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## Counseling on Sun Protection and Indoor Tanning

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### Abstract

**BACKGROUND**—The US Preventive Services Task Force recommends clinical counseling for individuals ages 10 to 24 years to decrease skin cancer risk.

**METHODS**—A national, random sample of US American Academy of Pediatrics members practicing primary care in 2002 (response rate 55%) and 2015 (response rate 43%). Surveys explored attitudes and experiences regarding sun protection counseling; indoor tanning questions were added in 2015.  $\chi^2$  tests compared demographics and counseling responses across years, and multivariable logistic regression models examined counseling predictors.

**RESULTS**—More pediatricians in 2015 (34%) than in 2002 (23%) reported discussing sun protection during recent summer months with 75% of patients. This pattern held across all patient age groups (each  $P < .001$ ). Female and suburban pediatricians counseled more; those in the South and West counseled less. More pediatricians in 2015 than in 2002 named time as a barrier. Sun protection ranked lowest among preventive topics in both years. In 2015, approximately one-third of pediatricians reported discussing indoor tanning at least once with 10 to 13 year-old patients; approximately half discussed this with older adolescents. Most (70%) did not know if their states had laws on minors' indoor tanning access; those stating they knew whether a law existed counseled more.

**CONCLUSIONS**—Although improved, sun protection counseling rates remain low. Indoor tanning counseling can be improved. Because early-life exposure to UV radiation increases risk and clinician counseling can positively impact prevention behaviors, pediatricians have an important role in skin cancer prevention; counseling may save lives. Time constraints remain a barrier.

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Preventing skin cancer is a major public health goal. Skin cancer can be deadly; treatments are costly and may result in scarring or other morbidities.<sup>1</sup> In 2014, the United States

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Surgeon General issued the “Call to Action to Prevent Skin Cancer.”<sup>1</sup> Its goals included providing individuals with information needed to make informed, healthy choices about exposure to ultraviolet radiation (UVR) and reducing harms from indoor tanning. The United States Preventive Services Task Force (USPSTF), an organization of experts who evaluate the effectiveness of clinical preventive health services, recommends clinical counseling for fair-skinned individuals ages 10 to 24 years about minimizing UVR exposure.<sup>2</sup> This is relevant to pediatricians because skin cancer prevention continues to be a priority of the American Academy of Pediatrics (AAP).<sup>3</sup>

Overexposure to the sun in early life contributes to one’s skin cancer risk,<sup>4</sup> including melanoma, the type most likely to lead to fatality and 1 of the most common cancers in teenagers and young adults.<sup>5</sup> Exposure to artificial UVR through indoor tanning in childhood and adolescence also contributes to this risk.<sup>4,6,7</sup> In 2006, the International Agency for Research on Cancer, a division of the World Health Organization, published the first expert review of the association of indoor tanning with skin cancer risk.<sup>8</sup> On the basis of those data, in 2009, the International Agency for Research on Cancer classified exposure to UVR through tanning lamps as a group 1 carcinogen (carcinogenic to humans).<sup>9</sup> Newer studies demonstrate that earlier and more frequent tanning bed use increases melanoma risk.<sup>7,10–14</sup> Indoor tanning remains common among adolescent girls and young women. Nationwide, 7.3% of high school students reported using a tanning device (excluding spray-on tanning) at least once in the past year. The prevalence was higher among girls (10.6%) than boys (4.0%) and increased with age. From 2009 to 2015, indoor tanning decreased significantly among all high school students (from 15.6% to 7.3%).<sup>15</sup> This trend is encouraging; nonetheless, >15% of non-Hispanic white high school girls reported participating in indoor tanning in 2015.<sup>15</sup>

In 2002, the AAP Periodic Survey of Fellows explored pediatricians’ experiences and attitudes regarding sun protection counseling. Respondents reported that skin cancer prevention was important, but they did not rate it as highly as other preventive topics.<sup>16</sup> Since then, skin cancer incidence has continued to rise,<sup>17</sup> and surveillance data have revealed frequent indoor tanning among non-Hispanic white teenaged girls and young women.<sup>18</sup> Given pediatricians’ important role in skin cancer prevention counseling, we designed a survey to follow-up on the 2002 results.

## METHODS

### Data Sources

The AAP Periodic Survey of Fellows collects data from a national, random sample of nonretired US AAP members on topics that are important to pediatricians. The AAP estimates that 60% of US board-certified pediatricians between 27 and 70 years of age are members. Surveys in 2002 and 2015 focused on skin cancer prevention, including pediatricians’ knowledge, attitudes, and practices surrounding sun protection counseling. Questions about indoor tanning were added in 2015. The 2 samples, which included residents, were drawn from the AAP’s administrative database. Surveys were approved by the AAP Institutional Review Board.

