

A Survey of Skin Cancer Screening in the Primary Care Setting

A Comparison With Other Cancer Screenings

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Objective: To determine primary care physicians' perceived importance and frequency of performance of skin cancer screening in comparison with other cancer screening examinations.

Design: Descriptive survey study.

Participants: Five thousand US family physicians and internal medicine specialists randomly selected from the Official American Board of Medical Specialists Directory of Board-Certified Medical Specialists.

Main Outcome Measures: Self-reported importance and performance of cancer screening examinations.

Results: Eligible physicians (1363 total: 814 family physicians and 549 internists) completed the survey with a response rate of 30%. Overall, 52% of respondents rated skin cancer screening as "extremely" important, compared with 79% for digital rectal examination, 88% for clinical breast examination, and 87% for Papanicolaou testing. Thirty-seven percent of physicians reported performing complete body skin examinations on 81% to 100% of patients, compared with digital rectal examina-

tion, for which 78% of physicians reported performing the examination on 81% to 100% of patients, or the clinical breast examination, for which 82% of physicians reported performing the examination on 81% to 100% of patients. A higher percentage of physicians in practice for more than 30 years ranked skin cancer screening as extremely important and reported a higher frequency of screening examinations. Physicians in a suburban practice setting reported performing skin examinations more often than those in urban or rural settings. Overall, the self-reported frequency of skin examination was strongly correlated with the physician's importance rating of skin cancer screening.

Conclusions: A majority of primary care physicians rate skin cancer screening as extremely important. The reported importance of skin cancer screening and frequency of skin cancer examination among primary care physicians is significantly less than for other cancer examinations. This likely represents a multitude of factors, including logistic constraints and lack of consensus on the efficacy of skin cancer screening.

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SKIN CANCER is the most common cancer.¹ It is estimated that there will be 47 700 new cases of malignant melanoma and 7700 melanoma deaths in the United States during 2000.¹ While incidence data on nonmelanoma skin cancers are not monitored, it is estimated that there are more than 1 million newly diagnosed basal cell and squamous cell carcinomas in the United States each year. Nonmelanoma skin cancer accounts for approximately 1900 deaths each year.¹ Nonmelanoma skin cancer has limited metastatic potential but is associated with significant morbidity from the potentially disfiguring effects of the tu-

mors and the scarring associated with therapy.

Recognition of the disease burden associated with skin cancer and concerns regarding the dramatic and persistent rise in skin cancer incidence during the past decades has led to efforts in the primary and secondary prevention of skin cancer. Primary prevention of skin cancer has focused on minimizing exposure to the sun and sun protection.²⁻³ Secondary prevention of skin cancer entails the detection of skin cancer in its earliest stages when it can readily be cured by simple outpatient excision.⁴⁻⁹ Given its location on the surface of the skin, skin cancer is amenable to early detection by visual whole body skin examination.

PARTICIPANTS AND METHODS

STUDY POPULATION

The Official American Board of Medical Specialists Directory of Board Certified Medical Specialists,²¹ which contains professional and biographical information on board-certified physicians in the United States, was used to identify physicians specialized in family practice (n=51 718) and internal medicine (n=149 053). Physicians with multiple board certifications or any subcertifications were excluded to enrich the sample with physicians who spend a majority of their time practicing primary care (family practice, n=4657; internal medicine, n=85 479). We further excluded physicians with incomplete mailing addresses (family practice, n=7137; internal medicine, n=5744) and those identified as deceased (family practice, n=657; internal medicine, n=3432). A random sample (n=5000: 2500 family physicians and 2500 internists) was selected from the remaining list of 39 267 family physicians and 54 398 internists.

SURVEY METHODS AND QUESTIONNAIRE CONTENT

In April 1999 a 1-page 6-question survey (**Figure**) was mailed to each of the 5000 primary care physicians selected for the study. Two weeks after the initial mailing, a second mailing was sent to all nonresponders. Two questions also included, but not shown in the Figure, related to the use of nonphysician health care providers for cancer screening. These results will be reported in a separate article.

DATA ANALYSIS

Descriptive frequencies and percentages were calculated to characterize physician demographics and survey responses. Odds ratios, χ^2 tests, and *P* values (2-tailed) are presented. The χ^2 tests for trend were performed to assess the correlation between frequency and importance of cancer screening. The Statistical Analysis System²² was used for all analyses.

