Current knowledge, patient educational practices, and personal use of sunscreens among primary care physician assistants in Ohio

Erika K. Wasilewski
Medical College of Ohio

Follow this and additional works at: http://utdr.utoledo.edu/graduate-projects
FINAL APPROVAL OF SCHOLARLY PROJECT
For the Degree of Master of Science in Biomedical Sciences
Concentration in Physician Assistant Studies

Student Name ___________________________ Erika Wasilewski

Title of Scholarly Project ___________ Current knowledge, patient educational practices
And personal use of sunscreens among primary care physician assistants in Ohio

____________________________
Name

____________________________
Signature

____________________________
Date

Thomas Parish, PA-C, MPH
Major Advisor

Patricia Francis Hogue, MS, PA-C
Department Chair

Christopher E. Bork, Ph.D.
Dean, School of Allied Health

Keith K. Schleider, Ph.D.
Dean, Graduate School

Date of Approval: ________________

Aug 9, 2004
8/31/04
9/1/04
9/27/04
Current knowledge, patient educational practices, and personal use of sunscreens among primary care Physician Assistants in Ohio

Scholarly Project

Erika K. Wasilewski PA-SII

Physician Assistant Student

Medical College of Ohio

July 2004

Advisor: Thomas Parish PA-C, MPH
## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>II. Literature Review</td>
<td>2</td>
</tr>
<tr>
<td>III. Methodology</td>
<td></td>
</tr>
<tr>
<td>A. Procedure</td>
<td>5</td>
</tr>
<tr>
<td>B. Subjects</td>
<td>6</td>
</tr>
<tr>
<td>C. Hypothesis</td>
<td>6</td>
</tr>
<tr>
<td>D. Limitations</td>
<td>7</td>
</tr>
<tr>
<td>IV. Results</td>
<td>8</td>
</tr>
<tr>
<td>V. Conclusion</td>
<td>10</td>
</tr>
<tr>
<td>VI. References</td>
<td>17</td>
</tr>
<tr>
<td>VII. Tables</td>
<td></td>
</tr>
<tr>
<td>Table 1</td>
<td>20</td>
</tr>
<tr>
<td>Table 2</td>
<td>21</td>
</tr>
<tr>
<td>Table 3</td>
<td>22</td>
</tr>
<tr>
<td>Table 4</td>
<td>23</td>
</tr>
<tr>
<td>Table 5</td>
<td>24</td>
</tr>
<tr>
<td>Table 6</td>
<td>25</td>
</tr>
<tr>
<td>Table 7</td>
<td>26</td>
</tr>
<tr>
<td>VIII. Figures</td>
<td></td>
</tr>
<tr>
<td>Figure 1</td>
<td>27</td>
</tr>
<tr>
<td>IV. Appendixes</td>
<td></td>
</tr>
<tr>
<td>Appendix A.</td>
<td>28</td>
</tr>
<tr>
<td>Appendix B.</td>
<td>29</td>
</tr>
<tr>
<td>Appendix C.</td>
<td>33</td>
</tr>
<tr>
<td>V. Abstract</td>
<td>34</td>
</tr>
</tbody>
</table>
Introduction

It has been proven that an increased amount of time spent exposed to the sun is a major risk factor in developing skin cancer. Knowledge of the risk factors associated with sun exposure and the benefits of sunscreen use, has improved over the past several years due to public health campaigns in the community and in schools. However, there is still a significant gap between knowledge and actual behaviors. In spite of patient awareness that sun exposure is the leading risk factor, malignant melanoma, one of the deadliest forms of skin cancer, has increased in incidence by 1000 percent in the past 50 years (Wolf, Tuzun, Tuzun, 2001).

It is unknown if Physician Assistants practicing primary care in Ohio are knowledgeable regarding the proper use of sunscreens, whether they educate their patients regularly, and whether they apply their knowledge to themselves personally.

The intention of this study is to evaluate Physician Assistant, knowledge of skin cancer prevention. The main purpose of this study is to 1) assess PA’s knowledge regarding the current recommendations of sunscreen use 2) assess how frequently PA’s in primary care are educating their patients regarding skin cancer prevention and, 3) to see how often PA’s are using sunscreen personally to prevent skin cancer. There will be a survey sent via email to assess the previous stated goals.

The results from this study may aid in determining whether health care providers have an influential impact on their patient’s sun related behaviors. It will also serve as a tool to see if PA’s are practicing good sun safety behaviors personally.
Literature Review

It is nearly impossible for the average person to completely avoid the sun’s ultraviolet rays. It has been shown that the average American is aware that the sun’s ultraviolet light causes serious health consequences; however, they seem to ignore the risks and expose themselves to the sun anyway. This is one of the reasons why exposure to the sun’s UV light is the leading modifiable risk factor for skin cancers.

