

# Smoking Screening and Management in Primary Care Practices

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**Objectives:** To describe the screening and management of patients who smoke by primary care physicians and to review practice factors associated with smoking services.

**Design and Methods:** A descriptive study based on physician and patient questionnaires and medical record retrospective reviews.

**Setting and Subjects:** Forty-five nonacademic primary care practices, including 160 physicians (whose subspecialty is family practice, internal medicine, or general practice) in 4 Midwest states and 4879 adult patients who completed questionnaires and consented for medical record review.

**Main Outcome Measures:** The a priori hypothesis was that screening by physicians would detect most persons who smoke, but that the lack of systematic methods to screen, intervene, or follow-up would limit the provision of smoking cessation services.

**Results:** Eighty-one percent of all patients and 93% of

patients who smoked in the past 2 years reported being asked if they smoked. Patients who smoked reported being told to quit (78%), discussing a quit date (60%), receiving a nicotine prescription (20%) or referral (25%) at higher rates than prior reports. Patients with coronary heart disease (CHD) or CHD risk factors, who smoked more, visited the physician more, or who wanted help were more likely to receive smoking cessation services. Few practices had developed systems to routinely provide services, and a lack of systems was associated with fewer interventions.

**Conclusions:** Physician screening and management of their practice patients is higher than reported in population surveys. Most patients who smoke report that they were asked whether they smoke, but smoking status is not routinely documented or updated. Significant variability is noted between physicians in smoking-related screening and interventions, and proved methods to improve services are infrequently used.

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**P** RIMARY CARE physicians and practices have been the target of many recommendations and interventions to improve the screening, management, and monitoring of patients who smoke. Asking all adult patients if they smoke, and providing interventions or referral for persons who would like to stop smoking, is considered a standard of care by physicians and health organizations. The Department of Health and Human Services set a goal that most primary care providers would routinely advise cessation and provide assistance and follow-up to all tobacco-using patients by the year 2000.<sup>1</sup> This is an important goal, as changing practice organizational systems to routinely provide smoking cessation services has led to improvements in the identification and interventions for patients

who wish to stop smoking.<sup>2-4</sup> Evidence suggests that physician interventions increase the frequency of quit attempts in their patients who smoke<sup>5-8</sup> and may increase long-term cessation rates.<sup>3,9</sup>

## See Practice Commentary at end of article

Population-based surveys reported low, ranging from 37% to 50%, rates of people ever receiving smoking screening and advice from physicians.<sup>10-12</sup> Because population surveys include persons with infrequent contact with their primary care provider or with no such provider, these reports may underestimate actual service delivery for patients with regular visits to a primary care provider. In addition, population surveys are unable to

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## SUBJECTS AND METHODS

### STUDY POPULATIONS AND PARTICIPATION

The practice population included primary care practices within 62 km of Madison, Wis, Iowa City, Iowa, Eau Claire, Wis, and Minneapolis, Minn. Since the HEART interventions are practice based, practices were recruited rather than individual physicians. Eligible practices had 2 to 8 primary care physicians, forming most of the practice group. Practices with more than 15 physicians of any specialty, academic practices, and those with prior participation in prevention studies were excluded because of intervention requirements. Practices were required to have organizational autonomy, including the ability to change their medical records and organizational systems.

All eligible practices in each region were contacted. Interested, eligible practices were admitted into the study if they had a clear majority of primary care physicians consent to participate. Practices and physicians consenting to participate in HEART agreed to baseline and postintervention medical record reviews, patient and physician surveys, attendance at a conference for physicians and office staff, and randomization to an intervention group. Of the 86 eligible practices contacted, 52 (60%) consented to participate and 45 (52%) were enrolled; 13 in the Madison region, 11 in the Minneapolis region, 11 in the Iowa City region, and 10 in the Eau Claire region. Practices recruited and participating represent the scope of practices in these regions, including urban and rural, small and large, affiliated and not affiliated with health maintenance organizations, different staffing structures, and physician specialty.

