various types of drugs	cAEs may present as alopecia (reversible and permanent), Hand-Foot Syndrome (HFS)/Palmar-Plantar Erythrodysesthesia (PPE),, nail changes (onycholysis, pigmentary alteration, brittle nails), phototoxicity, Periarticular thenar erythema with onycholysis (PATEO), Paronychia (± pyogenic granulomas), and urticaria Photo: Abrasion after Chemotherapy  Photo: Discoloration of nails 
Targeted therapies	cAEs may present as papulopustular (acneiform) eruption, alopecia (reversible), pruritus, nail changes, paronychia (± pyogenic granulomas), phototoxicity, trichomegaly, hirsutism, keratoacanthoma, keratosis-pilaris like reaction, morbilliform eruption, and dermal hypersensitivity Photo: Papulopustular (acneiform) reaction on the chest 
Immunotherapy	cAEs may present as non-specific maculopapular rash, pruritus, eczema/spongiosis, lichenoid reactions, psoriasis, pityriasis lichenoides-like reaction, exfoliative pyoderma gangrenosum, Grover's disease, vitiligo, bullous pemphigoid, dermatitis herpetiformis, prurigo nodularis, vasculitis, dermatomyositis, Sjögren's syndrome, Sarcoidosis, Sweet's Syndrome, acneiform rash/papulopustular rosacea, eruptive keratoacanthomas, actinic keratoses and squamous cell carcinoma, erythema nodosum-like panniculitis, radiosensitization, photosensitivity, urticaria, alopecia, alopecia areata, hair repigmentation, sclerodermoid reaction, nail changes, xerostomia Photo: Eruptions 
Hormonal therapy	AEs may present as alopecia (reversible); flushing; vulvovaginal dryness/atrophy Photo: Alopecia due to hormonal treatment 

When determining the severity of the cAEs, check for fever, malaise, pain, bullae, pustules or erosions, mucosal involvement, and significant blood abnormalities.[4,25-27,36-39,48,51,52,57-60-67] Symptoms that raise suspicion of severe cAEs include fever, widespread rash, skin pain, skin sloughing, facial or upper-extremity edema, bullae, pustules, or erosions.[4,13,25,26,39] Severe cAEs require prompt clinical attention, urgent referral, and triage.[4,13,25,26,39]

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When determining the severity of the cAEs, check for fever, pain, bullae, pustules or erosions, mucosal involvement, and significant blood abnormalities.[4,25-27,36-39,48,51,52,57-60-67] Further, check recent changes in the patient's general condition: when changes occurred, how severe these are, and whether they impact QoL.[4] Assess wellness: inquire about the intake of food and liquids, how the patient is coping with everyday living activities (eg, is assistance needed where it wasn't before?].[4,27] When assessing the cAEs, rule out other etiologies such as infections, effects of other agents, or other skin conditions.[4,25-27,36-39, 48,51,52,64-67]

Severe cAEs require prompt clinical attention, urgent referral, and triage.[4,13,25,26,39] Symptoms that raise suspicion for severe cAEs include fever, widespread rash, skin pain, skin sloughing, facial or upper-extremity edema, bullae, or erosions. [4,13,25,26,39]

A glossary containing photographs and a checklist for identifying cAE risk may support non-dermatologists in taking prompt and effective action.[4]

Telemedicine

The oncology nurse or other health care professionals treating patients with cancer can use telemedicine. The technology may help overcome organizational and logistic challenges or can be used as an adjunct to face-to-face evaluations. The NECOM advisors further stressed the need for using telemedicine or virtual consultation as a suitable way to give patients and health care professionals access to dermatological expertise.[4,18,24-26,39]

Telemedicine can include online patient portals, patient apps, remote monitoring, patient education, and clinical medical education on cAEs for health care providers.[4,18,24-26,39] These virtual tools further offer a suitable solution for rural areas where access to specialized multidisciplinary oncology teams may not be available. Finally, teledermatology software also allows for instant auditing of practices with the assessment of diagnoses, turnaround times, and outcomes.[4,18,24-26,39]

Treatment of Non-Life-Threatening cAEs

Once it is determined that the cAE is non-life-threatening, home care nurses (HCPs) are used frequently in Nordic countries; these important HCPs can help assess the severity of cAEs and ensure compliance with skincare regimens.[4]

In addition, safe therapies for cAEs are essential in supporting optimal management of cAEs.[4,24-26,39]

If after the skincare regimen is reinforced and basic skin therapy is instituted by the home care or oncology nurse the cAE is persistent, the oncologist or an oncodermatologist should be engaged. These health care professionals can examine whether the skin concern is an exacerbation of a pre-existing skin condition, a cAE, or the result of cancer.[4,24-26,36-39] Where the morphology is unclear, biopsies can play a role in further diagnosing cutaneous immune-related adverse events.[4,24-26] Oncologists or oncodermatologists can initiate more aggressive supportive care and reaction-specific management. Reaction-specific management is beyond the scope of this paper.

