To order reprints or e-prints of JDD articles please contact sales@jddonline.com

doi:10.36849/JDD.9131

Copyright © 2026 ORIGINAL ARTICLE

Increased Risk of Skin Cancers in Certain Occupations

Shannon Meledathu BS,[a] Imaray Noda BS,[a] Mariela Mitre MD PhD,[a,b] Robin Ashinoff MD[c]

[a]Hackensack Meridian School of Medicine, Nutley, NJ
[b]Division of Dermatology, Department of Medicine, Hackensack University Medical Center, Nutley, NJ
[c]Professor of Dermatology, Hackensack Meridian School of Medicine, Nutley, NJ; Chief of Dermatology and Dermatologic, Mohs, and Laser Surgery, Hackensack University Medical Center, Hackensack, NJ

ABSTRACT

Ultraviolet radiation (UVR) is the main risk factor for the development of skin cancer, and outdoor workers are especially at risk. Despite this, there is a lack of educational programs, and preventative measures are seldom implemented to protect these workers. This review discusses the various occupational causes of skin cancer as well as the need for increased skin surveillance and public health campaigns. Occupational exposures such as UVR, chemicals, and pesticides increase the risk of skin cancer. Examining the various occupational risks of skin cancers highlights the need for enhanced surveillance, prevention, education, and public health initiatives for these workers. Dermatologists are urged to tackle these issues to improve outcomes for these individuals.

J Drugs Dermatol. 2026;25(11):1010-1013. doi:10.36849/JDD.9131

INTRODUCTION

The incidence of melanoma and non-melanoma skin cancer (NMSC) has been increasing worldwide.[1] NMSC mainly consists of keratinocyte skin cancer, with about 80% basal cell carcinoma (BCC) and about 20% squamous cell carcinoma (SCC).[2] Studies have shown that 65 to 90% of all skin cancers are attributable to solar ultraviolet radiation (UVR) exposure.[3,4]

This exposure can be impacted by certain occupations. Pega et al found that globally in 2019, 1.6 billion workers were occupationally exposed to UVR. They also found that over 2000–2019, attributable deaths and disability-adjusted life years almost doubled.[5] Bauer et al found that participants with high occupational ultraviolet (UV) exposure had a greater than two-fold increased risk of developing BCC in commonly UV-exposed body sites compared to participants with no or moderate occupational UV exposure. The risk in individuals with occupational exposure increases independently of histological subtype, tumor localization, and Fitzpatrick phototype.[6] Keim et al conducted a population-based cohort study of 1621 subjects, with no previous keratinocyte carcinoma (KC), who were followed up to sixteen years. They found that 21% of the patients developed one KC, and 47% of those patients developed at least 2 KCs.[7] Also, there have been several studies reporting the coexistence of different types of KC, melanoma, and premalignant lesions in the same individual.[8] Rarely, malignant melanoma has been found within BCC and SCC.[9] Another significant risk factor is chemical exposure.

Our review aims to provide a comprehensive overview of occupational risks of skin cancers, highlighting the importance of skin surveillance and public health campaigns.

Occupations

Welder

Globally, there are about 11 million welders and an estimated 110 million additional workers who obtain welding-related exposures. The latter may be employed in fields such as construction, farming, shipbuilding, or vehicle servicing.[10] Arc welding exposes individuals to the full range of UVR, including UVA, UVB, and UVC radiation, as well as fumes, gases, and co-exposures to asbestos and solvents.[11] While the association between welding and skin cancer is still being studied, the International Agency for Research on Cancer (IARC) classified UVR and fumes from arc welding as Group 1 or 'carcinogenic to humans' in 2017.[10]

Ocular melanoma is a well-recognized risk linked to UVR exposure from welding. Case-control studies have shown positive associations with risks persisting after adjusting for sun exposure, sunbed use, or both. A dose–response relationship with job duration was also observed.[12] Other case-control studies looked to see the association of welding with NMSC. Heltoft et al examined a cohort of 4333 metal arc welders who were followed for 25 years, and they found a significantly increased risk of BCC in the head and neck region of welders compared with controls.[11] Most other case-control studies did not find an increased prevalence of skin cancer in welders,

