HIV Risk Screening in the Primary Care Setting

Assessment of Physicians' Skills

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OBJECTIVE: To assess the content and extent of HIV risk assessment by primary care physicians across a diverse panel of patients with unidentified HIV risk behaviors.

DESIGN: Standardized patient examination to assess primary care physicians' skills at identifying and managing HIV infection and overall clinical skills. In a day of testing, physicians saw 13–16 standardized patients (SPs) with diverse case presentations. In analyses presented here, physician performance was examined with nine SPs who had unidentified risks for HIV, which they offered if asked.

SETTING: An academic clinic.

PARTICIPANTS: We randomly selected 134 paid volunteers (general internists and family/general practitioners) after stratifying by specialty, experience caring for patients with HIV infection, and year of medical school graduation.

MEASUREMENTS AND MAIN RESULTS: Performance at initiating HIV risk screening and identifying patients' HIV risk behaviors were the main outcome measures. Physicians performed variably at HIV risk screening with different patients and across different HIV risk screening topics. Although physicians initiated screening with 60% of patients, they identified only 49% of risk behaviors and included HIV in the differential diagnosis for less than half of at-risk patients. Physicians performed better with cases in which there was a higher probability of HIV infection based on symptoms, but often did not screen at-risk patients without obvious symptoms suggestive of HIV. Board-certified general internists initiated screening and identified risk behaviors with more patients than board-certified family practitioners. Medical school graduation year also influenced performance.

CONCLUSIONS: Our data suggest that primary care physicians do not routinely perform HIV risk assessments with patients who have risk behaviors for HIV infection. Methods are needed to develop, standardize, and disseminate better screening techniques to identify patients with or at risk of developing HIV infection, such as written HIV risk screening questions for use in medical intake forms.

KEY WORDS: clinical competence; HIV infections; medical history-taking; patient simulation; physicians' practice patterns. *J GEN INTERN MED* 1997;12:107–113.

Early identification and treatment of HIV infection is important to reduce morbidity and to prevent HIV-related complications and hospitalizations, and spread of infection to others.^{1–6} The U.S. Preventive Task Force recommends that primary care physicians take a complete sexual and drug-use history from all adolescents and adults as a means of identifying behaviors associated with risk of HIV infection and other sexually transmitted diseases (STDs).⁷ In a busy practice setting, however, it may be difficult for clinicians to screen all patients, especially in appointments for acute illness during which the majority of care occurs. In fact, surveys suggest that primary care physicians do not routinely perform risk assessments for HIV infection. Primary care physicians estimate that they take sexual histories from one quarter to one half of their patients.^{8–10} The accuracy of HIV risk assessment data is difficult to evaluate because of limitations in the methods used. The physician-patient interaction is a private one between two individuals, and information about that interaction is not easily obtained. Medical record audits are not reliable sources of information about what occurs in these private interactions,¹¹ and self-report by physicians may not accurately portray actual practice activities.^{12,13} Two different approaches to quantify risk assessment for HIV are patient report^{14,15} and the use of standardized patients (SPs)¹⁶. Patient report suggests low levels of HIV risk screening, but the reliability of patient report is unknown. The most important patients to screen are those who have HIV infection or are at risk of HIV infection to reduce morbidity and mortality associated with the disease, counsel to reduce risk, and prevent transmission. It remains unclear to what extent primary care physicians perform HIV risk assessments with patients at risk of HIV infection. In addition, little is known about what questions constitute a typical HIV risk assessment among primary care physicians, particularly with patients who have HIV risk behaviors.

Studies that present physicians' self-reported estimates of HIV risk assessment suggest that some physician characteristics appear to be associated with increased HIV risk screening. Younger physicians, women physicians, and physicians who say they do not experience a great deal of discomfort with homosexuals may take sexual histories more often.¹⁷ Physicians who had diagnosed HIV-related problems in their practices also appear to be more likely to take routine histories of AIDS-related risk factors.⁸

Standardized patients provide an opportunity to study primary care physicians' skills in interactions that are similar to their interactions with real patients.^{16,18} In this study, 17 SP cases were used to test 134 primary care

