

# Concerns of Medical and Pediatric House Officers About Acquiring AIDS from Their Patients

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**Abstract:** To assess the degree of house officers' concerns about acquiring AIDS (acquired immunodeficiency syndrome) from their patients, we surveyed 263 medical and pediatric interns and residents in four housestaff training programs affiliated with seven New York City hospitals with large AIDS patient populations; 258 questionnaires (98 per cent) were returned. Thirty-six per cent of medical and 17 per cent of pediatric house officers reported percutaneous exposures to needles contaminated with blood of AIDS patients. Forty-eight per cent of medical and 30 per cent of pediatric house officers reported a moderate to major concern about acquiring AIDS from

their patients. Greater concern about personal risk was noted in those house officers who were earlier in their residency training, who reported having treated a greater number of AIDS patients, and who were in medicine rather than pediatrics programs. Twenty-five per cent of all respondents reported that they would not continue to care for AIDS patients if given a choice. The results demonstrate a substantial degree of concern about acquiring AIDS among house officers caring for AIDS patients and suggest the need for housestaff program administrators to formally address these concerns. (*Am J Public Health* 1988; 78:455-459.)

## Introduction

Since the discovery of human immunodeficiency virus (HIV) as the etiologic agent of the acquired immunodeficiency syndrome (AIDS), several studies have been undertaken to determine the risk of HIV transmission to health workers by occupational exposure. A nationwide prospective surveillance conducted by the Centers for Disease Control (CDC) has demonstrated, through June 30, 1987, three (0.9 per cent) HIV seroconversions among 351 health workers who experienced percutaneous exposures to blood of HIV-infected patients.<sup>1,2</sup> Three other prospective studies have reported no seroconversions among a combined total of 611 health workers who reported parenteral or mucous-membrane exposures to blood or body fluids of AIDS patients.<sup>2-5</sup> In addition, individual reports have documented HIV seroconversions in at least three other health workers, without known risk factors, following needlestick injuries.<sup>6-8</sup> These accounts provide convincing evidence that HIV transmission may occur, albeit at a very low rate, following percutaneous exposure to blood or serum of AIDS patients. A recent report has also documented HIV seroconversion in three health workers associated with *non-needlestick* exposures to blood from HIV-infected patients.<sup>9</sup>

Although the risk of HIV transmission through occupational exposure appears to be quite low, the fact that it is possible at all, coupled with the uniformly fatal prognosis associated with AIDS, suggests that physicians, nurses, and other health workers caring for AIDS patients may have significant concerns about their own health risk.<sup>10,11</sup> To evaluate this possibility, we surveyed medical and pediatric house officers in four residency programs representing seven New York City hospitals regarding their concerns about acquiring AIDS from their patients, and the effects these

concerns might have on their residency experiences and future plans.

## Methods

### Questionnaire Design and Administration

The approvals of institutional review boards, research review committees, and residency program administrators were first obtained. A multiple choice questionnaire was designed to elicit information about various aspects of caring for AIDS patients including numbers of AIDS patients cared for, beliefs about occupational transmission of AIDS, degree of concern about personal risk of acquiring AIDS from patients, and the potential effects of this concern upon current and future clinical practices. A pilot questionnaire of 90 questions was then administered to 12 randomly selected house officers to determine its adequacy and clarity. The survey instrument was redesigned accordingly and the pilot subsample was excluded from the final data analysis. Questionnaires were then distributed to house officers during weekly outpatient clinic sessions where they were completed individually and returned anonymously during the study period, February 1–May 1, 1986. Strict confidentiality was maintained in all cases and no attempt was made to identify the respondent corresponding to any particular questionnaire.

### Survey Participants

All first, second, and third year house officers in two medical and two pediatric residency programs were eligible to participate in the survey. Of the total 317 house officers in these programs, questionnaires were distributed to the 263 who were present at the study sites during the study period. Of the 258 questionnaires which were returned, eight were excluded from further analysis because the respondents stated they had AIDS risk factors. The results are therefore based upon a sample of 250 respondents.