The physician population included family physicians, primary care internists, or general practitioners who had practiced at least 1 year at the site and did not expect to leave their practice within the next 2 years. Physicians were limited to those who treated adult patients because we intervened on the screening and management of several risk factors (cholesterol, hypertension, and smoking) in the overall study. Of the 202 primary care physicians in the participating practices, 177 were eligible, and 160 (90%) consented to participate. Physician questionnaires were distributed at conferences or mailed, with phone and mail reminders as needed to obtain a 100% response rate.

Patients aged 21 to 70 years, without a diagnosis of cancer, terminal illness, or recent major surgery, and with at least 2 practice visits during the past 2 years formed the potential study patient population. Patient names were obtained from appointment records starting at a baseline date and going back until 100 unique male and 100 unique female patients of each participating physician were identified. Each potential patient was given the opportunity to consent to participate, including permission for a medical record review, according to the consent procedures of the University of Wisconsin Committee for the Protection of Human Subjects and ethical review boards of participating organizations. A large original patient sample was required because of the need for eligibility screening and medical record review consent requirement. To meet trial statistical requirements of 35 patients per physician, 15 639 patients were identified from patient appointment records.

### DATA COLLECTION

Data collection was designed to provide multiple data sources for a comprehensive evaluation of physician screening and management of patient smoking. Data reported here were collected using patient questionnaires, physician questionnaires, and medical record reviews in 1993-1994. The information collected included evaluations of overall heart disease prevention services, but this study is limited to data pertinent to smoking cessation. Initial brief patient questionnaires, along with a consent to review medical records, were mailed to the patients identified from the patient log, followed by a second mailing of the same forms 2 weeks later. Two weeks after the second mailing, longer questionnaires were mailed to all consenting patients, and the medical record reviews were initiated the same week. The HEART project-trained staff reviewed each medical record twice for accuracy at the practice site and entered this information directly into a computer database.

The patient questionnaire asked about personal health history, smoking status, and whether anyone at their clinic had asked if they smoked. If they smoked, they were asked how long they had been smoking; how many cigarettes per day they smoked; and whether anyone at their clinic had recommended that they quit, helped set a quit date, prescribed nicotine replacement, referred them to a quit smoking program, or asked them to return for further discussion. Patients were also asked if they wanted their physician to help them quit smoking. The medical record review looked for documentation of smoking status and documentation date and location. Documentation of cessation advice, prescription, referral, or follow-up was recorded, as was information on other CHD risk factors. Physician questionnaires asked for estimates of their own smoking screening and management of patients, assessed attitudes toward the practice provision of these services, and asked about their perception of patient attitudes and responses to smoking management.

### STATISTICAL ANALYSIS

For the analysis, we used the patient report of smoking screening, advice, and referral as the best indicators, given the frequent lack of medical record documentation, and used the medical record as the best source of nicotine prescription and diagnosis of heart disease, hypertension, diabetes, and high cholesterol (defined as highest total cholesterol level, ie,  $>6.2$  mmol/L [ $>240$  mg/dL], in the medical record in the last 5 years), given potential patient misclassification. We compared information from both the patient questionnaire and the medical record to describe their congruence in reporting smoking screening and management.

We hypothesized that smoking screening and management at the practice level would exceed past reports and that the existence of practice organizational aids, such as a problem list or record reminders, would be directly related to smoking screening and management. We also hypothesized that management would be directly related to older patient age, greater number of visits and years of smoking, presence of or risk factors for CHD (including diabetes, hypertension, or high cholesterol level), and patient interest in stopping smoking. Descriptive, bivariate, and  $\chi^2$  analyses were done with the Statistical Package for the Social Sciences (SPSS Inc, Chicago, Ill) and the box and whisker analysis of the Statistical Analysis System (SAS Institute Inc, Cary, NC).



assess physician or practice characteristics that may be associated with screening and intervention rates or variability between physicians and practices. Physician self-reports have been shown to overestimate preventive service delivery, while medical record reviews may underestimate activities because of failure to document.<sup>13</sup> Comprehensive evaluations of actual service delivery are needed to assess current primary care smoking cessation services accurately and to direct efforts to improve smoking services in primary care organizations.

