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Primary Care Physicians Practicing Preventive Medicine in the Outpatient Setting

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ABSTRACT

Background: Preventive care is an important part of primary care medicine, yet much variation in its practice exists. The aim of this study is to assess physicians' perspectives of practicing preventive medicine and evaluate which topics are deemed most important.

Methods: All primary care medicine providers at two separate academic medical centers (Mayo Clinic, MN and Mayo Clinic, FL) were surveyed via an E-mail questionnaire assessing physicians' perception of the role of preventive medicine during both acute/routine and yearly visits, physicians' perception of patients' response to preventive medicine topics, and which preventive medicine topics are commonly practiced.

Results: Of 445 providers meeting inclusion criteria, a total of 183 (41.1%) responded. Providers were more likely to engage patients in preventive medicine during yearly visits more so than acute visits (3.82 vs. 4.72, range 1–5 Likert Scale), yet providers were very likely to partake in such practices during both visits. Providers perceived that patients received the practice of preventive medicine very well (4.13 on 1–5 Likert Scale). No significant difference between provider practice and patient perception was noted between the two sites, although there was some variation based on clinical experience of the provider. Providers were found to most commonly practice topics recommended by the United States Preventive Services Task Force.

Conclusions: Our study found a high predisposition to practicing preventive medicine. Providers seem to practice according to published evidence-based medicine recommendations.

Keywords: Preventive medicine, primary care medicine, United States Preventive Services Task Force guidelines

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INTRODUCTION

Preventive care is an important component of primary care medicine. The United States Congress charged the United States Preventive Services Task Force (USPSTF) with the task of reviewing scientific evidence in an effort to develop preventive medicine guidelines for

primary care physicians (PCP). These guidelines aim to maximize public benefit by preventing the onset of both acute and chronic illness.[1] Although these guidelines have been shown to be efficacious and are reimbursed by most insurers, there is much hesitation by PCPs in its incorporation into clinical practice.[2]

A study evaluating medical students at 16 US-based medical schools found that even though medical schools are increasing emphasis on USPSTF guidelines in clinical teaching, 3–77% of medical students admitted to never counseling patients.[3] A self-administered questionnaire given to interns, residents, and attending physicians at all Guatemalan teaching hospitals by the Guatemalan Ministry of Health in 2011 noted that all providers, regardless of level of training, are not adequately recommending services and that preventive medicine guidelines need to be emphasized more during medical training.[4]

Numerous studies to date have examined why guidelines are not being practiced.[5-13] Over 290 barriers to preventive medicine discussions with patients have been explored, including lack of time, patient refusal or hesitance, inadequate insurance reimbursement, and lack of physician knowledge.[5,6] A study assessing the average amount of time needed daily to discuss all preventive medicine topics per USPSTF recommendations found that 7.4 h per working day would be required.[5] Another important barrier to acknowledge is physician disagreement with the guidelines.[7-10] Guideline complexity and perceived lack of evidence are other commonly cited barriers.[7,11-13]

Although such barriers exist, a significant portion of physicians do practice preventive medicine.[14-16] Following the finalized prostate-specific antigen guideline publication, over 7000 tweets, with a large portion in support of the recommendation, were observed on the popular social media platform Twitter.[14] Similar studies evaluating the change of clinical practice and decision making after other guideline publications show that physicians do, in fact, incorporate preventive medicine into practice.[15,16]

Considering much discordance exists in whether or not preventive medicine guidelines influence clinical practice, it is important to develop a better understanding of current practice. Furthermore, it is imperative to understand any differences in practice based on the level of training and ascertain whether these differences are geographic in nature. While very little literature has evaluated trends in preventive medicine practices based on experience and geographical location, our study assesses physician perception of preventive medicine, physician perception of patient acceptance, and which clinical preventive medicine practices are considered important in comparison with current USPSTF recommendations.

METHODS

Mayo Clinic Institutional Review Board approval was obtained prior to the initiation of the study.