There are several ways in which people can decrease the amount of sun exposure they are receiving everyday. They can wear clothing or hats or simply avoid the outdoors. These are not as enticing as simply applying sunscreen before going outdoors. In 1979, the FDA concluded that sun was a definite major risk factor for skin cancer. It was in 1985 when the SPF (sun protection factor) scale was introduced to sunscreens in order to provide guidance to the public about protection from the sun. Research showed that sunscreen alone blocks up to 95% of UV-B rays and 55% of UV-A rays if properly used (Maloney, Sinead & Murphy, 2002). Even with that much protection, it was concluded in 1988 by the American Academy of Dermatology (AAD), that there is absolutely “no safe way to tan” (Sikes, 1998). Sunscreens simply offer protection from sunburns and are a device that helps minimize skin damage from the sun.

Many studies have shown that 40-50 percent of Americans will have acquired some form of skin cancer by the age of 65 (National Institute of Health (NIH), 2002). The AAD predicted that 80 percent of new cases in 2003 would be basal cell carcinoma, 16 percent would be squamous cell carcinoma, and 4 percent would be melanoma. Basal cell carcinoma and squamous cell carcinoma have better than a 95 percent cure rate if detected and treated early. Melanoma is considered the most invasive and deadly, being the cause of more than 77 percent of cancer deaths (AAD, 2003).
All three of these skin cancers have one important thing in common; sun exposure is the strongest avoidable risk factor for developing them. Studies have shown that UVB radiation induces mutations in the p53 tumor suppressor gene that is not induced by any other oncogen (Ananthaswamy, Ulrich, Kripke, 2002). It has also been shown that skin cancers are more prevalent in areas of the country where people are exposed to more UV radiation such as Texas and Florida. Despite the knowledge that skin cancers are directly related to the sun’s UVA and UVB rays, only 1 out of every 3 Americans use any precautions at all to decrease their exposure (AAD, 2003). A sample phone survey from the AAD in March of 2003 concluded that of those surveyed between the ages of 12 -18 years old who reported using sunscreen regularly, an alarming 83 percent of them remembered having at least one sunburn the previous year while wearing sunscreen. This study demonstrates that people are either negligent about wearing sunscreen or simply unaware of the proper application of sunscreen to achieve its maximum efficacy. The National Cancer Institute reported that the cure for all skin cancer could be 100% if they were brought to a doctor’s attention before they had the chance to spread (NIH, 2003). If health care workers practicing in a primary care setting spent time educating patients on the benefits of wearing sunscreen and educated patients about the proper applications as well as the potential risk factors for developing skin cancer, perhaps many more skin cancers could be prevented.

According to the American Academy of Physician Assistants, approximately 50 percent of PA’s are practicing in a Primary Care Setting. That means that almost 50 percent of PA’s see patients on a regular basis and have the opportunity to educate the public on sun safety and skin cancer prevention. This is why it is important for Physician Assistants to be able to identify the risk factors associated with skin cancer and to know how to properly apply sunscreen. If they are
proficient at this, they would be better able to educate their patients, preventing at least some skin cancers.

The overall significance of this study is to learn whether or not primary care Physician Assistants in Ohio provide skin cancer prevention education to their patients.
Procedure

Sunscreen use guidelines were gathered from the recommendations published by the American Academy of Dermatology in 2003 (www.aad.org).

The method of research used in this project was a web-based questionnaire sent to 147 Physician Assistants practicing primary care in Ohio who are members of the Ohio Association of Physician Assistants and who have submitted their email addresses. The voluntary survey was sent via the Perseus system in order to protect confidentiality. This allowed for the completed survey to be sent back to the investigators without any identification attached to it in order to protect confidentiality. In order to get the best response rate the following was completed:

1) The survey was sent via email to 147 Physician Assistant practice primary care
2) An attached letter of intent explaining the purpose, their voluntary involvement, explanation of confidentiality, and the opportunity to ask questions, and the deadline to return the survey for inclusion in the study
3) 2-3 weeks later another identical survey and explanation was sent to all 147 PA’s asking them to voluntarily complete the survey if they had not already sent it back.

The survey answers were analyzed accordingly. Demographic information was obtained in order to assess the background of the participants. There were also 10 questions used to measure the respondent’s knowledge of appropriate sunscreen use. The remaining questions evaluated the methods PA’s use to educate their patients.

