A Multicenter Study of Internal Medicine Residents' Perceptions of Training, Competence, and Performance in Outpatient HIV Care

Karran A. Phillips, M.D., M.Sc.,¹ Joseph Cofrancesco, Jr., M.D., M.P.H.,² Stephen Sisson, M.D.,² Albert W. Wu, M.D., M.P.H.,² Eric B. Bass, M.D., M.P.H.,² and Gail Berkenblit, M.D., Ph.D.²

Abstract

Routine HIV screening is recommended by the Centers for Disease Control and Prevention (CDC), but it is unknown how well internal medicine residents are trained in HIV risk assessment, testing, counseling, and initial management of HIV patients. We sought to determine internal medicine residents' attitudes about HIV training and the factors that influence their HIV care performance utilizing a cross-sectional survey of 321 second- and third-year internal medicine residents from four programs in Baltimore, Boston, Detroit, and New York City between March and June 2006. Measurements included HIV care experience; attitudes, competency, and adequacy of HIV training; and basic HIV care performance and factors impacting performance. Two hundred twenty-three residents (69%) completed the survey. While 50% of residents reported over 30 HIV inpatient encounters in the past year, the majority of residents had limited outpatient exposure providing care for only 1–5 HIV outpatients. Managing HIV patients was rated an excellent educational opportunity by 89% of residents and 77% planned to care for HIV patients in the future. However, 39% stated that they did not feel competent to provide HIV outpatient care. Higher rates of residents reported deficiency in outpatient HIV training compared to outpatient non-HIV training ($p < 0.05$) or inpatient HIV training ($p < 0.05$). Residents reported substandard HIV risk assessment, testing, counseling, and initial management performance. Self-reported proficiency correlated with the number of HIV outpatients cared for and perceived training adequacy. Current residency training in HIV care remains largely inpatient-based and residents frequently rate HIV outpatient training as inadequate.

Introduction

IN SEPTEMBER 2006, the Center for Disease Control and Prevention (CDC) revised its guidelines to recommend routine HIV antibody testing of all Americans ages 13–64.¹ The American College of Physicians has endorsed the CDC guidelines, as part of an effort to identify the estimated quarter of a million Americans who are unknowingly infected with HIV and to reduce HIV transmission.^{2,3} Implementation of the CDC guidelines will require increased HIV testing, risk reduction counseling, and initial management of newly diagnosed patients by general internists.^{4,5} Yet studies have shown that primary care providers lack skills in HIV risk assessment, testing, counseling, and initial management.^{6–10}

Residency training programs need to prepare residents to meet the expected increased demands in case finding and HIV outpatient care. Early in the AIDS epidemic, a nationwide survey of residency programs found a minority of residents participated in the primary care of HIV patients and the majority of program directors as well as residents perceived their training in ambulatory HIV care as inadequate.^{11,12} In 1998, a general survey of internal medicine residents' preparedness to provide care for common medical conditions found that among the many areas assessed, HIV care ranked with nursing home care and substance abuse care as areas in which residents felt least prepared.¹³ Yet, detailed information is lacking about current residency training in HIV.

We hypothesize that while the diagnosis and care of HIV patients has shifted to the outpatient arena, the training of

¹National Institutes of Health, National Institute on Drug Abuse, Baltimore, Maryland.

²Johns Hopkins School of Medicine, Baltimore, Maryland.

internal medicine residents remains largely inpatient-based, resulting in suboptimal resident competence in and execution of HIV risk factor assessment, testing, counseling, and initial management skills.

Objective

We conducted a multicenter survey of internal medicine residents to determine their views on their HIV care experience and its educational value, their self-reported competency in HIV management and adequacy of HIV training, and their performance of CDC-recommended HIV care.

