

Effect of Physician Specialty on Counseling Practices and Medical Referral Patterns among Physicians Caring for Disadvantaged Human Immunodeficiency Virus–Infected Populations

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Data regarding the care and management of human immunodeficiency virus (HIV)–infected patients provided by infectious diseases (ID)–trained physicians, compared with data for care and management provided by other specialists, are limited. Here, we report results of a self-administered survey sent to 317 physicians (response rate, 76%) in 4 metropolitan areas of the United States who were identified as providing care to disadvantaged HIV-infected patients. ID-trained physicians who responded that they strongly agreed or somewhat agreed that they had enough time to care for their HIV-infected patients were more likely than were non-ID-trained physicians to provide therapy-adherence counseling. Physicians with ≥ 50 patients in care and ID-trained physicians were less likely to always discuss condom use and risk reduction for HIV transmission. Factors significantly associated with referring rather than treating HIV-infected patients with hypertension or diabetes included having < 50 patients in care, being an ID-trained physician, and practicing in a private practice. These results suggest the need for targeted physician training on the importance of HIV transmission prevention counseling, increasing the duration of patient visits, and improving strategies for generalist-specialist comanagement of HIV-infected patients.

Over the last few years, the success of HAART has dramatically changed the clinical course of HIV disease, such that this infection is now managed as a chronic illness. Prescribing and monitoring HAART regimens, managing side effects, and educating patients about the

importance of near perfect adherence to their therapy regimen are important components of modern HIV medical care. However, recent data suggest that there has been an increase in the frequency of high-risk behavior among people living with HIV [1, 2], which underscores the need for providing HIV transmission prevention education to HIV-infected patients. Thus, physicians with HIV-infected patients are now not only responsible for the primary care needs of these patients, including routine health maintenance and screening for and managing associated illnesses, such as diabetes or hypertension, but also must provide counseling on HIV transmission risks and secondary prevention. This requires renewed emphasis, given the current demographics of the epidemic's spread to resource-poor settings with few physicians.

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Historically, physicians with diverse professional training have provided HIV medical care, including physicians who are infectious diseases (ID)-trained specialists, as well as those who are general practitioners or trained in other specialties (i.e., non-ID trained). Previous studies have shown that generalists and family practitioners with the most residency- and practice-based experience with HIV and AIDS had patients with the lowest relative risks of dying [3]. There are studies indicating that ID-trained specialists are more familiar than are other specialists with the latest antiretroviral therapy (ART) recommendations [4, 5], but yet other studies have found that ID-trained physicians are less confident in their assessment of patients' sexual risk and substance abuse characteristics [6]. The number of years of experience with HIV-infected patients may be a better indicator of the quality of care than is the type of specialty training received [7, 8]. More information is needed about the medical training and practice experience that will best prepare physicians to respond to the challenges posed by persons living with HIV infection.

The current study compared the care practices and characteristics (e.g., years of experience, number of HIV-infected patients in care, and perceived time constraints) of ID-trained physicians with those of non-ID-trained physicians in 4 major U.S. cities. We examined how ID-trained physicians were addressing primary-care issues and then examined factors associated with these patterns of care.

METHODS

Study design. The Antiretroviral Treatment and Access Study (ARTAS) [9] seeks to evaluate the effectiveness of a case management intervention in 4 cities in the United States (Atlanta, GA; Baltimore, MD; Los Angeles, CA; and Miami, FL) that was designed to increase access to and use of HIV care services by individuals who recently received a diagnosis of HIV infection. ARTAS also includes 2 additional components, a site survey and a physician survey. In the context of the ARTAS evaluation, we mailed a questionnaire to 417 physicians who primarily served disadvantaged HIV-infected persons. These physicians were identified from records of medical care sites that received Ryan White funding in 2001 (i.e., sites that provide AIDS Drug Assistance Program services), HIV testing sites, city health departments, and community health centers, and from private practitioners who reported providing care to a predominantly indigent HIV-infected population. Physicians received a disclosure letter explaining the study, the confidentiality of records, and the requirements of participation. Physicians who returned a completed survey received \$25 in compensation. The study was approved by the Centers for Disease and Control and Prevention (CDC) Institutional Review Board (Atlanta, GA), as

well as by the institutional review boards of all participating institutions.

