Skin Cancer Screening and Prevention in the Primary Care Setting

National Ambulatory Medical Care Survey 1997

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OBJECTIVE: **To describe skin cancer prevention and screening activities in the primary care setting and to compare these findings to other cancer screening and prevention activities.**

DESIGN: **Descriptive study.**

SETTING/PATIENTS: **National Ambulatory Medical Care Survey 1997 data on office-based physician visits to family practitioners and internists.**

MEASUREMENTS AND MAIN RESULTS: **Data were obtained on 784 primary care visits to 109 family practitioners and 61 internists. We observed 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. Skin examination was reported at only 15.8% of all visits (17.4% for family practitioners vs 13.6% for internists, $P > .1$). For other cancer screening, the frequencies were as follows: breast examination, 30.3%; Papanicolaou test, 25.3%; pelvic examination, 27.6%; and rectal examination, 17.9%. Skin cancer prevention in the form of education and counseling was reported at 2.3% of these visits (2.9% for family practitioners vs 1.5% for internists, $P > .1$), while education on breast self-examination, diet and nutrition, tobacco use, and exercise was 13.0%, 25.3%, 5.7%, and 17.9%, respectively.**

CONCLUSIONS: **The results of this study indicate that the proportion of primary care visits in which skin cancer screening and prevention occurs is low. Strategies to increase skin cancer prevention and screening by family practitioners and internists need to be considered.**

KEY WORDS: **early detection; melanoma; screening; secondary prevention; skin neoplasms.**
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Skin cancer, including both melanoma and nonmelanoma, is the most common cancer in the United States, and the incidence has increased substantially over the past 40 years.[1–3] The major cause of these cancers is ultraviolet radiation from sun exposure.[4] Primary prevention efforts at reducing the incidence of skin cancer include minimizing exposure to the sun, as well as adopting sun protection strategies.[5,6]

Secondary prevention, including the detection and excision of early precancerous or thin lesions, might have an important impact on morbidity and mortality associated with skin cancer. Early melanoma is usually highly visible and research has shown that the detection of thin lesions is associated with a high 5-year survival rate.[7,8] Although nonmelanoma skin cancers, basal cell carcinomas, and squamous cell carcinomas rarely result in mortality, they are very common and have the potential to recur, disfigure, and metastasize.[9,10]

Skin cancer screening may be the best way to impact the rising incidence of skin cancer and is recommended by the American Cancer Society,[11] the American Academy of Dermatology,[12,13] and a National Institutes of Health Consensus Panel.[14] Increased efforts at skin cancer detection in the primary care setting have been proposed.[11,14] Primary care physicians are in an optimal position to influence both primary and secondary prevention of skin cancer because approximately 40% of office visits in the United States are to a family practitioner or internist.[15] Thus, a large number of patients are seen by these physicians. However, significant barriers exist to effective skin cancer education and detection by physicians, including the time it takes for the physician to perform the screening examinations, lack of reimbursement, inadequate physician training in skin cancer recognition, poor diagnostic accuracy in the primary care setting, and physician perception that patients are not receptive to counseling for prevention.[16,17]

Few studies have examined skin cancer screening and prevention in the primary care setting.[18–26] To understand skin cancer screening and prevention activities in the outpatient office setting, we conducted a descriptive analysis using data from the National Ambulatory Medical Care Survey (NAMCS), which represents the largest random sample of office-based visits in the United States. We describe skin cancer prevention and screening activities in the primary care setting and compare them to other cancer screening and prevention activities currently being performed.

METHODS

The NAMCS survey is a national survey conducted by the National Center for Health Statistics of the Centers

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for Disease Control and Prevention.[15,27,28] The survey has been conducted annually from 1974 to 1981, in 1985, and each year since 1989. Information is obtained on the provision and use of ambulatory medical care services in the United States. Outpatient visits to nonfederally employed office-based physicians primarily engaged in direct patient care are sampled using a multistage probability sampling design that is stratified by primary sampling units (defined as counties, groups of counties, standard metropolitan statistical area, or towns and townships), physician practice, and patient visits within practice. Sampling of the patient visits is accomplished by sampling within 52 weekly randomized periods. Visit data are collected using the 1-page patient record form which is completed by the physician with the help of office staff.

We restricted our analyses to data from the 1997 survey because it was the only survey for which information was available on skin examinations as well as skin cancer prevention. We initially identified visits to family practitioners and internists using the NAMCS master file. The physician response rate for primary care physicians was 68% with a total of 6,219 patient-visit record forms submitted. Because skin cancer rarely occurs in nonwhites, we limited our study sample to those visits where the patient was identified as being white and of non-Hispanic origin (n = 4,979). We were limited by the unavailability of data on services provided specifically for skin cancer screening. Diagnostic and or screening services for skin cancer were grouped together under skin examination. We were interested in screening and prevention activities and therefore selected visits where the reason for the visit was identified as nonillness-related. We excluded visits for acute problems, chronic problems, presurgery and postsurgery/injury follow-up, and injury or poisoning where formal skin cancer screening was unlikely to occur. The final study sample included information on 784 patient visits.