The 2002 survey was fielded from October 2001 through February 2002, with 1 initial and 5 follow-up mailings. The 8-page, self-administered questionnaire was sent to 1616 active AAP members; 896 surveys were received (response rate 55%).

The 2015 survey was fielded from August 2014 through February 2015, with 1 initial and 6 follow-up mailings. Nonrespondents were sent electronic surveys after the third and fourth paper contacts. The 8-page, self-administered questionnaire was sent to 1614 active AAP members (excluding those who were subboarded in a subspecialty). A total of 694 responses were received (response rate 43%). Because of the difference in the surveys' sampling frames, we adjusted the 2002 sample (by removing those who did not provide direct patient care or spent 100% of their time in a subspecialty other than adolescent medicine, family medicine, or internal medicine) to compare sun protection counseling across years. The analytic samples for both surveys (2002,  $N=673$ ; 2015,  $N=505$ ) consist of pediatricians providing primary care.

### **Pediatrician Characteristics**

Both surveys asked about demographics: sex, age (<43 years or ≥43 years, dichotomized on the basis of the average age for the 2002 and 2015 combined sample), race and ethnicity (non-Hispanic white or all other groups combined), region (Northeast, Midwest, South, or West), practice location (inner city, urban, suburban, or rural), training status (resident or postresident), primary practice setting (solo or 2-physician practice; group practice or health maintenance organization (HMO); or medical school, hospital, clinic, or community health center), and whether they spent ≥50% time in adolescent medicine, family medicine, or internal medicine. Respondents reported if they had a personal or family history of skin cancer.

### **Cases of Sunburn Treated**

In 2002 and 2015, pediatricians were asked, "In the past 12 months, approximately how many cases of sunburn have you treated?" The question did not specify whether sunburn was the reason for the visit. Responses were recoded into a dichotomous variable (none or ≥1 case).

### **Attitudes Toward Importance of Sun Protection, Skin Cancer Prevention, and Indoor tanning**

Respondents in 2002 and 2015 were asked to rate agreement ("strongly agree/agree" or "neutral/disagree/strongly disagree") with statements regarding the importance of sun protection counseling and skin cancer prevention. Indoor tanning questions were added in 2015.

### **Counseling on Sun Protection**

Respondents from both years were asked, "During the most recent summer months (June, July and August), with what proportion of patients/parents with children in the following age groups have you discussed sun protection at least once?" Response choices were dichotomized to identify pediatricians who counseled most patients (defined as 75%–100% of patients [vs <75%]) for each of 5 age groups (birth–6 months, 7 months–2 years, 3–9

years, 10–13 years, and 14 years). We computed a summary measure to indicate respondents discussing sun protection with 75% of patients in all 5 age groups (“no” or “yes”).

### **Awareness of a State Indoor Tanning Law and USPSTF Recommendation**

In 2015 only, respondents were asked if their states had “a law related to minors’ access to indoor tanning” (“don’t know” or “yes/no”). Respondents were asked if they were aware of the 2012 USPSTF counseling recommendation (“no” or “yes”).

### **Counseling on Avoiding Indoor Tanning**

In 2015 only, respondents were asked, “With what proportion of patients/parents of youth 10 years and older have you discussed indoor tanning at least once?” Answers were dichotomized to identify pediatricians who counseled any patients (defined as 1% of patients [vs 0%]) for 3 age groups (10–13 years, 14–17 years, and 18–24 years). We created a summary measure indicating those who discussed indoor tanning with 1% of their patients in all 3 categories (“no” or “yes”).

### **Recommended UVR Protection Practices**

Respondents to each survey were asked to indicate which of several possible UVR protective practices were usually recommended to patients and/or parents.

### **Importance of Sun Protection Compared With Other Topics**

Each survey asked respondents to rate the importance of sun protection counseling along with other basic public health issues and pediatric preventive hot topics by using a 5-point scale (1 = “very important” and 5 = “not at all important”).

### **Barriers**

Each survey included a question about perceived counseling barriers with slightly different wording in 2015 to incorporate indoor tanning: “How strongly do you agree or disagree that the following factors act as barriers to providing counseling on sun protection and avoiding indoor tanning in your practice?” Options were dichotomized (“agree/strongly agree” or “neutral/disagree/strongly disagree”). Eight items were asked in 2002 and 13 in 2015.