Primary care physicians play a central role in the prevention and detection of cancer. The majority of Americans see their primary care physicians regularly.¹⁰ Nonetheless, studies have demonstrated that complete body skin examinations are infrequently performed by primary care physicians.¹¹⁻¹⁸ Few studies have looked at skin cancer screening in comparison with other cancer screening examinations.^{13,17,18} Specific barriers to skin cancer screening in the primary care setting include low lethality

of skin cancer, inconsistent public health recommendations on skin cancer screening, inadequate physician training in skin cancer recognition, competing health promotional activities, lack of time, and inadequate reimbursement for preventive care.^{19,20}

Recommendations on skin cancer screening vary from no formal recommendation, to encouraging skin cancer examinations in routine care without specific screening examinations, to screening every 3 years in patients between the ages of 20 and 39 years and annually thereafter, to annual screening for all adults. These inconsistent recommendations reflect both optimism and uncertainty about the public health utility of skin cancer screening. Skin cancer screening is intuitively attractive, but there is a lack of randomized trials assessing the effect of skin cancer screening on mortality. As no such studies are ongoing, efforts in prevention of skin cancer mortality will remain anchored in the implicit potential of screening and early detection.

We conducted a descriptive survey of primary care physicians to determine the perceived importance and self-rated frequency of performance of skin cancer screening in comparison with other cancer screening examinations.

RESULTS

Four hundred seventy-five surveys were returned as undeliverable owing to an incorrect address. Of the returned surveys, 385 were considered ineligible because (1) physician was deceased (n=3), (2) physician indicated that he or she was retired or no longer practicing medicine in his or her specialty (n=70), or (3) physician indicated that 50% or less of their practice was devoted to primary care or physician failed to answer this question (n=145 and n=167, respectively). The final study population was composed of 1363 completed surveys from eligible practicing primary care physicians (1021 surveys were returned after the first mailing, and 342 surveys were returned after the second mailing). The overall response rate was 30% (1363/5000; 385 ineligible); the response rate by specialty was 35% of family physicians and 24% of internists.

Characteristics of the respondents are presented in **Table 1**. We explored differences between responders and nonresponders by geographic region and years since graduation. The distributions for geographic region and years since graduation were similar between the responders and nonresponders.

IMPORTANCE OF SKIN CANCER SCREENING EXAMINATIONS

The reported relative importance of the various cancer screening examinations is presented in **Table 2**. Com-

1. Approximately what percentage of your practice is primary care?	≤50%	>50%				
2. For each of the following screening exams, please rate the importance of including the exam as part of routine patient care (0-not important, 3-extremely important):						
a. Digital rectal exam (older men)	0	1 2 3				
b. Manual breast exam (women)	0	1 2 3				
c. Complete body skin exam (Caucasian adults)	0	1 2 3				
d. Pap smear (women)	0	1 2 3				
3. Please indicate the percentage of your patients (of the indicated patient population) on whom you perform the following screening exams as part of a complete physical exam:						
a. Digital rectal exam (older men)	0	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
b. Manual breast exam (women)	0	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
c. Complete body skin exam (Caucasian adults)	0	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
d. Pap smear (women)	0	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
4. Do you consider your practice setting to be:	Urban	Suburban	Rural			

The primary care survey. Respondents were asked to circle the appropriate response.

Table 1. Characteristics of Survey Respondents*

Characteristics	Family Physicians (n = 814)	Internists (n = 549)	Total (N = 1363)
Years since graduation			
≤10†	140 (17.2)	135 (24.6)	275 (20.2)
11-20	337 (41.4)	209 (38.1)	546 (40.1)
21-30	187 (23.0)	103 (18.8)	290 (21.3)
>30	86 (10.6)	73 (13.3)	159 (11.7)
Geographic region			
Midwest‡	264 (32.4)	110 (20.0)	374 (27.4)
Northeast‡	120 (14.7)	153 (27.9)	273 (20.0)
South	217 (26.7)	156 (28.4)	373 (27.4)
West	213 (26.2)	130 (23.7)	343 (25.2)
Practice setting			
Rural‡	254 (31.2)	91 (16.6)	345 (25.3)
Suburban	348 (42.8)	214 (39.0)	562 (41.2)
Urban‡	204 (25.1)	233 (42.4)	437 (32.1)

*All values are presented as number (percentage). Some questions do not total 100% because of missing responses.

†For family physicians vs internists, $P = .001$.