We report on smoking cessation services in primary care medical practices collected as baseline information for the Health Education and Research Trial (HEART), which is a randomized clinical trial testing interventions to improve coronary heart disease (CHD) prevention services in primary care practices. Our objectives are to provide a practice-based study of services to screen, manage, and monitor patients who smoke; to examine patient, provider, and organizational characteristics related to the provision of services for patients who smoke; and to describe physician and practice variability in the delivery of smoking cessation services. We examined patient and physician questionnaires and retrospective medical record reviews to evaluate the smoking-related preventive services in nonacademic, primary care practices. We also examined practice system and organizational characteristics to determine their relationship to services provided.

## RESULTS

Of the 8039 patients who returned the initial brief questionnaire, 5423 (67%) were initially eligible, consented to participate, and completed the longer questionnaire. Of these patients, 4879 (90%) had medical records available and were eligible based on the criteria of 2 visits within the past 2 years. Participation rates were similar to our expectations that were based on previous primary care recruitment experience. Patients who responded and consented to participate were more likely to be female (56% vs 44%), older (mean age, 48 vs 44 years), and white than those who did not consent.

Fifty-eight percent of the patients reported ever smoking and 23% reported smoking in the last 2 years. Of the respondents who had smoked in the last 2 years, 75% (n=825) were smoking at the time of the survey and 52% had stopped smoking at least once in that period. For the analysis of practice smoking management, any respondent who had smoked in the past 2 years (n=1103) was included, rather than including only patients smoking at the time of the survey. The analysis group was defined this way because of the high relapse rate of people who have stopped smoking and to provide the broadest possible view of the interventions that could have occurred in the practices.

Age was inversely related to smoking in the last 2 years ( $P<.001$ ), and a higher percentage of females than males smoked, with 24% of the females who reported smoking having been pregnant in the last 5 years. Patients who had less education, less income, and no in-

Table 1. Smoking Prevalence by Patient Characteristics

	No. of Patients % of Overall Population	No. of Patients % of Smokers (n=1103)
All patients	5423 (67)	1405 (26)
Age group, y		
<40	60 (1)	20 (3)
41-49	1022 (19)	272 (25)
50-59	1054 (19)	215 (20)
60-69	897 (16)	171 (19)
≥70	1418 (26)	322 (23)
Sex		
Female	2492 (46)	629 (44)
Male	2092 (39)	496 (23)
Education		
High school	1192 (22)	272 (23)
High school +	1636 (30)	411 (29)
College graduate	135 (2)	20 (1)
Race		
White	4630 (85)	1025 (73)
Black	10 (0)	5 (0)
Coronary heart disease	64 (1)	19 (1)
Diabetes	48 (1)	9 (1)
Hypertension	160 (3)	30 (3)
Cholesterol >6.2 mmol/L >240 mg/dL	435 (8)	75 (5)
Income		
<\$6000	169 (3)	44 (3)
\$6000-\$10000	228 (4)	50 (4)
>\$10000	324 (6)	20 (1)

\* $P<.001$  by  $\chi^2$  test.

† $P<.05$  by  $\chi^2$  test.

‡ $P<.01$  by  $\chi^2$  test.

\$ $\chi^2$  Analysis of patients with and without this characteristic.

surance were more likely to report smoking (Table 1). Compared with the overall sample, fewer patients with diagnosed CHD reported smoking, but approximately one fifth of the patients with CHD, hypertension, diabetes, or high cholesterol level (highest cholesterol level,  $>6.2$  mmol/L [ $>240$  mg/dL]) reported smoking in the previous 2 years. Of those who had smoked in the past 2 years, only 46% wanted their physician to help them stop smoking and, when asked, "If my doctor told me to stop smoking, I would stop," 7% strongly agreed, 33% agreed, 31% disagreed, 5% strongly disagreed, and 23% did not answer.