### **Data Analysis**

To assess nonresponse bias, we compared each analytic sample to its respective target sample on the basis of demographics in the AAP administrative database (age, sex, and region). For each year, 1-sample proportion tests compared the analytic sample to the target sample for sex and region; the *t* test was used for age.

$\chi^2$  tests were conducted to compare across survey years for pediatrician characteristics, sun protection counseling practices, and recommended UVR protection practices. Multivariable logistic regression was used to examine factors associated with our sun protection summary measure (counseling 75% of patients). To test for changes in counseling over time, we combined the 2002 and 2015 data and examined survey year as a factor in the model while

controlling for other variables. In follow-up analyses, we tested interactions for each significant factor by survey year to determine if the associations were consistent across years. We also ran a multivariable logistic regression model (2015 data only) to examine factors associated with indoor tanning counseling. *P* values  $\leq .05$  were considered significant. Analyses were done by using Statistical Package for the Social Science Statistics 22 (IBM SPSS Statistics, IBM Corporation, Armonk, NY).

## RESULTS

### Pediatrician Characteristics

Overall, 62% were women, 74% were non-Hispanic white, and 14% were residents (Table 1). Of participants, ~40% had a personal or family history of skin cancer. Compared with those in 2002, pediatricians in 2015 were more likely to be women, older, and have a family history of skin cancer ( $P < .001$  for each). In 2015, more worked in group practices or HMOs, and fewer were in hospitals or clinics ( $P < .05$ ).

In our nonresponse analyses for 2002, there were more women in the analytic sample than the target sample (56% vs 50%;  $P < .01$ ), but there were no differences for age or region. For 2015, the analytic sample was older than the target sample (mean ages of 46.8 and 44.5 years, respectively;  $P < .001$ ), and there were no differences for sex or region.

### Cases of Sunburn Treated

In each year, two-thirds of pediatricians treated  $\geq 1$  case of sunburn within the last 12 months. Respondents treating  $\geq 1$  sunburn reported an average of 7.7 cases in 2002 compared with 5.5 in 2015 (not significant).

### Attitudes Toward Importance of Sun Protection, Skin Cancer Prevention, and Indoor Tanning

In both years,  $>90\%$  “strongly agreed/agreed” (hereafter “agreed”) that skin cancer represents a significant public health problem and that it is a pediatrician’s role to educate on sun protection (Table 2). Almost all of those in 2015 agreed that indoor tanning raises skin cancer risk (97%), and most (82%) believed it is a pediatrician’s role to educate on avoiding indoor tanning.

### Counseling on Sun Protection

In 2002, ~1 in 5 pediatricians provided sun protection counseling for  $\geq 75\%$  of their patients in all age groups, whereas in 2015, 1 in 3 counseled  $\geq 75\%$  of their patients from all age groups ( $P < .001$ ). This percent differed by patient age; more pediatricians reported discussing sun protection with  $\geq 75\%$  of their patients in each age category in 2015 (45%–51%) than in 2002 (33%–41%;  $P < .001$  for all; Table 3).

In the multivariable model examining factors associated with sun protection counseling, the survey year remained significant after controlling for other pediatrician characteristics (Table 4). Pediatricians in 2015 were more likely to report discussing sun protection with  $\geq 75\%$  of their patients (34% vs 23%; adjusted odds ratio [aOR] 1.42; confidence interval [CI] 1.05–

1.93). Several other factors were significant. Pediatricians in suburban areas were more likely than those in inner-city areas to discuss sun protection (38% vs 16%; aOR 2.09; CI 1.23–3.53).

Female pediatricians were more likely than male pediatricians to counsel patients (31% vs 24%; aOR 1.53; CI 1.11–2.12), whereas pediatricians in the South and West were less likely to discuss sun protection than those in the Northeast (23% vs 35%; aOR 0.57; CI 0.38–0.84; and 26% vs 35%; aOR 0.55; CI 0.35–0.86, respectively). Pediatricians practicing in hospitals or clinics were less likely than those in solo or 2-physician practices to counsel (14% vs 35%; aOR 0.44; CI 0.26–0.77). In follow-up analyses, there were no significant interactions of any factor with survey year. Thus, the associations found among these factors (practice location, sex, region, and practice setting) and sun protection counseling did not vary significantly across years.

### **Awareness of a State Law on Indoor Tanning and USPSTF Recommendation**

In 2015, most pediatricians (70%) reported not knowing if their states had laws on minors' access to indoor tanning. Less than half (45%) reported being aware of the 2012 USPSTF counseling recommendation.

