FEATURE ARTICLE

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Indoor Tanning, Skin Cancer, and Tanorexia

Development of U.S. Indoor Tanning Policy

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ABSTRACT: Healthcare providers and public health advocates are celebrating a step forward in the campaign to address the exponential growth in tanning bed use, which has been linked to significantly increased rates of skin cancer, including melanoma. The levying of a 10% tax on indoor tanning was a significant addition to the recent healthcare reform bill, The Patient Protection and Affordable Care Act, signed into law by President Obama on March 23, 2010. The tax is a significant step taken in response to the unified voices of countless concerned healthcare providers and advocates. It paves the way for further artificial tanning regulation. To fully appreciate this public health accomplishment, it is helpful to place this historic legislation in the context of the development of the U.S. health policy relating to indoor tanning.

Key words: Artificial Tanning, Indoor Tanning, Tanning Salon, Healthcare Policy, Public Health, Dermatology, Melanoma, Skin Cancer, Tanning Tax, Tanning Legislation, Dermatology Nurse Practitioner, Teens Tanning, Tanorexia, FDA

HISTORY

In 2000, Euroskin, an independent nonprofit European scientific society, met in Hamburg with the principal aim of reducing the incidence and mortality of skin cancer in Europe. Its primary focus was the identification of health and safety problems arising from the use of artificial tanning devices (Greinert, McKinlay, & Breitbart, 2001). When in 2002 the National Toxicology Program, part of the National Institutes of Health, classified ultraviolet-A, ultraviolet-B, and ultraviolet-C as "known carcinogens to humans" (National Toxicology Program, 2002), it had been 8 years since the American Medical Association had unsuccessfully called for a complete ban on exposure to artificial sources of ultraviolet radiation (UVR) for nonmedical purposes (Health Physics Society, 2009). Across the ocean that same year, British public health scientists, through the National Radiation Protection Board, published a report advising against the use of artificial tanning devices and recommending clear information to the public regarding potential UV-associated health risks (National Radiation Protection Board, 2002). At the same time, the World Health Organization (WHO, 2003) was acknowledging concern about the steady increase in the incidence of melanomas worldwide.

The scientific community had conducted many small studies, but in 2003, a large prospective cohort study of Swedish and Norwegian women (n = 106,379) provided much stronger evidence (p = .04) linking indoor tanning with skin cancer. Researchers found that "solarium use at any age was associated with a statistically significant 55% increase in risk of melanoma after adjustment for sun sensitivity and measures of sun exposure" (Veierod et al., 2003, p. 1537). It is important to note that because this Scandinavian women's study excluded participants older than 49 years, excluded participants previously diagnosed with melanoma, and only provided a 9-year follow-up data, the actual lifetime melanoma risk for this population would be higher. Because of the long latency period for most nonmelanoma and melanoma skin cancers, the full impact of current year-round indoor tanning trends may take years to be fully demonstrated.

Finally, the WHO, after undertaking a meticulous and an exhaustive 3-year meta-analysis involving 19 studies and 7,335 patients worldwide, issued a much stronger statement and added tanning beds to the previously

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published list of known risky exposures such as cigarettes and asbestos (El Ghissassi et al., 2009). The International Agency for Research on Cancer (WHO, 2006) had found that sufficient evidence had been assembled to link having ever indoor tanned to increased risk for developing melanoma and squamous cell carcinoma. Their analysis concurred with what the international dermatology community had observed. Those individuals beginning indoor tanning before age 35 years demonstrated a 75% increased risk for developing melanoma, the deadliest form of skin cancer (WHO, 2006). The International Agency for Research on Cancer concluded that studies also indicated a 2.5 times greater risk of developing squamous cell carcinoma associated with the use of tanning beds and a 1.5 times increased risk associated with basal cell carcinoma (El Ghissassi et al., 2009). The International Commission on Non-ionizing Radiation Protection (2006), the Center for Disease Control (CDCP, 1995), the National Institutes of Health (2000), the Federal Trade Commission (Von Eschenbach, 2009), and the Food and Drug Administration (Von Eschenbach, 2009) had begun over that same period to express written concern warning consumers of the association of indoor tanning with increased risk of skin cancer. These bodies, along with numerous health organizations both nationally and internationally, have issued consumer warnings related to adverse health events associated with the use of tanning devices.