Methods

Participants and setting

The Johns Hopkins Internet Learning Center (ILC) is a Web-based ambulatory curriculum for internal medicine residents that has been described previously.¹⁴ In 2006, the ILC was used by 2900 residents at 50 programs throughout the United States. Survey participants were program year two and three (PGY-2 and PGY-3) residents at four internal medicine residency programs using the ILC. Four residency programs were selected for study to provide a range of burden of HIV care. Two programs were located in cities with high AIDS case rates, defined as greater than 25 AIDS cases annually per 100,000 population (the State University of New York–Downstate in New York City and the Johns Hopkins Hospital in Baltimore), and two programs were located in cities with lower AIDS case rates of fewer than 10 AIDS cases annually per 100,000 population (Boston Medical Center and Henry Ford Hospital in Detroit).¹⁵ The Johns Hopkins Medical Institutions Institutional Review Board (IRB) approved the study and it was conducted in accordance with the Helsinki Declaration of 1975, as revised in 1983. Informed consent was implicit with survey completion.

Survey instrument development

A team of physicians with clinical, educational, and research experience in HIV care created the survey. The 66-question survey (Appendix) was structured to address HIV ambulatory care competencies.⁶ The survey assessed residents' knowledge, attitudes, and practices using a combination of 5-point Likert, multiple choice, and yes–no questions. In addition to knowledge, attitudes, and practices questions, the survey gathered demographic, practice setting, and educational needs information. The survey was reviewed by experts in medical education, outcomes research, and HIV care for content validity. The survey was piloted on clinicians with experience caring for HIV ambulatory patients and inpatients.

Survey administration

We administered surveys electronically and by mail from March to June 2006. Electronic surveys were accessed through the ILC. Participation was voluntary. If an electronic survey was not completed by an eligible resident a printed copy of the survey was sent to the resident with a preaddressed, stamped return envelope. We offered a \$5 Amazon gift certificate as compensation for respondents' time and input. The gift certificate was emailed at the end of the month in which the survey was completed.

Measurements

The survey addressed four areas of HIV care: (1) residents' experience in caring for HIV-infected patients and its perceived educational value; (2) self-reported HIV care competency and training adequacy; (3) performance of basic HIV care including risk factor assessment, screening, testing, and initial management; and (4) barriers to providing care.

The primary outcome variable was basic HIV care performance. Secondary outcome variables included HIV care: experience, perceived educational value, competency, and training adequacy.

Likert responses for questions regarding attitudes and competency were dichotomized with 5 (strongly agree) and 4 (agree somewhat) constituting a positive response and 3 (neutral), 2 (disagree somewhat), and 1 (strongly disagree) a negative response. Responses for practice questions were dichotomized with 5 (always) and 4 (frequently) constituting a positive response and 3 (occasionally), 2 (rarely), and 1 (never) constituting a negative response.

Statistical analysis

Primary analysis included descriptive statistics exploring HIV care exposure, risk assessment, testing, counseling, and initial management and attitudes and perceived competency in these fields. Bivariate analyses were done using χ^2 tests. Logistic regression was used to quantify the association between HIV outpatient care exposure and perceived competency of HIV training and the performance of HIV risk assessment, testing, counseling, and initial management, adjusting for inpatient patient exposure, program year, and program site. Analyses were done using STATA v 9.0 (StataCorp LP, College Station, TX). A p value of ≤ 0.05 was considered significant.

Results

Demographics

A total of 223 of 321 (69%) junior and senior residents in the four internal medicine training programs surveyed responded (Table 1). Respondents were predominantly male, Caucasian, and planned to pursue a career in primary care or a noninfectious disease (non-ID) subspecialty. Respondents did not differ significantly from residency program participants overall by gender or ethnicity. Respondents' demographics were similar to residents nationwide who completed the ABIM In-Training Exam in 2005–2007, although a small but significantly higher percentage planned to pursue subspecialization in infectious disease.¹⁶ All of the programs surveyed had a separate outpatient clinic for HIV patients and 102 (46%) of residents had participated in an ID or HIV elective.

HIV care experience

Exposure to HIV care was predominantly inpatient based. Two hundred three (92%) of the respondents reported providing care for more than 10 HIV inpatients in the past year and of those, the majority (51%) cared for more than 30 HIV inpatients. In the outpatient setting, only 13% of residents had provided care for more than 10 HIV outpatients; the majority (63%) cared for only 1–5 HIV outpatients.

