Beyond *JAAD* October 2018: Articles of interest to dermatologists from the nondermatologic literature

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FACIAL EXPOSURE TO ULTRAVIOLET RADIATION: PREDICTED SUN PROTECTION EFFECTIVENESS OF VARIOUS HAT STYLES

In 1981, The Cancer Council of Victoria, Australia, launched a highly successful and durable campaign (the tagline of which was Slip, Slop, Slap) encouraging people to "slip on a shirt, slop on sunscreen, and slap on a hat." But exactly how much protection does slapping on a hat afford? The authors of this study set out to answer that question. Using the standard erythema dose (SED) as a comparative metric, the authors studied the solar doses potentially received by individuals wearing a variety of types of headgear and no headgear at all, as calculated by summing the estimated direct, diffuse, and reflected ultraviolet radiation. With respect to the SED received by an unprotected face during a 2-hour mid-day exposure, unprotected noses received 6.1 SED versus 1.4 SED for the chin. With headgear protection, on a cloudless summer day the lowest mean dose of ultraviolet radiation received by the entire face was that with a wide-brimmed hat (1.7 SED). Regardless of hat style, the chin received the least protection of any facial zone. Wearing a baseball cap offered the highest protection for ocular and nasal regions during all seasons but the least protection of all for the ears. The authors counsel that regardless of hat types, in situations of reflected glare, "effectiveness was highly reduced." The take-home message is that slapping is important, but so are slopping and slipping.

Backes C, Religi A, Moccozet L, Vuilleumier L, Vernez D, Bulliard J. Facial exposure to ultraviolet radiation: predicted sun protection effectiveness of various hat styles. *Photodermatol Photoimmunol Photomed*. doi.org/10.1111/phpp.12388, accessed August 15, 2018.

EFFECT OF ULTRAVIOLET LIGHT ON MOOD, DEPRESSIVE DISORDERS, AND WELL-BEING

We know the risks of episodic and cumulative exposure to ultraviolet (UV) light. But what are the benefits? The authors undertook a review of clinical trials and observational studies in an effort to assess the effect of UV light on mood, depressive disorders, and sense of well-being. Citing 7 studies, the authors conclude that 6 of the studies demonstrated a positive correlation between UV light exposure and mood improvement. They posit a possible mood-modulating effect of UV light via the skin through vitamin D. Referencing the fact that the major source of vitamin D for humans is exposure of the skin to sunlight, resulting in the conversion of 7-dehydrocholesterol to pre−vitamin D_3, they cite the recent discovery that the human brain also possesses vitamin D receptors and raise the question of whether mood and depressive disorders might be influenced by vitamin D deficiency and corrected by its replenishment. They also suggest possible pathways via the hypothalamopituitary axis, the serotoninergic/melatoninergic system, and the immune system. The authors hedge their findings by citing the small number of studies, the possibility of inherent biases, and the small number of participants in the studies. They suggest though that the results of the reviewed studies are sufficient to warrant further research in this area. As we counsel our patients to avoid sun, it behooves us to have a better understanding of why they seek it out.

Veleva B, van Bezooijen R, Chel V, Numans M, Caljouw M. Effect of ultraviolet light on mood, depressive disorders and well-being. *Photodermatol Photoimmunol Photomed*. doi.org/10.1111/phppp.12396, accessed August 15, 2018.

