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Skin Cancer—The Importance of Prevention

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In 2009, the US Preventive Services Task Force (USPSTF) found insufficient evidence to recommend skin examinations for the early detection of skin cancer in adults. The conclusion followed from a systematic review of the effectiveness and harms of clinical visual skin examinations by physicians or patient self-examinations in terms of morbidity and mortality from skin cancer.

Several years later, after another systematic review,[1] the USPSTF's conclusion—that there is insufficient evidence to recommend total-body skin examination for the early detection of melanoma, basal cell cancer, or squamous cell cancer in all adults—remains the same.[2]

The USPSTF's determination that evidence is not adequate to support a recommendation for skin cancer screening will likely once again disappoint national organizations such as the American Academy of Dermatology and the Skin Cancer Foundation, which have advocated for screening.[3,4] Physicians and patients might also be confused. After all, several organizations have encouraged screening; skin cancer seems easy to detect early because it is visible; skin examinations are neither painful nor invasive; and melanoma thickness at the time of diagnosis predicts mortality.

However, the USPSTF recommendations are based on a rigorous evidence review that balanced the benefits and risks of screening. The potential benefits are apparent but the risks, such as unnecessary procedures and their downstream complications, may not be. Over treatment of skin cancer may be especially problematic for patients with limited life expectancy due to old age or comorbidities. These patients may not live long enough to benefit from more intensive treatments but may be at risk for short-termtreatment-relatedcomplications.[5]

The USPSTF review identified no completed randomized clinical trials on the topic. The USPSTF rightly focused on the initially exciting results of an ecologic study, Skin Cancer Research to Provide Evidence for Effectiveness of Screening in Northern Germany (SCREEN), conducted in 1 German state during 2003–2004.[6] The SCREEN study showed a

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48% relative reduction in melanoma mortality in the state by 2009 after initiation of a population-based skin cancer awareness campaign, clinician education and training, and screening of nearly 20% of eligible adults aged 20 years and older with a single clinical visual skin examination. Those results prompted Germany to institute a nationwide program of clinical visual skin examinations. Unfortunately, the mortality benefit was not sustained with further follow-up, and several major methodological concerns about SCREEN have been raised.[7,8]

Skin Cancer Is a Major Problem

The incidence of skin cancer is higher than that of all other cancers combined. Both melanoma and nonmelanoma skin cancer incidence rates continue to increase. The 5.4 million new cases of basal and squamous cell carcinomas in the United States annually[9] and 76 380 new cases of malignant melanoma each year[10] raise concerns for both patients and the health care system. Skin cancer treatments cost the United States more than $8 billion each year, making skin cancer the fifth most costly cancer for Medicare. Furthermore, skin cancer is an under recognized problem for diverse populations, including young women and minorities such as Hispanic individuals and gay men.

If universal screening is not the right approach, what *can* we do? The answer is that we can do a lot, if we shift our focus from secondary prevention (catching a cancer early enough to treat it) to primary prevention (preventing the cancer from developing in the first place). More than half of cancers are considered preventable through behavioral changes, vaccinations, or medications.[11] The evidence suggests that much of skin cancer could also be prevented.

Preventability of Skin Cancer

The UV radiation from indoor tanning beds is a group 1 carcinogen, in the same category as tobacco or asbestos.[12] Preventing carcinogenic exposures can result in preventing cancer. Indoor tanning is estimated to cause more than 450000 new skin cancers, including more than 10000 melanomas, each year.[13] Despite substantial investment in prevention efforts, including several well- designed campaigns by the Centers for Disease Control and Prevention and foundations focused on skin cancer prevention, efforts to affect the incidence of skin cancer have hit a brick wall. Tanning bed use remains common, with 1 in 5 adolescents and more than 40% of college students using tanning beds.[13]

What are we doing wrong? In part, we might not be using the right tools to reach teens and young adults directly, and we might not be reaching the mat the right time. That is where technology may help. Social media and online search engines provide the ability to target health messages directly to those at highest risk. These platforms provide away to introduce messages precisely when teens are, for example, searching for a tanning salon.[14] Technology that targets health messages can get the right message to the right person at the right time. Refining messages that can shift social norms about tanning in general and studying whether these can actually change behaviors remain priorities.

Established and effective strategies for skin cancer prevention are also underused. Comprehensive sun-protection programs that emphasize shade and sun-protective clothing such as Australia's SunSmart program (*slip* on clothing, *slop* on sunscreen, *slap* on a hat, *seek* shade, and *slide* on sunglasses) should be implemented widely. The Australian program has been linked to a decrease in the incidence of skin cancer in young adults.[15,16] Strategies that go beyond education and address practical, environmental, and behavioral barriers to sustainable sun protection have the highest likelihood of success. Shade structures in playgrounds and free sunscreen dispensers in outdoor parks are innovative ideas that should be evaluated. In addition, there are lessons from successful antismoking efforts. Based on the experience with smoking cessation programs, increasing the legal age for indoor tanning to 21 years, restricting indoor tanning advertising directed to youths, and increasing taxation for indoor tanning beyond the 10% excise tax imposed by the Patient Protection and Affordable Care Act may be effective approaches. Physicians and the public should remain alert to the indoor tanning industry's use of the same techniques used by the tobacco industry: paying scientists to bring doubt to the evidence, making false advertising claims about the health benefits of tanning, and undermining the scientific consensus on the adverse health effects of indoor tanning.

Does Skin Cancer Screening Make Sense for High-Risk Individuals?

As new data emerge, we might find that the benefits of skin cancer screening outweigh the risks for high-risk individuals. Such individuals include solid-organ transplant recipients who have 3 times higher risk of developing malignant melanoma and more than 60 times higher risk of cutaneous squamous cell carcinoma. They also include people with a history of multiple skin cancers whose probability of developing another skin cancer is 50% within 1 year and 70% within 3 years of their last skin cancer diagnosis as well as people with a strong family history of melanoma. As more is learned about the genetic predictors of melanoma and other skin cancers, genotypic approaches may be developed to stratify and identify individuals at high risk who could benefit from screening.

Conclusions

The USPSTF recommendations should not be misinterpreted as minimizing the importance of skin cancer. Instead, the report should motivate us to improve the evidence base for identifying groups of people in whom the benefits of screening might outweigh risks. We need high-quality, long-term randomized clinical trials of the effectiveness of screening on skin cancer prevention. Meanwhile, we should also fully implement skin cancer primary prevention by eliminating indoor tanning exposure, especially among youths, and increasing the use of sun-protection strategies that work.

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