The patient-visit record form used for data collection included questions about patient demographics, insurance status, reason for visit, physician diagnoses, diagnostic and screening services, therapeutic and preventive services, and health care providers. We were interested in skin cancer screening and prevention activities, and we identified patient visits where skin examinations were provided as a diagnostic or screening service. We also identified visits where other tests and measurements (e.g., breast, pelvic, and rectal examination, Papanicolaou test, mammography, and prostate-specific antigen test) were provided. Information about preventive services provided at each visit was obtained for skin cancer prevention and other counseling or education for diet and nutrition, exercise, breast self-examination, and tobacco use and exposure. Information on health care provider or providers seen during the patient visit was obtained. These data were used to quantify the frequency of screening and prevention services by health care provider characteristics.

Descriptive statistics were used to characterize skin cancer prevention and screening activities in the primary care setting and to compare to the use of other cancer screening. Analyses were stratified by type of physician (family practitioner vs internist) and type of provider. We calculated 95% confidence intervals to quantify the precision of the estimates.

RESULTS

Data were obtained on a total of 6,219 primary care visits during 1997; based on our inclusion and exclusion criteria, we identified 784 patient visits for analysis. The mean age of the patients seen at these visits was 43.4 ± 24.8 years, and 56.6% of the visits were by females. In total, 109 family physicians and 61 internists contributed 454 and 330 patient visits, respectively, to the analyses.

For family practitioners and internists, the mean number of patient visits contributed by each physician was 4.2 (maximum, 23; minimum, 1; median, 3) and 5.4 (maximum, 22; minimum, 1; median, 4), respectively. Seven of the 109 family practice physicians contributed between 10 and 23 visits each (median, 12 visits), representing 21.3% of the 454 patient visits to family practitioners. Nine of the 61 internal medicine physicians contributed between 10 and 22 visits each (median, 16 visits), representing 44.5% of the 330 patient visits to internists.

The physician as a health care provider was seen at over 94% of the visits. A higher percentage of physicians were designated as the health care provider seen at visits to internal medicine practices compared to family practices (96.7% vs 92.3%; P = .02). Nurse practitioners or physician assistants were mentioned as the health care provider seen at less than 3% (n = 19) of the visits in our sample. In 16 of 19 visits where a nurse practitioner or physician assistant was identified as the health care provider, a physician was also seen at the patient visit.

Although we restricted our study sample to those visits with more of an opportunity for skin cancer screening and prevention, the percentage of visits where these services were performed was low (Table 1). Skin examination was reported at only 15.8% of all "nonillness" visits, while skin cancer prevention (education and counseling) was reported at 2.3% of these visits. Differences in the screening and prevention services of family practitioners and internists were apparent. Significant differences were observed between family practitioners and internists for Papanicolaou test (30.6% family practitioners vs 18.7% internists, P = .01), pelvic examination (33.0% family practitioners vs 21.1% internists, P = .01), and rectal examination (25.0% family practitioners vs 13.1% internists, P = .01). The frequency of counseling for breast self-examination was 18.4% for family practitioners versus 6.5% for internists (P = .001). However, skin cancer screening and prevention services did not differ significantly between family practitioners and internists. The frequency of skin examination was reported as 17.4% for family practitioners

Table 1. Screening and Prevention Services Provided at Visit by Physician Specialty*