This document contains proprietary information, images and marks of Journal of Drugs in Dermatology (JDD). No reproduction or use of any portion of the contents of these materials may be made without the express written consent of JDD. If you feel you have obtained this copy illegally, please contact JDD immediately at support@jddonline.com

To order reprints or e-prints of JDD articles please contact sales@jddonline.com

but this may be due to limitations such as a small sample size and a young average age of welders. In Emmett et al's study, they investigated 158 workers with a mean age of 43 years.[13] In addition to increased UVR exposure, chronic skin trauma and chronic inflammation from welding burns may also play a role in the development of skin cancer. Donoghue et al. reported a case of BCC occurring at a site of previous episodes of welding-induced cutaneous erythema and skin peeling.[14]

Farmer

Farmers are at a particularly high risk of developing skin cancer due to their constant exposure to UVR and pesticides. One study found that farmers made up 33% of all BCC patients, with the nose and cheek being the most common areas affected.[15] Another study showed that 27% of farmers had a recurrence of the disease, compared to 12% in non-farmers.[15]

Arsenic-based pesticides are particularly harmful to farmers, leading to conditions like Bowen's disease, multiple BCCs, and SCCs. Non-arsenic pesticides, such as paraquat, are also potentially carcinogenic.[16]

Firefighter

Research has shown that despite wearing protective gear, firefighters are still vulnerable because the UV protection provided by their gear is often inadequate, and their work involves prolonged outdoor activities.[17,18] Firefighters also face risks from polycyclic aromatic hydrocarbons (PAHs), benzene, and polychlorinated biphenyls (PCBs). Studies have revealed that after responding to fires, firefighters often have significantly higher levels of PAHs on their skin, highlighting the elevated risk of skin cancer in this profession.[17-19]

The risk of developing melanoma is particularly high among firefighters, and a systematic review of case-control studies found that male firefighters are more likely to develop melanoma compared to the general population, with a standardized morbidity odds ratio of 1.5 (95% CI: 1.33-1.70).[17] Another study found that firefighters have a higher risk of melanoma than police officers.[19,20]

Pilot

Pilots are regularly exposed to significant levels of UVA radiation during flights. While aircraft windshields are designed to block UVB radiation, they still allow a substantial amount of UVA radiation to pass through, with transmission rates ranging from 0.41% to 53.5%.[21] Research has shown that pilots flying at 30,000 feet for about 56.6 minutes receive the same amount of UVA radiation as they would during a 20-minute session in a tanning bed.[21] Pilots are also exposed to higher doses of cosmic radiation at high altitudes. Studies have found that commercial airline pilots have a standardized incidence ratio of 1.80 for non-melanoma skin cancer due to cosmic radiation exposure.[22]

Pilots face a higher risk of melanoma due to their exposure to UVA radiation and possibly cosmic radiation. A meta-analysis found that pilots and cabin crew have a higher incidence of melanoma, with a standardized incidence ratio of 2.22 for civil pilots.[21,22] For NMSC, risk factors among pilots include having an at-risk skin type, a history of childhood sunburns, a family history of NMSC, and extended flight time at high latitudes. Pilots who have flown for 20 years or more are at an increased risk of developing NMSC, with an odds ratio of 1.4 associated with flight time at high latitudes.[23]

Veteran

Veterans who have been deployed in desert climates, such as Iraq and Afghanistan, face a high risk of skin cancer. Research has shown that 77% of veterans spent 4 or more hours per day in direct sunlight, and 63% of these veterans reported experiencing at least one sunburn during their deployment.[24] Ethnic background also plays a role in the risk of developing NMSC among veterans. Those of Irish, Welsh, Scottish, or English descent, along with veterans showing signs of solar damage like actinic keratosis and solar elastosis, are at higher risk. Actinic keratosis on the face and solar elastosis on the neck have been identified as key predictors of skin cancer in this group.[25]