### Statistical Analyses

For univariate analyses of data with underlying continuous distributions, the Wilcoxon rank sum test was used to compare measures of central tendency. To analyze frequencies in four-fold tables, Fisher's exact test was used; for larger tables of categorical data that met particular assumptions, chi square tests were performed. Tests of hypotheses were two-tailed;  $\alpha = 0.05$ . For each questionnaire, a numerical "concern score" was derived from answers to preselected questions intended to reflect the degree of con-

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cern experienced by each respondent (Table 1); these scores were used to represent degree of concern about acquiring AIDS in all associations tested. In order to identify a subset of factors that might contribute to the degree of concern, multiple linear regression was used to assess multivariate relationships between the concern score (dependent variable) and total number of AIDS patients cared for, current year of residency training (1, 2, or 3), history of needlestick exposure to AIDS contaminated blood (yes or no), type of residency program (internal medicine or pediatrics), and sex of respondent. Collinearity was found not to be a problem. The frequency distribution of concern scores was somewhat bell-shaped, therefore no transformation was used. Variables were entered into the model in a predetermined order that provided the best intuitive interpretation of each factor's relative contribution to the variability in the concern score. A complete discussion of the steps used to derive this model and its results can be obtained by writing the authors.

All descriptive statistics and tests of hypotheses were performed using SAS Version V, Cary, NC, 1985.

## Results

### Participants

Of the 250 participants whose responses were analyzed, 52 per cent were medical and 48 per cent were pediatric house officers. Thirty-six per cent were first year, 33 per cent second year, and 31 per cent third year residents. Fifty-three per cent were male and 47 per cent were female. Seventy-eight per cent were ages 26 to 30, and 98 per cent were age 35 or less.

### Occupational Contact with AIDS Patients

The median response for the total number of AIDS patients cared for by medical house officers during their internship year was 15; the median response for their second

and third years combined (if applicable) was 20. These AIDS patients represented 15 per cent of their total inpatients and required 20–25 per cent of their total inpatient care time. Pediatric house officers gave median responses of four total AIDS patients cared for as interns and six as residents, representing 3–5 per cent of their total inpatients and requiring 10 per cent of their total patient care time. Only two house officers surveyed had not cared for a single AIDS patient. Thirty-six per cent of medical and 19 per cent of pediatric house officers reported having experienced at least one needlestick exposure, defined as percutaneous exposure to a needle contaminated with the blood of an AIDS patient. Because several were multiple occurrences, these 66 house officers reported a total of 95 needlestick exposures.

### Precautions

Seventy-four per cent of all respondents reported using at least gloves and 5 per cent reported using a gown or mask when drawing blood from AIDS patients; and 11 per cent used gloves for routine contact not involving drawing blood. Fifty per cent of respondents reported using gloves for drawing blood from patients known to have risk factors but not suspected to have AIDS.

### Concerns about Acquiring AIDS from Patients

Eighty-nine per cent of all respondents believed it was possible to acquire AIDS from their patients by needlestick exposure, 67 per cent believed it was possible by other contact with body fluids, and 2 per cent believed it was possible by casual contact. When asked to estimate their chances of developing AIDS from their contact with AIDS patients to date, more than 80 per cent indicated a probability of 1 in 10,000 or less (Table 1). A greater degree of concern was noted in those house officers who estimated a higher numerical risk of acquiring AIDS from their patients ( $p < 0.01$ , Wilcoxon rank sum test). House officers who had a history of needlestick exposure did not estimate a higher numerical risk than their counterparts. Forty-eight per cent of medical and 30 per cent of pediatric residents experienced moderate to major concern about acquiring AIDS from their patients. Eighty-four per cent of all house officers had discussed such a concern with someone else.

Among medical house officers, 64 per cent of respondents had created a mental scenario about what they would do if diagnosed as having AIDS, 47 per cent had examined themselves for signs of AIDS, 14 per cent had considered increasing their personal insurance based upon a perceived occupational risk of AIDS, and 10 per cent had actually suspected they had AIDS at some time. Forty per cent of medical and 24 per cent of pediatric house officers felt that concern about acquiring AIDS increased the stress of their residency experience moderately to extremely.

### Association of Concern with Other Factors

The results of the multiple linear regression indicated that a greater degree of concern was independently associated ( $p < 0.05$ ) with house officers earlier in their residency training, with house officers who had cared for a greater number of AIDS patients, and with house officers on the medical rather than the pediatric service (data available on request to authors).