	Family Practice (*N* = 454 patient visits)		Internal Medicine (*N* = 330 patient visits)		Total (*N* = 784 patient visits)†	
	n (%)	95% CI‡	*n* (%)	95% CI‡	*n* (%)	95% CI‡
Physical Screening						
Skin exam	79 (17.4)	(14.1 to 21.3)	45 (13.6)	(10.2 to 17.9)	124 (15.8)	(13.4 to 18.6)
Breast exam§	63 (31.3)	(25.1 to 38.3)	49 (29.0)	(22.4 to 36.6)	112 (30.3)	(25.7 to 35.3)
Papanicolaou test‖	64 (30.6)	(24.6 to 37.4)	32 (18.7)	(13.3 to 25.5)	96 (25.3)	(21.0 to 30.0)
Pelvic exam‖	69 (33.0)	(26.8 to 39.9)	36 (21.1)	(15.4 to 28.1)	105 (27.6)	(23.3 to 32.5)
Rectal exam¶	34 (25.0)	(18.2 to 33.3)	26 (13.1)	(8.9 to 18.7)	60 (17.9)	(14.0 to 22.5)
Prevention Services						
Skin cancer prevention	13 (2.9)	(1.6 to 5.0)	5 (1.5)	(0.6 to 3.7)	18 (2.3)	(1.4 to 3.7)
Breast self-exam§	37 (18.4)	(13.4 to 24.6)	11 (6.5)	(3.5 to 11.6)	48 (13.0)	(9.8 to 16.9)
Diet and nutrition	119 (26.2)	(22.3 to 30.6)	79 (23.9)	(19.5 to 29.0)	198 (25.3)	(22.3 to 28.5)
Tobacco use and exposure	22 (4.8)	(3.1 to 7.4)	23 (7.0)	(4.6 to 10.4)	45 (5.7)	(4.3 to 7.7)
Exercise	81 (17.8)	(14.5 to 21.8)	59 (17.9)	(14.0 to 22.5)	140 (17.9)	(15.3 to 20.8)
Other Screening Tests						
Mammography‡	24 (22.4)	(15.2 to 31.7)	21 (15.7)	(10.2 to 23.2)	45 (18.7)	(14.1 to 24.3)
Prostate-specific antigen test**	12 (16.9)	(9.4 to 28.1)	28 (26.4)	(18.5 to 36.0)	40 (22.6)	(16.8 to 29.6)

* *One hundred nine family practice and 61 internal medicine physicians contributed to the 784 patient visits.*

† *Skin exam vs: Breast exam, 95% CI, 9.0 to 20.0,* P *< .0001; Papanicolaou test: 95% CI, 4.2 to 14.8;* P *< .0001; Pelvic exam, 95% CI, 6.4 to 17.2,* P *< .0001; Rectal exam, 95% CI, −3.0 to 7.2,* P *= .44. Skin cancer prevention vs: Breast self-exam, 95% CI, 6.9 to 14.5,* P *< .0001; Diet and nutrition, 95% CI, 19.7 to 26.4,* P *< .0001; Tobacco use and exposure, 95% CI, 1.3 to 5.5,* P *= .001; Exercise, 95% CI, 12.6 to 18.6,* P *< .0001. All confidence intervals are for the difference in proportions.*

‡ *95% CI indicates 95% confidence interval associated with the percentage of patient-visits.*

§ *Denominator restricted to females aged 20 or over; Family Practice* N *= 201, Internal Medicine* N *= 169.*

‖ *Denominator restricted to females aged 18 or over; Family Practice* N *= 209, Internal Medicine* N *= 171.*

¶ *Denominator restricted to ages 50 or over; Family Practice* N *= 136, Internal Medicine* N *= 199.*

‡ *Denominator restricted to females aged 40 or over; Family Practice* N *= 107, Internal Medicine* N *= 134.*

** *Denominator restricted to males aged 45 or over; Family Practice* N *= 71, Internal Medicine* N *= 106.*

versus 13.6% for internists ($P = .18$). The frequency of skin cancer prevention did not differ with type of provider (2.9% for family practitioners vs 1.5% for internists, $P = .30$).

We were able to assess baseline differences between visits to family practitioners ($N = 454$) and internists ($N = 330$) with respect to office geographic region, office location in a metropolitan statistical area, and the ages of the respective patient populations. More patient visits occurred in the Midwest for family practitioners compared to internists (28.4% vs 19.7%, respectively, $P = .007$), and visits to internists were more likely to occur in a metropolitan statistical area compared to family practitioners (84.8% vs 67.6%, respectively, $P < .0001$). Sixty percent of visits to internists represented patients aged 50 years or older compared to 30% for family practitioners ($P < .0001$).

Our intent was to capture "formal skin cancer screening" in the context of nonillness visits, and we acknowledge that some opportunistic screening in the context of visits for acute problems, chronic problems, presurgery and postsurgery/injury follow-up, and injury or poisoning may have been missed. The main diagnoses associated with these visits were upper respiratory infection, hypertension, and diabetes mellitus. We assessed the frequency of skin examination within the context of these acute and illness visits. The frequency of skin examination and skin cancer prevention services within the context of acute and illness visits ranged from 5% to 7% and 0.6% to 0.9%, respectively. There was no pattern of associated diagnoses for these visits, and it cannot be determined if opportunistic screening was likely to occur.

DISCUSSION

We conducted an analysis of the NAMCS data to describe skin cancer screening and prevention activities in the primary care setting and to compare our findings to the frequency of other cancer screening. We observed that the frequency of skin cancer prevention and screening activities in the primary care setting was lower than other cancer screening and prevention practices for both family practitioners and internists.