## SCREENING OF SMOKING STATUS

The rates at which patients answered yes to the question, "In the past 2 years, did anyone in your clinic ask if you smoke?" are given in Table 2. Significantly more patients who said they smoked in the last 2 years reported being asked about smoking (93%) than nonsmokers (78%) ( $P<.001$ ), and this did not vary by age, sex, or education. Having a diagnosis of CHD, smoking more than 10 cigarettes per day, and more practice visits increased screening for all patients and those who smoked. The diagnosis of hypertension, diabetes, or high chole-

Table 3. Agreement of Smoking Status by Patient Characteristics

Patient Characteristics	Patient-reported Smoking Status			
	Smoker	Former Smoker	Never Smoker	Unknown
	N (%)	N (%)	N (%)	N (%)
All patients	48	75	77	84
Age group				
<40	32	63	88	69
40-49	18	30	77	87
50-59	52	78	72	74
60-69	40	70	74	86
≥70	40	82	76	84
Sex				
Female	34	78	74	63
Male	14	27	77	87
Education				
<High school	34	66	77	84
High school	12	72	77	70
College/other degree				
Yes	104	243	488	634
No	92	77	76	86
History of diabetes				
Diagnosed/medicated	45	89	74	81
Diagnosed only				
Yes	104	243	488	634
No	92	77	76	86
Medication				
Yes	104	243	488	634
No	92	77	76	86
Time with physician				
<2	104	243	488	634
≥2	92	77	76	86
Smoking status documentation				
Consistent medication	44	70	72	76

\*Overall N=4879 (116 patients did not answer smoking screening question on questionnaire).

†P≤.05 by  $\chi^2$  test.

‡P≤.01 by  $\chi^2$  test.

§P≤.001 by  $\chi^2$  test.

||An additional 35% of past smokers were documented as nonsmokers but smoking history was not documented.

terol level increased screening for patients who smoke. Overall, youngest patients and those with CHD were screened most often.

Medical record documentation of smoking status was inconsistent and incomplete and often differed from the patient's report. In the overall sample, documentation of smoking status at any time was in 81% of the medical records, but 39% of these records had no update in smoking status in the last 2 years. Current smokers had their status updated in the last 2-year period 78% of the time. If status was updated within the past 2 years, the status was more likely in agreement with patient reports. For the patients who reported currently smoking, 9% had no smoking status recorded, 14% were incorrectly identified as nonsmokers, and 76% were correctly identified in the records. Former smokers had no status documented in 18% of the records, 5% were incorrectly identified as

current smokers, and 2% were identified as never having smoked.

We also assessed the "most accessible" medical record location of smoking status information, using a hierarchy of the problem list as most accessible, then a database or flowsheet, next the visit note, and any other location as the least accessible when reviewing the record. The most accessible smoking status medical record notation of 15% of patients was a problem list; for 34%, it was found on a database or flowsheet; for 22%, a visit note; and for 9% of the records, it could only be found on a hospital or consultation summary. Nineteen percent of patient records had no smoking status documented.

## SMOKING CESSATION MANAGEMENT

The practice management of patients who smoke is described by patient subgroup in Table 3. Older patients, those with more visits, those who smoked more cigarettes per day or smoked for a longer time, those with CHD or CHD risk factors, and those who stated that they wanted their physician to help them stop smoking were the most likely to report receiving advice to stop smoking or an intervention to assist them to stop. Being told to stop smoking was the most common smoking cessation intervention, regardless of patient characteristics. Interventions such as setting a quit date, prescribing nicotine replacement therapy, referring to a smoking program, or arranging follow-up visits occurred at lower rates, possibly because these interventions require more time and also require a commitment from the patient. In fact, these interventions were reported twice as often by patients who said they wanted their physicians to help them quit (Table 3). A minority of patients reported specific counseling by their physician (16%) or being told to follow-up for further evaluation and interventions (5%).

It is clear that patients report more smoking screening and management than is documented in their medical records (Table 4); however, physician estimates of their smoking screening and management of patients who smoke are very close to patient reports of most services, with the exception of nicotine prescriptions for patients who smoke. In looking at the agreement of the medical records and patient questionnaires (Table 4), we found that the sensitivity, which measures patient agreement with what is documented in the medical record, is very high on all measures except prescriptions. Specificity, which looks at the medical record documentation agreement with the services reported by the patient, is very low for counseling services and highest for prescriptions.

## PHYSICIANS, PRACTICES, AND SERVICE PROVISION

Physicians reported strong attitudes about the effect of smoking: 95% of physicians stated that smoking had a "large" effect on CHD, and 4% stated that it had a "modest" effect. About advice, 82% of the physicians believed that smokers are receptive to their advice to stop smoking.