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physicians. The overall purpose of the study was to assess the skills of primary care physicians at identifying and managing patients with or at risk of HIV infection as well as assessing their overall clinical skills. In nine of the cases, patients were at high risk of HIV infection as indicated by risk behaviors that were not initially identified to physicians who saw them. The remainder of cases tested physicians' skills in other clinical areas, and one case assessed physicians' skills in an initial interview with a patient with known HIV infection.¹⁹ Physicians were not informed that one focus of the study was their identification of HIV risk behaviors. The study described here was designed to assess the extent to which primary care physicians perform an HIV risk assessment with a diverse panel of acute care patients at high risk of HIV infection and the content of the risk assessment. The influence of physician demographic characteristics on performance of HIV risk assessment was also assessed.

METHODS

Standardized patients are individuals trained to enact specific case presentations.¹⁸ For this study, 17 diverse primary care cases were developed by a team of clinical investigators. The study reported here describes nine SPs who were at high risk of HIV infection, with HIV risk behaviors not identified to physicians unless risk screening occurred. The cases and scoring system developed for the cases underwent extensive review by a large group of investigators and consultants and were pretested with medical residents and faculty members. The SP development for the examination has been described previously.²⁰ Study protocol and instruments were reviewed

and approved by the University of Washington Human Subjects Review Committee.

Physicians saw SPs in 20-minute visits in a clinic setting and had another 10 minutes after seeing each patient to complete written questions and read introductory materials about the next patient (vital signs, presenting complaint and, in some cases, x-rays, referring letters, or chart notes). Each physician saw 14 to 16 SPs in a full day of testing. Because of occasional absences among SPs, not all physicians saw precisely the same SPs. All testing took place in a general medicine clinic at a major university medical center. The SPs had a variety of common symptoms and presentations appropriate for the primary care setting. Among the SPs at high risk of HIV infection, some had real physical findings related to HIV infections (e.g., Kaposi's sarcoma lesions on the ear and shoulder of a patient with an earache and shoulder pain),²¹ and others had presentations consistent with possible HIV infections (e.g., diarrhea of 6 weeks' duration) or clues (e.g., history of hepatitis B offered in response to a question about past medical history in a patient with resolving cough) that could alert the physician to HIV risks. Descriptions of the presenting complaints and underlying HIV risk behaviors are shown in Table 1 for the nine cases with HIV risk behaviors used in these analyses.

Physicians were instructed to perform several tasks with each patient, including history taking, physical examination, or counseling. They were asked to treat SPs they saw as they would treat patients in their own practices. The SPs were trained to evaluate physicians' performance by completing checklists of history items asked and physical examination procedures or counseling performed by the physician. In addition, physicians re-

Table 1. Descriptions of Standardized Patient Cases and Percentage of Physicians Who Asked HIV Risk Assessment Questions*

Case	Patient Gender/ Age	Presenting Symptom	Patient HIV Risk Behavior	Physicians Who Asked Question in Category, %				
				Sexually Active	Sex with Men	Number of Sexual Partners	History of STDs	IDU
1	M/34	Resolving cough	Sex with men	24	16	5	5	21
2	F/27	Urinary frequency for 3 days	IDU/sex for money or drugs	56	NA	14	17	26
3	M/26	Diarrhea for 6 weeks	IDU/multiple sexual partners	64	65	19	10	73
4	M/43	Chest pain due to herpes zoster	Sex with men	21	30	11	4	19
5	M/25	Dyspnea/fever	Sex with men and prostitutes	83	65	20	12	57
6	F/38	Depression	IDU	12	NA	6	4	37
7	M/44	Earache/shoulder pain	Sex with men	29	28	19	9	23
8	M/37	Sore throat, white spots on tongue	Sex with men	73	73	30	16	39
9	M/51	Fatigue/weight loss	Sex with men	61	59	14	28	38

*HIV indicates human immunodeficiency virus; IDU, injection drug use; STDs, sexually transmitted diseases; NA, not applicable. Data obtained from standardized patient checklist.

sponded to open-ended written questions about important history and physical examination findings, differential diagnosis, and workup and management strategy after seeing each patient.