LIMITATIONS

Limitations include the inherent bias and lack of robust studies supporting skin care for cancer treatment-related cAEs. Strengths include the composition of a collaborative team including specialists from oncology and oncodermatology to formulate a practical treatment algorithm for skin care for patients with cancer and survivors.

CONCLUSIONS

Communication on best practices in the fast-evolving area of oncology is necessary to provide tailored general measures and skin care supported by evidence- and practice-based expert recommendations. The skincare algorithm for patients with cancer and survivors promotes healthy skin that reduces cancer treatment-related cAEs. Essential points in the implementation of oncology patient care include: 1) Skin care should be taught and recommended before the oncology treatment starts, 2) The oncology nurse should be educated in the early identification of cAEs, 3) Dermatologist -oncologist –nurse team/ close collaboration is vital for the wellbeing of the patients during their cancer treatment and survival.

DISCLOSURES

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REFERENCES

1. Estimated number of new cases in 2020, Denmark, Norway, Sweden, Finland, both sexes, all ages. Cancer Today: International Agency for Research on Cancer. Accessed October 2022. https://gco.iarc.fr/today/online-analysis-pie?v=2020&mode=cancer&mode_population=continents&population=900&populations=208_578_752_246&key=total&sex=0&cancer=39&type=0&statistic=5&prevalence=0&population_group=0&ages_group%5B%5D=0&ages_group%5B%5D=17&nb_items=7&group_cancer=1&include_nmsc=1&include_nmsc_other=1&half_pie=0&donut=0
2. The Global Cancer Observatory (GCO). International Agency for Research on Cancer. 2020. Accessed October 2022. http://gco.iarc.fr
3. NORDCAN. International Agency for Research on Cancer. 2021. Accessed October 2022. https://nordcan.iarc.fr
4. Girnita A, Lorentzen H, Kauppi S, et al. Supplement individual article: skincare for cancer patients in Scandinavia. *J Drugs Dermatol.* 2021;20(12):s4-s14. doi: 10.36849/jdd.M1221.
5. Ransohoff JD, Kwong BY. Cutaneous Adverse Events of Targeted Therapies for Hematolymphoid Malignancies. *Clin Lymphoma Myeloma Leuk.* 2017;17(12):834-851. doi: 10.1016/j.clml.2017.07.005.
6. Gandhi M, Oishi K, Zubal B, Lacouture ME. Unanticipated toxicities from anticancer therapies: survivors' perspectives. *Support Care Cancer.* 2010;18(11):1461-1468. doi: 10.1007/s00520-009-0769-1.
7. McGarvey EL, Baum LD, Pinkerton RC, Rogers LM. Psychological sequelae and alopecia among women with cancer. *Cancer Pract.* 2001;9(6):283-289. doi: 10.1046/j.1523-5394.2001.96007.x.
8. Schnur JB, Quellette SC, Dilorenzo TA, Green S, Montgomery GH. A quantitative analysis of acute skin toxicity among breast cancer radiotherapy patients. *Psychooncology.* 2011;20(3):260-268. doi: 10.1002/pon.1734.
9. Pinter AB, Hock A, Kajtar P, Dóber I. Long-term follow-up of cancer in neonates and infants: a national survey of 142 patients. *Pediatr Surg Int.* 2003;19(4):233-239. doi: 10.1007/s00383-002-0760-0.
10. Brouwers M, Kho ME, Browman GP, et al. AGREE II: advancing guideline development, reporting and evaluation in healthcare. *CMAJ.* 2010;182(18):E839-842. doi: 10.1503/cmaj.090449.
11. Trevelyan EG, Robinson N. Delphi methodology in health research: how to do it? *Eur J Integrative Med.* 2015;7(4):423-428. doi: 10.1016/j.eujim.2015.07.002
12. Smith Begolka W, Elston DM, Beutner KR. American Academy of Dermatology evidence-based guideline development process: responding to new challenges and establishing transparency. *J Am Acad Dermatol.* 2011 Jun;64(6):e105-112. doi: 10.1016/j. jaad.2010.10.029.
13. Lin WL, Sun JL, Chang SC, et al. Development and application of telephone counseling services for care of patients with colorectal cancer. *Asian Pac J Cancer Prev.* 2014;15(2):969–973. doi: 10.7314/apjcp.2014.15.2.969.
14. Ostwal V, Kapoor A, Mandavkar S, et al. Effect of structured teaching module including intensive prophylactic measures on reducing the incidence of capecitabine-induced hand-foot syndrome: Results of a prospective randomized phase III study. *Oncologist.* 2020;25(12): :e1886-e1892. doi: 10.1634/theoncologist.2020-0698.
15. Murugan K, Ostwal V, Carvalho MD, et al. Self-identification and management of hand-foot syndrome (HFS): Effect of a structured teaching program on patients receiving capecitabine-based chemotherapy for colon cancer. *Support Care Cancer.* 2016;24(6):2575-2581. doi: 10.1007/s00520-015-3061-6.
16. Yu Z, Dee EC, Bach DQ, Mostaghimi A, LeBoeuf NR. Evaluation of a Comprehensive Skin Toxicity Program for Patients Treated With Epidermal Growth Factor Receptor Inhibitors at a Cancer Treatment Center. *JAMA*