Comparisons of PA’s personal risk factors and educational practices were done along with other comparisons and descriptive analyses.
Subjects

The original email list consisted of Physician Assistants who indicated a specialty in Primary Care to the Ohio Association of Physician Assistants (OAPA). There were 147 email addresses obtained from the OAPA. The list was reduced to approximately 125 emails due to inactivated email addresses.

The demographics of the 43 respondents demonstrated 25 PA’s working in a primary care setting and 18 specifying another specialty. Of those who indicated primary care, 7 identified themselves working in family practice, 12 in emergency medicine, 3 in pediatrics, and 3 in internal medicine. Most of the PA’s had about 1-5 years of experience in this field. The Demographic information of PA’s who responded to this study is represented in Table 1.
Hypothesis

It is hypothesized that Physician Assistants practicing Primary Care in Ohio are not completely familiar with the current standards and recommendations for using sunscreen. It is also theorized that like the average American they are not following the current recommendations for sunscreen use nor are they educating patients regularly about the effectiveness of sunscreen use in preventing skin cancer.
Limitations

There are several limitations to this research study. The first limitation is the population being surveyed. Because it only involves PA’s practicing in Ohio, it may not be generalized to other parts of the country. PA’s practicing in other states such as Florida, California, and Texas are at higher risk for increased sun exposure and frequencies of skin cancer. Therefore, their methods and knowledge of current recommendations may be different. The sample size may also be a limitation. This study is limited to a population of PA’s who gave their email listing to a directory. This will not include PA’s who do not have access to the Internet, and it will not include those who wished to keep their E-mail addresses private. It can be assumed that the PA’s who respond will be honest in all of their answers and that they do not look up some of the answers to questions being presented.
Results

A total of 147 surveys were sent out to Physician Assistants who had previously indicated to the OAPA that they were practicing in a primary care setting including: family medicine, pediatrics, internal medicine, or emergency medicine. A total of 43 surveys were returned after 2 e-mailings were sent.

The first series of questions were used to identify the PA’s personal risk factors for developing skin cancer. They were asked personal information regarding their natural hair color, eye color, amount of freckles, family history of skin cancer, and their personal skin type based on a skin type classification proposed by the American Academy of Dermatology (AAD). Based on the responses from the subjects, the total numbers of risk factors were calculated. Table 2 illustrates the results of this line of questioning. There are also several questions asking about the respondents’ personal behaviors pertaining to sunscreen use including how often they personally wear sunscreen, the SPF factor of sunscreen used when wearing it, and how often they are reapplying sunscreen. The findings of these questions are outlined in Table 3.

The survey also functioned as a tool to see if PA’s were regularly educating their patients about using sunscreen in order to help prevent skin cancer. If the respondents answered yes they were asked some questions on how they were selecting which patients to educate and how they were educating them. These answers are listed in Table 4.

The final sets of questions were used to assess PA’s knowledge of current recommendations regarding sunscreen use and skin cancer prevention. There were 10 multiple-choice questions used to examine the subject’s knowledge regarding different facts about sunscreen use. Most of the questions included only had 1 correct answer. However, #15, #19, and #20 were designed to have multiple correct answers. In order for subjects to receive full
credit for analysis they had to answer all parts of the questions correctly. If the subjects were able to identify at least 1 part of the answer correct, they were designated only half credit for their answer. The complete findings from these questions can be found in Table 5.

The 10-question test concerning sunscreen facts served as a basis of the knowledge of each subject. Once each individual's score was calculated, the numbers of risk factors were also computed in order to look at the PA’s risk factors and see if there was any correlation with their scored on the test. The results of this comparison are located in Table 8.
Conclusion

The purpose of this study was to establish Physician Assistant’s knowledge concerning sunscreen, to investigate whether PA’s educate their patients regarding skin cancer prevention, as well as finding out if PA’s personally use sunscreen. Data for this study was collected via an anonymous email survey asking respondents for demographic and personal information as well as a series of questions testing knowledge of current guidelines regarding sunscreen use to prevent skin cancer.