Recruitment of Physician-Subjects and Assessment Criteria

All primary care physicians identified through the *American Medical Association Directory* in Washington, Alaska, Montana, Idaho, and Oregon were recruited by letter to participate in a study assessing the primary care skills of practicing physicians. Physicians were told that they would interview and examine SPs presenting diverse primary care problems. Criteria for study entry included: at least 50% of time providing primary care; graduation from medical school in 1967 or later; and specialty in internal medicine, family practice, or general practice. Incentives to participate included \$500, confidential feedback, and continuing medical education credits. A total of 2,308 physicians responded to an initial screening questionnaire about their training and practice. Of these, 599 were eligible and agreed to participate. Recruitment results are described in more detail elsewhere.^{19,22} A total of 134 physicians were randomly selected, after stratifying by number of HIV-positive patients for whom care had been provided in the previous 5 years (none, 1–5, and more than 5 patients), year of medical school graduation (through and after 1980), and specialty (internal medicine and family/general practice).

To evaluate the effects of physician demographic and practice characteristics on performance, we examined physician gender, board-certified specialty (internal medicine vs family practice), geographic location of practice (large metropolitan, small metropolitan, nonmetropolitan), type of practice (solo/one partner, small group practice of 3–9 physicians, large group practice of more than 9 physicians), year of medical school graduation (1967–1974, 1975–1981, 1982–1988), and HIV experience as variables. Different components of HIV experience that were initially examined included training experience in medical school and in residency (determined by AIDS incidence rates in cities where training occurred and timing of training) and number of HIV-positive patients for whom care was provided in the previous 5 years (none, 1–5, and more than 5 patients). An overall variable that combined the three sources of HIV experience (medical school experience, residency experience, and practice-based experience) was developed and used in these analyses.

Among the 134 participating physicians, 36 were women and 98 were men. There were 66 board-certified internists, 60 board-certified family practitioners, and 8 noncertified physicians. Among the noncertified physicians, seven were family or general practitioners and one was an internist. By medical school graduation year, 30 physicians graduated between 1967 and 1974, 58 graduated between 1975 and 1981, and 46 graduated between

1982 and 1988. Nearly half of the physicians practiced in a large metropolitan location, and the remainder were equally divided between those practicing in small metropolitan and nonmetropolitan locations. Physicians were equally divided by practice type (solo/one partner, small group practice, and large group practice). Finally, by HIV experience from training and practice, 57 physicians were defined as having the least experience, 47 as having moderate experience, and 30 as having the most experience.

Methods of Evaluating HIV Risk Assessment

To evaluate physicians' performance at HIV risk assessment among the nine cases used in these analyses, investigators involved in the project (including the principal investigator, project director, a medical educator, and two clinical AIDS specialists) defined a set of five risk assessment topics that were included on the SP checklist for each case. These topics, or categories for questioning, were history of injection drug use, whether the patient is sexually active, number of sexual partners, history of STDs, and (among men) history of sex with men. Considerable latitude was allowed in the manner in which physicians could pose questions in these categories in order to receive credit.

The amount of time that physicians spent with SPs was assessed to determine if sufficient time was allotted for an initial visit. Physicians used a median of 15 minutes of the 20 minutes allotted per case for the nine cases described here. The full 20 minutes allotted was used in only 15% of interactions. Descriptive statistics were developed for each case and across cases concerning the frequency with which the five questions (four for women patients) were asked of patients. For each case, the percentage of physicians who asked a screening question in at least one of the five risk screening categories was determined as a measure of initiating risk assessment. For physician-level analyses, an HIV risk assessment score was developed for each physician-subject that identified the percentage of the patients seen by the physician with whom any one or more of these HIV risk assessment questions were asked. Analyses were also performed to assess identification of patients' HIV risk behaviors across all nine SPs. Clinical investigators reviewed all risk behaviors for each patient and isolated a key risk for that patient. If investigators identified multiple risks contributing to the patient's risk status (e.g., multiple sexual partners and injection drug use), identification of any one or more risk behavior was scored as identifying the patient's potential risk for infection. Whether the physician identified the patient's risk was determined by notation of the risk either on the checklist completed by the SP or on the written information completed by the physician about significant history. For each case, the percentage of physicians who identified the patient's risk behavior was determined. In addition, for each physician, an overall score was developed of the percentage of SPs seen for whom the physi-

cian identified HIV risk behaviors. Finally, analyses were performed to determine the percentage of the nine SPs seen by the physician for whom physicians included HIV in the differential diagnosis. Inclusion of HIV in the differential diagnosis was determined from physicians' responses to a written question, completed after seeing each SP, concerning the most likely diagnostic considerations for that patient related to the presenting complaint and associated medical problems identified in the interview. For each physician, a score was developed of the percentage of these patients seen by the physician for whom the physician included HIV in the differential diagnosis.