doi:10.36849/JDD.SF359557

Dermatol. 2020;156(10):1079-1085. doi: 10.1001/jamadermatol.2020.1795.
17. Dreno B, Bensadoun RJ, Humbert P, Krutmann J, et al. Algorithm for dermocosmetic use in the management of cutaneous side-effects associated with targeted therapy in oncology. *J Eur Acad Dermatol Venerol.* 2013; 27(9):1071-1080. doi: 10.1111/jdv.12082.
18. Garbe C, Peris K, Soura E, et al. The evolving field of Dermato-oncology and the role of dermatologists: Position Paper of the EADO, EADV and Task Forces, EDF, IDS, EBDV-UEMS and EORTC Cutaneous Lymphoma Task Force. *J Eur Acad Dermatol Venereol.* 2020;34(10):2183-2197. doi: 10.1111/jdv.16849.
19. Lucas AS, Ciccolini K. The role of oncodermatology in care of patients receiving cancer therapy. *Semin Oncol Nurs.* 2017;22(4):393-401. doi: 10.1016/j.soncn.2017.08.001.
20. Aizman L, Nelson K, Sparks AD, Friedman AJ. The Influence of Supportive Oncodermatology Interventions on Patient Quality of Life: A Cross-Sectional Survey. *J Drugs Dermatol.* 2020;19(5):477- 482.
21. Chen ST, Molina GE, Lo JA, et al. Dermatology consultation reduces interruption of oncologic management among hospitalized patients with immune-related adverse events: A retrospective cohort study. *J Am Acad Dermatol.* 2020;82(4): 994-996. doi: 10.1016/j.jaad.2019.09.026.
22. Barrios DM, Phillips GS, Feites-Martinez A, et al. Outpatient dermatology consultations for oncology patients with acute dermatologic adverse events impact anticancer therapy interruption: a retrospective study. *J Eur Acad Dermatol Venereol.* 2020;34(6):1340-1347. doi: 10.1111/jdv.16159.
23. Barrios DCK, Phillips G, Lucas AS, et al. Anticancer therapy interruption and diagnostic concordance between referring clinicians and dermatologists at Memorial Sloan Kettering Cancer Center. *J Am Acad Dermatol.* 2017;76(6):AB45. doi: 10.1016/j.jaad.2017.04.196.
24. Sauder MB, Addona M, Andriessen A, et al. The role of skin care in oncology patients. *Skin Ther Letter.* 2020; 10:1-12. https://www.skintherapyletter.com/wp-content/uploads/2020/12/STL-Supp-SkinCareOnc-v2-correction.pdf
25. Sauder MB, Andriessen A, Claveau J, Hijal T, Lynde CW. Canadian skin management in oncology (CaSMO) algorithm for patients with oncology treatment-related skin toxicities. *Skin Ther Letter.* 2021; 3:1-10.
26. Lacouture ME, Choi J, Ho A et al. US cutaneous oncodermatology management (USCOM): A practical algorithm. *J Drugs Dermatol.* 2021;20(9):3ss-s19. doi: 10.36849/jdd.6229.
27. Dermatologic principles and practice in oncology: conditions of the skin, hair, and nails in cancer patients. Lacouture ME, ed. Wiley Blackwell; 2014.
28. Wolf SL, Qin R, Menon SP et al. Placebo-controlled trial to determine the effectiveness of a urea/lactic acid-based topical keratolytic agent for prevention of capecitabine-induced hand-foot syndrome: North Central Cancer Treatment Group Study N05C5. *J Clin Oncol.* 2010;28(35):5182-5187. doi: 10.1200/JCO.2010.31.1431.
29. Macedo LT, Lima JPN, dos Santos LV et al. Prevention strategies for chemotherapy-induced hand-foot syndrome: A systematic review and meta-analysis of prospective randomised trials. *Support Care Cancer.* 2014;22(6):1585-1593. doi: 10.1007/s00520-014-2129-z.
30. Chen HM, Tsai CM, Wu YC et al. Randomised controlled trial on the effectiveness of home-based walking exercise on anxiety, depression and cancer-related symptoms in patients with lung cancer. *Br J Cancer.* 2015;112(3):438-445. doi: 10.1038/bjc.2014.612.
