Training Internal Medicine Residents in Outpatient HIV Care: A Survey of Program Directors

Jennifer Adams, MD^{1,2}, Karen Chacko, MD², Gretchen Guiton, PhD², and Eva Aagaard, MD²

¹Denver Health and Hospital Authority, Denver, CO, USA; ²University of Colorado, Aurora, CO, USA.

BACKGROUND: The care of patients with HIV is increasingly focused on outpatient chronic disease management. It is not known to what extent internal medicine residents in the US are currently being trained in or encouraged to provide primary care for this population of patients.

OBJECTIVE: To survey internal medicine residency program directors about their attitudes regarding training in outpatient HIV care and current program practices.

DESIGN: Program directors were surveyed first by email. Non-responding programs were mailed up to two copies of the survey.

SUBJECTS: All internal medicine residency program directors in the US.

MAIN MEASURES: Program director attitudes and residency descriptions.

KEY RESULTS: Of the 372 program directors surveyed, 230 responded (61.8 %). Forty-two percent of program directors agreed that it is important to train residents to be primary care providers for patients with HIV. Teaching outpatient-based HIV curricula was a priority for 45.1%, and 56.5% reported that exposing residents to outpatient HIV clinical care was a high priority. Only 46.5% of programs offer a dedicated rotation in outpatient HIV care, and 50.5% of programs have curricula in place to teach about outpatient HIV care. Only 18.8% of program directors believed their graduates had the skills to be primary providers for patients with HIV, and 70.6% reported that residents interested in providing care for patients with HIV pursued ID fellowships. The strongest reasons cited for limited HIV training during residency were beliefs that patients with HIV prefer to be seen and receive better care in ID clinics compared to general medicine clinics.

CONCLUSIONS: With a looming HIV workforce shortage, we believe that internal medicine programs should create educational experiences that will provide their residents with the skills and knowledge necessary to meet the healthcare needs of this population.

KEY WORDS: HIV/AIDS; primary care; medical education; residency education; workforce.

J Gen Intern Med 25(9):977-81

DOI: 10.1007/s11606-010-1398-6

© Society of General Internal Medicine 2010

INTRODUCTION

The Centers for Disease Control and Prevention (CDC) estimated there were 1,106,400 adults and adolescents living with HIV infection in the United States at the end of 2006.¹ The HIV epidemic has changed drastically since its recognition in 1981, with significant progress in both treatment and prognosis. What was once acute inpatient care of the dying has become outpatient chronic disease management with equal or greater focus on other co-morbidities. Projections suggest that there will soon be a shortage of HIV providers.² Training primary care providers (PCPs) to care for patients with chronic HIV infection may allow us to better meet the chronic health care needs of this growing population.

The projected workforce shortage is attributable to many factors. Many of the clinicians involved in HIV care entered this field at the beginning of the epidemic and are nearing retirement.² As patients are living longer with HIV, the number of patients with chronic infection has exploded.³ Additionally, as screening rates increase due to new CDC recommendations for universal screening,⁴ we expect to see an increase in diagnosis of patients previously unaware of their HIV status who will now require care. Finally, HIV disproportionately affects underserved and minority populations;⁵ therefore reimbursement is often low, making the recruitment of new providers difficult.⁶ The HIV Medicine Association (HIVMA) and the American Academy of HIV Medicine (AAHIVM) issued a joint statement in 2009 confirming their belief that a workforce shortage is imminent.²

Given these changes in the epidemic and the HIV workforce, it is critical that we train a new generation of providers who are comfortable providing complex HIV chronic disease management. In addition, as these patients continue to live longer with HIV,⁷ caring for other medical co-morbidities, and providing routine preventive care services become increasingly important. PCPs, including general internists, are uniquely situated to provide this type of comprehensive, longitudinal care to patients with HIV. It is well documented that general practitioners and mid-level providers provide quality of care equal to that of ID specialists when they have experience caring for patients with HIV.⁸⁻¹¹ However, many PCPs do not provide this care for HIV

Electronic supplementary material The online version of this article (doi:10.1007/s11606-010-1398-6) contains supplementary material, which is available to authorized users.

Received September 17, 2009

Revised March 17, 2010

Accepted May 1, 2010

Published online May 27, 2010

patients, presumably due to the fact that they have not been trained in HIV care and feel more comfortable referring these patients to specialists. Prior research has shown that only 67% of residents in primary care fields felt prepared to care for patients with HIV/AIDS.¹²

HIVMA and AAHIVM have both defined criteria for HIV specialists.^{13,14} Commonalities include passing a certification exam, providing care to at least 20 HIV infected patients, and ongoing continuing medical education in the area of HIV. These criteria suggest that PCPs can function as primary providers of HIV care with additional training and interest in this area short of an infectious diseases (ID) fellowship.