Evaluation of Potential Cueing to HIV Orientation of the Study

Analyses were performed to determine if cueing or detection by physicians of the HIV orientation of the study occurred, which would bias results. These analyses tested whether cueing or detection occurred in the course of testing (with identification of HIV or risk of HIV in cases seen early in the day cueing to consideration of HIV in cases seen later in the day) and over the 10 sessions (due to potential discussion about cases between physicians who had completed the examination with physicians who had not yet completed the examination). The progression of scores related to HIV risk assessment on the SP examination for these cases was used as a marker of cueing. Each case was assessed individually using analysis of variance to determine if there was a linear progression of scores across the days and across weeks. The order of cases in the day had no effects on HIV risk assessment scores. In addition, among these cases, there were no linear effects of order of cases across the 10 weeks of testing.

Statistical Analyses

Interrater reliability between SPs and SP trainers was analyzed through review of a systematic sample of audiotapes to ensure accurate scoring. Analyses to assess interrater reliability used both κ statistics and point agreement. For agreement between SPs and SP trainers, κ statistics indicated good to excellent reproducibility (range .52–.84), and mean per-case point agreement ranged from 82% to 93%.

All group comparisons of physician performance by demographic characteristics were performed at the level of the physician. For comparisons by physician demographic characteristics, Student's *t* tests (for gender and specialty) and one-way analysis of variance (ANOVA) (for all other demographic variables) were used to compare percentages of cases in which physicians asked at least one risk assessment question and in which physicians identified the patient's risk behavior. When the *F* test was significant in ANOVA, post-hoc group comparisons were performed using the Scheffé procedure. Correlations were determined between the percentage of risk behaviors

identified and the percentage of cases for which HIV was included in the differential diagnosis. Backward, forward, and stepwise multiple regression analyses were performed to determine the robustness of findings concerning group comparisons, with all the demographic variables defined above used in the model. The α level for a significant difference was set at $p < .05$.

RESULTS

The mean percentage of physicians asking individual HIV risk assessment questions varied substantially by category of question and by case (Table 1). Across all interactions between SPs and physicians, 12% of SPs were asked about their history of STDs; 49% of SPs were asked if they were sexually active; 50% of male SPs were asked about sex with other men; 15% of SPs were asked about the number of sexual partners they had; and 39% of SPs were asked about injection drug use.

Individual physicians initiated screening (asked a screening question in at least one of the five HIV risk assessment categories) with an average of 60.5% (SD 24%, range 0–100%) of at-risk SPs they saw. Overall, physicians identified a mean of 49% (SD 26%, range 0–100%) of risk behaviors. Physicians included HIV infection in the differential diagnoses of less than half (46%) of these SPs for whom active HIV infection should have been considered. Identifying risk behaviors of SPs at risk of HIV infection was strongly associated with including HIV infection in the differential diagnosis ($r = .92$, $p < .001$). At the individual case level, there was considerable variation among cases in initiating HIV screening (Table 2).

The influence of physicians' demographic and practice characteristics on performance in initiating HIV screening with these SPs was assessed. In physician-level comparisons, statistically significant differences were found by

Table 2. Percentage of Physicians Initiating HIV Risk Screening and Identifying Patient's HIV Risk Behavior per Case

Case	Initiating Screening, % (screening in at least one of five question categories)*	Identifying Patient's HIV Risk Behavior, %
1	31	18
2	66	38
3	84	75
4	38	30
5	87	71
6	41	37
7	33	30
8	77	75
9	71	61

*HIV risk categories included history of drug injection, whether patient is sexually active, number of sexual partners, history of sexually transmitted diseases, men who have sex with men. Data obtained from standardized patient checklist and written exam.