Studies indicate that veterans with actinic keratosis, solar elastosis, and prolonged sun exposure are more likely to develop NMSC than the general population.[25] Additionally, a study found that veterans with a history of multiple BCCs had a 40% chance of developing another within two years, which highlights the importance of regular follow-up visits for early detection and treatment.[26]

Construction

Thomas et al used an ecological model to examine melanoma incidence in construction workers. They found that in US counties with lower UVR, there is an association between high proportions of construction workers and melanoma incidence rates. In higher UV counties, melanoma incidence was consistently elevated across all occupation proportions, indicating occupation may not exert a significant impact at higher ultraviolet exposure levels.[27] Peters et al also looked at UVR exposure and found 6.31% (4556 cases) of NMSC cases were estimated to be attributable to occupational exposure, the majority of which in construction fields, to solar UVR.[28]

Chemical Worker

Nonsolar factors are also important with regard to causing NMSC. Gallagher et al conducted a case-control study and found elevated risks for SCC in subjects exposed to insecticides, herbicides, fungicides and seed treatments, petroleum products, grease, and several other exposures. This group also found increased risks of BCC in subjects exposed to fiberglass dust.[29]

This document contains proprietary information, images and marks of Journal of Drugs in Dermatology (JDD). No reproduction or use of any portion of the contents of these materials may be made without the express written consent of JDD. If you feel you have obtained this copy illegally, please contact JDD immediately at support@jddonline.com

To order reprints or e-prints of JDD articles please contact sales@jddonline.com

Benzene exposure can occur in various fields such as petroleum, chemical production, printing, and rubber manufacturing. In 2017, the IARC confirmed the carcinogenicity of benzene based on evidence in experimental animals and humans.[30] Stenehjem et al examined a cohort of offshore petroleum workers and found an association between exposure to crude oil or benzene and skin cancer risk on hands and forearms.[31] Lastly, arsenic exposure has been associated with an increased risk for all types of skin cancer.[32]

Lifeguards and maritime workers

Research has shown that lifeguards have a high frequency of sunburns.[33] In addition, many lifeguards believe that a tan makes people more attractive, which contributes to higher UVR exposure. Even after participating in a sun safety program, this belief did not significantly change, showing how deeply rooted these attitudes are.[33] Maritime workers are also at higher risk of cancers due to UVR exposure, including mesothelioma and non-melanoma skin cancer, most notably lip cancer.[34]

DISCUSSION

Standard prevention strategies like wearing sunscreen, protective clothing, taking shade, and getting regular skin checks are critical for workers. The Occupational Safety and Health Administration (OSHA) tackles sun protection for outdoor workers, specifically those in general industry, maritime, and construction, through its regulations regarding personal protective equipment (PPE), though the use of sunscreen is not explicitly mentioned. OSHA requires employers to provide eye, face, foot, and hand protection as well as filter lenses with the appropriate associated shade number for affected employees.[35] In regard to welders, OSHA states that helmets and hand shields that protect the face, neck, and ears from direct radiant energy be provided. OSHA also states that where permitted, welders should be enclosed in individual booths or noncombustible screens painted with finishes of low reflectivity such as zinc oxide and lamp black.[36]

Despite this, adherence can be inconsistent. One study found that welders may not wear their protective gear due to the work environment being too hot and the gear itself being more of a hindrance when working jobs requiring more detailed welds.[37] Even in welders who use protective gear, the UVR from the welding light can be reflected off painted walls and ceilings.[38] Workers' decisions to use sunscreen in addition to PPE are also variable. For example, a study showed that only 44.3% of outdoor workers regularly used sunscreen compared to 60.2% of indoor workers.[39] Cioffi et al found that 25% of construction workers reported rarely or never using sunscreen, while Laporte et al found 92% of construction workers reported this.[40,41] This highlights the need for more effective education on sun protection practices and the importance of regular skin exams for early detection of skin cancers.