The AAD as well as many other sources have reported several well-known risk factors for developing skin cancer. The non-modifiable risk factors include having fair skin, red or blonde hair, freckles, blue eyes, and a family history of skin cancer. Results of this survey have indicated that 58% of the Physician Assistants who replied have at least 2 or more of these non-modifiable risk factors for developing skin cancer themselves. However, one of the most important preventable risk factors is sun exposure. Research has shown that developing skin cancer is at least a 2-step process. It involves both an initiation and promotions stage to get malignant growth and UV plays both roles. UV harms the mechanism for repairing cell damage. Once this repair system is damaged, cells will then have an increased vulnerability for injury. After this time, repeated exposures makes matters worse and this is what initiates malignancy. After UV exposure, the repair mechanism found in cells normally directs apoptosis in the damaged cell. This is found when skin peels after a sunburn. If the cells have been previously damaged there will be a malfunction in this repair system and the damaged cells will escape. This genetic damage accumulates as normal cells die and the abnormal cells survive (Strange, 1995). This factor can be reduced by avoiding the sun or simply wearing sunscreen or protective clothing. With this in mind, only 33% of the PA’s indicated that they are using sunscreen on a
regular basis. According to several studies conducted by the U.S. Preventable Risk Task Force, it has been reported that only 1/3 or 33% of adults use sunscreen, seek shade, or wear sun-protective clothing. Other surveys indicate that the 33% of Americans that do practice sun-protective behaviors do so at varying degrees based upon age, sex, and their ability to tan and burn (CDC, 2003). This means that PA’s are using sunscreen at the same rate as the average American. What is even more alarming is that only 12% of the PA’s who are using sunscreen are reapplying sunscreen properly.

There are several standards that have been set in order for sunscreen to achieve its maximum efficacy in preventing UV light from damaging skin. That is why the current recommendation is to apply sunscreen at least 30 minutes before expected exposure to the sun. It is also prudent to reapply sunscreen at crucial times when sunscreen effect is known to wear off, such as after swimming and perspiring. Many people are not aware that UV will actually penetrate water to a depth of 1 meter (APTP, 1998). It is also advised to reapply sunscreen every 2 hours. Only 10 % of the PA’s answered this question correctly in the survey which required choosing all three of these times. Most answered the question partially correct as 70% knew to reapply sunscreen every 2 hours, 72% knew to reapply after swimming, and 63% answered to reapply after perspiring. This raises concern because without reapplication at any of these times can lead to a damaging sunburn and skin damage.

When PA’s were questioned about their own personal habits, 16% reapply sunscreen every 2 hours and 58% reapply after swimming or sweating. However, 21% indicated that they never reapply sunscreen and 19% only reapply if they feel themselves getting sunburn. This shows that even though most PA’s know the standard recommendations they are choosing not to abide by them and therefore they are significantly increasing their chances for developing skin cancer.
When inquired about what SPF the subjects personally used it was satisfactory in that 91% of the PA’s indicated that they were using an SPF of 15 or greater which is the current minimal standard accepted for all skin types. Of the PA’s polled 19% answered the question correctly, but better yet, 100% picked an SPF of 15 or above as the recommendation. There are also several different guidelines of SPF recommendations according to skin types. The chart recommended by the AAD is displayed in Table 6. This chart also shows the disparity in the amount of sunscreen that should be applied to reach maximum efficacy.

Recent studies have shown that most people who are using sunscreen are failing to apply sunscreen appropriately. They are using less than the manufacturer’s recommendations located on the label of the product (Diffey, 2000). In other words, people who are not using enough sunscreen are not gaining the maximal SPF offered by the product. The internationally accepted sunscreen testing protocol requires that a sunscreen product be applied to a subject’s skin at an application rate of 2mg/cm², which is comparable to 1 ounce, the amount in a shot glass. This should be applied to each of the 11 areas of the body, which represent 9% of body surface area. Only 26% of PA’s answered this question properly. It has been shown that the average person only applies enough sunscreen to achieve an SPF of about 1/3 or 1/4 of the level stated on the product (Taylor, 1995).

It is well known that both UVA and UVB light from the sun damages the skin and potentially leads to skin cancer. Sunscreens serve as filters and do not block all of the UV light that reaches the skin. They block up to 95% of UVB light and 55% of UVA light and significantly reduce the amount of light that can potentially damage the skin. Only 23% of PA’s could identify the correct UV spectrums sunscreen protects against. However, commendably, 81% of PA’s were knowledgeable that sunscreen was reducing the amount of ultraviolet damage
to the skin. The remaining 19% were under the presumption that sunscreen completely blocks all UV light not just A and B. Recent surveys have shown that 80% of Americans are under the presumption that sunscreens are primarily used just to tan without burning (AAD Survey, 2003). They are unaware that they are actually reducing UV light, which is actually the predisposing factor for developing skin cancer. PA’s, in this case, are more knowledgeable and could use this to educate their patients on the benefits of sunscreen.

The average shelf life of a bottle of sunscreen is 3 years. If applied correctly a “120 ml bottle will cover the entire adult body skin surface only 4 times to achieve 2mg/cm² or 2 oz.” (Phillips, 2003). Only 5% of PA’s could acknowledge the correct shelf life; however, 65% indicated that the shelf life was 1 year. With that, 65% of the PA’s would most likely not use an expired bottle of sunscreen.