board-certified specialty, HIV experience, and medical school graduation year. General internists initiated screening for a higher percentage of SPs than family practitioners (67% vs 55% of SPs seen, $p < .005$), and physicians with the most HIV experience initiated screening more often than physicians with the least experience (69% vs 55% of SPs seen, $p < .05$). Most recent medical school graduates initiated screening more often than most distant medical school graduates (65% vs 51%, $p < .05$). There were no statistically significant differences by geographic location, gender, or practice type. Physician-level comparisons were also performed for the percentage of SPs' HIV risks identified. As shown in Table 3, statistically significant differences were found between the same groups of physicians in the percentage of SPs' risk behaviors identified, with more identification of at-risk SPs among most recent medical school graduates compared with most distant,

physicians with most HIV experience compared with those with least, and board-certified general internists compared with board-certified family practitioners. Using multiple regression to test the robustness of findings, board-certified specialty and medical school graduation year were both significant predictors of initial HIV risk screening and identification of HIV risk behaviors.

DISCUSSION

Although national recommendations call for screening all patients for risks of HIV infection, these recommendations may be difficult to follow in the context of brief appointments with patients. Failing to screen patients may have few or no consequences in patients with few or no risks of HIV; however, failing to screen a patient at high risk may result in inadequate or misdirected patient management and adversely influence the course of disease. Although previous studies suggest that primary care physicians do not routinely perform HIV risk assessment with their patients, practice-based data for patients with known risks are not available. Therefore, little is known about the content of HIV risk assessment, the consistency of questioning, or the extent to which physicians identify patients' HIV risk behaviors. We assessed physicians' skills in detecting HIV risk using a panel of standardized patients with primary care presentations and unidentified risk behaviors for HIV infection. The context of risks and cues available to physicians varied considerably, as would be true in the practice setting. The SPs had features of their history or physical examination that should have directed physicians to perform an HIV risk assessment. Our data suggest that there is great variability in the performance of HIV risk assessment across different patients at risk of HIV infection. There was also considerable variation within individual cases in the frequency of covering HIV risk assessment topics. These data suggest that primary care physicians are inconsistent and sporadic in their practices related to screening for and identification of HIV risk behaviors in brief visits and frequently miss important HIV risk behaviors. Systematic screening for HIV risks would reduce variability and increase detection of HIV risk behaviors.

Relative to self-reported estimates of HIV risk assessment from previous studies,⁸⁻¹⁰ physicians did better than expected in this study in performing a minimal HIV risk assessment. However, physicians still did not ask any HIV risk assessment questions of 40% of SPs who had HIV risk behaviors and, more importantly, missed clinically important HIV risk behaviors in 50% of SPs they saw who were at risk. As a result, physicians did not identify HIV as a potential consideration in more than half of these cases in which SPs were at high risk of HIV infection. The discrepancies in all cases between initiating screening (screening in at least one of the five HIV screening topic areas) and identifying the patient's risk behavior

Table 3. Mean Percentage of HIV Risk Behaviors Identified by Physicians Among Nine Patients at Risk of HIV*

Physician Characteristic	n	SD of Risk Behaviors Identified	p Value
Year of medical school graduation			
1967-1974	30	38.7 (25)	
1975-1981	58	49.3 (25)	
1982-1988	46	55.9 (28)	.02†
HIV experience			
Least	57	42.3 (25)	
Moderate	47	50.7 (28)	
Most	30	59.9 (25)	.01†
Board-certified specialty			
Internal medicine	66	54.4 (28)	
Family medicine	60	45 (28)	.04
Geographic location			
Large metropolitan	64	49.2 (25)	
Small metropolitan	33	46.8 (29)	
Nonmetropolitan	37	51.4 (27)	NS‡
Gender			
Male	98	49.3 (26)	
Female	36	49.1 (28)	NS‡
Practice type			
Solo/one partner	44	42.4 (25)	
3-9 Physicians	44	50 (23)	
>9 Physicians	39	55.3 (28)	NS‡

*For each physician-subject, a score was developed representing the percentage of cases in which the patients' HIV risk behaviors were identified among a maximum of nine patients at high risk of HIV infection. For patients with more than one risk factor, identification of at least one risk factor was taken as identifying the patient's risk behavior. The unit of analysis is the physician.

†Post-hoc comparisons were performed using the Scheffé procedure; statistically significant differences were found between the two extreme groups.