Hayward et al.¹⁵ surveyed residency program directors in internal medicine and family medicine in 1991 to assess attitudes about training residents to care for inpatients and outpatients with AIDS. To the best of our knowledge, attitudes of program directors and educational experiences in HIV care during internal medicine residency training have not been examined since then. It is not known to what extent residents in the US currently are being trained or encouraged to provide primary care for patients with HIV.

We conducted a survey of all internal medicine residency program directors in the United States (US). Our goals were to evaluate attitudes toward training residents to provide comprehensive primary care to patients with HIV; to assess the prevalence of curricula in this field; and to determine the impact of program characteristics, HIV prevalence in the training area and geographic location of the program on these results. In addition, we sought to determine how attitudes and training opportunities have changed since the study performed by Hayward, et al. in 1991.¹⁵

METHODS

We contacted all members of the Association of Program Directors in Internal Medicine (APDIM) listserve with a one-time email containing a link to our "Zoomerang" survey.¹⁶ All but six US internal medicine programs are current members of APDIM. We subsequently mailed copies of the survey to all non-responding and non-APDIM member accredited internal medicine residency programs listed by the American Medical Association (AMA). Data were collected between May and October of 2008. If we received responses from both program directors and other residency administrators, we used only the program director response. For those programs where the program director did not respond, we used other program administrators' responses if available.

In designing the survey, we attempted to replicate questions posed by Hayward et al.¹⁵ based on the results presented in that paper. We were unable to obtain the original survey instrument. Some questions were modified or added to focus on our interest in outpatient care of HIV. The survey (see appendix online) asked questions about program directors' attitudes about the importance of training residents to care for outpatients with HIV infection; factors that limit training of residents in outpatient HIV care; the level of exposure to patients with HIV in the resident continuity clinic practice setting; HIV outpatient curricula and other clinical experiences

offered during training; and demographic information about the program and training setting. Attitudes and opinions were assessed using a five point Likert scale ranging from 1=strongly disagree to 5=strongly agree. Because the attitudinal data tended to cluster together, we felt these responses were more effectively interpreted as dichotomous variables. Therefore, for the analysis, we grouped strongly agree and agree responses together and neutral, disagree and strongly disagree together. Demographic data for non-responding programs were collected by searching the AMA's FRIEDA database.¹⁷ For those with incomplete information in this database, a web search was conducted, including review of the program website. We analyzed the responses of programs even if all questions on the survey were not complete; for this reason, responses to some questions do not add up to 100%.

We defined a rural training setting as a population of less than 10,000; a small city as a 10,000 to 50,000; and urban setting as greater than 50,000. The geographic regions are those defined by the American Association of Medical Colleges (AAMC).¹⁸ We characterized the program director specialty as generalist, infectious diseases, or other subspecialty. We collected data on program size, the presence or absence of a primary care track within a residency program, the presence of an HIV/ID sub-specialty clinic at the institution, and whether the program was university-based or community-based. For our analysis, we divided programs into three equal sized and based groups of 70 programs each based on the number of residents. Small programs were defined as having between 12–37 residents, medium programs had 38–72 residents, and large programs had 73–192 residents.

Data regarding HIV prevalence in the residency program location were collected independent of the survey since it was felt that published data on prevalence would be more accurate than program directors' estimates. These data were collected from the CDC HIV Prevalence report in 2006.⁵ The CDC reports AIDS prevalence data for metropolitan areas as well as by state. We used AIDS prevalence data as a proxy for HIV prevalence. If a training program was located in an area outside one of the metropolitan areas reported (70 programs, 18.8%), we used state-wide data. For the analysis, programs were divided into three equal groups of high, low or moderate prevalence. HIV prevalence was characterized as low if the rate of AIDS cases per 100,000 population was between zero and 10, moderate prevalence between 10.1 and 16, and high prevalence between 16.1 and 41.9.