### **Counseling on Avoiding Indoor Tanning**

In 2015, ~1 in 4 pediatricians (28%) provided indoor tanning counseling to 1% of their patients in all 3 age groups. One in 3 (34%) pediatricians reported discussing the need to avoid indoor tanning at least once with patients ages 10 to 13 years, and approximately half discussed indoor tanning with older adolescents (50% for patients 14–17 years and 47% for 18–24 years).

Table 4 shows multivariable results for discussing indoor tanning among all patients. Only a few factors predicted discussions. Respondents who reported knowing whether their states had indoor tanning laws were more likely to counsel than those who did not know (41% vs 23%; aOR 2.32; CI 1.42–3.79). Those treating 1 sunburn were more likely to counsel (34% vs 16%; aOR 2.00; CI 1.15–3.49). Pediatricians from the South and West were less likely than those from the Northeast to counsel (27% vs 37%; aOR 0.46; CI 0.25–0.87; and 16% vs 37%; aOR 0.24; CI 0.11–0.51, respectively).

### **Recommended UVR Protection Practices**

Using sunscreen with a sun protection factor of 15 or greater was the most commonly recommended sun protection measure in both years (Table 5). Fewer pediatricians in 2015 compared with those in 2002 (90% vs 99%;  $P < .001$ ) reported recommending sunscreen. In contrast, more pediatricians in 2015 compared with those in 2002 reported advising seeking shade whenever possible (69% vs 60%;  $P < .01$ ) and wearing long sleeves or other protective clothing (68% vs 57%;  $P < .001$ ).

## Importance of Sun Protection compared With Other Topics

Sun protection was ranked lowest among all preventive topics in both years, with fewer than half of all pediatricians (48%) rating avoiding indoor tanning as “important/very important” in 2015 (Fig 1).

## Barriers

A lack of sufficient time was the most commonly reported barrier to counseling in 2002 and 2015 (58% and 65%, respectively). Fewer pediatricians named other barriers in 2015 (Fig 2).

## DISCUSSION

In this study, we assessed attitudes and reported practices of a large, random, national sample of primary care pediatricians. Our findings can inform educational and public health efforts to increase pediatricians’ knowledge of and adherence to AAP recommendations and the USPSTF recommendation to counsel fair-skinned individuals ages 10 to 24 years about UVR protection.

Comparable to 2002, current results indicate that most respondents believe skin cancer prevention is an important issue relevant to pediatricians. A larger percentage of pediatricians in 2015 compared with those in 2002 reported counseling most patients in each age category about sun protection; similarly, more pediatricians reported discussing sun protection with 75% of their patients in all age groups. This increase is encouraging. Nevertheless, there remains a mismatch between the perceived importance of skin cancer prevention and counseling practices. Time constraints were the main barrier; this is not surprising because pediatricians are asked to address many topics during visits.<sup>19</sup>

Female pediatricians and those in suburban areas were more likely to report sun protection counseling; findings align with other research about female pediatricians’ counseling practices.<sup>20</sup> Respondents from the South and West and those in hospital or clinic settings were less likely to report counseling. We expect pediatricians in hospitals and clinics to counsel less on sun protection because patients in these settings often have other, more urgent issues to address. It is surprising that pediatricians from the South and West counsel less because these areas tend to be sunnier.

In 2015, more pediatricians reported recommending protective clothing and fewer reported recommending sunscreen compared with those in 2002. Sunscreen remains a primary sun protection method used by the population<sup>21</sup>; it is not clear why fewer pediatricians recommended sunscreen in 2015, although there may generally be an increasing awareness about using protective clothing. The AAP, the Centers for Disease Control and Prevention, and other organizations recommend using multiple sun protection strategies rather than relying on sunscreen alone.<sup>22,23</sup>

Although most believed that pediatricians should counsel on avoiding indoor tanning, only approximately one-third reported discussing indoor tanning at least once with patients 10 to 13 years old; approximately half discussed this with older adolescents. Approximately one-

fourth reported discussing indoor tanning at least once with all age groups. Other confidential adolescent issues, including depression, tobacco and marijuana use, and sexual activity, may take up available visit time. Adding an indoor tanning discussion is important, however, because early-life tanning bed exposure increases skin cancer risk; thus, pediatricians advising against indoor tanning supply potentially life-saving advice.<sup>24</sup>

Pediatricians who stated they knew if their states had indoor tanning laws were more likely to counsel about indoor tanning. However, this association does not imply causality; the relationship could be reversed, with pediatricians focusing on indoor tanning being more likely to seek information on laws. At least 44 states regulate minors' use of tanning facilities through laws that include age limits and parental consent; 17 states and the District of Columbia ban use by minors <18 years old.<sup>25,26</sup> In 2017, 11 states introduced legislation to ban minors from using tanning beds.<sup>25</sup> State laws, especially those with age restrictions, may be effective in reducing adolescent tanning rates.<sup>27</sup> Although enforcement is an issue, state legislation remains an important component of indoor tanning harm-reduction efforts. Heightening pediatricians' awareness of their states' tanning laws may result in increased counseling.