Meanwhile, spokespersons for the tanning industry use tactics reminiscent of the tobacco industry, creating sophistries that obscure the hazards of tanning beds in their messages to consumers. Because randomized controlled trials involving harmful UVR exposure of human subjects would be neither possible nor ethical, the tanning industry continues to claim that there is a lack of conclusive evidence that indoor tanning is a cancer-provoking activity. Examples of the type of false information the tanning industry conveys to an uninformed public can easily be found on their Web sites. For example: "Calling a tan damage to your skin is like calling exercise damage to your muscles" (Tanningtruth, 2009).

According to the American Cancer Society, the lifetime risk to U.S. Whites for developing a melanoma has risen from 1 in 1,500 in the 1930s to 1 in 50 in 2009 (American Cancer Society, 2009). Although people with pale skin, light eyes, tendency to freckle, and many or atypical moles are at greatest risk for skin cancer (Maguire-Eisen, 2003), the rates are increasing in every segment of our population, including children, Latinos, and Blacks (National Cancer Institute, 2009). It should be noted that Veierod et al. (2003) in their large prospective cohort study found red or blonde hair color to be more strongly associated with melanoma risk than skin type. Melanoma is the second most common cancer in young White women between the ages of 19 and 29 years old (American Cancer Society, 2009).

Estimates of the U.S. healthcare-related costs of treating nonmelanoma skin cancer in 2001 were calculated to be about $650 million annually (Chen et al., 2001). Tsao, Rogers, and Sober (1998), estimated direct cost associated with treating melanoma in 1998 in the United States to be $563 million. That cost, on the basis of payment trends and prevalence estimates, was projected to be $1.5 billion in 2005 (Barrow & Barrow, 2005). Barrow and Barrow (2005) further state that if indirect costs (loss of income because of lost work hours, death and if the cost of skin care products, elective patient-financed plastic surgery, insurance settlements, screening, home care, and education) were included, the burden caused by melanoma would be more than $10 billion in 2005.

However, despite many recently enacted state and local statutes, the United States lacks consistent and effective policy to protect our population from the increased burden imposed by tanning. Tanning proponents continue to claim that there is no conclusive evidence to support a need for increased regulation, whereas opponents cite an excess of studies demonstrating the dangers inherent in the practice of tanning (American Cancer Society, 2009). There are currently no limits to the amount of ultraviolet-A exposure available year round to the public through indoor tanning, and indoor tanners can even tan at various locations on the same day (Gordon, Hirst, Gies, & Green, 2008).

STATE AND LOCAL MEASURES

The rate at which states have officially adopted regulatory measures pertaining to indoor tanning is gaining momentum. As of October 2009, 31 states had adopted these regulations (National Conference of State Legislatures [NCSL] Report, 2009). Current state statutes vary considerably in their scope and the methods by which they control indoor tanning, but all 31 involve some form of age-based restrictions. The Aim at Melanoma Foundation Web site includes a state-by-state list of regulations and pending bills easily accessed at http://www.aimatmelanoma.org/aim-for-a-cure/legislative-accomplishments-in-melanoma/tanning-restrictions-for-minors.html. To summarize, the most restrictive statutes, which ban tanning bed use for those younger than 14 years, only exist in nine states; Wisconsin and Texas ban tanning bed use by individuals younger than 16 and 16.5 years, respectively. Parental or guardian permission is a component of 30 of the statutes. The use of eye protection is required in 23 statutes, and 17 states require operators to limit exposure times to manufacturers' maximum recommendation. No statutes require accompanying minors into the tanning booth to control or to check their positioning in relation to the lights or their adherence to eye wear regulations (NCSL Report, 2009, pp. 4–6). There are variations in how parental consent is obtained, how receipt of warning information is documented, how violations are addressed, who has the right to prescribe

medically necessary artificial tanning for minors, and how proof of age and records in general are kept. Massachusetts proposed Senate Bill 903, recognizing concerns related to having teen receptionists overseeing the operation of tanning salons would require tanning facility employees to be 18 years or older, but this has not yet been enacted. Not allowing teens to assist in dispensing UVR is in keeping with not allowing them to dispense alcohol or tobacco, products also addictive and potentially hazardous to health. In 2009, 12 state legislatures failed to pass bills that would have strengthened current oversight of tanning salons. In 2009, Utah Representatives were unique in proposing H B 419, a bill to apply a 10% tax on tanning services with tax revenue used to support the Melanoma Cancer Research and Education Fund; however, that bill failed to pass (NCSL Report, 2009). As of October 2009, there were seven carryover bills to tighten controls on the indoor tanning industry still pending in various state legislatures, not having ever reached a final vote.