In this report, we compared responses from ID-trained physicians with those from non-ID-trained physicians regarding the treatment HIV-infected adults. The latter group of physicians included general practitioners and physicians eligible for board status or board certified in family practice, internal medicine, or other medical subspecialties.

Measurements and data analysis. We assessed physicians' response to questions that addressed the following topics:

1. Characteristics of physicians. We assessed professional training and/or background, age and sex, the number of years of caring for HIV-infected patients, and the number of HIV-infected patients in primary practice.

2. Topics discussed with patients. We assessed reports of the frequency in which physicians and their patients discussed adherence to ART regimen (e.g., impact on virus load, CD4 counts, and drug resistance) or to opportunistic infection (OI) prophylaxis, how to take the prescribed medicine (e.g., dose, frequency, dietary restrictions, and refrigeration), mental health (e.g., psychological issues that could interfere with taking medication), and wellness (e.g., nutrition and exercise). Specifically, for *established* patients (i.e., patients seen during return visits), we assessed the frequency in which risk reduction behavior for HIV transmission and condom use were discussed. Respondents selected 1 of 4 options from a 4-point Likert scale ("almost never discuss," "sometimes discuss," "frequently discuss," and "always discuss"). Responses were dichotomized by aggregating the selections of "almost never discuss," "sometimes discuss," and "frequently discuss" and contrasting the result with the number of times "always discuss" was selected.

3. Perceived time constraints. We assessed responses to the statement "I feel I have sufficient time to provide care and information needed to my HIV-positive patients" with a 4-point Likert scale ("strongly agree," "somewhat agree," "somewhat disagree," and "strongly disagree").

4. Referral patterns. We assessed patterns of treatment or referral of HIV-infected patients with diabetes or hypertension, which is considered an index of the provision of non-HIV-related primary care.

Eight categories (0%, 1%–10%, 11%–25%, 26%–40%, 41%–60%, 61%–75%, 76%–90%, and 91%–100% of patients) were provided for respondents to indicate the frequency of discussion of condom use and provision of HIV transmission reduction counseling with established HIV-infected patients. For the purpose of this analysis, responses were dichotomized as follows: 91%–100% of patients versus 0%–90% of patients.

For statistical analysis, we employed SAS, version 8.0 (SAS Institute), in a multivariate logistic regression analysis to obtain adjusted ORs (aORs) and 95% CIs. Our analyses primarily

Table 1. Comparison of characteristics of physicians caring for HIV-infected patients, by type of physician training.

Characteristic	No. (%) of physicians, by training type		P
	ID trained (n = 148)	Non-ID trained ^a (n = 169)	
No. of years of caring for patients with HIV/AIDS			
1–4	14 (9)	42 (24)	<.01 ^b
5–8	31 (21)	34 (20)	
> 8	103 (70)	94 (56)	
No. of HIV-infected patients in care			
<10	17 (12)	21 (12)	.94 ^b
10–50	33 (22)	39 (23)	
>50	97 (66)	110 (65)	
Age in years			
40	47 (32)	57 (34)	.71
≥40	101 (68)	113 (66)	
Male sex	95 (64)	113 (67)	.62
“Always discuss” with patients			
Adherence to ART regimen	131 (89)	135 (80)	.03
Adherence to OI prophylaxis	102 (69)	104 (61)	.17
How to take medicine	86 (58)	87 (52)	.26
Condom use ^c	15 (10)	35 (21)	.01
Transmission risk reduction ^c	13 (9)	31 (18)	.02

NOTE. ART, antiretroviral therapy; ID, infectious diseases; OI, opportunistic infection.