Table 3. Smoking Management Practices: Will Have Smoked Within 3 Years (n=149)

	Patient History and/or Smoking Management					
Practice and Practice	Asked	Offered	Alcohol	Referral to	Follow-up	Physician
Smoked in last 3 years	71	51	48	24	5	16
Age group, years						
25-30	60	50	29	14	2	0
31-40	7	2	10	2	0	2
41-50	40	12	21	7	3	4
51-60	8	20	20	30	0	1
61-70	87	24	27	30	2	10
Sex						
Female	75	38	16	24	0	16
Male	40	13	32	24	5	1
Education						
High school	45	31	17	7	0	3
Some college	77	20	30	24	5	16
College graduate						
Yes	24	70	28	35	2	2
No	76	30	20	24	3	15
Physician's specialty or						
Internal medicine	88	40	22	20	1	20
Obstetrics						
Yes	72	12	1	14	2	10
No	36	3	27	30	0	20
Physician's age						
Under 40	60	50	10	22	0	10
Year smoked						
Yes	23	3	2	7	0	3
No	38	48	20	20	0	10
Offered cessation						
Yes	62	45	36	19	0	1
No	74	6	12	15	5	15
Physician's smoking						
Active or quit smoking						
Yes	88	60	24	34	7	20
No	40	30	24	16	0	15

\*Patients were asked specifically, "Did you receive any advice to stop smoking from your doctor?"

†P≤.001 by  $\chi^2$  test.

‡P≤.05 by  $\chi^2$  test.

§P≤.01 by  $\chi^2$  test.

ing, and 73% believed that smokers are receptive to advice from office staff. The leading reasons physicians cited for not providing CHD prevention services were lack of time, 89%; nonprevention visits, 89%; lack of prevention systems, 87%; lack of staff for prevention assistance, 81%; lack of financial reimbursement for prevention services, 68%; patients not thinking that prevention is important, 45%; and lack of community resources for referral, 45%. Overall, 64% of physicians reported dissatisfaction with their practice's services for smoking counseling. Only 49% have a routine established for smoking screening, and 38% have an established system for cessation services. Less than one fourth of the physicians reported using a periodic patient questionnaire that includes smoking status, and only 9% used a chart-labeling system to identify patients with risk factors including smoking.

Physician specialty or sex had no significant effect on smoking screening, but physicians in practice 1 to 4 years were significantly more likely to ask all patients if they smoked than were physicians in practice 5 years or

longer (87% vs 80%;  $P<.01$ ). Practice characteristics, such as number of physicians or rural or urban location, had no significant effect on patients screened for smoking.

A wide variability in service provision by physicians studied reflects the lack of systems and routines for smoking interventions. The actual range of all smoking management services across physicians was 0% to 100%. The SDs of services ranged from 13% for referrals to smoking programs to more than 20% for asking if patients smoked and providing interventions to assist patients to stop smoking (Figure). Services were low overall for many interventions, including physician counseling and follow-up visits. The variation in service provision between practices was substantially less, suggesting that practices were more alike in service provision and that the largest variations are among physicians (clinic data not shown). The lack of systems for reminding physicians to intervene has an important influence on interventions. If the physician had smoking status recorded on a medical record problem list, 90% of patients reported that they were told to stop smoking, compared

Table 4. Screening and Management of Smoking

	Comparison #2				
	Physician Estimate, %	Patient Report, %	Medical Record Documentation, %	Sensitivity, %†	Specificity, %‡
Smokers					
Advised to quit or quit	79	81	68	68	86
Management					
Advised to quit	69	71	47	48	80
Quit date set	57	60	44	44	88
Wide area nicotine patch	60	48	41	40	86
Referral to smoking program	26	25	6	7	76

\*Internal or external to the practice.

†Specificity indicates medical record documentation agreement based on patient report.

‡Sensitivity indicates patient reports agreement based on medical record documentation.

§For smokers in past 2 years only.

||Mean percentage of physician estimates of services they provide to patients.

#Patch or gum.

with 69% if recorded status was more difficult to find in the record and 44% if smoking status was not documented ( $P < .001$ ).