Our study has limitations. Findings are self-reported and may not reflect actual practices. Response rates were relatively low. We ran nonresponse analyses, and there were statistically significant sex differences for 2002 and age differences for 2015, but the absolute differences were small. Additionally, our models accounted for both variables. We did not verify respondents' reports of knowing if their states had laws; we also did not explicitly compare respondents with state laws to those without. The barriers question was double barreled; in retrospect, it should have been asked separately for sun protection and indoor tanning. Finally, because the survey was only sent to US AAP members, findings may not generalize to nonmembers. However, AAP members represent the majority of US board-certified pediatricians.

## CONCLUSIONS

The USPSTF concluded that clinician counseling can improve the skin cancer prevention practices of fair-skinned people aged 10 to 24 years. Although reported counseling rates were less than optimal, especially for indoor tanning, our study reveals that more pediatricians are addressing sun protection. Lack of time remains the primary barrier; research to identify innovative solutions to this problem could be helpful. Further educational efforts by the AAP, skin cancer-prevention organizations, government agencies, and others that heighten awareness about adverse effects of early-life UVR exposure may serve to increase counseling. With better knowledge, more pediatricians may act on their key role in skin cancer prevention, potentially saving lives and avoiding the morbidities and treatment costs of nonfatal skin cancers.

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Dr Balk helped conceptualize and design the study, drafted the initial manuscript, and reviewed and revised the manuscript; Ms Gottschlich participated in the data collection process, conducted the analyses, and reviewed and revised the manuscript; Ms Holman and Ms Watson helped with the initial design of the survey and critically reviewed and revised the manuscript; and all authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

## ABBREVIATIONS

<b>AAP</b>	American Academy of Pediatrics
<b>aOR</b>	adjusted odds ratio
<b>CI</b>	confidence interval
<b>HMO</b>	health maintenance organization
<b>USPSTF</b>	United States Preventive Services Task Force
<b>UVR</b>	ultraviolet radiation

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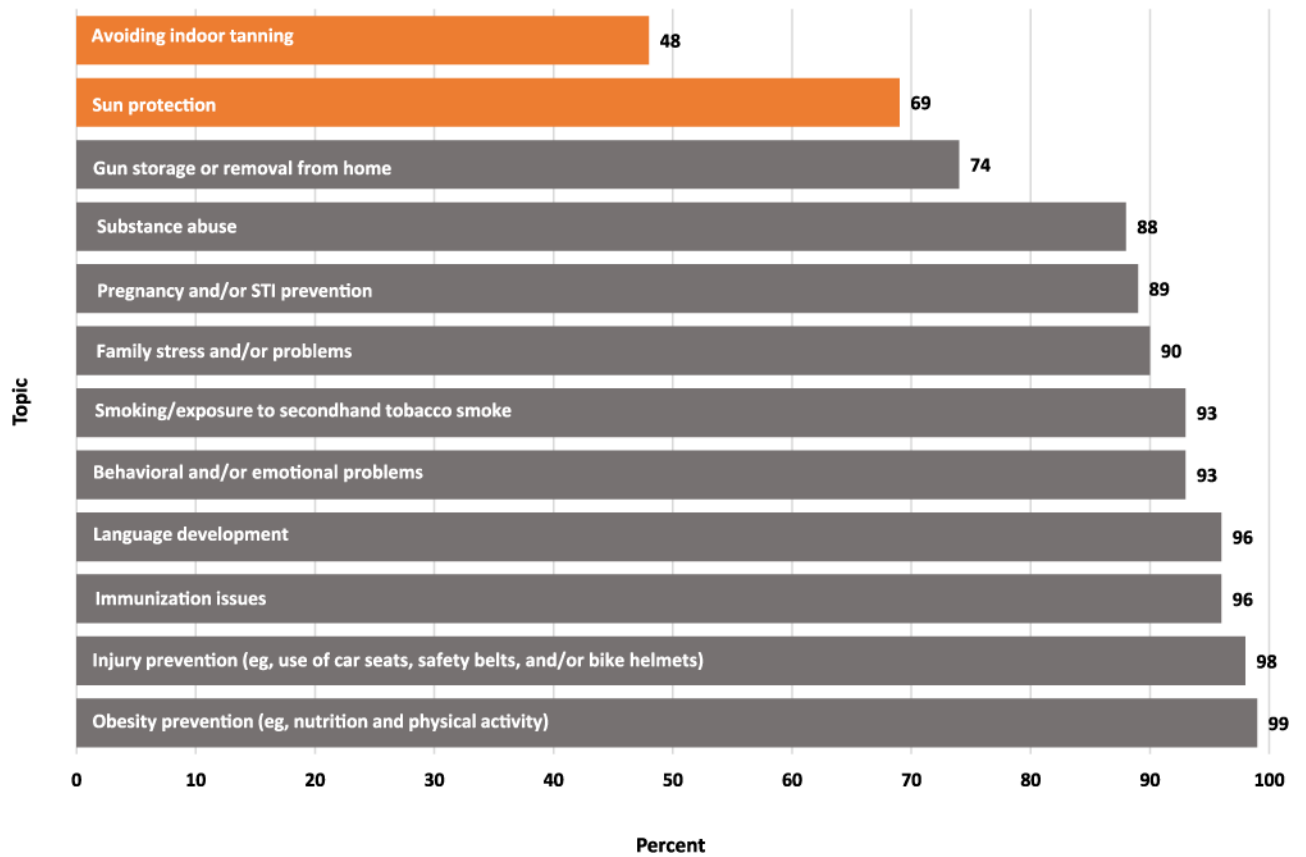
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**WHAT'S KNOWN ON THIS SUBJECT**