^a Trained in internal medicine, family practice, general practice, preventive medicine, oncology, obstetrics/gynecology, allergy/immunology, or pulmonary/critical care medicine.

^b Calculated by a heterogeneous χ^2 test.

^c Response was “discuss >90% of the time” instead of “always discuss.”

compared the responses of ID-trained physicians with those of non-ID-trained physicians. Specifically, we analyzed whether 4 variables—type of professional training, perceived time constraints, number of HIV-infected patients in care (≥ 50 patients or < 50 patients), and number of years of caring for HIV-infected patients (≤ 8 years or > 8 years)—were predictive of whether physicians discussed certain care topics with their patients. We also determined whether 4 variables—type of professional training, estimated duration of time spent with patients during visits (≥ 30 min or < 30 min), number of HIV-infected patients in care (≥ 50 patients or < 50 patients), and practice setting (private office vs. hospital, community clinic, or public health setting)—influenced the decision to treat or refer HIV-infected patients with diabetes or hypertension. The effects of specialty training and of the estimated duration of time spent with patients on whether adherence to ART regimen and OI prophylaxis was discussed were estimated with an interaction term. The term “statistically significant” refers to a P value of $< .05$.

RESULTS

Physician characteristics. The physician response rate was 317 (76%) of 417 physicians surveyed. Of these 317, 148 (46.7%) indicated they were ID trained, 90 (28.4%) were internal medicine trained, 50 (15.8%) were family practice trained, 15 (4.7%) described themselves as general practitioners, and 14 (4.4%) had received other professional training (table 1). The latter category included physicians who described themselves as eligible for board status or board certified in preventive medicine, oncology, obstetrics/gynecology, allergy/immunology, or pulmonary/critical care medicine.

Overall, ID-trained physicians reported a greater number of years of caring for patients with HIV/AIDS than did non-ID-trained physicians ($P < .01$; table 1). However, the majority of physicians in both categories reported having > 8 years of experience. The number of HIV-infected patients in care was similar for both groups, with the majority of physicians reporting that they were caring for ≥ 50 HIV-infected patients

(table 1). The majority of physicians were >40 years of age, and the majority were male.

Topics discussed with HIV-infected patients. Numbers and percentages of physicians who always discussed topics in the survey with their patients are shown in table 1. Regardless of professional training, physicians were more likely to always counsel on antiretroviral adherence and OI prophylaxis than to counsel on condom use or HIV transmission risk reduction.

Multivariate analysis (table 2) revealed that ID-trained physicians who agreed that they had enough time to see patients were much more likely to discuss adherence to ART regimen (aOR, 8.4; 95% CI, 2.1–32.7) or adherence to OI prophylaxis (aOR, 4.2; 95% CI, 1.8–9.9) than were non-ID-trained physicians who agreed they had enough time (table 2). For physicians who somewhat agreed there was enough time, ID-trained physicians, compared with non-ID-trained physicians, also reported that they more often always discussed adherence to ART regimen (aOR, 2.6; 95% CI, 0.8–13.2) and OI prophylaxis (aOR, 1.6; 95% CI, 1.0–2.7). For those who disagreed that there was enough time, the percentage who reported always discussing adherence to ART regimen (aOR, 0.8; 95% CI,

0.3–2.0) and OI prophylaxis (aOR, 0.6; 95% CI, 0.3–1.3) was indistinguishable between ID-trained physicians and non-ID-trained physicians (table 2).

Compared with physicians who had <50 HIV-infected patients in care, physicians who had ≥50 HIV-infected patients in care were more likely to discuss adherence to ART regimen (aOR, 1.7; 95% CI, 0.9–3.4; table 2). Also, those physicians with ≥50 patients in care were significantly more likely to discuss how to take medication (aOR, 1.8; 95% CI, 1.1–2.9; table 3). In contrast, having a greater number of patients in care was associated with significantly less-frequent discussion of condom use with established patients (aOR, 0.4; 95% CI, 0.2–0.8; table 3) and with less-frequent discussion of risk reduction; however, the latter difference did not reach statistical significance (aOR, 0.6; 95% CI, 0.3–1.1; table 3).