Because one of our primary interests was to see how attitudes and training models in outpatient HIV care have changed over time, we compared our findings to those reported by Hayward et al. who conducted a similar study in 1991.¹⁵

All analyses were performed using SPSS version 16. Descriptive statistics (frequencies, percents, means and standard deviations as appropriate) were generated for all variables. ANOVAs with post hoc Scheffe analyses and t-tests were used to compare means of continuous data, after verifying normality. Chi-square tests were used for categorical variables. The predictive value of program characteristics on program director attitudes (specifically, 'I believe it is important to train all residents in my program to be PCPs for patients with HIV by the completion of a 3 year residency without further subspecialty training') were assessed using logistic regression. The base model was compared to a full model with all program characteristics entering the model simultaneously. The ade-

quacy of the model was assessed using the Hosmer and Lemeshow goodness-of-fit test. The questionnaire and study design were approved by the University of Colorado Multiple Institutional Review Board.

RESULTS

Of the 372 program directors surveyed, 230 responded (61.8%). The demographic characteristics of responding programs are shown in Table 1. Comparison of respondents to non-respondents using chi-square tests indicates that only setting was significantly different with university-based programs being disproportionately represented in the sample of respondents.

Fewer than half of program directors (42.1%) felt it was important to train residents to be PCPs for patients with HIV. Providing a curriculum in outpatient-based HIV care was a priority for 45.1% of program directors, and 56.5% reported that clinical exposure to outpatient HIV care was a priority. Approximately half of the programs offered curricula or clinical experiences in outpatient-based HIV care. Of those programs that offered HIV curricula or didactic programs, 19.6% incorporate online educational modules or cases. Only 4.5% of programs that do not offer curricula or didactics in outpatient HIV made online modules available to their residents.

Among all programs, 34% of program directors stated residents in their program care for HIV patients throughout the spectrum of disease in their continuity clinics, consulting a specialist only when necessary. Thirty-eight percent of program directors reported that their housestaff care for patients in the early stages of HIV infection in a general medicine setting and refer to a specialist when complications of AIDS develop or antiretroviral therapy is required. Forty-five percent of programs report that residents do not provide any continuity care for patients with HIV and all chronic care for these patients is delivered in a subspecialty clinic. Only 18.8% of program directors believed their graduates had the skills necessary to be primary providers for patients with HIV, and 70.6% reported that residents interested in providing care for patients with HIV typically pursue ID fellowships.

Table 1. Characteristics of Internal Medicine Programs Responding to Survey (N=230 Responding Programs)

Program characteristics	
Setting	
University based	48.3%
Community based	51.2%
Location	
Rural (pop. <10,000)	0.5%
Small city	6.0%
Urban (pop. >50,000)	93.1%
Region	
Northeast	38.8%
South	23.3%
Midwest	21.0%
West	16.4%

Table 2. Program Director Attitudes about Potential Barriers in Outpatient HIV Training of Residents (N=230 Responding Programs)

The following factors limit resident training in HIV:	Strongly agree or Agree
HIV is too complicated for generalists	37.1%
HIV is too complicated for trainees	22.4%
We do not have faculty with enough expertise in HIV care to supervise and teach residents caring for a continuity panel of patients with HIV	36.3%
Few of our graduates will practice HIV as a generalist	77.2%
HIV prevalence is too low in the geographic area where my residency training program exists to warrant training residents in HIV care	12.9%
Residents resist caring for patients with chronic HIV in a continuity clinic setting	9.8%
Patients receive better care in ID subspecialty clinics than in general primary care clinics at my institution	64.6%
Patients at our institution with HIV prefer to be seen by an infectious disease/HIV specialist than a generalist	59.8%

Table 2 outlines many of the potential barriers to providing comprehensive outpatient HIV training to residents. The strongest reasons cited for limited HIV training were beliefs that few graduates will practice HIV medicine as a generalist, patients with HIV prefer to be seen in ID subspecialty clinics and that patients receive better care in ID clinics compared to general medicine clinics.

Logistic regression found directors of programs in areas with low HIV prevalence were significantly less likely to agree that it is important to train all residents in their program to be PCPs for patients with HIV (OR 0.41, CI 0.19-0.91). No other program characteristics were predictive of program director attitudes.

DISCUSSION

Based on the results of this study, fewer than half of program directors agreed that it is important to train residents to be PCPs for patients with HIV and provide residents with an outpatient-based HIV curricula. Fewer than half of programs offer a dedicated rotation in outpatient HIV care, and half have curricula in place to teach about outpatient HIV care. Very few program directors believed their graduates had the skills to be PCPs for these patients, and most reported that residents interested in providing care for patients with HIV were likely to pursue ID fellowships. The strongest reasons cited for limited HIV training were beliefs that most trainees will not practice HIV medicine as a generalist, and that patients with HIV prefer to be seen in and receive better care in ID clinics compared to general medicine clinics.