An analysis looking at the number of answers out of 10 that assessed the PA’s basic knowledge of sunscreen and the number of risk factors that the individual PA has, is shown in Figure 1. There was no statistical evidence that supports that PA’s with more risk factors know more about sunscreen than those with fewer risk factors. However, when calculating the risk factors individually and taking the average score according to the number of risk factors it shows that PA’s with more personal risk factors for developing skin cancer scored better than those with fewer risk factors. Of the PA’s polled, 60% indicated that they had 0-2 risk factors while 40% of the PA’s have between 3-5 risk factors. The average score for the PA’s with 0-2 risk factors was 4.61 out of 10. The average score for PA’s with 3-5 risk factors was 5.0 out of 10. Even with these differences, the PA’s overall had an average of 4.7 out of 10 on the test, which is less than 50%.
Based on all 10 questions asked in the survey examining PA’s knowledge of certain facts about sunscreens, the conclusion is that PA’s are not completely knowledgeable about sunscreens, their benefits, and the proper application methods. It is important that PA’s practicing in primary care are very knowledgeable because they have the ability to educate their patients and decrease their patients risk of developing skin cancers. For the most part, PA’s were able to identify most of the recommendations regarding sunscreen application, the goals of sunscreen, how sunscreens work, and the benefits sunscreens provide. However, as a group, they were less knowledgeable about issues like shelf life and how much to apply. The survey results suggest that PA’s with more personal risk factors for the development of skin cancer were more knowledgeable about sunscreen use, but only slightly so. The survey results suggest that Ohio PA’s are in need of more information regarding sunscreens, their actions, benefits, and proper use.

Another important issue that the survey was examining is the patient education practices of PA’s practicing Primary Care in Ohio. Several national studies have looked at the benefits of public awareness and whether or not it truly affects sun protective behaviors of Americans. Reports from the U.S. Preventative Services Task Force (USPSTF) have shown that educational and policy approaches in primary schools and recreational or tourism settings has produced moderate behavior changes in the subjects. However, when the USPSTF inspected educational and policy approaches in heath-care settings and for providers, there was insufficient evidence to determine if it was effective because of the small number of studies (CDC, 2003). According to this survey, 40% of the PA’s polled acknowledged that they were educating patients while 60% stated that they were not. When asked how the PA’s discern which patients to educate only 35%
of the PA’s admitted to educating all patients. If patients came into the office sunburned 50% of
the PA’s stated they would educate them on skin cancer prevention. If the patient had a known
family history of skin cancer 35 % of the PA’s stated they would educate the patient. Other
factors PA’s are using to educate their patients include patients having risk factors (45%), if they
were removing a mole in the office (55%), or they were asked about it by the patient (30%). An
even more disturbing fact is that only 10% of the PA’s are informing patients of their personal
risk factors and asking the patients about their personal family history of skin cancer on a regular
basis. If studies have shown that simply educating people in public places and primary schools
can impact behaviors, it can easily be assumed that healthcare providers given their stature can
have an even larger impact on people’s behaviors. With the knowledge that PA’s have, as well
as their focus on preventative health, PA’s should inquire about patient’s family histories,
calculate each patient’s risk factors, and actively educate the patient about preventing skin cancer
by using sunscreen. This course of action could potentially lead to changes in American’s
behaviors and possibly decrease the prevalence of skin cancers.
References


[Http://www.aad.org/SkinCancerNews/SafeSunTips/sunscreenfacts.html](http://www.aad.org/SkinCancerNews/SafeSunTips/sunscreenfacts.html)


[http://www.cancer.org/docroot/SPC/content/SPC_1_Fewer_Americans_Using_Sunscreen](http://www.cancer.org/docroot/SPC/content/SPC_1_Fewer_Americans_Using_Sunscreen)


Http://www.preventcancer.org

Diffey, B. (2000). Has the sun protection factor had its day? British Medical Journal 320, 176-177


Table 1

Descriptive Data of Physician Assistants Subjects

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Years of Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Medicine: 16.2%</td>
<td>1-5 y: 55.8%</td>
</tr>
<tr>
<td>Emergency Medicine: 27.9%</td>
<td>5-10y: 6.9%</td>
</tr>
<tr>
<td>Pediatrics: 6.9%</td>
<td>10-15y: 4.7%</td>
</tr>
<tr>
<td>Internal Medicine: 6.9%</td>
<td>15-20y: 16.3%</td>
</tr>
<tr>
<td>Other: 41.8%</td>
<td>20+y: 16.3%</td>
</tr>
</tbody>
</table>
Table 2