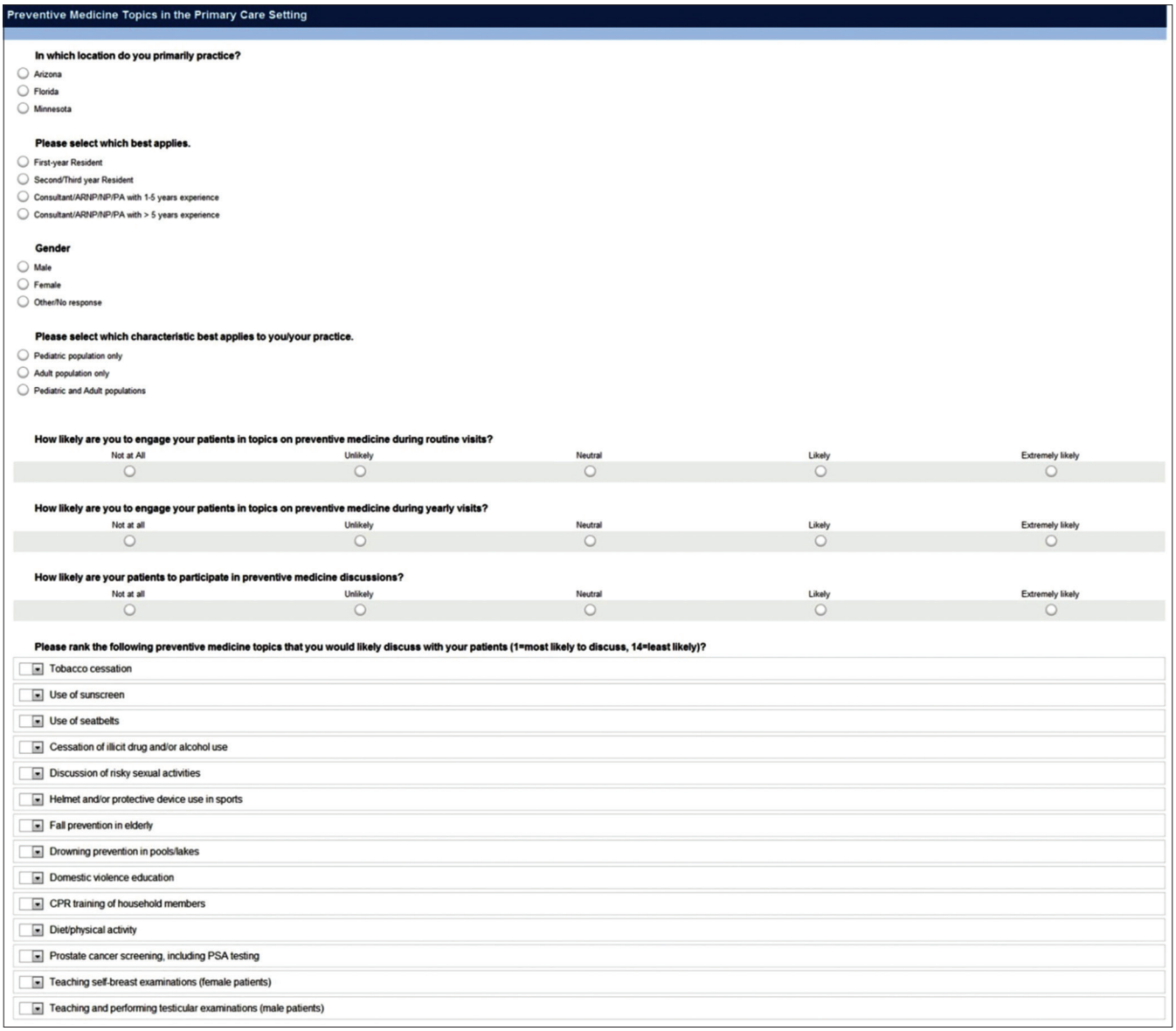
We surveyed all outpatient general medicine providers within the divisions of family and internal medicine at Mayo Clinic in Rochester, MN and Mayo Clinic in Jacksonville, FL. Providers, including advanced registered nurse practitioners (ARNP), physician assistants (PA), residents, and attending physicians, were sent an online questionnaire to complete via E-mail. Three separate E-mail messages were sent 1-week apart with a unique link to the questionnaire. The questionnaire consisted of three main components [Figure 1]. The first component assessed the demographic information of the responder. The second component assessed the likelihood of the responder to incorporate preventive medicine into clinical practice as well as evaluate the responder's perception of the patients' acceptance of such topics during both acute/routine and yearly examinations. The last component assessed which preventive medicine topics were most frequently conducted within clinical practice. A list of these preventive medicine topics was developed by a PubMed search of "preventive medicine topics" and review of all abstracts within the past 3 years in an effort to identify those most commonly cited in publication. The majority of the questions were based on the Likert Scale, with a rating scale for the last question identifying which topics are most commonly incorporated into practice. A score of 1 was used for an option of "not at all," 2 for "unlikely," 3 for "neutral," 4 for "likely," and 5 for "extremely likely."