Despite these beliefs, training PCPs to care for patients with HIV is critical. Since the advent of potent antiretroviral therapy, rates of AIDS-related morbidity and mortality have decreased dramatically. The proportion of deaths amongst patients with HIV due to AIDS-related causes fell from 54.2% in 1996 to 25.0% in 2004. At the same time, the proportion of

deaths attributed to non-AIDS causes increased from 13.1% in 1996 to 42.5% in 2004.⁷ Overall in the US, the incidence of HIV infection has remained stable since the late 1990s, and therefore with the dropping death rate, the prevalence of HIV infection has risen annually³ without a proportionate increase in qualified HIV providers.²

Although we did not find a large number of differences in program director attitudes based on program characteristics, we did find that program directors in low HIV prevalence areas were significantly less likely to believe that training all residents in outpatient HIV care was important as compared with programs in higher prevalence areas. This may reflect a lack of access to training opportunities, but is concerning because many graduates do not practice in the same area they trained after completion of residency. It is important that all internal medicine graduates have a working knowledge of outpatient HIV care so they will be well-prepared to care for this population.²⁰

In comparing these data to those collected by Hayward et al. in 1991,¹⁵ it is interesting to note that at that time, 42% of program directors reported that their residents were adequately trained in AIDS ambulatory care. In our survey, this percentage had dropped to 19%. In 1991, 91% of program directors felt providing primary care for AIDS patients was a valuable educational experience; today only 56% reported that clinical exposure to outpatient HIV was a priority. Unfortunately, it appears that program director interest in training residents in HIV ambulatory care is waning significantly at a time when there is a dramatic increase in the need for practitioners with HIV training.

Overall, little has changed since the 1991 study with regards to resident preparation to provide primary care to patients with HIV, but the reasons and attitudes cited for not providing this training have evolved over time. The previously cited reasons for not encouraging residents to assume primary care of AIDS patients included provision of care to patients with AIDS was too stressful for residents, care was too complex for generalists, and a lack of faculty with qualifications to supervise residents in this care. The most common reasons found in our study were the belief that most graduates will not provide HIV ambulatory care as a generalist, and that patients both prefer to be seen and receive better care in HIV specialty clinics than general medicine clinics.

There are limitations to our study. The survey results reflect attitudes and descriptions of training environments and educational opportunities by residency program directors. It is not known if surveying residents would yield the same results. In addition, although it would be more applicable to know HIV prevalence than AIDS prevalence, these data are not readily available in all locations as they are determined by case reporting and there are differences in testing and reporting in different communities. AIDS and HIV prevalence may not correlate in all communities, especially given that universal HIV testing is inconsistently practiced. However, we assume AIDS prevalence is proportional to HIV prevalence in most settings and would not expect this to affect our findings. Another limitation is that program directors may have different interpretations of what primary care for HIV patients encompasses. This may have caused respondents to alter their responses to some of the attitudinal questions. This was unlikely to affect our results as the overall content of the survey focused on providing independent care to HIV patients

as opposed to co-management with an HIV specialist. Finally our comparisons to the findings published by Hayward et al. in 1991 are limited by the fact that the previous survey focused on AIDS patients while ours focused on patients with HIV, and the 1991 survey included internal medicine and family medicine programs, while ours focused only on internal medicine. Additionally, because we did not have access to the original survey, many of our questions were likely stated slightly differently which affects our ability to directly compare results.

Though a model of HIV care being delivered by ID specialists has predominated in recent years, historically HIV care has been provided by a wide range of providers including ID specialists, general internists, family practitioners, and others.¹⁹ With a workforce shortage looming, we must increase our focus in training PCPs in addition to ID specialists to meet this need. With additional training in HIV care offered during residency, those residents with a specific interest in HIV can obtain a level of expertise that would allow them to practice HIV care without further fellowship training as defined by HIV professional organizations.^{13,14} Furthermore, offering additional exposure to HIV medicine in residency training would benefit all trainees since the aging HIV population is likely to require care from a variety of specialists and a working knowledge of outpatient HIV care should be required for all internists.²⁰

We conclude that despite a growing need for PCPs to care for patients with HIV, most internal medicine residency programs are not providing their residents with this training, and as a result, most program directors do not feel their graduates have developed adequate skills to provide competent HIV continuity care at the conclusion of residency. While several factors are likely at play, it is clear that program director attitudes that devalue this training contribute significantly. Future research should focus on strategies for tackling the predicted HIV workforce shortage including development of training programs to promote HIV clinical skills among PCPs. There will be challenges in adding HIV curricula to residency training given the broad scope of clinical competencies that must be achieved. However, as we face a looming workforce shortage, we need to proactively create educational experiences that will provide trainees with the skills and knowledge to deliver comprehensive care to the growing population of patients with HIV.

