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# Medical Students Educate Teens About Skin Cancer: What Have We Learned?

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**Abstract** Skin cancer is a serious societal problem, and public awareness outreach, including to youth, is crucial. Medical students have joined forces to educate adolescents

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Portions of preliminary results have been presented at: 34th Annual Western Student Medical Research Forum, Carmel, CA 2/1/06- 2/4/06, oral presentation. American Academy of Dermatology (AAD) 2006 64th Annual Meeting, San Francisco, CA 3/3/06-3/7/06, abstract and poster. American Medical Student Association (AMSA) 11th Annual Convention, Chicago, IL, 3/30/06, poster.

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about skin cancer with significant impacts; even one 50-min interactive outreach session led to sustained changes in knowledge and behavior in a cohort of 1,200 adolescents surveyed. Medical students can act as a tremendous asset to health awareness public outreach efforts: enthusiastic volunteerism keeps education cost-effective, results in exponential spread of information, reinforces knowledge and communication skills of future physicians, and can result in tangible, life-saving benefits such as early detection of melanoma.

**Keywords** Skin cancer · Education · Melanoma awareness · Outreach

## Skin Cancer: an Epidemic

Each year there are more new cases of skin cancer than cancers of breast, prostate, lung, and colon combined [1], with an estimated direct cost of treatment in the US totaling more than 1.7 billion dollars annually and total costs (direct + indirect) of over 5.5 billion dollars annually [2]. Skin cancer has been officially classified as an epidemic by the Center for Disease Control. Melanoma, the most lethal form of skin cancer, kills approximately one person each hour in the US despite being easily detectable and 95–100% curable if treated early. Melanoma incidence is currently increasing by 2.5% annually, faster than any other preventable cancer; mortality has increased by approximately 44% since 1973, and it remains among the top causes of life years lost to preventable cancer [3]. Up to 90% of deadly melanomas may ultimately be linked to sun exposure during the childhood years [4–7], and solar radiation is now classified as a ‘known human carcinogen,’ with ultraviolet rays joining the ranks of other known

cancer-causing elements such as tobacco, arsenic, and radon [8].

Because sun exposure during youth appears particularly important to melanoma risk, and because habits and attitudes pertaining to sun protection behavior are presumably formed early in life, it is crucial to teach our youth the importance of sun safety and skin cancer awareness.

### The Joel Myres and National Melanoma Awareness Projects

With concern for their high-risk local population of Orange County, California, medical students at the University of California, Irvine (UCI) developed a program to teach students in grades 6–12 about the importance of sun protection and early detection of skin cancer. The project was created in memory of Joel Myres, a beloved UCI medical student who passed away from melanoma which first presented when he was 16 years old. With students like Joel in mind, UCI medical students created a 50-min interactive curriculum based on a review of the literature and other existing skin cancer educational programs [9–15]. The curriculum educates about skin structure and function, effects of solar radiation, the three major kinds of skin cancer, skin cancer self-screening for earlier detection, and tools for safer sun enjoyment. It is well interconnected with school lessons, drawing on student's skills in mathematics (statistics, geometry), biological sciences (anatomy of skin, UV radiation, concepts of cancer), critical thought (group participation activity/analysis of images), and health (sun safety practices, cancer screening) among others. Because a considerable portion of the young teen population may not be amenable to changing their sun habits [16], in addition to encouraging sun protection, the curriculum emphasizes the importance of early detection to empower the students with a memorable message: "Spot a Spot, Save a Life!"

The program has been innovative in its ability to reach a substantial number of teens with little manpower, its message which strongly promotes early detection in addition to sun protective practices, and its concurrent education of medical students, teachers, and other community members. The program's success has been overwhelming; begun as a local effort by three medical students educating 1,200 teens in 2003, within 3 years the program grew into the National Melanoma Awareness Project ([www.spotaspot.org](http://www.spotaspot.org)), with over 25 medical school chapters educating over 14,000 students annually since 2005. The program continues to flourish in 2009, after two successive generations of student-run leadership have passed since its inception.

### Impact

In order to evaluate the efficacy of their outreach, in 2004–2005, the UC Irvine medical students surveyed 1,260 students in grades 6–12 at five Orange County, CA public schools. Briefly, surveys were completed before, immediately after, and 3 months following a single 50-min lecture. Responses were combined into index scores for knowledge, attitude, and behavior categories and scores were compared across time points. We demonstrated significant, sustained improvement in knowledge and behavior scores from the first to third survey (both  $p < 0.001$ ). Further details can be found at: [http://www.spotaspot.org/impact\\_research.html](http://www.spotaspot.org/impact_research.html).

The success of this outreach highlights that medical students represent a vast and efficient source of enthusiasm and energy for public outreach endeavors. We quickly realized that one individual, in a single day of volunteerism, can teach approximately 180 students over six classroom periods. While professional groups may work tirelessly to recruit dermatologists for such outreach, they may be missing a valuable resource in medical students, who tend to have more flexible schedules, are not losing income by volunteering, and often have personal connections with local public schools. Furthermore, public school health programs, in the face of ubiquitous budget cuts, may be deterred from optional programs which encourage them to use the time of salaried school nurses as educators [17]. While it has been shown that the majority of public schools would be interested in implementing a skin cancer educational policy or curriculum, budgetary constraints often preclude skin cancer awareness education-related expenses from being a top priority [18]. However, when implemented through medical student volunteers, the cost of a skin cancer education program is limited to the negligible one-time cost of reproducing the curriculum slides.