Risk Factors for Skin Cancer of Physician Assistant Subjects

<table>
<thead>
<tr>
<th>Natural Hair Color</th>
<th>Eye Color</th>
<th>Amount of Freckles</th>
<th>Family History</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blonde: 19%</td>
<td>Blue: 32%</td>
<td>Many: 18%</td>
<td>Positive: 40%</td>
</tr>
<tr>
<td>Red: 2%</td>
<td>Green: 19%</td>
<td>Some: 49%</td>
<td>Negative: 60%</td>
</tr>
<tr>
<td>Brown: 70%</td>
<td>Hazel: 14%</td>
<td>None: 33%</td>
<td></td>
</tr>
<tr>
<td>Black: 9%</td>
<td>Brown 35%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skin Type</th>
<th># Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I: 2%</td>
<td>0 RF: 16%</td>
</tr>
<tr>
<td>Type II: 16</td>
<td>1 RF: 26%</td>
</tr>
<tr>
<td>Type III: 26%</td>
<td>2 RF: 19%</td>
</tr>
<tr>
<td>Type IV: 35%</td>
<td>3 RF: 28%</td>
</tr>
<tr>
<td>Type V: 19%</td>
<td>4 RF: 7%</td>
</tr>
<tr>
<td>Type VI: 2%</td>
<td>5 RF: 4%</td>
</tr>
</tbody>
</table>
Table 3

PA’s Responses to Selected Survey Questions

<table>
<thead>
<tr>
<th>Question #</th>
<th>Response</th>
<th>% PA’s response</th>
</tr>
</thead>
<tbody>
<tr>
<td>12) How often do you use sunscreen?</td>
<td>Always</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Sometimes</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>7%</td>
</tr>
<tr>
<td>13) How frequently do you reapply sunscreen?</td>
<td>Every 2 hours</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>After swim or sweat</td>
<td>58%</td>
</tr>
<tr>
<td></td>
<td>Only if sunburned</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>Only if hot</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>21%</td>
</tr>
<tr>
<td>14) What SPF do you use?</td>
<td>2-10</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>30+</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td>Unanswered</td>
<td>2%</td>
</tr>
</tbody>
</table>
Table 4

How PA’s are choosing to Educate Patients

<table>
<thead>
<tr>
<th>% of PA’s who regularly educate patients</th>
<th>Asking about personal/family history</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes: 40%</td>
<td>Always: 10%</td>
</tr>
<tr>
<td>No: 60%</td>
<td>Sometimes: 75%</td>
</tr>
<tr>
<td></td>
<td>Never: 15%</td>
</tr>
</tbody>
</table>

How PA’s are selecting patients to educate

<table>
<thead>
<tr>
<th>Informing Individuals of personal RF’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients: 35%</td>
</tr>
<tr>
<td>If sunburned: 50%</td>
</tr>
<tr>
<td>If + family history: 35%</td>
</tr>
<tr>
<td>If risk factors: 45%</td>
</tr>
<tr>
<td>If Removing Mole: 55%</td>
</tr>
<tr>
<td>If asked by patient: 30%</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Table 5
Correct Answers to Question of Sunscreen Use

<table>
<thead>
<tr>
<th>Question #</th>
<th>% Correct Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>15: Current recommendation of applying sunscreen</td>
<td>43%</td>
</tr>
<tr>
<td>16: Current amount applied</td>
<td>26%</td>
</tr>
<tr>
<td>17: Time for sunscreen to work</td>
<td>30%</td>
</tr>
<tr>
<td>18: Current recommendation of SPF for all skin types</td>
<td>19%</td>
</tr>
<tr>
<td>19: Type of UV light causes skin damage</td>
<td>23%</td>
</tr>
<tr>
<td>20: When sunscreen should be reapplied</td>
<td>49%</td>
</tr>
<tr>
<td>21: Primary goal of sunscreen</td>
<td>81%</td>
</tr>
<tr>
<td>22: Shelf life of sunscreen</td>
<td>5%</td>
</tr>
<tr>
<td>23: Does a tan prevent skin damage</td>
<td>95%</td>
</tr>
<tr>
<td>24: What does SPF 15 mean</td>
<td>81%</td>
</tr>
</tbody>
</table>
### TABLE 6
SPF Protection (Azurdia, Pagliara, Diffey, Rhoades, 1999)

<table>
<thead>
<tr>
<th>Skin Sensitivity</th>
<th>Effect on skin</th>
<th>SPF Required if applied correctly</th>
<th>SPF required when applied “typically”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Sensitive (I-II)</td>
<td>Always burn never tan</td>
<td>SPF 30</td>
<td>SPF 90+</td>
</tr>
<tr>
<td>Moderately Sensitive (II-III)</td>
<td>Tan sometimes burn</td>
<td>SPF 10</td>
<td>SPF 30+</td>
</tr>
<tr>
<td>Least Sensitive (IV-VI)</td>
<td>Tans with No/little burn</td>
<td>SPF 5</td>
<td>SPF 15+</td>
</tr>
</tbody>
</table>
Table 7