Statistical analysis

Descriptive analyses comparing the likelihood to incorporate preventive medicine topics into clinical practice by level of training and experience as well as geographic location (Southeast [Mayo Clinic in Jacksonville, FL] vs. Midwest [Mayo Clinic in Rochester, MN]) during both acute/routine visits and yearly visits were made. Comparisons between the most commonly performed preventive medicine topics and current USPSTF and other evidence-based guidelines were also analyzed. Fisher's *t*-test and analysis of variance were used for statistical analysis when comparing subsets within the study.

RESULTS

A total of 445 providers met inclusion criteria in both Mayo Clinic campuses. A total of 41.1% of providers responded. More providers from the Minnesota campus (69.9%) responded compared to the Florida



Preventive Medicine Topics in the Primary Care Setting

In which location do you primarily practice?
- Arizona
- Florida
- Minnesota

Please select which best applies.
- First-year Resident
- Second/Third year Resident
- Consultant/ARNP/NP/PA with 1-5 years experience
- Consultant/ARNP/NP/PA with > 5 years experience

Gender
- Male
- Female
- Other/No response

Please select which characteristic best applies to you/your practice.
- Pediatric population only
- Adult population only
- Pediatric and Adult populations

How likely are you to engage your patients in topics on preventive medicine during routine visits?

Not at All	Unlikely	Neutral	Likely	Extremely likely
○	○	○	○	○

How likely are you to engage your patients in topics on preventive medicine during yearly visits?

Not at all	Unlikely	Neutral	Likely	Extremely likely
○	○	○	○	○

How likely are your patients to participate in preventive medicine discussions?

Not at all	Unlikely	Neutral	Likely	Extremely likely
○	○	○	○	○

Please rank the following preventive medicine topics that you would likely discuss with your patients (1=most likely to discuss, 14=least likely)?
- Tobacco cessation
- Use of sunscreen
- Use of seatbelts
- Cessation of illicit drug and/or alcohol use
- Discussion of risky sexual activities
- Helmet and/or protective device use in sports
- Fall prevention in elderly
- Drowning prevention in pools/lakes
- Domestic violence education
- CPR training of household members
- Diet/physical activity
- Prostate cancer screening, including PSA testing
- Teaching self-breast examinations (female patients)
- Teaching and performing testicular examinations (male patients)

Figure 1: Survey questions

campus (30.1%). Fifty-five of 117 providers (47%) at the Florida campus responded and 128 of 328 providers (39%) at the Minnesota campus responded. Most responses were received by 2nd and 3rd year residents (41.0%) followed by consultant/ARNP/nurse practitioner (NP)/PA with >5 years clinical experience (26.2%). Most providers practiced only adult medicine compared to a combination of adult and pediatric medicine (76.5% vs. 23.5%). An almost equal distribution in sex was present [Table 1].

During acute visits, providers were likely to engage patients in topics on preventive medicine [Table 2a]. On a Likert Scale (1 = not at all, 5 = extremely likely), an average rating of 3.82 was measured in the group. When comparing the Florida and Minnesota campuses, a very similar response was seen between subsets, with an average rating of 3.87 from the Florida campus and 3.80 from the Minnesota campus (P = 0.363). Interestingly, when comparing all providers based on level of training, the consultant/ARNP/NP/PA subsets had a higher average (4.06) compared with the resident subsets (3.66) (P = 0.10) [Table 2b].

During yearly visits, providers were more likely to engage patients in preventive medicine topics, with an average score of 4.73, with very little difference between the Florida and Minnesota subsets (4.64 vs. 4.77, P = 0.19) [Table 3a]. Variation was seen based on level of training and experience, as 1st year residents had a slightly lower average than the other respondent subsets (P = 0.05) [Table 3b].

Providers perceived that patients would be willing to participate in preventive medicine discussions, with an average score of 4.13 on the Likert Scale, with very similar responses between both sites (P = 0.66) [Table 4a]. Interestingly, there was a difference in perception among

level of training and experience ($P = 0.01$) [Table 4b]. Providers with >5 years' experience had a higher score (4.46) compared with those <5 years (4.00). Similarly, 2nd and 3rd year residents had a slightly higher score (4.05) when compared to 1st year residents (3.95).