The Firefighter Cancer Initiative (FCI) addresses occupational risks by promoting regular skin cancer screenings and encouraging better sun protection habits. The initiative also focuses on reducing carcinogen exposure by recommending thorough decontamination of personal protective equipment (PPE) to limit skin absorption of hazardous chemicals. Additionally, FCI uses innovative tools like skin swabs and silicone wristbands to monitor toxic exposures during firefighting operations.[17]

Previous public health campaigns have been instrumental in raising awareness. The Slip! Slop! Slap! Campaign, launched in Australia in 1981, encouraged sun safety by promoting the use of shirts, sunscreen, and hats. This campaign later added messages about seeking shade and wearing sunglasses, making it one of the most successful efforts to reduce skin cancer risks.[42]

In addition to basic sun protection methods, setting up shaded rest areas and adjusting work hours to avoid the strongest midday sun can make a big difference.[43] Heydari et al also investigated the implementation of a mobile phone-based text message intervention among a sample of seafarers, and found significantly higher scores among the intervention group compared to the control group in adopting skin cancer preventive behaviors, perceived self-efficacy, protection motivation, and fear.[44]

Beyond workplace conditions, other factors that may be involved in these occupations may also play a role in skin cancer risk. Kricker et al found that UVR exposure is correlated with increased prevalence of β-HPV, and other studies have shown a correlation between UVR and cutaneous beta human papillomaviruses (β-HPV), specifically in the development of SCC.[45,46] Additionally, having a family history of skin cancer can also increase the risk, suggesting that genetics may play a role. For example, inherited mutations in genes such as CDKN2A, CDK4, POT1, and TERT confer a 60% to 90% lifetime risk of melanoma.[47] Lastly, the risk of skin cancer increases with age due to accumulated sun exposure.[48]

The American Academy of Dermatology is in a strong position to expand these efforts by leading educational campaigns and can collaborate with local health departments to organize free skin cancer screenings at worksites. Dermatologists can collaborate with employers to establish workplace policies promoting regular skin exams and sun protection, such as distributing sunscreen and providing protective clothing. Workplace education on sun protection practices has been seen as workplace support which encourages workers to engage in these protective behaviors.[49] These interventions can significantly reduce the incidence of occupational skin cancers and ensure earlier detection, improving outcomes for those at risk.

This document contains proprietary information, images and marks of Journal of Drugs in Dermatology (JDD). No reproduction or use of any portion of the contents of these materials may be made without the express written consent of JDD. If you feel you have obtained this copy illegally, please contact JDD immediately at support@jddonline.com

To order reprints or e-prints of JDD articles please contact sales@jddonline.com

DISCLOSURES

The authors have no conflicts of interest to disclose.

Patient Consent Statement: Authors obtained written patient consent for use of their medical information.

