UV light exposure still not classified as US workplace hazard

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> Ultraviolet (UV) light exposure is a recognised risk factor for dermal haemangiosarcoma (HSA) and squamous cell carcinoma (SCC) in companion animals, causing substantial local disease and often requiring repeated surgery due to recurrence or de novo lesions. These tumours create a notable welfare and financial burden for pet owners.1 But while the veterinary field acknowledges this risk, US occupational health regulations for humans remain silent on UV light as a workplace hazard.

KEY TAKEAWAYS

- The Pivot: Research explicitly links UV exposure to specific dermal cancers in animals, yet US workplace safety standards do not reflect this known hazard for humans.
- The Data: UV light is strongly implicated in a range of dermatoses, from actinic keratosis to dermal HSA and SCC in dogs and cats.1
- The Action: Clinicians should educate patients in outdoor occupations about UV risks and advocate for stronger workplace safety classifications.

The veterinary literature provides a clear picture of UV light's carcinogenic potential. Research summarises current evidence on UV-induced carcinogenesis, strategies to reduce UV exposure, and the safety of sunscreen ingredients in dogs and cats.1 This review highlights that UV light is strongly implicated in a range of dermatoses, from actinic keratosis to dermal HSA and SCC in dogs and cats, with the risk likely higher in Australian pets.1 These conditions are not merely cosmetic; they cause significant morbidity and often necessitate aggressive, repeated surgical interventions.

The tumours typically develop in sparsely haired or hairless regions such as the nose and ventrum, making these areas suitable for targeted sunscreen application.1 Researchers are exploring various strategies to mitigate this risk in animals. Indoor confinement during peak UV periods, providing shade, and using sun-protective clothing can reduce exposure.1 Sunscreen serves as an additional strategy, particularly for vulnerable areas. This focus on prevention in companion animals highlights the established understanding of UV's harmful effects.

What the animal data tells us

A review by Granados-Soler and colleagues, published in Vet Sci, specifically examined UV-induced skin cancer in pets and the safety of sunscreen use.1 The authors detailed how UV light exposure is a recognised risk factor for dermal haemangiosarcoma in dogs and dermal squamous cell carcinoma in dogs and cats.1 These tumours are not benign; they cause substantial local disease and frequently require repeated surgical procedures due to recurrence or the development of new lesions.1 This creates a significant welfare and financial burden for pet owners, a burden that could be lessened

with effective preventative measures.

The review also examined the efficacy and safety of sunscreens for pets. Sunscreens containing non-nanoparticle zinc oxide appear safe for dogs and cats when ingestion is prevented or minimised.1 But the safety of organic UV filters remains unclear due to limited safety data in both humans and animals.1 Non-nanoparticle titanium dioxide presents a possible alternative to zinc oxide and organic filters, but information on its safety when ingested by dogs and cats is currently scarce.1 This gap in safety data for common sunscreen ingredients in animals mirrors similar concerns that have arisen in human dermatology, highlighting a shared research need.

The broader context of UV detection

Beyond direct prevention, the scientific community continues to advance methods for detecting UV light, which could indirectly inform hazard assessment. Zhang and Wu, writing in Adv Sci (Weinh), described exploiting the bulk photovoltaic effect in a polar hybrid perovskite towards self-powered detection of weak ultraviolet polarized light.2 While this research focuses on technological applications, the development of more sensitive and efficient UV detection methods could eventually lead to better monitoring of workplace exposure levels for humans. Such advancements could provide the quantitative data needed to push for regulatory changes.

Another area of materials science, explored by Li and colleagues in Small, involves recyclable dry-processed PTFE composite films for passive radiative cooling with interfacial energy harvesting.3 Although not directly about UV carcinogenesis, these innovations in materials science demonstrate the ongoing scientific effort to understand and manipulate light, including UV radiation. The ability to manage thermal and radiative properties of materials has implications for protective gear and environmental controls in workplaces where UV exposure is a concern.

Why the US lags on classification

The stark contrast between the veterinary understanding of UV as a carcinogen and its lack of classification as a workplace hazard in the US for humans is striking. The evidence from animal models, particularly the clear link between UV exposure and specific dermal cancers, provides a strong biological plausibility for similar risks in humans.1 The repeated surgical interventions and significant welfare burdens observed in pets due to UV-induced tumours should serve as a cautionary tale for human occupational health.1

Still, the US Occupational Safety and Health Administration (OSHA) does not list UV radiation as a specific hazard requiring mandatory controls, unlike other physical agents such as ionising radiation or extreme temperatures. This omission leaves workers in outdoor professions, or those exposed to industrial UV sources, without explicit protections. The lack of comprehensive safety data for organic UV filters in both humans and animals also presents a challenge, suggesting a broader need for research into the long-term safety of these compounds.1 For clinicians managing skin conditions, a comprehensive guide like the Oxford Handbook of Medical Dermatology can be invaluable for understanding the full spectrum of dermatoses, including those linked to environmental exposures.

The available evidence supports sunscreen as a necessary component of UV-reduction strategies in pets, but substantial research is needed to determine the safety profiles of different UV filters and to establish evidence-based guidelines for their safe use.1 This research gap, combined with the clear carcinogenic link, highlights an urgent need for regulatory bodies to re-evaluate UV light's classification as a workplace hazard for humans. Without this reclassification, workers will continue to face preventable risks, relying on individual initiative rather than systemic protection.

CLINICAL IMPLICATIONS

The veterinary literature's unequivocal stance on UV light as a carcinogen in animals should prompt a re-evaluation of its status in human occupational health. Clinicians regularly see the consequences of chronic sun exposure in their patients, from actinic keratoses to squamous cell carcinomas. The fact that US regulatory bodies have not formally classified UV as a workplace hazard means that preventative measures are often left to individual employers or, more commonly, to the exposed worker themselves.

This regulatory gap creates a significant public health blind spot. GPs and specialists should proactively counsel patients in outdoor occupations, such as construction workers, farmers, or those involved in landscaping, about the risks of UV exposure and the importance of protective measures. This includes recommending broad-spectrum sunscreens, protective clothing, and seeking shade during peak UV hours, even in the absence of explicit workplace mandates.

The ongoing research into the safety of sunscreen ingredients, particularly organic UV filters, also has direct implications for patient advice. While non-nanoparticle zinc oxide appears safe in animals, the lack of clear human safety data for many common filters means clinicians should remain vigilant and advise patients on products with established safety profiles. This is not merely about preventing sunburn, but about mitigating a known carcinogenic risk that is currently under-recognised in occupational settings.

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