TABLE 1. CHARACTERISTICS OF SURVEY RESPONDENTS (n = 223)

Variable		n (%)
Gender	Male	133 (60)
Ethnicity	Caucasian	78 (35)
	African American	21 (10)
	Hispanic	16 (7)
	Asian	76 (34)
	Other	32 (14)
Postgraduate year (PGY)	PGY 2	107 (48)
	PGY 3	116 (52)
International medical graduate	Yes	108 (48)
HIV prevalence ^a	Low	120 (54)
Future career plans	Primary care	28 (13)
	Subspecialize non-ID	149 (67)
	Subspecialize ID	21 (9)
	Other	25 (11)
Participated in an ID or HIV elective	Yes	102 (46)

^aLow prevalence defined as <10 AIDS cases annually per 100,000 population and high prevalence defined as >25 AIDS cases annually per 100,000 population.

Residents attending programs located in cities with high AIDS case rates (>25 AIDS cases reported annually per 100,000 population) had greater inpatient experience with HIV patients (64% versus 38% reporting >30 inpatients, $p = 0.001$). However, they had less outpatient experience than residents in lower HIV prevalence areas (18% versus 35% reporting ≥ 6 outpatients, $p = 0.004$).

Attitudes, competency, and training adequacy

Caring for patients with HIV infection was rated as an excellent educational opportunity by 198 (89%) of residents and 172 (77%) planned to take care of HIV patients in the future. However, only 135 (61%) reported feeling competent to provide ambulatory care for patients with HIV/AIDS (Table 2). Significantly more residents reported a deficiency in HIV outpatient training (34%) versus non-HIV outpatient training (7.6%), HIV inpatient training (4.5%), and non-HIV inpatient training (2.7%; $p < 0.05$; Fig. 1).

The amount and adequacy of HIV ambulatory care exposure was associated with residents' attitudes about HIV care (Table 2). Ninety-six percent of residents who cared for more than 10 outpatients in the past year reported agreement that

they felt competent to provide ambulatory care for patients with HIV versus 61% of all residents surveyed ($p < 0.001$). Likewise, more residents who perceived their training as adequate described themselves as competent to provide outpatient care for patients (85% versus 61%, $p < 0.001$). There were trends in both groups that taking care of HIV/AIDS patients is an excellent educational opportunity and that care of HIV/AIDS patients will be important in their future. Local HIV prevalence had no impact on residents' attitudes and self-perceived competency.

Basic HIV care performance

Residents were asked about their usual performance of outpatient HIV care including: risk assessment, testing and counseling, and initial management of HIV.

Risk factor assessment

Residents reported inconsistent conduct of risk factor assessment. When interviewing a new patient, 94% of residents said that they ask about illicit drug use "frequently" or "always." However fewer residents asked about risk factors for sexual transmission: history of sexually transmitted diseases (58%), patient's perception of HIV risk (55%), number of sexual partners (48%), sexual orientation (44%), and partners' HIV risk factors (36%).

Testing and counseling

In performing HIV testing and counseling, 84% of residents reported offering testing frequently or always to patients at high risk versus only 14% who reported offering testing to patients at low risk. While 77% stated they provided pretest counseling, only 57% reported that they discuss HIV prevention strategies and only 35% reported referral of patients to an HIV prevention counselor. In caring for HIV positive patients, 61% reported that they discuss prevention of HIV transmission and 58% discussed partner notification.

Initial management of HIV

Residents reported high levels of performance of initial management of HIV patient care including ordering immunizations (69%), screening for tuberculosis (66%) and viral hepatitis (72%), and initiating opportunistic infection prophylaxis (85%). Fewer residents reported ordering baseline genotype tests (34%) or initiating antiretroviral therapy (35%).