Other studies have reported similar findings.[18–25] In a study by Girgis et al.,[18] only 17% of an Australian study population had been screened for skin cancer by a general practitioner in the preceding 12 months based on self-report; however, 28% had received some advice about early detection. Forty-eight percent of respondents to a telephone survey conducted in Rhode Island[19] reported that their general medical physician or nurse practitioner rarely or never examined their skin. Recommendations by a physician to regularly examine skin for signs of skin cancer were reported by 25% of these participants. In another Australian study, 55% of survey respondents reported a skin examination by a medical examiner.[20] The American Cancer Society conducted a survey of physicians' attitudes and practices in early cancer detection. Fifty-nine percent of

internists and 62% of family practitioners discussed skin cancer with their patients.[25] Only 27% and 32% of internists and family practitioners, respectively, cautioned most patients about skin cancer.[25] In a survey of melanoma patients, Geller et al.[22] found that only 20% had a physician skin examination in the year prior to their diagnosis.

Dolan et al.[21] assessed skin cancer control practices in a general medicine practice of 50 physicians. Based on self-report, the results showed that 44% of physicians performed a complete skin examination at the first visit for a new patient 61% to 100% of the time, while only 15% performed these examinations at follow-up visits. More than half of the physicians reported that they infrequently counseled their patients about skin cancer. Heywood et al.[23] conducted a large study on skin screening rates in patients (n = 7,160) seen by general practitioners in Australia. Physicians provided self-report of the preventive care provided at the visit. Only 6% of males and 5% of females defined as being at risk for skin cancer had been adequately screened.

The frequency of recorded skin examinations was assessed in the primary care setting by Federman et al.[24] Skin examination was performed in 18% of patients without skin-related complaints. The frequency of skin cancer examination was much lower when compared to other cancer screening examinations: fecal occult blood testing, rectal examination, sigmoidoscopy, prostate examination, mammography, and Papanicolaou smear. These results are consistent with the findings from our study.

Skin examination during routine care has been proposed as the optimal strategy to reduce the morbidity and mortality associated with skin cancer.[11–14,29] Primary care physicians have a unique opportunity to provide cancer screening and preventive services because a large number of patients are seen during routine health examinations.[15] Further, primary care physicians already manage many dermatologic conditions, including skin cancer.[22] Significant barriers exist to effective skin cancer detection in the primary care setting.[16,17] These barriers include lack of time, knowledge, and ability to diagnose serious skin lesions and other dermatologic conditions.[17,21] Strategies to involve primary care physicians in skin cancer prevention activities have been suggested.[30,31]

The strength of the NAMCS is that data are available on the utilization of health care services related to skin diseases in the ambulatory care setting; the vast majority of care for skin diseases is by office-based physicians. Further, differences between physician specialties as well as by provider type can be evaluated. However, the sample we used was limited due to the small number of patient visits that contributed to the analyses, based on the exclusion criteria and the availability of only 1 year of data. The most significant limitation of this study is related to the method of recording and collecting data. Physicians and/or office staff complete a patient record form and may or may not refer to the patient's medical chart. This type of data collection is subject to reporting and recording errors.[32] Data collected from the patient-visit record form may not be a valid measure of what screening and/or prevention services have been actually provided during a patient visit; substantial overreporting or underreporting may occur. With respect to skin examination, there may be substantial overreporting and misinterpretation of what constitutes a skin examination. Conversely, there may be failure to document skin examinations.[32] A significant limitation to interpreting these data is that it cannot be ascertained which of the health care providers documented as being present for the visit actually provided the skin examination or counseling services. In addition, the results of these data may be skewed because a significant proportion of the patient visits were contributed by a small number of internists (9 physicians contributed 44.5% of the 330 patient visits to internists).

Geographic factors may have affected observed differences in skin examination/skin prevention performance between family practitioners and internists. Interestingly, skin examinations and skin prevention counseling occurred slightly less frequently among internists (although these findings were not statistically significant), even though these visits included an older age patient population. One might expect such services to occur more frequently among older age groups based on current skin cancer screening recommendations. Baselines differences related to visit diagnoses and reasons for visit are less likely to explain differences between physician specialty because our initial inclusion criteria restricted the analysis to nonillness-related visits. Physician age, gender, and years in practice were not available and may have affected observed differences in our data.

Our findings indicate that skin cancer screening and prevention is not being performed as often as other cancer screening and prevention activities in the primary care setting. One explanation may be that the recommendations have been inconsistent.[11–14,33,34] This in turn reflects the lack of randomized trials assessing the impact 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.

This study provides important information on the utilization of health care services for skin cancer prevention and screening in the primary care setting. Strategies to increase the delivery of these services by family practitioners and internists needs to be considered as well as the potential role of other health care providers in the delivery of skin cancer screening and prevention services.

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