According to the U.S. NCSL Report (2009, p. 1), members are responding in various ways to the clearest indictment issued thus far by the WHO regarding indoor tanning: "Policy makers should consider enacting measures, such as prohibiting minors and discouraging young adults from using indoor tanning facilities, to protect the general population from possible additional risk for melanoma" (WHO, 2006, p. xi). Despite this WHO advisory, Balk and Geller (2008) found that tanning industry marketers specifically targeted teenagers by placing ads in school newspapers often offering discounts, including "unlimited tanning" offers. In response to tanning industry marketing efforts, 2.3 million teens visit tanning salons across the country every year (American Cancer Society, 2009). Cokkinides, Weinstock, O'Connell, and Thun (2002) concluded that state legislation restricting minors' access to indoor tanning was not effective, "perhaps because most states' policies permit use with parental consent" (p. 198).

Lax enforcement was also hypothesized to be a factor by Cokkinides et al. (2009, p. 198), who concluded that "multipronged approaches are needed to reduce indoor tanning use in youths." The issue of enforcement was examined by Forster, Lazovich, Hickle, Sorensen, and Demierre (2006), who examined tanning business practices in Minnesota and Massachusetts, which have laws requiring parental permission for persons younger than 16 or 18 years, respectively, to use tanning beds. In their study, 15-year-old girls tried to purchase a tanning session without parental consent, and 81% of those efforts by underaged buyers were successful on at least one of two tries in both states. Tanning facilities that were larger and required employee certification violated the law 44% to 62% of the time, leading researchers to conclude that Minnesota and Massachusetts laws specifying a minimum age of sale for indoor tanning are ineffective (Forster et al., 2006).

On November 11, 2009, the Howard County, Maryland, Board of Health passed the most restrictive U.S. regulation thus far, prohibiting individuals younger than 18 years from using artificial tanning devices. The New York State Senate is currently considering SB 3461, which contains the same restriction as that passed by Howard County.

THE FOOD AND DRUG ADMINISTRATION

The FDA is the government agency charged with regulating medical devices in the United States. On September 27, 2007, Congress passed the Food and Drug Administration Amendments Act of 2007, Public Law 110–85, Section 230 (Von Eschenbach, 2009). It required the FDA to determine whether the existing labeling requirements for indoor tanning devices adequately provide consumers with enough risk information, whether the warning label needs modification, or whether there is no warning capable of adequately communicating the risks of indoor tanning devices. In 2008, the FDA submitted its report to congress as required by section 230. The FDA determined that there are warnings that are capable of adequately communicating the risks but that on the basis of consumer feedback, a modified warning statement label may be needed to more effectively convey those risks. The agency also determined that changes to the positioning requirements for the warning statement label may communicate risks more effectively.

The FDA report to congress in 2008 stated that the agency was currently considering amending the warning labels on sunlamp devices to more explicitly communicate the risk regarding the development of irreversible damage to the eyes and skin, including skin cancer. The agency stated in that same report that its staff is considering amending the performance requirements for sunlamp products to make them consistent with the International Electrotechnical Commission standard. The FDA's Center for Devices and Radiological Health is presently considering reclassifying tanning beds from a Type 1 Medical Device to a Type 3. This would impose more stringent regulations regarding personnel training and operation of the medical device.

In addition, the FDA has begun educational outreach efforts to better inform potential consumers before they decide to tan. On what the FDA calls its "Tanning Web site" (http://www.fda.gov/cdrh/tanning/), consumers are warned that exposure to UV radiation, "whether from the sun or indoor tanning beds," can cause:

- Skin cancer
- Skin burns
- Premature skin aging
- Eye damage (both short- and long-term).