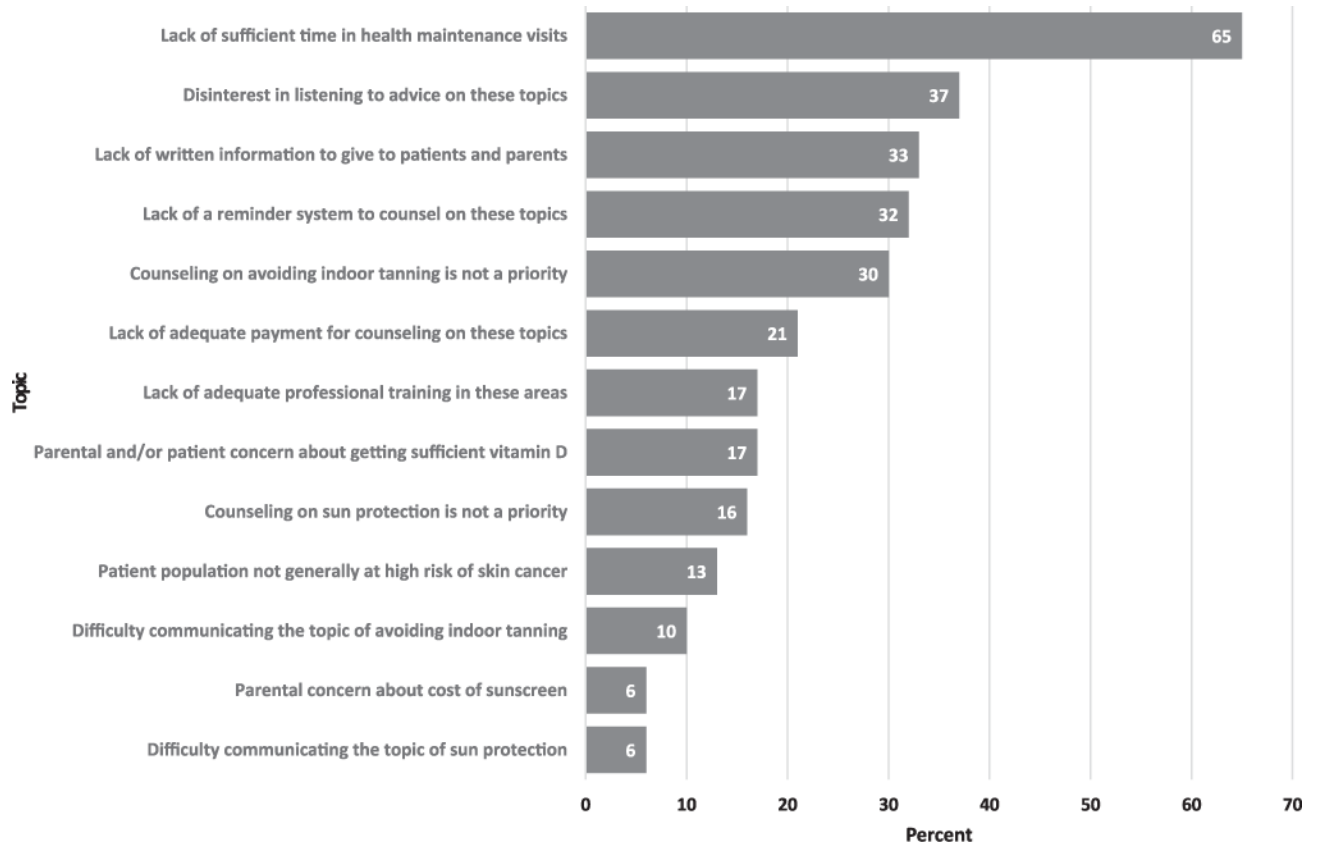
Counseling is recommended to decrease skin cancer risk. In our 2002 national survey of American Academy of Pediatrics members, respondents rated skin cancer prevention as important but not as important as other preventive topics. Time constraints were the main barrier.