31. Berger A, Regueiro C, Hijal T, et al. Interest of supportive and barrier protective skin care products in the daily prevention and treatment of cutaneous toxicity during radiotherapy for breast cancer. *Breast Cancer (Auckl).* 2018;12:1178223417752772.. doi: 10.1177/1178223417752772.
32. Wohlrab J, Lueftner D, Johne A, et al. The advantage of a proactive, barrier-protective, supportive skin care in patients with breast cancer on chemotherapy. *Onkologie.* 2011;34: 62.
33. Lüftner D, Dell'Acqua V, Selle F, et al. Evaluation of supportive and barrier-protective skin care products in the daily prevention and treatment of cutaneous toxicity during systemic chemotherapy. *Onco Targets Ther.* 2018 17;11:5865-5872. doi: 10.2147/OTT.S155438.
34. Baumann BC, Verginadis II, Zeng C, et al. Assessing the validity of clinician advice that patients avoid the use of topical agents before daily radiotherapy treatments. *JAMA Oncol.* 2018;4(12):1742-1748. doi: 10.1001/jamaoncol.2018.4292.
35. Salzmann M, Marmé F, Hassel JC. Prophylaxis and management of skin toxicities. *Breast Care (Basel).* 2019;14:72-77. doi: 10.1159/000497232
36. Haanen J, Carbonnel F, Robert C, et al. Management of toxicities from immunotherapy: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol.* 2017;28(suppl 4):iv119-iv142. doi: 10.1093/annonc/mdx225.
37. Schneider BJ, Naidoo J, Santomasso BD, et al. Management of immunotherapy-related adverse events in patients treated with immune checkpoint inhibitor therapy: ASCO guideline update. *J Clin Oncol.* 2021;39(36):4073-4126. PIMD: 34724392.
38. Thompson JA, Schneider BJ, Brahmer J, et al. NCCN Guidelines insights: Management of immunotherapy-related toxicities, Version 1.2020. *J Natl Compr Cancer Netw.* 2020;18(3):230-241. doi: 10.6004/jnccn.2020.0012
39. Hijal T, Sauder MB, Andriessen A, Claveau J, Lynde CW. Canadian Skin Management in Oncology Group (Casmo) algorithm for the prevention and management of acute radiation dermatitis. *Skin Ther Letter;* 2021;11:1-13. https://www.skintherapyletter.com/wp-content/uploads/2021/11/STL-Suppl-CaSMO-Algorithm-RD.pdf
40. Phillips GS, Wu J, Hellmann MD, et al. Treatment outcomes of immune-related cutaneous adverse events. J Clin Oncol. 2019;37(30):2746-2758. doi: 10.1200/JCO.18.02141.
41. Rosenthal A, Irailevich R, Moy R. Management of acute radiation dermatitis: A review of the literature and proposal for a treatment algorithm. *J Am Acad Dermatol.* 2019;81(2):558-567. doi: 10.1016/j.jaad.2019.02.047.
42. Leventhal J, Young MR. Radiation Dermatitis: Recognition, Prevention, and Management. *Oncology (Williston Park).* 2017;31(12):885-887, 894-899.
43. Ferreira MN, Ramseier JY, Leventhal S. Dermatologic conditions in women receiving systemic cancer therapy. *Int J Women Dermatol.* 2019;5(5):285-307. doi: 10.1016/j.ijwd.2019.10.003.
44. Friese CR, Harrison JM, Janz NK, et al. Treatment-associated toxicities reported by patients with early-stage invasive breast cancer. *Cancer.* 2017;123(11):1925-1934. doi: 10.1002/ cncr.30547.
45. Freites-Martinez A, Chan D, Sibaud V, et al. Assessment of quality of life and treatment outcomes of patients with persistent postchemotherapy alopecia. *JAMA Dermatol.* 2019;155(6):724-728. doi: 10.1001/jamadermatol.2018.5071.
46. Biswal SG, Mehta RD. Cutaneous Adverse Reactions of Chemotherapy in Cancer Patients: A Clinicoepidemiological Study. Indian J Dermatol. 2018;63(1):41-6. doi: 10.4103/ijd.IJD_65_17.