‡For family physicians vs internists, $P < .001$.

plete body skin examination was rated significantly lower in “extreme importance” than the other screening examinations (52% of physicians rated skin examination as “extremely” important [a rating of 3] compared with 79% to 88% for other cancer screenings; $P < .001$). There were no important differences by specialty, geographic region, or practice setting for ratings of importance of skin examination. Importance ratings for skin examination and digital rectal examination were significantly higher for physicians who graduated more than 30 years ago (percentage who reported “3” [highest rating]: skin examination, 66%; digital rectal examination, 89%) than those who graduated less than 10 years, 11 to 20 years, or 21 to 30 years ago (percentage who reported “3”: skin examination, 48%-52%; digital rectal examination, 71%-82%; $P = .001$). Furthermore, importance rating by graduation year did not significantly vary by specialty.

Table 2. Importance of Skin Cancer Screening Compared With Other Cancer Screening Examinations*

Screening Examination	Importance Rating Score†			
	0	1	2	3‡
Complete body skin examination	8 (0.6)	117 (8.6)	525 (38.5)	707 (51.9)
Digital rectal examination	20 (1.5)	62 (4.5)	194 (14.2)	1080 (79.2)
Clinical breast examination	3 (0.2)	19 (1.4)	132 (9.7)	1205 (88.4)
Papanicolaou test	2 (0.1)	15 (1.1)	148 (10.9)	1192 (87.5)

*All values are presented as number (percentage). Responses for each screening examination do not total 1363 or 100% because of missing responses.

†Scores range from 0 (not important) to 3 (extremely important). Screening examination categories are not mutually exclusive.

‡For skin examination vs each other cancer screening examination, $P < .001$.

FREQUENCY OF SKIN CANCER SCREENING

The frequency of cancer screening examination performance is presented in **Table 3**. Thirty-seven percent of physicians reported performing complete body skin examinations on 81% to 100% of patients. This was significantly lower than the percentage of physicians performing this level of digital rectal examinations or clinical breast examinations (78% and 82%, respectively) ($P < .001$ for skin examination vs either examination). No significant differences were seen for skin examination performance by physician specialty or region. Physicians who reported a suburban practice setting were more likely to perform skin examinations on 81% to 100% of patients (42.0%) than urban (36%) or rural (31%) physicians ($P = .005$). Significant differences were also observed for years since graduation, with physicians who graduated more than 30 years ago performing skin examination more frequently than those who graduated within the past 10 years (46% vs 36% for performing skin examination on 81%-100% of patients; $P = .01$). Furthermore, fre-

Table 3. Performance of Screening Examinations by Primary Care Physicians (N = 1363)*

Screening Examination†	Percentage of Patients Having Screening Examination Performed by Physician					
	0%	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%‡
Complete body skin examination	23 (1.7)	117 (8.6)	126 (9.2)	216 (15.8)	364 (26.7)	508 (37.3)
Digital rectal examination	2 (0.1)	31 (2.3)	23 (1.7)	58 (4.3)	188 (13.8)	1056 (77.5)
Clinical breast examination	4 (0.3)	15 (1.1)	13 (1.0)	54 (4.0)	153 (11.2)	1112 (81.6)

*All values are presented as number (percentage). Responses for each screening examination do not total 1363 or 100% because of missing responses.

†Screening examination categories are not mutually exclusive. Results for Papanicolaou (Pap) test performance are not presented because of the large number of noncategorical responses (eg, "perform Pap tests in patients with a uterus" or "refer patient to a gynecologist"), which could not be analyzed to obtain a valid estimate of test performance.

‡For skin examination vs both digital rectal examination and clinical breast examination, $P < .001$.

quency of skin cancer screening by graduation year did not significantly vary by specialty.

Frequency of skin examination was strongly correlated with the physician's importance rating of skin examination (χ^2 test for test, $P = .001$). The percentage of physicians rating skin examination "extremely important" was 23% for physicians performing skin examinations on 0% to 20% of patients, 17% for physicians performing skin examinations on 21% to 40% of patients, 31% for physicians performing skin examinations on 41% to 60% of patients, 50% for physicians performing skin examinations on 61% to 80% of patients, and 83% for physicians performing skin examinations on 81% to 100% of patients.

COMMENT

The dramatic rise in skin cancer incidence coupled with the central role of primary care physicians in cancer prevention and detection has led many to emphasize the importance of skin cancer screening in routine primary care.²³⁻²⁹ Data suggest that melanomas detected by physicians are thinner than those detected by patients themselves, and that they therefore may be associated with improved survival.^{30,31} There are, however, multiple barriers to skin cancer screening in the primary care setting. These include inadequate physician training in skin cancer recognition, competing health promotional activities, lack of time, and inadequate reimbursement for preventive care.^{19,20,32} Our survey sought to elucidate the relative importance placed on skin cancer screening by primary care physicians. In our study, we found that primary care physicians considered skin examination less important than digital rectal examination, clinical breast examination, and Papanicolaou testing. Several factors may contribute to the lower ranking of importance of skin cancer screening beyond the logistic barriers. These include the lower lethality of skin cancer, including the fact that skin cancer is not one of the leading causes of cancer death, the relative lack of knowledge and training about skin cancer diagnosis among primary care providers, lack of patient