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FAT INTAKE AND RISK OF SKIN CANCER IN US ADULTS

The authors examined the association between fat intake and the risk of development of skin cancer, including malignant melanoma, squamous cell carcinoma (SCC), and basal cell carcinoma (BCC), within 2 prospective studies, the Nurses' Health Study (1984-2012) and the Health Professionals Follow-up Study (1986-2012). Dietary information on total, saturated, monounsaturated, polyunsaturated, omega-6, and omega-3 fat and cholesterol was assessed repeatedly, and incident cases of skin cancer were identified by self-report, with reports of melanoma and SCC confirmed by pathologic records. No association between total fat intake and risk of skin cancer was found. However, elevated polyunsaturated fat intake was associated with an increased risk of both SCC and BCC, with the hazard ratio for SCC being 1.16 and that for BCC being 1.06. Higher omega-6 intake was associated with an elevated risk of all 3 skin cancers. Omega-3 intake was associated with risk of BCC but not with risk of SCC or melanoma. Interestingly, higher intake of cholesterol was associated with a lower risk of SCC and higher intake of monounsaturated fat was associated with a lower risk of BCC. The authors conclude that polyunsaturated fat is modestly associated with skin cancer risk, and they call for further studies to confirm these findings and elucidate relevant biologic mechanisms.

Park M, Li W, Qureshi A, Cho E. Fat intake and risk of skin cancer in US adults. *Cancer Epidemiol Biomarkers Prev*. 2018;27:776-782.

RISK STRATIFICATION FOR MELANOMA: MODELS DERIVED AND VALIDATED IN A PURPOSE-DESIGNED PROSPECTIVE COHORT

The most powerful way to reduce deaths from metastatic melanomas is to identify and remove melanomas before they have had a chance to metastasize. Identification can be made by patient self-diagnosis, by the incidental discovery of a melanoma during a patient's visit to her or his dermatologist or primary care physician, or by melanoma screening. The efficacy of population-based screening for melanoma remains unproved. The authors observe that the typical recommendation regarding screening suggests the targeting of "high-risk" individuals, but no definition of high risk has been agreed on. The authors undertake to apply risk stratification to the selection of suitable screening subjects, and they report "the development of a tool intended for community use, with which to stratify people based on their predicted risk of melanoma into appropriate early detection activities." Interestingly, the authors found that self-perceived risk of melanomas correlated poorly with actual risk. They found that information on 7 items yielded a risk prediction index for invasive melanoma with high discrimination; these items include age, sex, tanning ability, number of moles at age 21 years, and number of skin lesions treated destructively. Hair color and sunscreen use also independently predicted risk. The authors cite the strength of their model as using information that can be captured easily by self-report, thus making it suitable for use in the general population.

Olsen C, Pandeya N, Thompson B, et al. Risk stratification for melanoma: models derived and validated in a purpose-designed prospective cohort [e-pub ahead of print]. *J Natl Cancer Inst*. doi:10/1093/jnci/djy023/4925165, accessed August 15, 2018.

MAN AGAINST MACHINE: DIAGNOSTIC PERFORMANCE OF A DEEP LEARNING CONVOLUTIONAL NEURAL NETWORK FOR DERMATOSCOPIC MELANOMA RECOGNITION COMPARED WITH THAT OF 58 DERMATOLOGISTS

Computer-assisted image analysis of melanocytic lesions is an area of fertile investigation. Haenssle et al compared the sensitivity and specificity of melanoma detection between a deep learning convolutional neural network and an international group of 58 dermatologists that included 30 experts. A 300-image set, 20% of which comprised melanomas (of all depths) and 80% of which comprised benign melanocytic nevi of various subtypes, was evaluated in 2 stages. The initial (level 1) stage included assessment of dermatoscopic images with only a dichotomous choice: melanoma or not. After 4 weeks the experiment was repeated (level 2), but participants were also provided with additional clinical information and close-up images of the same lesions. At both level 1 and level 2, machine specificity was greater (82.5% vs 71.3% for level 1 and 75.7% for level 2). An obvious drawback of the study is that even with the additional data offered at level 2, the clinical information presented to the dermatologist was digital, not real-life, real-time information. The real message from this study may be that when we dermatologists are reluctant to make definitive diagnoses based on images sent to us by our patients, the data support our reluctance. It will be interesting to see a study comparing artificial intelligence examination of photographs with examination by skilled dermatologists looking at the same patients in person. That will be the study that counts.

Haenssle H, Fink C, Schneiderbauer R, et al. Man against machine: diagnostic performance of a deep learning convolutional neural network for dermoscopic melanoma recognition in comparison to 58