Additionally, in training medical students to teach others about skin cancer, it is hoped that future physicians across all specialty interests may potentially develop increased awareness of melanoma. It has been shown that medical students may have relatively limited knowledge of skin cancer, often not focused upon in the standard curriculum [19, 20]. Though we have not specifically evaluated changes in medical student volunteers' knowledge, attitudes, and behaviors, we hypothesize that beneficial effects would be seen and suggest this as a possible future area of study.

Furthermore, the exponential spread of the outreach message is impressive. On average, teens surveyed reported having shared what they learned from the educational session with 1.65 other individuals; thus, the 680 respondents to this question shared what they learned with approximately 1,110 additional people. If this data can be extrapolated, the 14,000 teens that medical students now

educate annually through the National Melanoma Awareness Project may be reaching over 23,000 others!

Anecdotally, in addition to one teen student who detected and had an early melanoma removed from his leg shortly after our educational intervention, one of our medical student volunteers detected an abnormal mole on her own back, also found to be a superficial melanoma. Another medical student volunteer detected a melanoma on her relative's neck soon after beginning to teach the curriculum. Each of these students directly attributed his or her heightened awareness to the outreach project, and these only represent a few of the local stories we have heard; presumably, melanomas are also being detected all around the country as a result of this intervention. Furthermore, our memorable slogan, "Spot a Spot, Save a Life!", will hopefully trigger students' recall of the melanoma awareness message should they spot a suspicious lesion on themselves or loved ones in future years.

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## References

1. American Cancer Society (2008) Cancer facts & figures 2008. American Cancer Society, Atlanta
2. Bickers DR, Lim HW, Margolis D et al (2006) The burden of skin diseases: 2004. *J Am Acad Dermatol* 55:490–500
3. National Cancer Institute. SEER cancer statistics review, 1973–1998. [http://seer.cancer.gov/Publications/CSR1973\\_1998/melanoma.pdf](http://seer.cancer.gov/Publications/CSR1973_1998/melanoma.pdf). Accessed January 14, 2005
4. Centers for Disease Control and Prevention (2002) Guidelines for school programs to prevent skin cancer. *MMWR* 51(No. RR-4):1–16
5. Weinstock MA, Colditz GA, Willett WC, Stampfer MJ, Bronstein BR Jr, Speizer FE (1989) Nonfamilial cutaneous melanoma incidence in women associated with sun exposure before 20 years of age. *Pediatrics* 84:199–204
6. Stern RS, Weinstein MC, Baker SG (1986) Risk reduction for nonmelanoma skin cancer with childhood sunscreen use. *Arch Dermatol* 122:537–545
7. Gilchrest BA, Eller MS, Geller AC, Yaar M (1999) The pathogenesis of melanoma induced by ultraviolet radiation. *N Engl J Med* 340:1341–1348
8. Hatmaker G (2003) Development of a skin cancer prevention program. *J Sch Nurs* 19(2):89–92
9. EPA sunwise resources for educators. [http://www.epa.gov/sunwise/educator\\_resources.html](http://www.epa.gov/sunwise/educator_resources.html). Accessed February 2, 2005
10. Lotze T, Dallal RM, Kirkwood JM, Flickinger JC (2001) Cutaneous melanoma. In: De Vita VT, Rosenverg SA, Gellman S (eds) Principles and practice of oncology, 6th edn. Lippincott, Philadelphia
11. Rigel D, Friedman R, Dzubow L, Reintgen D, Marks R, Bystryk JC (eds) (2005) Cancer of the skin. WB Saunders Co, New York
12. American Cancer Society, Statistics. [www.cancer.org/statistics](http://www.cancer.org/statistics). Accessed January 7, 2005
13. American Academy of Dermatology. Stop! Look for danger signs bookmark, and the complete skin exam bookmark. <http://www.aad.org/marketplace/productslist.aspx?categoryid=73>. Accessed January 6, 2005
14. University of Texas MD Anderson Cancer Center, Project Safety. <http://www.mdanderson.org/departments/projectsafety/>. Accessed January 4, 2005
15. Melanoma Education Foundation. Melanoma facts and figures. [www.skincheck.org](http://www.skincheck.org). Accessed January 3, 2005
16. Buendia-Eisman A, Feriche Fernandez-C E, Serrano Ortega S (1999) Awareness, attitudes and behaviour of teenagers to sunlight. *Eur J Dermatol* 9(3):207–210
17. Geller AC, Rutsch L, Kenausis K, Selzer P, Zhang Z (2003) Can an hour or two of sun protection education keep the sunburn away? Evaluation of the Environmental Protection Agency's Sunwise School Program. *Environ Health* 2:13
18. Buller D, Geller AC, Cantor M et al (2002) Sun protection policies in US elementary schools. *Arch Dermatol* 138:771–774
19. Geller AC, Prout M, Sun T, Lew RA, Culbert AL, Koh HK (1999) Medical students' knowledge, attitudes, skills, and practices of cancer prevention and detection. *J Cancer Educ* 14(2):72–77
20. Geller AC, Venna S, Prout M et al (2002) Should the skin cancer examination be taught in medical school? *Arch Dermatol* 138(9):1201–1203