47. Lee J, Lim J, Park JS, et al. The impact of skin problems on the quality of life in patients treated with anticancer agents: a cross-sectional study. *Cancer Res Treat.* 2018;50(4):1186-1193. doi: 10.4143/crt.2017.435.
48. Ng CY, Chen CB, Wu MY, et al Anticancer drugs induced severe adverse cutaneous drug reactions: An updated review on risks associated with anticancer targeted therapy or immunotherapy. *J Immunol Res.* 2018;2018:5376476. doi: 10.1155/2018/5376476.
49. Yagasaki K, Komatsu H, Hamamoto Y. Targeted therapy-induced facial skin toxicities: Impact on quality of life in cancer patients. *Asia Pac J Oncol Nurs.* 2018;5(2):172-177. doi: 10.4103/apjon.apjon_74_17.
50. Lacouture ME, Mitchell EP, Piperdi B, et al. Skin toxicity evaluation protocol with panitumumab (STEPP), a phase II, open-label, randomized trial evaluating the impact of a pre-emptive skin treatment regimen on skin toxicities and quality of life in patients with metastatic colorectal cancer. *J Clin Oncol.* 2010; 28(8): 1351-1357. doi: 10.1200/JCO.2008.21.7828.
51. Sibaud V. Dermatologic Reactions to Immune Checkpoint Inhibitors: Skin Toxicities and Immunotherapy. *Am J Clin Dermatol.* 2018;19(3):345-361. doi: 10.1007/s40257-017-0336-3.
52. Curry JL, Tetzlaff MT, Nagarajan P, et al. Diverse types of dermatologic toxicities from immune checkpoint blockade therapy. *J Cutan Pathol.* 2017;44(2):158-176. doi: 10.1111/cup.12858.
53. Fucà G, Galli G, Poggi M, et al. Modulation of peripheral blood immune cells by early use of steroids and its association with clinical outcomes in patients with metastatic non-small cell lung cancer treated with immune checkpoint inhibitors. *ESMO Open.* 2019;4(1):e000457. doi: 10.1136/esmoopen-2018-000457.
54. Rzepecki A, Birnbaum M, Ohri N, et al. Characterizing the Effects of Radiation Dermatitis on Quality of Life: A Prospective Survey-Based Study. *J Am Acad Dermatol.* 2022;86(1):161-163. doi: 10.1016/j.jaad.2019.03.011.
55. Ho PH, Lin IC, Yang X, Cho YT, Chu CY. Using a novel scoring system for paronychia related to oncologic treatments (SPOT) for assessing paronychia severity and its correlation with pain index and quality of life. *J Eur Acad Dermatol Venereol.* 2019;33(1):204-212. doi: 10.1111/jdv.15121.
56. Wu J, Freitez-Martinez A, Hellmann MD, et al. Treatment outcomes of cutaneous adverse events to immune checkpoint inhibitors. *J Clin Oncol.* 2018;36(15_suppl):e2209. doi: 10.1200/JCO.2018.36.15_suppl.e22093.
57. Min Lee CK, Li S, Tran DC, et al. Characterization of dermatitis after PD-1/PD-L1 inhibitor therapy and association with multiple oncologic outcomes: A retrospective case-control study. *J Am Acad Dermatol.* 2018;79(6):1047-1052. doi: 10.1016/j.jaad.2018.05.035.
58. Coens C, Suciu S, Chiarion-Sileni V, et al. Health-related quality of life with adjuvant ipilimumab versus placebo after complete resection of high-risk stage III melanoma (EORTC 18071): secondary outcomes of a multinational, randomised, double-blind, phase 3 trial. *Lancet Oncol.* 2017;18(3):393-403. doi: 10.1016/S1470-2045(17)30015-3.
59. Freeman-Keller M, Kim Y, Cronin H, Richards A, Gibney G, Weber JS. Nivolumab in Resected and Unresectable Metastatic Melanoma: Characteristics of Immune-Related Adverse Events and Association with Outcomes. *Clin Cancer Res.* 2016;22(4):886-894. doi: 10.1158/1078-0432.