The FDA has published an article entitled, "The Truth About Tanning: What You Need to Know to Protect Your Skin," which focuses on how to avoid the risks

posed by UV radiation and publishes a newsletter "FDA & You: News for Health Educators and Students" (FDA, 2009). It also has links to tanning information on its consumer Web page at http://www.fda.gov/cdrh/consumer/. This is not the first time that the FDA has been in the forefront of federal efforts to reduce the rates of cancer. In 1994, it was Dr. David Kessler, Commissioner of the FDA, who led the battle against "big tobacco" (Kennedy School of Government Case Program, 1996). Although current U.S. federal, state, and local regulations lack consistency regarding the use of indoor tanning facilities, factors presented indicate that a call for consistent policy is emerging.

SCOPE OF THE PROBLEM

The importance of addressing indoor tanning as a public health issue relates to the rate of growth of that industry and its potential to cause societal harm as well as the degree to which the industry self-regulates. The WHO reported in 2006 that the desire to acquire a tan for fashion or cosmetic purposes had led to the development of a $5 billion-a-year tanning industry in the United States (Balk & Geller, 2008), employing 160,000 people (Indoor Tanning Association, 2004). The Skin Cancer Foundation (2009) estimates that nearly 30 million Americans tan annually at 50,000 U.S. tanning facilities (Balk & Geller, 2008). The American Cancer Society estimates there will be 68,720 new cases of melanoma and 8,650 melanoma-related deaths this year in the United States (American Cancer Society, 2009). Squamous cell carcinoma deaths are estimated to be about 2,500 annually in the United States (Skin Cancer Foundation, 2009). The National Cancer Institute (2009) reports that about half of all Americans who live to age 65 years will have UV-caused nonmelanoma skin cancer at least once. According to High (2008), leukemia is the only type of cancer that causes more years of lost life than melanoma. It is the fact that the loss of life is substantially preventable through early detection and risk reduction that draws such attention to this topic. According to Barrow and Barrow (2005), skin cancer morbidity and mortality rates in this country will continue to grow exponentially without policy change. In the absence of policy change, the FDA and the local health boards will continue to make occasional health inspections of tanning facilities, but will lack sufficient workforce and funding to enforce regulatory compliance (Dellavalle, Parker, & Ceronsky, 2003).

Researchers at Wake Forest University School of Medicine found that a chemical blockade of UV light-induced endorphins can result in opiate withdrawal symptoms in 50% of frequent tanners (Kaur et al., 2006). The term *tanorexia* was coined several years ago to refer to the condition of becoming obsessed with, even addicted to, tanning, believing that one is unattractively pale, even when quite tan. The term is fast becoming part of common parlance. The study of Kaur et al. (2006) and other recent studies have demonstrated substance-related disorders, seasonal affective disorders, and several compulsive disorders to be associated with frequent habitual tanning (Heckman, Egleston, Wilson, & Ingersoll, 2008). These studies indicate that changing tanning dependence behaviors might require interventions, similar to other addiction therapies. These findings also help explain why education alone may not work. Endorphins, which can also be produced in the brain through various other activities, produce some degree of pleasure and pain relief by increasing the pain threshold (Kaur et al., 2006). Tanners also report mood enhancement, relaxation, and socialization with indoor tanning in a manner consistent with reinforcement patterns found in smoking addiction, according to Heckman et al. (2008). In June 2006, the first class action for indoor tanning consumer fraud was filed against Hollywood Tanning Systems, in Mount Laurel, New Jersey, operators of one of the largest tanning chains in the country. The suit accuses the company of promoting UV lamps as a healthy alternative to outdoor tanning, likening a "safe" tan to a "safe" cigarette (Rawe, 2006, p. 54). Recognition by policy planners that indoor tanning behaviors have features in common with other addictions has significant implications for the development of policy alternatives to address the indoor tanning issue.

Tanning addiction will increase with increased exposures during youth, unless society establishes an appropriate age below which tanning is prohibited (Heckman et al., 2008). Without change, tanning salons will continue to thrive as an industry (Barrow & Barrow, 2005). Tanning salon spokesmen and marketers will continue to make claims of therapeutic benefits as well as promoting their ideal of beauty to the public (Tanningtruth, 2009). Some of the public will believe those claims. Parents will in some cases continue to sign consents endorsing their children's use of indoor tanning, even when described as exposure to a carcinogen. In other cases, they will engage in conflict with their adolescents who desire to tan (Cokkinides et al., 2009). Some teens and tanning salon owners will continue to violate unenforced regulations that exist in many states (Dellavalle et al., 2003).