## COMMENT

Our study of 45 practices, including almost 5000 patients, provides new information concerning the way tobacco use is being addressed by real-world primary care practices. Our study of practices in 1993-1994 examines medical records and patient questionnaire responses to determine how well physicians ask, advise, assist, or arrange follow-up for patients who smoke and whether physicians document their activity. The use of systematic approaches to smoking screening and management, such as establishing a practice routine for smoking status (eg, smoking as a vital sign), using nonphysician providers to assist with screening and counseling, and developing reminders and follow-up systems were used by few practices in this study. Most striking is the variability among physicians in their provision of screening and management, which is likely caused by the lack of systematizing of these tasks. Most patients in this study, including 93% of patients who smoke, report that clinicians screened for smoking, which is higher than previously reported population studies,<sup>10-12</sup> but it is difficult to compare our data with these reports because of the limited number of practices studied. However, a much smaller percentage of smokers receive the essential next-step specific counseling and assistance from their clinician to help them quit successfully.

Our practice-based study found that physicians in these practices are asking most patients whether they smoke and that they are even more effective at screening patients who are currently smoking, have CHD or CHD risk factors, or smoke more cigarettes. As expected, physicians do better in asking patients whether they smoke if the patients have more practice visits. A new finding is that younger adults are screened most often, which is important because of the increasing numbers of young smokers.

Practice management of patients who smoke still lags behind recommendations. Our study shows that 78% of

smokers are advised to stop smoking, but substantially fewer receive specific assistance for smoking cessation, such as discussing a quit date, prescribing nicotine replacement therapy, or arranging referral or follow-up. This compares with previous studies that used population surveys to ask about contacts with any health care providers, found that approximately half the responding smokers reported that their physicians had ever advised them to stop smoking, and estimated a positive trend in smoking advice as modest during the last decade.<sup>10-12</sup> Physicians seem to be targeting their management efforts to those patients at higher risk (patients with CHD, who smoke more cigarettes, or who have smoked longer) and to the patients who have more practice visits, which is also consistent with comments in previous studies.<sup>10-12</sup> The discussion of quit dates with most (60%) of patients who smoke is positive and indicates that physicians are aware of this important intervention.

The low rates of detailed counseling, nicotine replacement therapy, and follow-up visits in this study document the need for improvement in smoking management, especially with the physicians who do not provide these services to any of their patients who smoke. Our study shows that primary care physicians provide less smoking management to younger patient groups, which is unfortunate because just these groups have the highest rates of smoking. The use of nicotine replacement therapy, either as gum or a patch, is prescribed for a minority of patients who smoke, but these prescriptions are necessarily influenced by many patient characteristics.<sup>14</sup>

From the multiple data sources available in this study, it becomes obvious that documentation of smoking status in the medical record needs improvement. Established practice system methods, such as making smoking status a vital sign<sup>2,15</sup> or using chart labels or reminders,<sup>16,17</sup> are not being widely used in these primary care practices. Records are frequently not updated, and 20% of the patients who reported that they had been asked if they smoked in the last 2 years had no notation of smoking status on their medical record.

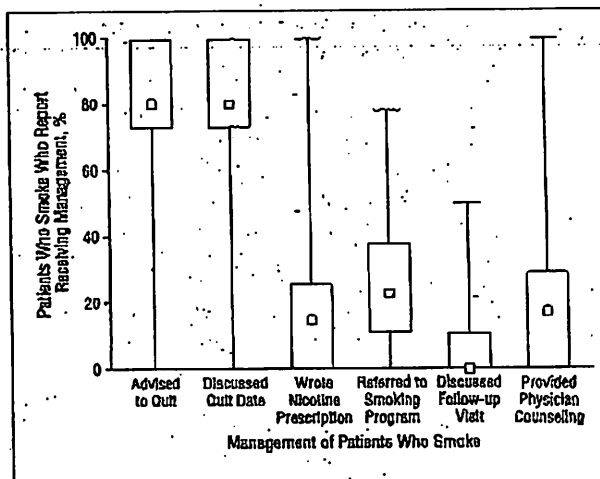
The documentation and updating of smoking status is important to encourage physician intervention, reduce du-

plication of effort in the practice, and improve physician ability to reinforce their past efforts to assist patients. Several recent studies<sup>24</sup> have documented a more than doubling of screening and intervention when routines and organizational system approaches are used. Our study indicates that if a physician records smoking status in a location where patients will be reminded about the status (eg, on a problem list or a flowsheet), those patients are more than twice as likely to report that their physician told them to stop smoking.