60. Rosen AC, Case EC, Dusza SW, et al. Impact of dermatologic adverse events on quality of life in 283 cancer patients: a questionnaire study in a dermatology referral clinic. *Am J Clin Dermatol.* 2013;14(4):327–333. doi: 10.1007/s40257-013-0021-0.
61. Drilon A, Eaton AA, Schindler K, et al. Beyond the dose-limiting toxicity period: Dermatologic adverse events of patients on phase 1 trials of the Cancer Therapeutics Evaluation Program. Cancer. 2016;122(8):1228-1237. doi: 10.1002/cncr.29918.
62. Müller V, Fuxius S, Steffens CC, et al. Quality of life under capecitabine (Xeloda®) in patients with metastatic breast cancer: Data from a German non-interventional surveillance study. *Oncol Res Treat.* 2014;37(12):748-755. doi: 10.1159/000369487.
63. Common Terminology Criteria for Adverse Events (CTCAE) v5.0 April 1, 2018. Updated April 19, 2021. https://ctep.cancer.gov/protocoldevelopment/electronic_applications/ctc.htm
64. Schaberg KB, Novoa RA, Wakelee HA, et al. Immunohistochemical analysis of lichenoid reactions in patients treated with anti-PD-L1 and anti-PD-1 therapy. *J Cutan Pathol.* 2016;43(4):339-346. doi: 10.1111/cup.12666.
65. Voudouri D, Nikolaou V, Laschos K, et al. Anti-PD1/PDL1 induced psoriasis. *Curr Probl Cancer.* 2017;41(6):407-412. doi: 10.1016/j.currproblcancer.2017.10.003.
66. Rofe O, Bar-Sela G, Keidar Z, Sezin T, Sadik CD, Bergman R. Severe bullous pemphigoid associated with pembrolizumab therapy for metastatic melanoma with complete regression. *Clin Exp Dermatol.* 2017;42(3):309-312. doi: 10.1111/ced.13042.
67. Vivar KL, Deschaine M, Messina J, et al. Epidermal programmed cell death-ligand 1 expression in TEN associated with nivolumab therapy. *J Cutan Pathol.* 2017;44(4):381-384. doi: 10.1111/cup.12876.
68. Chan RJ, Blades R, Jones L, et al. A single-blind, randomised controlled trial of StrataXRT® – a silicone-based film-forming gel dressing for prophylaxis and management of radiation dermatitis in patients with head and neck cancer. Radiother Oncol. 2019;139:72–78. doi: 10.1016/j.radonc.2019.07.014.
69. Herst PM, Bennett NC, Sutherland AE, Peszynski RI, Paterson DB, Jasperse ML. Prophylactic use of Mepitel Film prevents radiation-induced moist desquamation in an intra-patient randomised controlled clinical trial of 78 breast cancer patients. *Radiother Oncol.* 2014;110:137-143. doi: 10.1016/j.radonc.2014.01.005.
70. Jensen JM, Gau T, Schultze J, et al. Treatment of acute radiodermatitis with an oil-in-water emulsion following radiation therapy for breast cancer: a controlled, randomized trial. *Strahlenther Onkol.* 2011;187(6):378-384. doi: 10.1007/s00066-011-2224-8.
71. Zenda S, Yamaguchi T, Yokota T, et al. Topical steroid versus placebo for the prevention of radiation dermatitis in head and neck cancer patients receiving chemoradiotherapy: the study protocol of J-SUPPORT 1602 (TOPICS study), a randomized double-blinded phase 3 trial. *BMC Cancer.* 2018;18(1):873. doi: 10.1186/s12885-018-4763-1.
72. Belum VR, Benhuri B, Postow MA, et al. Characterisation and management of dermatologic adverse events to agents targeting the PD-1 receptor. *Eur J Cancer.* 2016;60:12-25. doi: 10.1016/j.ejca.2016.02.010.
73. Ho AY, Olm-Shipman M, Zhang Z, et al. A randomized trial of mometasone furoate 0.1% to reduce high-grade acute radiation dermatitis in breast cancer patients receiving postmastectomy radiation. *Int J Radiat Oncol Biol Phys.* 2018;101(2):325–333. doi: 10.1016/j.ijrobp.2018.02.006.