desire or expectation for a total body skin examination, and inconsistent recommendations regarding skin cancer screening among various health care organizations.³²⁻³⁷ These inconsistent recommendations reflect both optimism and uncertainty about the public health utility of skin cancer screening. Skin cancer screening is intuitively attractive, but formal studies of its clinical efficacy are lacking. Recommendations on skin cancer screening vary from no formal recommendation (US Preventive Services Task Force), to encouraging skin cancer examinations in routine care without specific screening examinations (National Cancer Institute), to screening every 3 years between the ages of 20 and 39 years and annually thereafter (American Cancer Society), to annual screening for all adults (American Academy of Dermatology).³³⁻³⁷ It is interesting to note that digital rectal examination was reported as being important and performed by physicians; however, this type of screening has also been subject to conflicting recommendations.

The lower importance placed on skin cancer screening by our survey respondents was strongly correlated with lower self-reported skin cancer screening frequencies. This latter finding is consistent with past observations. A 1989 survey of primary care physicians found that only 30% of respondents even broached the subject of skin cancer with most of their patients, while more than 90% of physicians stated that they perform digital rectal examination, clinical breast examination, and Papanicolaou tests on asymptomatic patients without a personal history of cancer.¹⁷ Other studies^{11-16,18} have demonstrated similar low frequencies of skin examination performance by primary care physicians ranging from approximately 25% to 50%. A recent descriptive analysis using data from the National Ambulatory Medical Care Survey on office-based physician visits during 1997 revealed that the frequency of skin cancer prevention and screening activities in the primary care setting was much lower than other cancer screening and prevention activities.¹⁸ In another study,¹³ the frequency of documented examinations and procedures was obtained by

medical record review. Skin examination was documented less often as compared with other cancer screening examinations and procedures.

The specific frequencies of screening reported in our study are highly susceptible to recall bias, as physician self-reporting may not accurately reflect their true practices. Indeed, a previous study has demonstrated low correlation between physician reporting and patient reporting or medical record review.³⁸ Nonetheless, the frequencies recorded in our survey are similar to previously published self-reported rates, and they confirm the continued performance of skin cancer screening at rates significantly below that of other cancer screening examinations. A strength of our study is the size of the surveyed population with responses from more than 1300 primary care physicians from across the entire United States. A significant potential weakness of the study is the final response rate of 30%, which raises the possibility of significant sampling bias if responders and nonresponders are different on factors likely to affect the study results. Furthermore, we excluded physicians with incomplete mailing addresses in the database from the sampling frame, which has the potential to bias the study results. However, several factors support the representativeness of our sample. Demographic data with regard to geographic location and years since medical school graduation were very similar among responders and nonresponders, although responders consisted of more family practice physicians than nonresponders (60% responders vs 47% nonresponders). In addition, results from our first mailing were very similar to results from the second mailing with respect to specialty, years since medical school graduation, and geographic region. This is consistent with a 1989 survey of physicians' attitudes and practices in early cancer detection, which formally addressed the issue of "error from nonresponse" between hard-to-reach and easy-to-reach physicians, and found no evidence of sampling bias.¹⁷ Most importantly, there are no apparent systematic biases that are likely to contribute to significant differences among responders and nonresponders for the questions under study, and our data are consistent with previous reports.

Reporting bias may have affected the findings on the relative importance of skin examination if physicians prioritized the importance based on frequency of skin cancer relative to breast, cervical, and prostate cancer, which are more common than melanoma, the most lethal skin cancer. The physicians' patient population may affect both the importance and frequency of cancer screening. For instance, if the majority of the patient population is African American, then patients may be screened for skin cancer less often, because they are not considered at high risk. We focused physicians' responses to the patient subgroups of interest, asking

about certain groups such as older men, women, and whites (Figure). Finally, this study did not have the ability to show how physicians might use risk assessment to identify high-risk patients and provide tailored screening in the form of skin examination and prevention counseling.

In conclusion, 52% of primary care physicians regard skin cancer screening to be extremely important. This likely represents an appreciation by primary care physicians of the disease burden associated with skin cancer. Primary care physicians place less emphasis on the importance and performance of skin cancer screening than on other cancer screening examinations. This likely represents a multitude of factors, including logistic constraints and lack of consensus on the efficacy of skin cancer screening.

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