Documentation of smoking management activities in the medical record is a consistent problem in this study, with medical record notation much less than a problem patient report and physician estimate. Patients report discussion of a quit date 60% of the time, while physicians' estimates are 52%, but medical record documentation of a quit date discussion is only 4%. When medical records document physician management, patient agreement with the documented intervention is high. Documentation of smoking cessation services is an important part of a practice system, which can facilitate practice communication between different providers who may see the patient to reinforce past quit attempts and reduce relapse of successful quit attempts by patients. In addition, documentation will contribute required information for quality assessments and potential reimbursement. Documentation can be facilitated by the use of a smoking flowsheet that can serve as an office reminder, protocol, and efficient documentation tool.<sup>4</sup>

Physicians were candid about their need to improve services, and their estimates of their behavior were surprisingly accurate, except for overestimating the use of the nicotine replacement patch. The main reasons listed by physicians for not providing more prevention services were lack of time, patient visits with a nonprevention focus, the practice's lack of prevention systems, and the lack of practice staff who can provide prevention services. Using a practice organizational approach to develop systems can address all of these concerns by establishing efficient routines that guarantee consistent patient screening and support management activities.<sup>18</sup> A meta-analysis of smoking cessation trials indicated that the most effective interventions are those applied consistently, ie, on each visit, over the longest time.<sup>6</sup> Practice intervention trials have verified that practice routines substantially improve provider interventions and patient quit attempts and cessation rates.<sup>21</sup>

A strength of our study is the use of multiple methods, in many different practice settings, to determine whether smoking was asked about or advice and treatment given and documented. This study provides the opportunity to evaluate physician and practice rates, in addition to provider, patient, and organizational variables, to determine factors that predict more preventive service delivery. The largest variability in the services is among individual physicians, rather than the practices, which suggests that organizational system change has the most potential to improve smoking services. In addition, while a previous study of a single practice indicated that patients fail to remember smoking advice,<sup>19</sup> our study showed a high correlation of patient report with documented advice over many practices. The study dem-



Physician variation in smoking management. Rectangular box upper and lower boundaries indicates 75% and 25%, respectively; line (whisker) upper and lower boundaries, nonoutlier maximum and minimum, respectively; and squares, medians.

onstrates the limitations of medical record reviews for assessing counseling due to lack of documentation.

Limitations to this study include possible selection bias related to the volunteer nature of the physicians, patients, and practices. However, the practices represented a wide range of nonacademic practice types and locations, and 60% of the eligible practices agreed to participate. These practices entered this trial to improve their prevention services, which could indicate either a greater interest in prevention or a greater need to improve services. Patient responses analyzed in this study were from volunteers, but response rates to the questionnaires of those who consented to a medical record review were more than 90% and patients aged from 20 to 70 years are represented in large numbers. The smoking rates of the study patients are lower than the overall population, which likely reflects the older, educated, and mainly white population represented, but the number of patients smoking in the prior 2 years was consistent with the current regional statistics.<sup>20</sup> The higher rates of receiving advice may also have been influenced by the ethnicity of the population attending these clinics, as white individuals have been noted to be counseled at a higher rate than ethnic minority patients.<sup>11</sup> There is the possibility of patient recall bias related to physician services based on previous reports that patients have both overestimated and underestimated physician services.<sup>19,21</sup> However, a study by Frank et al<sup>11</sup> found that the attrition of patient memory of physician smoking advice in a small cohort of smokers followed for 9 years was 9%. Unfortunately, there is no standard criterion for clinic visit information, and studies that have used a variety of methods, including videotapes or audiotapes, in addition to patient questionnaires and record reviews, have concluded that questionnaires are the most feasible method to assess service provision in large-scale research or audit studies.<sup>21,22</sup>

Our study suggests that national efforts to improve physician-based services may have led to increased physician awareness of their practices and may have



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### Practice Commentary

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