REFERENCES

1. Global Burden of Disease 2019 Cancer Collaboration, Kocarnik JM, Compton K, et al. Cancer incidence, mortality, years of life lost, years lived with disability, and disability-adjusted life years for 29 cancer groups from 2010 to 2019: a systematic analysis for the Global Burden of Disease Study 2019. *JAMA Oncol.* 2022;8(3):420-444. doi:10.1001/jamaoncol.2021.6987.
2. Leiter U, Keim U, Garbe C. Epidemiology of skin cancer: update 2019. *Adv Exp Med Biol.* 2020;1268:123-139. doi:10.1007/978-3-030-46227-7_6.
3. Koh HK, Geller AC, Miller DR, et al. Prevention and early detection strategies for melanoma and skin cancer: current status. *Arch Dermatol.* 1996;132(4):436-443.
4. Glanz K, Buller DB, Saraiya M. Reducing ultraviolet radiation exposure among outdoor workers: state of the evidence and recommendations. *Environ Health.* 2007;6:22. doi:10.1186/1476-069X-6-22.
5. Pega F, Momen NC, Streicher KN, et al. Global, regional and national burdens of non-melanoma skin cancer attributable to occupational exposure to solar ultraviolet radiation for 183 countries, 2000-2019: a systematic analysis from the WHO/ILO Joint Estimates of the work-related burden of disease and injury. *Environ Int.* 2023;181:108226. doi:10.1016/j.envint.2023.108226.
6. Bauer A, Haufe E, Heinrich L, et al. Basal cell carcinoma risk and solar UV exposure in occupationally relevant anatomic sites: do histological subtype, tumor localization, and Fitzpatrick phototype play a role? A population-based case-control study. *J Occup Med Toxicol.* 2020;15:28. doi:10.1186/s12995-020-00279-8.
7. Keim U, van der Pols JC, Williams GM, et al. Exclusive development of a single type of keratinocyte skin cancer: evidence from an Australian population-based cohort study. *J Invest Dermatol.* 2015;135(3):728-733. doi:10.1038/jid.2014.410.
8. Suhonen V, Siiskonen H, Suni M, et al. Malignant and in situ subtypes of melanoma are associated with basal and squamous cell carcinoma and its precancerous lesions. *Eur J Dermatol.* 2022;32(2):187-194. doi:10.1684/ejd.2022.4221.
9. Cornejo KM, Deng AC. Malignant melanoma within squamous cell carcinoma and basal cell carcinoma: is it a combined or collision tumor?—A case report and review of the literature. *Am J Dermatopathol.* 2013;35(2):226-234. doi:10.1097/DAD.0b013e3182545e27.
10. Guha N, Loomis D, Guyton KZ, et al. Carcinogenicity of welding, molybdenum trioxide, and indium tin oxide. *Lancet Oncol.* 2017;18(5):581-582. doi:10.1016/S1470-2045(17)30255-3.
11. Heltoft KN, Slagor RM, Agner T, et al. Metal arc welding and the risk of skin cancer. *Int Arch Occup Environ Health.* 2017;90(8):873-881. doi:10.1007/s00420-017-1248-5.
12. Guénel P, Laforest L, Cyr D, et al. Occupational risk factors, ultraviolet radiation, and ocular melanoma: a case-control study in France. *Cancer Causes Control.* 2001;12(5):451-459. doi:10.1023/a:1011271420974.
13. Emmett EA, Buncher CR, Suskind RB, Rowe KW Jr. Skin and eye diseases among arc welders exposed to welding operations. *J Occup Med.* 1981;23(2):85-90. doi:10.1097/00043764-198102000-00010.
14. Donoghue AM, Sinclair MJ. Basal cell carcinoma after frequent episodes of cutaneous erythema and peeling induced by welding. *Occup Environ Med.* 1999;56(9):646. doi:10.1136/oem.56.9.646a.
15. Szewczyk M, Pazdrowski J, Golusiński P, et al. Basal cell carcinoma in farmers: an occupation group at high risk. *Int Arch Occup Environ Health.* 2016;89(3):497-501. doi:10.1007/s00420-015-1088-0.