Example of Skin Types (AAD, 2003)

<table>
<thead>
<tr>
<th>Skin Type</th>
<th>Sun History</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Always burns easily, never tans, extremely sun sensitive</td>
<td>Red Headed, freckles, Irish/Scots/Welsh</td>
</tr>
<tr>
<td>II</td>
<td>Always burns easily, tans minimally, very sun sensitive skin</td>
<td>Fair-skinned, fair-haired, blue-eyed, Caucasians</td>
</tr>
<tr>
<td>III</td>
<td>Sometimes burns, tans gradually to light brown, sun sensitive skin</td>
<td>Average skin</td>
</tr>
<tr>
<td>IV</td>
<td>Burns minimally, always tans to moderate brown, minimally sun sensitive</td>
<td>Mediterranean-type Caucasian</td>
</tr>
<tr>
<td>V</td>
<td>Rarely burns, tans well, sun insensitive</td>
<td>Middle Eastern, some Hispanics, some African Americans</td>
</tr>
<tr>
<td>VI</td>
<td>Never burns, deeply pigmented, sun insensitive skin</td>
<td>African Americans</td>
</tr>
</tbody>
</table>
Figure 1

Figure 1. Questions Answered Correctly as a Function of PA’s Risk Factors

\[ y = 0.1568x + 4.3877 \]
\[ R^2 = 0.0352 \]
Appendix A

Cover Letter

Dear Physician Assistant,

You have been chosen from the Ohio Association of Physician Assistants directory to participate in my academic research project associated with the Medical College of Ohio. Your participation is entirely voluntary.

My name is Erika Wasilewski and I am a Physician Assistant student at the Medical College of Ohio. I am currently doing academic research targeting Ohio Physician Assistants practicing in the Primary Care setting. I am researching PA’s familiarity with 1) The recommended guidelines of using sunscreen, 2) How PA’s implement skin cancer prevention into their individual practices, and 3) Do PA’s use sunscreen themselves.

If you decide to participate, your name and answers will remain completely anonymous. By using a computer program your completed and returned survey will not have any identification attached to it assuring you complete confidentiality and privacy. The investigators involved with this research will only view the surveys answers.

Please take the time to answer the following survey questions. After you have completed the survey please email them back to me at Ewasilewski@mco.edu by March 30th, 2004.

There are no foreseeable risks in participating in the research project. You may contact questions TParish@mco.edu or Ewasilewski@mco.edu or call 1-419-xxx-xxxx with any questions or concerns. Note that if you decide to contact any of the investigators you may lose confidentiality.

Thank you for your time and participation.

Tom Parish PA-C, MPH    Erika Wasilewski PA-SII
Primary Investigator    Student Investigator
Assistant Professor    Physician Assistant Student
Appendix B

Questionnaire

The following survey is being conducted to assess the current practices of Ohio Physician Assistant in patient education and personal use of sunscreens to prevent skin cancer. Please answer the following questions by filling in the appropriate answer. Your participation is greatly appreciated.

1) In what setting are you currently practicing as a Physician Assistant?
   - Family Medicine
   - Emergency Medicine
   - Pediatrics
   - Internal Medicine
   - Other

2) How many years have you been practicing as a PA?
   - 1-5
   - 5-10
   - 10-15
   - 15-20
   - 20+

3) What is or was your natural hair color?
   - Blonde
   - Red
   - Brown
   - Black

4) What is your Eye Color?
   - Blue
   - Green
   - Hazel
   - Brown

5) Do you have freckles?
   - Many
   - Some
   - None

6) Do you have a family history of skin cancer? (mom, dad sisters, brothers, or children)
   - Yes
   - No
7) What is your skin type?
   - Type 1: always burns easily, never tans, extremely sun sensitive
   - Type 2: always burns easily, tans minimally, very sun sensitive
   - Type 3: sometimes burns, tans gradually to light brown, sun sensitive
   - Type 4: burns minimal, always tans to moderate light brown, minimal sun sensitive
   - Type 5: rarely burns, tans well, sun insensitive
   - Type 6: never burns, deeply pigmented, insensitive

8) Do you routinely educate patients regarding the use of sunscreen as a means of preventing skin cancer?
   - Yes
   - No

   If YES please answer the following questions (9-11):

   If NO, please skip to question 12.