The final question assessed which preventive medicine topics are routinely practiced [Figure 2]. As a group, the most discussed items included smoking cessation, diet/physical activity, and cessation of drugs and/or alcohol as first, second, and third most common, respectively. Subsets from each site had the same practice. When making comparisons based on level of training, 1st year residents, 2nd and 3rd year residents, and providers with >5 years' experience showed the same results, yet providers with 1–5 years' experience were more likely to practice topics involving diet/physical activity, tobacco cessation, and cessation of illicit drugs/alcohol as the first, second, and third options, respectively. Of all participants, the topics least likely to be practiced included cardiopulmonary resuscitation (CPR) training of household members, drowning prevention, and teaching/performing self-testicular examinations. Identical findings were present when dividing the participants based on location. Regardless of the level of training, all respondents were least likely to discuss CPR training of household members. Teaching and performing self-testicular examinations and drowning prevention were least likely to be discussed in all groups, except that providers with 1–5 years' training included domestic violence education instead of self-testicular examinations as topics least likely to be incorporated with patients.

The topics most likely discussed in practice compared with current USPSTF recommendations are highlighted in Table 5.[17-27] Of the 5 most common preventive

Table 1: Responder demographics

	Both sites (%)	Minnesota (%)	Florida (%)	*P*
n (%)	183	128 (69.9)	55 (30.1)	
Sex				0.45
Male	102 (55.7)	69 (53.9)	33 (60)	
Female	81 (44.3)	59 (46.1)	22 (40)	
Experience level				0.81
First-year resident	39 (21.3)	27 (21.1)	12 (21.8)	
Second/third year resident	75 (41.0)	54 (42.2)	21 (38.2)	
Consultant/ARNP/NP/PA 0-5 years	21 (11.5)	14 (10.9)	7 (12.7)	
Consultant/ARNP/NP/PA >5 years	48 (26.2)	33 (25.8)	15 (27.2)	

Cumulative responses and frequencies with averages illustrated in table. *T*-test and analysis of variance used for statistical analyses. ARNP=Advanced registered nurse practitioners, PA=Physician assistants, NP=Nurse practitioner

Table 2a: Reponses to question 5 based on location

How likely are you to engage your patients in topics on preventative medicine during acute/routine visits?			
Answer options	**Practice location (%)**		**Rating average**
	Florida	**Minnesota**	
Not at all	0 (0)	1 (0.8)	
Unlikely	5 (9.1)	14 (10.9)	
Neutral	12 (21.8)	34 (26.6)	
Likely	23 (41.8)	40 (31.3)	
Extremely likely	15 (27.3)	39 (30.5)	
	3.87	3.80	3.82

Cumulative responses and frequencies with averages illustrated in table

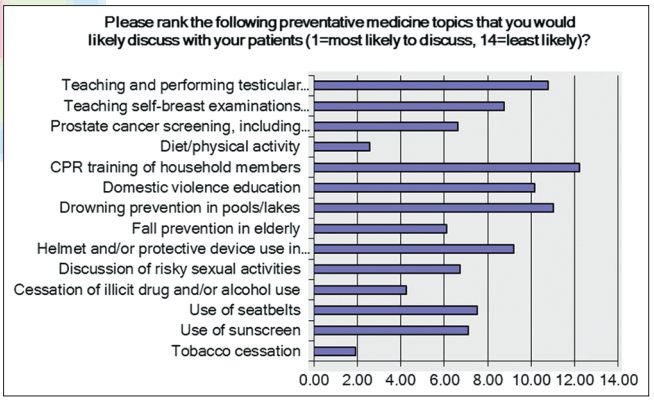


Figure 2: Representation of topics providers are most likely to practice with patients (survey question 8). Average of all responses per topic

Table 2b: Responses to question 5 based on experience

How likely are you to engage your patients in topics on preventative medicine during acute/routine visits?					
Answer options	**First-year resident (%)**	**Second/third year resident (%)**	**Consultant/ARNP/NP/PA with 1-5 years' experience (%)**	**Consultant/ARNP/NP/PA with >5 years' experience**	**Rating average**
Not at all	0 (0)	1 (1.3)	0 (0)	0 (0)	
Unlikely	5 (12.8)	8 (10.7)	2 (9.5)	4 (8.3)	
Neutral	9 (23.1)	21 (28)	4 (19.0)	12 (25)	
Likely	22 56.4)	25 (33.3)	5 (23.8)	11 (22.9)	
Extremely likely	3 (7.7)	20 (26.7)	10 (47.6)	21 (43.8)	
	3.59	3.73	4.10	4.02	3.82