ID-trained physicians were significantly less likely to discuss condom use (aOR, 0.5; 95% CI, 0.2–0.9) and risk reduction (aOR, 0.4; 95% CI, 0.2–0.9) with their established HIV-infected patients (table 3). Physicians with >8 years of experience were more likely to discuss mental health (aOR, 2.1; 95% CI, 1.0–4.4)

Table 2. Adjusted ORs (aORs) for variables predictive of physicians discussing therapy adherence with HIV-infected patients.

Variable	No. (%) of physicians (n = 317)	Adherence to ART regimen			Adherence to OI prophylaxis		
		No. of physicians who		aOR ^a (95% CI)	No. of physicians who		aOR ^a (95% CI)
		Always discuss	Frequently, sometimes, or never discuss		Always discuss	Frequently, sometimes, or never discuss	
Professional training, by perceived time constraint ^b							
Strongly agree time is sufficient							
ID	50 (52)	49	1	8.4 (2.1–32.7)	42	8	4.2 (1.8–9.9)
Non-ID	46 (48)	36	10	Reference	26	20	Reference
Somewhat agree time is sufficient							
ID	46 (42)	40	6	2.6 (0.8–13.2)	33	13	1.6 (1.0–2.7)
Non-ID	63 (58)	49	14	Reference	40	23	Reference
Disagree time is sufficient							
ID	51 (46)	41	10	0.8 (0.3–2.0)	26	25	0.6 (0.3–1.3)
Non-ID	59 (53)	49	10	Reference	37	22	Reference
No. of HIV-infected patients in care							
≥50	207 (65)	180	27	1.7 (0.9–3.4)	138	69	1.1 (0.6–1.9)
<50	110 (35)	86	24	Reference	68	42	Reference
No. of years of caring for patients with HIV/AIDS							
>8	197 (62)	163	34	0.7 (0.4–1.3)	122	75	0.6 (0.4–1.1)
≤8	120 (38)	103	17	Reference	84	36	Reference

NOTE. ART, antiretroviral therapy; OI, opportunistic infection.

^a Adjusted for professional training, perceived time constraints, patient load, and number of years of caring for patients by multivariate logistic regression.

^b “Professional training” refers to either infectious diseases (ID)–training or non-ID training (i.e., training in internal medicine, family practice, general practice, or other specialties). “Perceived time constraint” refers to the response to the statement “I feel I have sufficient time to provide care and information needed to my HIV-positive patients.”

Table 3. Adjusted ORs (aORs) for variables predictive of the number of physicians discussing certain care topics with HIV-infected patients.

Variable	No. (%) of physicians (n = 317)	How to take drugs			Condom use ^a			HIV transmission risk reduction ^a		
		No. of physicians who		aOR ^b (95% CI)	No. of physicians who		aOR ^b (95% CI)	No. of physicians who		aOR (95% CI)
		Always discuss	Frequently, sometimes, or never discuss		Discuss >90% of time	Discuss ≤90% of time		Discuss >90% of time	Discuss ≤90% of time	
Professional training										
Infectious diseases	148 (47)	86	62	1.2 (0.7–1.9)	15	130	0.5 (0.2–0.9)	13	132	0.4 (0.2–0.9)
Non-infectious diseases ^c	169 (53)	86	81	Reference	35	134	Reference	31	138	Reference
No. of HIV-infected patients in care										
≥50	207 (66)	122	85	1.8 (1.1–2.9)	24	183	0.4 (0.2–0.8)	24	183	0.6 (0.3–1.1)
<50	110 (34)	51	58	Reference	26	81	Reference	20	87	Reference
No. of years of caring for HIV-infected patients										
>8	197 (62)	114	83	0.7 (0.5–1.2)	27	168	0.7 (0.5–2.3)	28	167	1.2 (0.6–2.4)
≤8	119 (38)	59	60	Reference	23	96	Reference	16	103	Reference
Perceived time constraint^d										
Strongly agree time is sufficient	96 (30)	66	30	2.5 (1.4–4.5)	17	77	1.1 (0.5–2.3)	13	81	1.0 (0.5–2.3)
Somewhat agree time is sufficient	109 (35)	54	54	1.1 (0.7–1.9)	14	95	0.7 (0.3–1.5)	16	93	1.1 (0.5–2.3)
Disagree time is sufficient	110 (35)	52	58	Reference	19	90	Reference	15	94	Reference