**WHAT THIS STUDY ADDS**

In our 2015 follow-up survey, reported rates of sun protection counseling, although improved, were suboptimal. Counseling on avoiding indoor tanning needs much improvement. Skin cancer prevention remains low on pediatricians' priority lists. Lack of time remains the primary barrier.



**FIGURE 1.** Percent of pediatricians rating topics as “important/very important” (2015 data only). STI, sexually transmitted infection.



**FIGURE 2.** Percent of pediatricians reporting barriers to counseling on sun protection and indoor tanning (2015 data only).

TABLE 1

## Pediatrician Characteristics, 2002 and 2015

	%			<i>P</i>
	Total ( <i>N</i> = 1178)	2002 ( <i>N</i> = 673)	2015 ( <i>N</i> = 505)	
Sex				<.001
Male	38	44	30	
Female	62	56	70	
Age, y				<.001
<43	51	58	43	
43	49	42	57	
Race and/or ethnicity				.98
Non-Hispanic white	74	74	74	
All other groups combined	26	26	26	
Region				.06
Northeast	26	27	24	
Midwest	22	21	24	
South	33	35	30	
West	19	17	22	
Practice location				.29
Inner city	22	23	21	
Urban	24	25	22	
Suburban	42	39	45	
Rural	12	13	12	
Training status				.06
Resident	14	16	12	
Postresident	86	84	88	
Primary practice setting				<.05
Solo, 2 physicians	16	16	16	
Group, HMO	53	50	57	
Hospital, clinic	31	34	27	
50% of time in adolescent, family, or internal medicine				.06
No	94	93	96	
Yes	6	7	4	
Family history of skin cancer				<.001
No	61	65	55	
Yes	39	35	45	

**TABLE 2**

Percent of Pediatricians Agreeing With the Following Statements, 2002 and 2015

	%	
	2002 (N = 659)	2015 (N = 503)
Indoor tanning raises skin cancer risk	—	97
It is a pediatrician's role to educate parents and/or patients on sun protection	93	92
Skin cancer represents a significant public health problem in the United States	94	90
It is a pediatrician's role to educate parents and/or patients on avoiding indoor tanning	—	82
Schools should provide comprehensive educational programs on sun protection at all grade levels to help reduce children's sun exposure	76	72
Sun exposure is necessary to get adequate vitamin D	—	50
Counseling on sun protection should be directed only toward patients who are white or have light-skinned coloring	8	7
Counseling on avoiding indoor tanning should be directed only toward patients who are white or have light-skinned coloring	—	4

—, not applicable.

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**TABLE 3**

Percent of Pediatricians Discussing Sun Protection During Recent Summer Months (June, July, and August) With 75% of Their Patients by Age Group, 2002 and 2015

Patient Age	%		<i>P</i>
	2002	2015	
Birth–6 mo	39	49	<.001
7 mo–2 y	41	51	<.001
3–9 y	37	48	<.001
10–13 y	33	46	<.001
14 y	34	45	<.001
All age groups (summary measure)	23	34	<.001

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TABLE 4

Factors Associated With Counseling on Sun Protection (2002 and 2015) and Indoor Tanning (2015 Only)