16. Spiewak R. Pesticides as a cause of occupational skin diseases in farmers. *Ann Agric Environ Med.* 2001;8(1):1-5.
17. Caban-Martinez AJ, Hughes J, Bator C. A Total Worker Health approach to skin exposure assessment: experiences from the Firefighter Cancer Initiative. *Ann Work Expo Health.* 2021;65(2):143-147. doi:10.1093/annweh/wxaa066.
18. Hoppe-Jones C, Griffin SC, Gulotta JJ, et al. Evaluation of fireground exposures using urinary PAH metabolites. *J Expo Sci Environ Epidemiol.* 2021;31(5):913-922. doi:10.1038/s41370-021-00311-.
19. Sama SR, Martin TR, Davis LK, et al. Cancer incidence among Massachusetts firefighters, 1982-1986. *Am J Ind Med.* 1990;18(1):47-54. doi:10.1002/ajim.4700180106.
20. Kang D, Davis LK, Hunt P, et al. Cancer incidence among male Massachusetts firefighters, 1987-2003. *Am J Ind Med.* 2008;51(5):329-335. doi:10.1002/ajim.20549.
21. Sanlorenzo M, Vujic I, Posch C, et al. The risk of melanoma in pilots and cabin crew: UV measurements in flying airplanes. *JAMA Dermatol.* 2015;151(4):450-452. doi:10.1001/jamadermatol.2014.4643.
22. Wilkison BD, Wong EB. Skin cancer in military pilots: a special population with special risk factors. *Cutis.* 2017;100(4):218-220.
23. Nicholas JS, Swearingen CJ, Kilmer JB. Predictors of skin cancer in commercial airline pilots. *Occup Med (Lond).* 2009;59(6):434-436. doi:10.1093/occmed/kqp058.
24. Powers JG, Patel NA, Powers EM, et al. Skin cancer risk factors and preventative behaviors among United States military veterans deployed to Iraq and Afghanistan. *J Invest Dermatol.* 2015;135(11):2871-2873. doi:10.1038/jid.2015.238.
25. Rigopoulos D, Petropoulou H, Nikolopoulou M, et al. Total congenital anonychia in two children of the same family. *J Eur Acad Dermatol Venereol.* 2006;20(7):894-896. doi:10.1111/j.1468-3083.2006.01585.x.
26. Beatson M, Misitzis A, Landow S, et al. Predictors of basal cell carcinoma and implications for follow-up in high-risk patients in the Veterans Affairs Keratinocyte Carcinoma Chemoprevention (VAKCC) Trial. *J Cutan Med Surg.* 2021;25(1):102-103. doi:10.1177/1203475420945230.
27. Thomas KM, Cullison CR, Herrera HO, et al. Occupational association with melanoma: a US ecological county-level analysis. *Arch Dermatol Res.* 2024;316(5):165. doi:10.1007/s00403-024-02922-4.
28. Peters CE, Kim J, Song C, et al. Burden of non-melanoma skin cancer attributable to occupational sun exposure in Canada. *Int Arch Occup Environ Health.* 2019;92(8):1151-1157. doi:10.1007/s00420-019-01454-z.
29. Gallagher RP, Bajdik CD, Fincham S, et al. Chemical exposures, medical history, and risk of squamous and basal cell carcinoma of the skin. *Cancer Epidemiol Biomarkers Prev.* 1996;5(6):419-424.
30. Loomis D, Guyton KZ, Grosse Y, et al. Carcinogenicity of benzene. *Lancet Oncol.* 2017;18(12):1574-1575. doi:10.1016/S1470-2045(17)30832-X.
31. Stenehjem JS, Robsahm TE, Bråtveit M, et al. Aromatic hydrocarbons and risk of skin cancer by anatomical site in 25,000 male offshore petroleum workers. *Am J Ind Med.* 2017;60(8):679-688. doi:10.1002/ajim.22741.
32. Kennedy C, Bajdik CD, Willemze R, et al. Chemical exposures other than arsenic are probably not important risk factors for squamous cell carcinoma, basal cell carcinoma, and malignant melanoma of the skin. *Br J Dermatol.* 2005;152(1):194-197. doi:10.1111/j.1365-2133.2005.06411.x.
33. Hiemstra M, Glanz K, Nehl E, et al. Changes in sunburn and tanning attitudes among lifeguards over a summer season. *J Am Acad Dermatol.* 2012;66(3):430-437.