Cumulative responses and frequencies with averages illustrated in table. ARNP=Advanced registered nurse practitioners, PA=Physician assistants, NP=Nurse practitioner

medicine practices, 3 are strongly supported by USPSTF, 1 is deemed to be neutral/indeterminate, and 1 in which the USPSTF recommends against. Of the 5 least frequently practiced preventive medicine topics, 3 have no current USPSTF recommendation, 1 indeterminate, and 1 against.

DISCUSSION

Our study found that providers are likely to discuss and practice preventive medicine with patients during both acute/routine and yearly visits. Providers were more likely to incorporate preventive medicine during yearly visits, likely given the fact that more time is generally allocated for these visits compared to acute/routine visits throughout the year. Interestingly, providers do note that these discussions and practices are well received by patients. Of the preventive medicine topics most discussed in the literature, providers are likely to practice and spend more time on recommendations with stronger evidence based medicine, such as those published by the USPSTF.

We found that there was very little difference in regard to clinical practice between the two clinical sites surveyed. Almost equal scores were given by providers at the Mayo Clinic, MN and Mayo Clinic, FL sites in regard to practice during acute/routine visits and yearly visits and providers' perception of patients' acceptance of such recommendations. No difference was noted in which recommendations were most commonly practiced. Both sites deemed smoking cessation, diet/physical activity, and cessation of recreational drugs and alcohol as the most important topics. The congruency indicates that guidelines are being communicated among both trainees and providers on a national level and preventive medicine practice may be higher than previously thought.

Interestingly, there was some variation in practice based on provider training and experience. During both acute/routine and yearly visits, providers of all levels had similar practices, although the resident group was less likely to practice preventive medicine. Similarly, the resident group and those with <5 years' experience did not perceive patient acceptance was as high as did the group with >5 years' experience. One likely explanation is that with more clinical experience, providers are able to build stronger relationships, fostering better communication. As well, after following with a provider for a longer period of time, it is more likely that many of the acute issues a patient may initially present with when establishing care have resolved, therefore allowing more time for preventive care.

The most commonly selected preventive medicine topics by survey respondents were more likely to be supported by USPSTF guidelines when compared to the least commonly selected. Data were similar throughout both locations as well as the experience level of the provider. Interestingly, prostate cancer screening was ranked as the fifth most common preventive medicine practice, of which the USPSTF recommends against. Much debate has revolved around this recommendation; therefore the authors had expected it ranked higher than the fifth most common topic. Although many preventive medicine topics do not have a clear-cut support statement from the USPSTF, of which the USPSTF has recognized in its past publications,[1,12,13] our data show that providers generally practice those guidelines supported by USPSTF, presumably those with the most evidence-based support.

Although the primary goal of our study was to determine the physicians' likelihood to practicing preventive medicine, it should be noted that the USPSTF recommendations do help guide physicians. Although there were no direct comparisons based on the level

Table 3a: Reponses to question 6 based on location

How likely are you to engage your patients in topics on preventative medicine during yearly visits?			
Answer options	**Practice location**		**Rating average**
	Florida	**Minnesota**	
Not at all	0	0	
Unlikely	2	2	
Neutral	4	4	
Likely	6	15	
Extremely likely	43	107	
	4.64	4.77	4.73

Cumulative responses and frequencies with averages illustrated in table

Table 3b: Responses to question 6 based on experience

How likely are you to engage your patients in topics on preventative medicine during yearly visits?					
Answer options	**First-year resident (%)**	**Second/third year resident (%)**	**Consultant/ARNP/NP/PA with 1-5 years' experience (%)**	**Consultant/ARNP/NP/PA with >5 years' experience (%)**	**Rating average**
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	
Unlikely	0 (0)	3 (4)	0 (0)	1 (2.1)	
Neutral	4 (10.3)	3 (4)	0 (0)	1 (2.1)	
Likely	10 (25.6)	7 (9.3)	2 (9.5)	2 (4.2)	
Extremely likely	25 (64.1)	62 (82.7)	19 (90.5)	44 (91.7)	
	4.54	4.71	4.90	4.85	4.73