74. Wooding H, Yan J, Yuan L, et al. The effect of Mepitel film on acute radiation-induced skin reactions in head neck cancer patients: a feasibility study. *Br J Radiol.* 2018;91(1081):20170298. doi: 10.1259/bjr.20170298.
75. Cruceriu D, Balacescu O, Rakosky E. Calendula officinalis: Potential roles in cancer treatment palliative care. I*ntegr Cancer Ther.* 2018;17(4):1068-1078. doi: 10.1177/1534735418803766.
76. Menêses AG de, Reis PED dos, Guerra ENS, Canto GDL, Ferreira EB. Use of trolamine to prevent and treat acute radiation dermatitis: a systematic review and meta-analysis. *Rev Latino-Am Enfermagem.* 2018;26(0). doi: 10.1590/1518-8345.2035.2929.
77. Sharp L, Finnilä K, Johansson H, Abrahamsson M, Hatschek T, Bergenmar M. No differences between Calendula cream and aqueous cream in the prevention of acute radiation skin reactions—results from a randomised blinded trial. *Eur J Oncol Nurs.* 2013;17(4):429-435. doi: 10.1016/j.ejon.2012.11.003.
78. Schneider F, Danski MTR, Vayego SA. Usage of Calendula officinalis in the prevention and treatment of radiodermatitis: a randomized double-blind controlled clinical trial [in Portuguese]. *Rev Esc Enferm USP.* 2015;49(2):221-228. doi: 10.1590/S0080-623420150000200006.
79. Graham PH, Plant N, Graham JL, et al. A paired, double-blind, randomized comparison of a moisturizing durable barrier cream to 10% glycerine cream in the prophylactic management of postmastectomy irradiation skin care: trans Tasman Radiation Oncology Group (TROG) 04.01. *Int J Radiat Oncol Biol Phys.* 2013;86(1): 45-50. doi: 10.1016/j.ijrobp.2012.12.009.
80. Chan RJ, Mann J, Tripcony L, et al. Natural oil-based emulsion containing allantoin versus aqueous cream for managing radiation-induced skin reactions in patients with cancer: a phase 3, double-blind, randomized, controlled trial. *Int J Radiat Oncol Biol Phys.* 2014;15;90(4):756-764. doi: 10.1016/j.ijrobp.2014.06.034.
81. Lam AC, Yu E, Vanwynsberghe D, et al. Phase III Randomized Pair Comparison of a Barrier Film vs. Standard Skin Care in Preventing Radiation Dermatitis in Post-lumpectomy Patients with Breast Cancer Receiving Adjuvant Radiation Therapy. *Cureus.* 2019;11(6):e4807. doi: 10.7759/cureus.4807.
82. Kornhaber, R, Visentin, D, Thapa, DK, et al. Cosmetic camouflage improves quality of life among patients with skin disfigurement: a systematic review. B*ody Image.* 2018;27:98-108. doi: 10.1016/j.bodyim.2018.08.004.
83. Gholizadeh S, Rice DB, Carboni-Jiménez A, et al. Effects of cosmetic and other camouflage interventions on appearance-related and psychological outcomes among adults with visible differences in appearance: a systematic review. *British Med J Open.* 2021;11(3): e046634. doi:10.1136/bmjopen-2020-046634.
84. Chen, SC, Huang, BS, Lin, CY, et al. Psychosocial effects of a skin camouflage program in female survivors with head and neck cancer: a randomized controlled trial. *Psychooncology.* 2016;26(9):1376–1383. doi: 10.1002/pon.4308.
85. Wakeda T, Okamura T, Kawahara T, Heike Y. Camouflage makeup improves quality of life in cancer patients with treatment-related skin changes. *Tumori.* 2020;106(2):95-100. doi: 10.1177/0300891619867844.
86. Derbyshire E. Innovations in skin camouflaging techniques: Where are we scientifically? *Int J Cos Sci.* 2019;41(6):526-533. doi: 10.1111/ ics.12575

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