34. Ugelvig Petersen K, Pukkala E, Martinsen JI, et al. Cancer incidence among seafarers and fishermen in the Nordic countries. *Scand J Work Environ Health.* 2020;46(5):461-468. doi:10.5271/sjweh.3879.
35. Occupational Safety and Health Administration. 1910.133 - Eye and face protection. Accessed February 4, 2025. https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.133.
36. Occupational Safety and Health Administration. 1910.252 - General requirements. Accessed February 4, 2025. https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.252.
37. Dixon AJ, Dixon BF. Ultraviolet radiation from welding and possible risk of skin and ocular malignancy. *Med J Aust.* 2004;181(3):155-157. doi:10.5694/j.1326-5377.2004.tb06207.x.
38. Falcone L. Welding fume exposure and lung cancer: Evidence of lung toxicity and tumor promotion from in vivo studies in A/J mice. West Virginia University; 2018. doi:10.33915/etd.5567.
39. Trakatelli M, Barkitzi K, Apap C, et al. Skin cancer risk in outdoor workers: a European multicenter case-control study. *J Eur Acad Dermatol Venereol.* 2016;30 Suppl 3:5-11. doi:10.1111/jdv.13603.
40. Cioffi J, Wilkes L, O'Brien J. Outdoor workers and sun protection: knowledge and behaviour. *Constr Econ Build.* 2002;2(2):10-14.
41. Laporte J. Sensibilisation des salariés du bâtiment et des travaux publics au risque solaire: pour une prévention efficace. *Arch Mal Prof Env.* 2006;67(6):828-841. doi:10.1016/S1775-8785(06)70486-6.
42. Smit-Kroner C, Brumby S. Farmers sun exposure, skin protection and public health campaigns: An Australian perspective. *Prev Med Rep.* 2015;2:602-607. Published 2015 Jul 22. doi:10.1016/j.pmedr.2015.07.004.
43. Cherrie JW, Cherrie MPC. Workplace exposure to UV radiation and strategies to minimize cancer risk. *Br Med Bull.* 2022;144(1):45-56. doi:10.1093/bmb/ldac019.
44. Heydari E, Dehdari T, Solhi M, et al. Can adopting skin cancer preventive behaviors among seafarers be increased via a theory-based mobile phone-based text message intervention? A randomized clinical trial. *BMC Public Health.* 2021;21(1):134. Published 2021 Jan 14. doi:10.1186/s12889-020-09893-x.
45. Kricker A, Weber MF, Brenner N, et al. High ambient solar UV correlates with greater beta HPV seropositivity in New South Wales, Australia. *Cancer Epidemiol Biomarkers Prev.* 2020;29(1):49-56. doi:10.1158/1055-9965.EPI-19-0400.
46. Tommasino M. HPV and skin carcinogenesis. *Papillomavirus Res.* 2019;7:129-131. doi:10.1016/j.pvr.2019.04.003.
47. Ransohoff KJ, Jaju PD, Tang JY, et al. Familial skin cancer syndromes: Increased melanoma risk [published correction appears in J Am Acad Dermatol. 2016 Jun;74(6):1290. doi: 10.1016/j.jaad.2016.03.032.]. *J Am Acad Dermatol.* 2016;74(3):423-436. doi:10.1016/j.jaad.2015.09.070.
48. Yu SY, Hirsch A, Zaslavsky O, et al. Risk factors and early prevention of skin cancer in rural older outdoor workers: a scoping review. *Geriatr Nurs.* 2023;54:37-45. doi:10.1016/j.gerinurse.2023.08.017.
49. Janda M, Stoneham M, Youl P, et al. What encourages sun protection among outdoor workers from four industries? *J Occup Health.* 2014;56(1):62-72. doi:10.1539/joh.13-0179-oa.

AUTHOR CORRESPONDENCE

Mariela Mitre MD PhD

E-mail:..... marimi21345@gmail.com

This document contains proprietary information, images and marks of Journal of Drugs in Dermatology (JDD). No reproduction or use of any portion of the contents of these materials may be made without the express written consent of JDD. If you feel you have obtained this copy illegally, please contact JDD immediately at support@jddonline.com