TABLE 2. RESIDENTS' ATTITUDES AND SELF-REPORTED COMPETENCY IN CARING FOR PATIENTS WITH HIV

Statement	All residents (n = 223)	Agree or strongly agree, n (%)	
		Residents who cared for >10 HIV outpatients in the past year (n = 28)	Residents who perceived their HIV/AIDS ambulatory training as adequate (n = 103)
Taking care of HIV/AIDS patients is an excellent educational opportunity	198 (89)	27 (96)	97 (94) ^a
Care of HIV/AIDS patients will be important in my future career	172 (77)	24 (86)	84 (82)
I feel competent to provide ambulatory care for patients with HIV/AIDS	135 (61)	27 (96) ^b	85 (83) ^b

^a $p < 0.05$, ^b $p < 0.001$.

FIG. 1. Residents report deficiency in HIV outpatient training versus non-HIV outpatient, HIV inpatient, and non-HIV inpatient training ($p < 0.05$).

Factors associated with self-rated HIV care performance

Basic HIV performance data were adjusted for HIV inpatient care exposure, PGY, and program (Table 3). Residents

with greater HIV outpatient exposure showed trends toward or statistically significant better performance in all items of risk factor assessment. For this group, the greatest effects were seen in items related to primary and secondary prevention of HIV transmission. Perception of adequate training in HIV correlated with higher rates of performance of risk factor assessment, counseling, and prevention items, and had a strong positive effect in each of these areas.

Residents with greater HIV ambulatory care exposure were also more likely to report providing elements of initial HIV management, when compared to residents with less HIV ambulatory care exposure. With increased perception of adequacy of HIV ambulatory training, residents were more likely to report provision of advanced care such as antiretroviral resistance testing and initiation of antiretroviral therapy (data not shown).

The amount of inpatient HIV care exposure did not influence residents' provision of outpatient HIV care. Local HIV prevalence had no effect independent of HIV patient exposure. Additionally, there was no difference in resident HIV risk factor assessment, testing and counseling, or initial management by post graduate year. There did not appear to be a consistent relationship between specialty plans and HIV care. However, future primary care providers were more willing to provide general care to HIV patients than future noninfectious disease specialists ($p = 0.01$).

Discussion

A significant proportion of internal medicine residents rated their HIV ambulatory training as inadequate and did not feel competent to provide HIV outpatient care. Thirty-four percent of junior and senior residents reported a deficiency in their outpatient HIV training, four times greater than the number reporting a deficiency in general outpatient training and seven times greater than those reporting a deficiency in inpatient HIV training. These findings emerge despite strong agreement by residents that HIV care represents an excellent educational opportunity and a high expectation that they will provide care for HIV patients in the future.

TABLE 3. RESIDENTS' PERFORMANCE OF HIV RISK FACTOR ASSESSMENT, COUNSELING, AND PREVENTION BY LEVEL OF OUTPATIENT EXPOSURE AND TRAINING SATISFACTION

Item asked about or discussed	All residents % Report performing	Residents who cared for >10 HIV outpatients vs. ≤10 HIV outpatients in past year		Residents who perceived their HIV/AIDS ambulatory training as adequate vs. those who did not	
		Odds ratio	95% Confidence interval	Odds ratio	95% Confidence interval
Self-perceived risks for HIV	55	1.7	0.9, 3.3	3.3 ^a	1.8, 6.0
Sexual orientation	44	1.9	0.97, 3.9	4.4 ^a	2.3, 8.4
# sexual partners	47	1.8	0.95, 3.4	5.7 ^a	3.0, 11
Partners' HIV risk factors	35	2.3 ^a	1.1, 4.7	6.5 ^a	3.2, 14
History of STDs	58	1.7 ^a	0.88, 3.2	3.2 ^a	1.7, 5.9
Prior HIV testing	55	2.6 ^a	1.3, 5.2	3.3 ^a	1.7, 6.4
History of incarceration	26	2.0 ^a	0.92, 4.2	1.9 ^a	0.89, 4.0
HIV prevention strategies	57	1.9 ^c	1.0, 3.7	3.5 ^a	1.9, 6.5
Referral to HIV prevention counselor	35	5.9 ^a	2.7, 13	4.8 ^a	2.4, 9.8
HIV transmission prevention	60	2.2 ^b	1.2, 4.2	3.5 ^b	1.9, 6.6
Partner notification	58	6.0 ^a	2.7, 13.1	3.4 ^a	1.8, 6.6

Adjusted for level of exposure to HIV/AIDS inpatient care, Post Graduate Year, and program.