Conflict of Interest: None disclosed.

Corresponding Author: Jennifer Adams, MD; Denver Health and Hospital Authority, 1100 Federal Blvd, MC 3000, Denver, CO, USA (e-mail: Jennifer.adams@dhha.org).

REFERENCES

1. Campsmith M, Rhodes P, et al. HIV prevalence estimates-United States, 2006. *MMWR Morb Mortal Wkly Rep*. 2008;57(39):1073-1076.
2. Carmichael D, Feinberg, et al. Averting a Crisis in HIV Care: A Joint Statement of the American Academy of HIV Medicine (AAHIVM) and the HIV Medicine Association (HIVMA) On the HIV Medical Workforce. Available at: <https://www.hivma.org/WorkArea/DownloadAsset.aspx?id=14752>. Accessed April 4, 2010.

3. New Estimates of US HIV Prevalence. Available at: <http://www.cdc.gov/hiv/topics/surveillance/resources/factsheets/pdf/prevalence.pdf>. Accessed April 4, 2010.
4. **Branson BM, Handsfield HH, Lampe MA, et al.** Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR Recomm Rep.* 2006;55(RR-14):1–17. quiz CE11–14.
5. Centers for Disease Control and Prevention HIV/AIDS Surveillance Report 2006 [website]. Available at: <http://www.cdc.gov/hiv/topics/surveillance/resources/reports/2006report/default.htm>. Accessed April, 2010.
6. **Salsberg E, Grover A.** Physician workforce shortages: implications and issues for academic health centers and policymakers. *Acad Med.* 2006;81(9):782–787.
7. **Palella FJ Jr, Baker RK, Moorman AC, et al.** Mortality in the highly active antiretroviral therapy era: changing causes of death and disease in the HIV outpatient study. *J Acquir Immune Defic Syndr.* 2006;43(1):27–34.
8. **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(10):1133–1139.
9. **Koethe JR, Moore RD, Wagner KR.** Physician specialization and women's primary care services in an urban HIV clinic. *AIDS Patient Care STDS.* 2008;22(5):373–380.
10. **Wilson IB, Landon BE, Ding L, et al.** A national study of the relationship of care site HIV specialization to early adoption of highly active antiretroviral therapy Physician specialization and antiretroviral therapy for HIV Specialty training and specialization among physicians who treat HIV/AIDS in the United States. *Med Care.* 2005;43(1):12–20.
11. **Wilson IB, Landon BE, Hirschhorn LR, et al.** Quality of HIV care provided by nurse practitioners, physician assistants, and physicians. *Ann Intern Med.* 2005;143(10):729–736.
12. **Weissman JS, Campbell EG, Gokhale M.** et. a. Residents' preferences and preparation for caring for underserved populations. *J Urban Health.* 2001;78(3):535–549.
13. AAHIVM HIV Specialist Credentialing Program. Available at: www.aahivm.org. Accessed April 4, 2010.
14. HIVMA's Definition of an Experienced HIV Provider. Available at: www.hivma.org. Accessed April 4, 2010.
15. **Hayward RA, Kravitz RL, Shapiro MF.** Program directors' attitudes towards residents' care of patients who have AIDS. *J Gen Intern Med.* 1991;6(1):18–26.
16. Zoomerang Online Survey. Available at: www.zoomerang.com. Accessed April 4, 2010.
17. American Medical Association-FREIDA Online. Available at: <http://www.ama-assn.org/ama/pub/education-careers/graduate-medical-education/freida-online.shtml>. Accessed April, 2010.
18. U.S. and Canadian Regional Map. Available at: <http://www.aamc.org/members/gea/regions/regional.pdf>. Accessed April 4, 2010.
19. **Landon BE, Wilson IB, Wenger NS, et al.** Specialty training and specialization among physicians who treat HIV/AIDS in the United States. *J Gen Intern Med.* 2002;17(1):12–22.
20. American Board of Internal Medicine Certification Exam Blueprint. Available at: http://www.abim.org/pdf/blueprint/im_cert.pdf. Accessed April 4, 2010.