^a Discussed specifically with established patients.

^b Adjusted for professional training, patient load, number of years of caring for patients, and perceived time constraints by multivariate logistic regression.

^c Trained in internal medicine, family practice, general practice, preventive medicine, oncology, obstetrics/gynecology, allergy/immunology, or pulmonary/critical care medicine.

^d Refers to the response to the statement “I feel I have sufficient time to provide care and information needed to my HIV-positive patients.”

and wellness (aOR, 1.8; 95% CI, 1.0–3.0), compared with those with <8 years of experience.

Referral patterns. Variables associated with referring rather than treating HIV-infected patients with diabetes or hypertension are shown in table 4. ID-trained physicians were more likely than those without ID training to refer an HIV-infected patient with diabetes or hypertension (aOR, 4.1; 95% CI, 1.6–10.7). Physicians who practiced in a private office, compared with those who did not, were also more likely to refer such patients (aOR, 3.2; 95% CI, 1.6–6.4). Physicians who had <50 HIV-infected patients in care were more likely to refer HIV-infected patients with diabetes or hypertension than were those with ≥50 such patients in care (aOR, 2.2; 95% CI, 1.1–4.6). Notably, the number of minutes physicians reported spending with their patients was not related to the decision to refer or treat HIV-infected patients with diabetes or hypertension.

DISCUSSION

Our study compared the HIV-related care practices and characteristics of ID-trained physicians with those of non-ID-trained physicians. ID-trained physicians and non-ID-trained physicians reported more frequently that they counseled on ART regimen adherence and OI prophylaxis adherence, compared with the number who reported counseling on condom use or HIV transmission risk reduction. Physicians who treat patients with HIV infection now find themselves in the role of primary care providers and are responsible not only for

prescribing medications but also for monitoring adherence to medication regimens, treating drug-induced side effects, and managing patients who have other chronic conditions, such as diabetes or hypertension. Because HIV infection can be transmitted to others, prevention and risk reduction education remain very important.

We found that ID-trained physicians were much more likely than were other physicians to provide adherence counseling if they had enough time to provide care to their HIV-infected patients. Although the frequency of adherence-related counseling was higher than that of other types of counseling overall, ID-trained physicians gave such counseling a high priority relative to that given to other counseling activities, compared with other physicians. On the other hand, ID-trained physicians were less likely than were physicians with other training to discuss HIV transmission risk reduction and condom use with their established patients. These associations held even when we controlled for the number of HIV-infected patients in care, years of experience with patients with HIV/AIDS, and perceived time constraints. It is possible that the group of ID-trained physicians who participated in this study may have some of these counseling functions performed by other members of their office staff. However, studies have consistently demonstrated that patients view their physician as a trusted and authoritative source of health-related information [10–12], and so physicians should be reminded that providing or even introducing prevention counseling to patients may have an important effect on their patients' behavior. Physicians caring for

Table 4. Adjusted ORs (aORs) for variables that predict referral and treatment of HIV-infected patients with diabetes or hypertension.