‡NS indicates nonsignificant difference.

suggests that even among physicians who initiate screening, basic risk behaviors may not be covered, resulting in missed opportunities to detect HIV risk and to intervene to decrease risk.

Physicians performed substantially better with four of the nine SPs (cases 3, 5, 8, and 9) at initiating HIV risk screening and identifying the risk behaviors. Although speculation concerning what differentiated these four from the other five SPs cannot adequately consider all the factors that led to screening, the four SPs who were screened more comprehensively appear to be distinguished by their symptoms. All described symptoms consistent with possible HIV-related disease (prolonged diarrhea, dyspnea and fever, sore throat with white spots on the tongue, and fatigue and weight loss). Symptoms of other patients may have been less overtly suggestive of HIV infection, although they had symptoms, histories, or clues that should have led to consideration of HIV infection. It appears that physicians appropriately ask questions about HIV risk behavior when the presenting symptoms indicate a higher probability of HIV infection. Many HIV-positive individuals are asymptomatic, however, and others may not have classic, obvious, or well-known presentations associated with the disease. In addition, patients with risk behaviors for HIV infection may not be easily identified by their medical, physical, or social presentations. In general, it appears that primary care physicians do not routinely screen patients without obvious symptoms of HIV infection, and our findings highlight the need for better screening processes to identify risk behaviors.

Several physician demographic characteristics appear to influence performance in screening patients for HIV risk behaviors. Board-certified internists performed better at initiating screening and identifying risk behaviors than board-certified family practitioners. In addition, medical school graduation year was significantly associated with performance in these areas. The findings concerning the influence of number of years since training on performance in HIV risk screening are similar to previous findings.¹⁷ The findings concerning performance by general internists compared with family practitioners, however, are new.

This study has several limitations. Physician participants were volunteers and may not be representative of all primary care physicians. Individuals who are willing to have their skill levels tested might be expected to have more confidence in their skills. In addition, performance in a known SP setting may be better than in actual practice settings because physicians know they are being tested. Thus, our data may overestimate average practice performance at HIV risk behavior screening by primary care physicians. Second, the number of SPs seen who had HIV risk behaviors was disproportionate to what most primary care physicians would actually see in practice. Although all patients had common primary care presentations (e.g., cough, fatigue), a typical case load would not consist of so many patients with HIV risk behaviors, de-

creasing the likelihood that physicians would consider HIV so frequently. Finally, this type of SP assessment provides information only about what happens in an initial, relatively brief visit. Follow-up visits and test information could result in further insights about HIV risk behaviors. However, for the patient who is generally healthy and seen only infrequently and for patients with acute illness, the initial visit assumes added importance. For these patients, missed history and physical examination items and missed diagnoses may increase morbidity because of treatment delays for a patient with underlying disease and may delay important preventive counseling for the well patient with risk behaviors.

Unidentified HIV infection or risk of infection presents an important opportunity to prevent morbidity and mortality. Our findings document the need for improvement in HIV risk screening by primary care providers. However, although guidelines for primary care physicians emphasize the importance of routine HIV risk screening, there is little recognition of the difficulty of covering multiple diverse screening topics in a limited amount of time. Our data suggest the need for new methods that will systematically incorporate HIV risk screening questions into practices. A brief set of standardized HIV risk screening questions, such as exists for alcoholism through the CAGE questions,^{23,24} is one approach that might improve HIV risk behavior screening in primary care. In one study using a single SP, physicians who used an HIV risk questionnaire performed better at assessing HIV risks than physicians who did not use the questionnaire.²⁵ Research is needed to determine what questions perform best at identifying HIV risks in a written screening questionnaire. Overall, our data suggest that physicians do not routinely address HIV risk assessment with patients who are at risk of HIV infection and, when they do perform screening, the content of risk assessments is variable and limited. As a result, many HIV risk behaviors among patients remain unidentified.

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ANNOUNCEMENT

Call for Papers

Papers are being accepted for an issue of *Family Medicine* dedicated to minority health to be published in February 1998. This issue is sponsored by the Division of Medicine, Bureau of Health Professions, Health Resources and Services Administration, and the Society for Teachers of Family Medicine. The deadline for submission is March 15, 1997.

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