According to Gordon et al. (2008), it is customary for governments to intervene where there is market failure in an industry. The promotion of indoor tanning for noncosmetic health benefits, the failure of the industry to self-regulate through enforcement of health standards, the lack of sufficiently informed risk awareness among tanning bed users, and the scope of the preventable health burden to society all suggest that enforced government regulations are necessary. Many active in the campaign to educate the public and to promote regulatory legislation see the newly enacted 10% tanning tax as an important step toward addressing and focusing the public's attention on this issue. At long last there is a new, dare I say, "ray" of hope.

VOICES UNITE FOR CHANGE

It was in a last minute coup by the American Academy of Dermatology (2009) that the tax on indoor tanning was realized. The American Academy of Dermatology has been a leader in the effort to publicize the skin cancer risk associated with indoor tanning. The legislative support that made this happen, however, was the culmination of years of work by numerous organizations, including the membership of the Dermatology Nurses' Association (DNA, 2009). It is important for all of us to appreciate the magnitude of this public health victory. For years, members of the DNA have been educating patients about UV protection and caring for those suffering from skin cancers as well as their families. Recommendations that parents talk with teens, dispel myths about tanning, provide a positive example, offer tanning alternatives, encourage healthy relaxation, and "stay connected" are key components to the educational efforts underway by health professionals combating skin cancer (Maguire-Eisen & Demierre, 2005). It is a time to acknowledge the contributions of DNA members like Maryellen Maguire-Eisen, MSN, RN, founder of The Children's Melanoma Prevention Foundation as well as the many members who organized local "Don't Fry Day" activities coast to coast. This public education event was an initiative of the National Council on Skin Cancer Prevention, of which the DNA is an active member (National Council on Skin Cancer Prevention, 2010). The lobbying efforts concerning tanning legislation have involved many advocacy groups, with testimony provided at key hearings nationwide by skin cancer patients and their families as well as by DNA members.

TANNING TAX AND BEYOND

Revenues from the tanning tax could be used in many ways. Public education about skin cancer prevention and the risks associated with tanning bed use and enhancing regulatory enforcement staff are among some needs identified by researchers (Geller et al., 1992). With the current significant shortage of dermatology service providers, access to care is a critical issue for patients in need (Jancin, 2003). It is important to enhance education for primary care providers charged with the responsibility of accurately identifying and referring patients appropriately to dermatology care (Hu et al., 2009; Geller et al., 1992). When combined with effective regulation of indoor tanning facilities and public health campaigns, the tanning tax has the potential to help reverse the trend of increasing skin cancer incidence, to lower skin cancer-related healthcare costs, and to reduce the suffering, morbidity, and mortality associated with these preventable cancers. Taxing facility users in a manner consistent with this country's taxation of tobacco has now sent a clear message to consumers.

A thoughtful multifaceted approach will be needed to address the complexities of the skin cancer epidemic (Hill, Dobbinson, & Makin, 2009). Dr. Debra Shelby, Board Member of the DNA, has identified educating dermatology nurse practitioners as critical. Because of her efforts, a Doctor of Nursing Practice Dermatology Residency program was developed at the University of South Florida (Shelby, 2008). According to Dr. Shelby (2008, p. 437), "Skin cancer is occurring at epidemic proportions. It will be vital for health care professionals to be prepared with the skills necessary to detect and treat malignant lesions. Studies show a deficiency in basic dermatologic training in medical and nursing programs. As current programs are evaluated and future programs develop, it will be important for leaders to consider including formal didactic and clinical training in dermatology. A multidisciplinary approach that includes physicians, nurses, and other health care professionals is crucial in overcoming this healthcare crisis." Increasing the number of qualified Certified Dermatology Nurse Practitioners is an important component to providing patient access to care in this time of dermatologist shortage (Cawley, 2009; Resneck & Kimball, 2008). According to Krista M. Rubin, MS, FNP-BC, nurse practitioner specializing in melanoma at the Melanoma Disease Center, Massachusetts General Hospital, "Nurses are in key positions to identify populations at risk for the development of melanoma, to perform screening evaluations in the primary care setting, and to play a significant role in the education process of those at risk" (Rubin, 2009, p. 234). It is hoped that U.S. healthcare policy will facilitate the development of a broad range of these much needed measures. Resources obtained from taxing indoor tanning, if used to provide health education and treatment combined with improved funding for enforcement, can help stop the current exponential increase of preventable skin cancers in this country. ■

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