Cumulative responses and frequencies with averages illustrated in table. ARNP=Advanced registered nurse practitioners, PA=Physician assistants, NP=Nurse practitioner

Table 4a: Reponses to question 7 based on location

How likely are your patients to participate in preventative medicine discussions?			
Answer options	**Practice location (%)**		**Rating average**
	Florida	**Minnesota**	
Not at all	0 (0)	0 (0)	
Unlikely	4 (7.3)	2 (1.6)	
Neutral	11 (20)	21 (16.4)	
Likely	16 (29.1)	61 (47.7)	
Extremely likely	24 (43.6)	44 (34.4)	
	4.09	4.15	4.13

Cumulative responses and frequencies with averages illustrated in table

of evidence of the USPSTF recommendations, the study suggests that physicians do take the evidence into consideration in clinical practice. Further studies evaluating guidelines practiced solely on grade of evidence would be interesting to assess, especially since there is still some debate regarding recommendations.

In addition, further studies assessing practice at institutions outside of the United States will be helpful to assess whether concordance exists on an international level and allow for the planning of different interventions to help increase compliance. Although our study only assessed providers within the

Table 4b: Responses to question 7 based on experience

How likely are your patients to participate in preventative medicine discussions?					
Answer options	**First-year resident (%)**	**Second/ third year resident (%)**	**Consultant/ARNP/NP/PA with 1-5 years' experience (%)**	**Consultant/ARNP/NP/PA with >5 years' experience (%)**	**Rating average**
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	
Unlikely	1 (2.6)	3 (4)	1 (4.8)	1 (2.1)	
Neutral	10 (25.6)	15 (20)	6 (28.6)	1 (2.1)	
Likely	18 (46.2)	32 (42.7)	6 (28.6)	21 (43.8)	
Extremely likely	10 (25.6)	25 (33.3)	8 (38.1)	25 (52.1)	
	3.95	4.05	4.00	4.46	4.13

Cumulative responses and frequencies with averages illustrated in table. ARNP=Advanced registered nurse practitioners, PA=Physician assistants, NP=Nurse practitioner

Table 5: Likelihood of preventive medicine topics practiced by providers compared with current USPSTF recommendations

Ranking	Topic	USPSTF recommendation	USPSTF recommendation grade	Comment
1	Tobacco cessation	Supports	A	-
2	Diet/physical activity	Neutral/indeterminate	C	Population should be selected based on comorbidities
3	Cessation of illicit drug and/or alcohol use	Supports (alcohol cessation)	B	-
4	Fall prevention in elderly	Supports vitamin D and exercise in prevention; recommends against in-depth multifactorial analysis on all patients	B, C	-
5	Prostate cancer screening	Against	D	-
6	Discussion of risky sexual activities	Supports	B	Perform only in sexually active adults
7	Use of sunscreen	Indeterminate	I	Perform if risk factors present
8	Use of seatbelts	Indeterminate	I	-
9	Teaching self-breast exams	Against	D	-
10	Use of helmet and/or protective device in sports	None	-	Last recommendation in 1996, will not update; USPSTF states update will have no additional benefit
11	Domestic violence education	Indeterminate	I	-
12	Teaching and performing testicular examinations	Against	D	-
13	Drowning prevention in pools/ lakes	None	-	Last recommendation in 1996, will not update; USPSTF states update will have no additional benefit
14	Cardiopulmonary resuscitation training of household members	None	-	-

USPSTF=United States Preventive Services Task Force

United States, it gives evidence to the importance of guidelines and demonstrates that clinical practice can be altered based on them. Other countries experience similar issues in trying to identify the extent of which guidelines are followed, therefore further studies in an international setting will be helpful to understand such practice.[4]

Several limitations were present in our study. The study type was a questionnaire sent to primary care providers. Although a higher than expected response rate was received, not all providers that were contacted had completed the survey. The participants included providers at a large academic medical center where evidence-based medicine is strongly encouraged. Therefore, the responses and practices of the providers may not be representative of all institutions nationwide. The preventive medicine topics used for the final survey question attempted to obtain a broad perspective of physician practice based on commonly cited publications over the past 3 years and are not inclusive of all preventive medicine subjects in clinical practice.

CONCLUSIONS

Providers are likely incorporating preventive medicine topics into everyday clinical practice. Little variation in practice was seen based on location, yet providers with a higher level of experience and training are more likely to integrate preventive medicine into practice. Providers focus on those topics that are evidence-based.

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