9) Do you routinely ask each patient about and family/personal history of skin cancer?
   - Always
   - Sometimes
   - Never

10) Do you inform patients about their individual risk factors for getting skin cancer?
    - Always
    - Sometimes
    - Never

11) What best describes how you select patients to inform about skin cancer prevention (choose all that apply)
    - I instruct all patients to use sunscreen regularly
    - I instruct patients only if they come in with a sunburn
    - I instruct patients only if they have a family history
    - I instruct patients if they have many freckles/fair skin/blue-green eyes/ and blonde-red hair
    - I instruct patients if they are having a mole removed
    - I instruct patients only if they ask about it

12) Do you personally use sunscreen every time you expose yourself to the sun for greater than 30 minutes?
    - Always
    - Sometimes
    - Never
13) **Do you personally reapply sunscreen after sweating or swimming?**
   - Always
   - Sometimes
   - Never

14) **Do you reapply sunscreen after 2 hours of being in the sun?**
   - Always
   - Sometimes
   - Never

15) **What SPF sunscreen do you use (if you chose to use it) on a regular basis when exposing yourself to the sun?**
   - SPF 2-10
   - SPF 15
   - SPF 20
   - SPF 30
   - SPF 30+

16) **What is the current recommendation for applying sunscreen?**
   - Every day before leaving your home
   - If expected time of exposure is greater than 30 minutes
   - If expected time of exposure to the sun is greater than 1 hour
   - If you are spending all day in the sun

17) **What is the recommended amount of sunscreen that should be applied to your skin?**
   - Just enough sunscreen to cover the area that will be exposed
   - 2 ounces to cover the exposed areas of the body
   - 1 ounce, the amount in a shot glass, to cover the exposed areas of the body
   - Fill the palm of your hand and spread evenly over exposed areas of the body

18) **How long does it take for sunscreens to begin working?**
   - Immediately after applying it to your skin
   - 10 minutes
   - 20 minutes
   - 30 minutes

19) **What is the current SPF factor recommendation for all skin types?**
   - SPF 10+
   - SPF15+
   - SPF 20+
   - SPF 30+
20) **What type of UV (ultraviolet) rays from the sun are known to damage the skin?**
   - UVA
   - UVB
   - UVC
   - All of the above
   - Both a and b

21) **When should you reapply sunscreen? (check all that apply)**
   - Every hour
   - Every 2 hours
   - After swimming
   - After perspiring
   - You do not have to reapply sunscreen at all

22) **What is the Primary goal of sunscreen?**
   - To block all UV exposure to skin
   - To keep skin from getting sunburned
   - To significantly reduce the amount of UV exposure to skin
   - To help patients get a tan
   - To prevent patients from getting a tan

23) **What is the average shelf life of sunscreen?**
   - 1 year
   - 5 years
   - 3 years
   - Unlimited

24) **Does having a dark tan and decrease the need to use sunscreen to prevent skin damage from the sun?**
   - True
   - False

25) **Specifically, what does a sunscreen of SPF 15 mean?**
   - Protected from a sunburn for 15 hours
   - Protection from sunburn 15 times longer than when not using sunscreen
   - Ability to tan without burning
   - Application of sunscreen must be every 1.5 hours

Thank you for your time and honesty while filling out this survey as completely as possible,

Erika Wasilewski
Physician Assistant Student
Medical College of Ohio
Appendix C

Second Notice of Participation Sent

Dear Physician Assistant,

A few weeks ago you received a survey regarding recommended standards for sunscreen use.

If you already completed this and returned it to me, I thank you for your time and participation. You can disregard this request.

I ask that if you have not completed this survey and wish to do so, to please take time now to complete and return it. For your convenience, I have included another copy of the survey with this email.

Once again, thank you for your time and cooperation.

Erika Wasilewski
Physician Assistant Student
Medical College of Ohio
ewsilewski@mco.edu
Abstract

**Objective.** The intention of this study was to evaluate Ohio primary care Physician Assistants knowledge regarding recommendations for sunscreen use, to investigate how PA’s are educating patients regarding skin cancer prevention, and to examine PA’s personal habits of skin cancer prevention. **Method.** 147 PA’s practicing primary care including family medicine, emergency medicine, pediatrics, and internal medicine were sent a survey regarding sunscreen and skin cancer prevention. **Results.** PA’s were able to identify most of the recommendation for sunscreen application and the efficacy of sunscreen. However, PA’s were not educating patients on a regular basis and were not using sunscreens personally at the recommended times. **Conclusion.** Primary Care PA’s are in need of additional information regarding sunscreen, its benefits for preventing skin cancer, and the importance of educating patients regularly. PA’s also are in need of modifying their own sun protective behaviors in order to comply with current commendations.