^a $p < 0.001$, ^b $p < 0.01$, ^cexposure to HIV/AIDS inpatient care also significant. N = 213, excludes "Don't know".

Resident self-reported performance frequently did not meet established guidelines in areas of HIV risk factor assessment, testing and counseling, and initial management. The changing epidemiology of HIV has resulted in young people, men who have sex with men (MSM), and minority women bearing a disproportionate disease burden,^{17,18} yet residents do not regularly perform risk assessment for sexual transmission. Most residents do not report testing patients perceived to be low risk for HIV. This failure to test low-risk patients is especially notable in light of the latest CDC guidelines that recommend expanding testing to all Americans¹ and it appears to persist as suggested by a 2007 study of internal medicine resident trainees in New York City that found the continued use of risk-based testing rather than the CDC-recommended routine-based testing.¹⁹ In our study while most residents performed pretest counseling, fewer reported discussing HIV prevention or partner notification, both key strategies in reducing transmission.²⁰

Two factors impacted attitudes about HIV care as well as performance: degree of outpatient exposure and perceived adequacy of training. Most exposure to HIV care still occurs in the inpatient setting and HIV care experience in the outpatient setting is limited. Yet our study suggests that resident exposure to ambulatory HIV patients is important to self-assessed competency and performance in key areas of risk assessment, counseling, and initial management of HIV. Performance in these areas was not affected by level of inpatient exposure even though inpatient exposure was much greater. While it was beyond the scope of this survey to assess the type of training received, education efforts in these areas appeared to be effective as residents who perceived their training to be sufficient also reported higher levels of performance of basic competencies in HIV care.

Our results reinforce and expand upon the deficiency in HIV training reported in the 2001 Clinical Practice Reports of Graduating Residents.¹⁴ Compared to a prior detailed study on HIV training reported in 1991, our study found that the value of HIV educational experience remains highly rated, but resident reported competency in this area has not appreciably improved.¹²

Our study has certain limitations. First, the data are self-reported and are therefore subject to recollection bias and may not reflect true practices. However, the survey was anonymous and residents did report varying levels of performance among different aspects of risk factor assessment. Furthermore, studies have shown that physicians' self-assessment skills tend to overestimate their actual skill level; therefore, the deficiencies are likely larger than detected. Second, responder bias may select for those who are more invested in HIV care or who were more dissatisfied with training in general; however, comparison with other parts of their training did not yield high rates of dissatisfaction. Third, our survey only sampled four residency programs, and we do not have survey data from some key areas which train large numbers of residents and have high HIV prevalence, such as California. However, the four programs sampled were large programs located in different geographic regions representing areas with both high and low HIV prevalence rates. Finally, the demographic characteristics of the residents surveyed did not differ significantly from internal medicine residents nationwide. All four of the survey sites had separate outpatient HIV practices, so residents at these sites may therefore have had less am-

bulatory exposure to HIV infected patients than residents at sites without such specialty clinics.

Finally, 25 years into the HIV pandemic, substantial numbers of residents rate their training in HIV outpatient care as inadequate. Residency training in HIV care continues to occur predominantly in the inpatient setting; however, as the current CDC recommendations are implemented, the need for outpatient HIV testing and care will increase. Our results suggest that increased exposure to HIV patients in an outpatient setting as well as incorporating HIV risk factor assessment, testing and counseling, and initial management training into internal medicine residency curricula are needed to improve ambulatory care of HIV-infected patients and those at risk for HIV. Successfully increasing exposure to outpatient HIV care and developing internal medicine residency curricula that address training in these areas will be essential to the success of the CDC's initiative to expand HIV testing, increase access to care, and reduce transmission.

Acknowledgments

We would like to acknowledge the assistance of Ms. Jeanne Macrae, Mr. Bruce Martin, Ms. Elizabeth Thompson, and Dr. Baker-Genaw in technical support of the survey administration. We acknowledge methodological consultation provided by Hsin-Chieh Yeh, Ph.D., Core Faculty of the Johns Hopkins General Internal Medicine Methods Core. This project was supported by the Osler Center for Clinical Excellence at Johns Hopkins.