Variable	No. (%) of physicians (n = 296)	No. of physicians who		aOR ^a
		Refer	Treat	
Professional training				
Infectious diseases	137 (46)	36	101	4.1 (1.6–10.7)
Internal medicine	87 (30)	2	85	0.3 (0.5–1.5)
Other specialties ^b	72 (24)	6	66	Reference
Time spent with patients, min				
<30	230 (78)	38	192	2.0 (0.8–5.3)
≥30	66 (22)	6	60	Reference
No. of HIV-infected patients in care				
<50	107 (36)	21	86	2.2 (1.1–4.6)
≥50	189 (64)	23	166	Reference
Practice setting				
Private office	91 (31)	24	67	3.2 (1.6–6.4)
All other sites ^c	205 (69)	20	185	Reference

^a Adjusted for physician training, time spent with patients, patient load, and practice setting by multivariate logistic regression

^b General practice, family practice, and other physicians combined as reference group.

^c Hospital, community-based clinic, or public health setting.

HIV-infected patients should be trained in risk-reduction counseling and to include such counseling as an integral part of comprehensive care, and more time should be allotted during the typical office visit to provide such counseling.

In a study of communication between physicians and their HIV-infected patients, longer visit durations were significantly associated with better HIV-specific communication about alcohol, drugs, and sexual behavior [13]. In the present study, physicians with ≥ 50 HIV-infected patients in care were less likely than were physicians with fewer patients to discuss condom use, how to take medicines, and HIV transmission risk reduction. Shorter visit duration (as assessed by a feeling that there was not enough time to care for a patient in a visit) was also correlated with lower frequencies of discussing adherence to ART regimen and OI prophylaxis and how to take medicine. However, ID-trained physicians who strongly agreed there was enough time during visits to care for a patient reported a higher frequency of discussion of adherence- and medication-related topics; notably, this increase was not observed for the discussion of condom use or HIV transmission risk reduction. The concomitant occurrence of both a high patient volume and perceived time constraints appears to force physicians to limit the frequency with which they discuss HIV-related topics with patients. In the ARTAS survey, when the choices were made to limit discussion of topics, the choice was most often to limit the discussion of HIV transmission prevention topics.

It is interesting that ID-trained physicians, compared with non-ID-trained physicians, were more likely to refer patients with diabetes or hypertension. There could be several reasons for this. First, ID-trained specialists may not perceive that provision of general medical care is their role. Second, as is the case for many subspecialists, demands on the physician's time, a large patient load, and the practice setting may have decreased the focus on comprehensive medical care. Third, ID-trained physicians may be less comfortable in the delivery of primary care. This interpretation is consistent with previous studies showing that ID-trained physicians are less confident in their ability to perform general medical care and assess their patients' risky sexual behavior [6]. We also found that physicians in private offices were more likely to refer patients with diabetes or hypertension. This suggests different outpatient care practices between physicians at private sites and those at public sites, which possibly reflects more comprehensive HIV primary care services in public settings.

Limitations of these data should be noted. First, there is still the possibility that nonrespondents differ from respondents with regard to prevention practices, although that possibility is very limited, given the high response rate. Second, the physicians' data are self-reported and are not confirmed by either patients' reports or notations in charts. Third, data collected in these 4 cities represented physicians in clinics that serve

disadvantaged patients; this sampling scheme may not be representative of all HIV clinics in cities in the United States.

A mechanism to train and to provide continuing education to new physicians regarding specialist and generalist skills should be put in place if we are to continue to provide high quality care for HIV-infected patients. Because routine care required by HIV-infected patients is likely to become a regular part of mainstream medical practice, the quality and coordination of care provided by generalists and specialists may be improved by increasing visit duration, optimizing use of referrals, and increasing the use of generalist-specialist comanagement [14]. There is also a role that care systems can play to encourage more prevention-oriented activities during the clinical care visit; in particular, care systems could make these activities reimbursable [15].

ANTIRETROVIRAL TREATMENT AND ACCESS STUDIES (ARTAS) STUDY GROUP

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