	Counsel 75% of all Patients on Sun Protection <sup>a</sup>		Counsel 1% of all Patients on Indoor Tanning <sup>b</sup>	
	% (N = 1146)	aOR (95% CI) (N = 999)	% (N = 492)	aOR (95% CI) (N = 436)
Survey year				
2002 <sup>c</sup>	23.4	1.00	NA	NA
2015	33.9	1.42 (1.05–1.93) <sup>d</sup>	NA	NA
Sex				
Male <sup>c</sup>	24.2	1.00	25.7	1.00
Female	30.5	1.53 (1.11–2.12) <sup>d</sup>	29.2	1.41 (0.83–2.41)
Age, y				
<43 <sup>c</sup>	23.8	1.00	22.6	1.00
43	32.1	1.12 (0.81–1.54)	32.1	1.47 (0.86–2.52)
Race and/or ethnicity				
Non-Hispanic white <sup>c</sup>	28.5	1.00	30.9	1.00
All other groups combined	25.3	1.05 (0.73–1.51)	19.0	0.62 (0.33–1.18)
Region				
Northeast <sup>c</sup>	34.9	1.00	37.1	1.00
Midwest	29.2	0.74 (0.49–1.12)	32.5	0.64 (0.33–1.25)
South	23.1	0.57 (0.38–0.84) <sup>d</sup>	27.0	0.46 (0.25–0.87) <sup>d</sup>
West	25.9	0.55 (0.35–0.86) <sup>d</sup>	16.2	0.24 (0.11–0.51) <sup>d</sup>
Practice location				
Inner city <sup>c</sup>	16.3	1.00	19.2	1.00
Urban	22.2	1.44 (0.82–2.52)	19.6	0.92 (0.37–2.26)
Suburban	38.3	2.09 (1.23–3.53) <sup>d</sup>	33.0	1.66 (0.73–3.80)
Rural	24.5	1.38 (0.73–2.60)	37.3	2.28 (0.87–5.92)
Training status				
Resident <sup>c</sup>	10.3	1.00	17.2	1.00
Postresident	30.7	1.86 (0.89–3.86)	29.4	0.66 (0.25–1.80)
Primary practice setting				
Solo, 2 physicians <sup>c</sup>	35.2	1.00	26.9	1.00
Group, HMO	34.6	0.94 (0.63–1.40)	33.0	1.47 (0.71–3.04)
Hospital, clinic	13.7	0.44 (0.26–0.77) <sup>d</sup>	20.8	1.08 (0.44–2.67)
50% time in adolescent, family, or internal medicine				
No <sup>c</sup>	29.5	1.00	28.2	1.00
Yes	16.1	0.84 (0.40–1.76)	36.4	2.10 (0.76–5.82)
Family history of skin cancer				
No <sup>c</sup>	25.7	1.00	27.4	1.00

	Counsel 75% of all Patients on Sun Protection <sup>a</sup>		Counsel 1% of all Patients on Indoor Tanning <sup>b</sup>	
	% (N = 1146)	aOR (95% CI) (N = 999)	% (N = 492)	aOR (95% CI) (N = 436)
Yes	31.8	1.21 (0.88–1.66)	29.1	0.95 (0.57–1.56)
Treated sunburn				
None <sup>c</sup>	21.9	1.00	15.8	1.00
1 case	31.0	1.11 (0.79–1.56)	34.2	2.00 (1.15–3.49) <sup>d</sup>
Knows if state has a law				
No <sup>c</sup>	NA	NA	22.7	1.00
Yes	NA	NA	40.8	2.32 (1.42–3.79) <sup>d</sup>
Aware of 2012 USPSTF recommendation				
No <sup>c</sup>	NA	NA	24.5	1.00
Yes	NA	NA	32.7	1.09 (0.68–1.76)

NA, not applicable.

<sup>a</sup>Based on pooled data from 2002 to 2015; follow-up analyses showed no significant time-by-factor interactions.

<sup>b</sup>Based on data from 2015 only (questions about counseling on indoor tanning were not included in 2002).

<sup>c</sup>Reference category.

<sup>d</sup> $P < .05$ .

**TABLE 5**

Percent of Pediatricians who Usually Recommend the Following Practices to Patients and/or Parents, 2002 and 2015

	%		<i>P</i>
	2002 ( <i>N</i> = 579)	2015 ( <i>N</i> = 483)	
Using a sunscreen with an SPF of 15 or greater	99	90	<.001
Reapplying sunscreen every 2 h and after swimming, sweating, or toweling off	—	79	—
Using a broad-spectrum sunscreen (protects against both UV A and B radiation)	—	76	—
Wearing a hat with a brim	69	73	.10
Avoiding the sun during peak hours (ie, 10 <sub>AM</sub> –4 <sub>PM</sub> )	72	73	.70
Seeking shade whenever possible	60	69	<.01
Wearing long-sleeve shirts or other protective clothing	57	68	<.001
Avoiding indoor tanning <sup>a</sup>	46	44	.59
Consulting the UV Index	7	6	.44

SPF, sun protection factor; —, not applicable.

<sup>a</sup>The wording in 2002 was “avoiding use of sun lamps or tanning salons.”