Author Disclosure Statement

No competing financial interests exist.

References

1. Centers for Disease Control and Prevention. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR* 2006;55: 1–17.
2. Qaseem A, Snow V, Shekelle P, et al. Screening for HIV in Health Care Settings: A Guidance Statement from the American College of Physicians and HIV Medicine Association. *Ann Intern Med* 2009;150:125–131.
3. Marks G, Crepaz N, Janssen RS. Estimating sexual transmission of HIV from persons aware and unaware that they are infected with the virus in the USA. *AIDS* 2006;20:1447–1450.
4. Bayer R, Fairchild AL. Changing the paradigm for HIV testing—the end of exceptionalism. *N Engl J Med* 2006;355: 647–649.
5. Saag M. Opt-out testing: Who can afford to take care of patients with newly diagnosed HIV infection? *Clin Infect Dis* 2007;45:S261–S265.
6. Hecht F, Wilson I, Wu A, Cook R, Turner B. Optimizing care for persons with HIV infection. Society of General Internal Medicine AIDS Task Force. *Ann Intern Med* 1999;131:136–143.
7. Wenrich MD, Curtis JR, Carline JD, Paauw DS, Ramsey PG. HIV Risk Screening in the Primary Care Setting: Assessment of Physicians' Skills. *J Gen Intern Med* 1997;12:107–113.
8. Haas DM, Coe RM. Do physicians discuss HIV and AIDS with patients? A survey of physician practices. *J Commun Health* 1997;22:401–416.

9. Curtis JR, Paauw DS, Wenrich MD, Carline JD, Ramsey PG. Physicians' ability to provide initial primary care to an HIV-infected patient. *Arch Intern Med* 1995;155:1613-1618.
10. Landon BE, Wilson IB, McInnes K, et al. Physician specialization and the quality of care for human immunodeficiency virus infection. *Arch Intern Med* 2005;165:1133-1139.
11. Hayward R, Kravitz R, Shapiro M. Program directors' attitudes towards residents' care of patients who have AIDS. *J Gen Intern Med* 1991;6:18-26.
12. Hayward R, Shapiro M. A national study of AIDS and residency training: Experiences, concerns, and consequences. *Ann Intern Med* 1991;114:23-32.
13. Blumenthal D, Gokhale M, Campbell EG, Weissman JS. Preparedness for clinical practice reports of graduating residents at academic health centers. *JAMA* 2001;286:1027-1034.
14. Sisson S, Hughes M, Levine D, Brancati F. Effect of an Internet-based curriculum on postgraduate education. A multicenter intervention. *J Gen Intern Med* 2004;19(5 Pt 2): 505-509.
15. Centers for Disease Control and Prevention, Divisions of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. www.cdc.gov/hiv/topics/surveillance/resources/reports/2007report/table17.htm (Last accessed September 13, 2009).
16. West CP, Drefahl MM, Popkave C, Kolars JC. Internal medicine resident self-report of factors associated with career decisions. *J Gen Intern Med* 2009;24:946-949.
17. Fenton KA. Changing epidemiology of HIV/AIDS in the United States: Implications for enhancing and promoting HIV testing strategies. *Clin Infect Dis* 2007;45(Suppl 4):S213-220.
18. Hall HI, Song R, Rhodes P, et al. Estimation of HIV incidence in the United States. *JAMA* 2008;300:520.
19. Jain CL, Wyatt CM, Burke R, Sepkowitz K, Begier EM. Knowledge of the Centers for Disease Control and Prevention's 2006 Routine HIV Testing Recommendations among New York City Internal Medicine Residents. *AIDS Patient Care STDs* 2009;23:167-176.
20. Center for Disease Control and Prevention. Revised guidelines for HIV counseling, testing and referral. *MMWR* 2001;50:1-58.

Address correspondence to:
Gail Berkenblit, M.D., Ph.D.
601 North Caroline Street
Baltimore, MD 21287
E-mail: gberken@jhmi.edu