### HIV Antibody Testing

Twenty-one per cent of medical and 39 per cent of pediatric house officers stated that if confidentiality could be assured they would want to know their HIV antibody status at this time; the reason cited most frequently was that they

TABLE 1—Concerns about Acquiring AIDS from patients

Survey Questions		Medicine	Pediatrics
		(N = 129)	(N = 121)
		Per Cent	Per Cent
1. Self-estimated chances of acquiring AIDS based upon contact with AIDS patients to date	0	11	16
	1/1,000,000	35	47
	1/10,000	32	22
	1/1,000	17	11
	1/100	4	2
	>1/100	1	2
2. Degree of personal concern about acquiring AIDS from patients*	None (0)	9	10
	Mild (1)	44	60
	Moderate (2)	36	26
	Major (3)	12	4
3. Have discussed such concern with someone else	Yes	88	81
	No	12	19
4. Frequency with which respondents think about their personal risk*	Daily (4)	9	1
	Weekly (3)	33	14
	Monthly (2)	32	24
	<Monthly (1)	23	55
	Never (0)	4	6
5. Degree of increased stress secondary to concern about acquiring AIDS*	None (0)	16	22
	Mild (1)	44	55
	Moderate (2)	28	22
	Extreme (3)	12	2

\*Questions 2, 4, and 5 were used to derive the concern score (range 0 to 10) with point values assigned to each response shown in parentheses.

desired the reassurance of knowing they were seronegative (Table 2). Of these 74 house officers, 12 had already made an effort to have their serology tested. Concern score was not related to the desire to know HIV status (Wilcoxon rank sum test). Conversely, a substantial majority of all house officers stated that they did not want to know their HIV status at this time. When asked to explain why, 10 per cent stated that they were already sure they were seronegative, and 54 per cent stated that they did not believe the significance of HIV serology was presently understood. Fifty per cent stated that they did not want to be tested because if they were HIV seropositive they would not want to know it. A greater degree of concern about acquiring AIDS was noted in this latter group than among the others ( $p < 0.01$ , Wilcoxon rank sum test). That these individuals were more concerned was also suggested by added comments such as "scared", "it would make me uneasy", "why live in fear", and "upsetting information if positive".

House officers indicated they would change their behavior in a variety of ways if determined to be HIV antibody positive, including 23 per cent who planned to decrease or refrain from direct patient care. Seventy per cent of respondents disagreed with the proposition that HIV seropositive physicians should be prevented from participating in direct patient care, and 23 per cent stated they would refuse mandatory HIV testing even if it meant giving up the privilege to practice medicine.

TABLE 2—HIV Antibody Testing

Survey Questions	Medicine	Pediatrics
	(N = 129)	(N = 121)
	Per Cent	Per Cent
1. Want to know current HIV antibody status		
Yes	21	39
No	79	61
2. If yes, reason for wanting to know status (N = 74)*		
Reassurance of knowing they are negative	74	87
Plan to alter behavior if positive	59	26
Other	0	11
3. If no, reason for <i>not</i> wanting to know status (N = 171)*		
Already sure they are HIV negative	6	14
Don't want to know if they are positive	54	44
Don't believe significance of HIV serology is presently understood	56	49
Other	5	8
4. Response if determined to be HIV positive*		
Change sexual behavior	48	41
Decide not to have children	38	42
Decrease amount of direct patient care	17	20
Refrain from all direct patient care	5	5
No change in behavior	18	12
5. Agree that physicians who are HIV positive should be prevented from participating in direct patient care		
Strongly agree	2	7
Agree	5	6
No opinion	28	13
Disagree	44	56
Strongly disagree	21	18
6. Response if HIV testing were mandatory for all physicians		
Agree to be tested	73	82
Refuse to be tested (even if this means losing patient care privileges)	27	18

\*Responses to questions 2-4 total more than 100% because respondents were not limited to one answer.

### Effects of Concern

Two-thirds of respondents stated that their concerns about acquiring AIDS (if any) did not adversely affect patient care at all, and only 8 per cent felt that patient care was adversely affected to a moderate or major degree (Table 3). Only 11 per cent of all respondents were moderately or extremely resentful of having to care for AIDS patients, and 51 per cent were not resentful at all. However, 25 per cent of all house officers surveyed would not continue to care for AIDS patients if given a choice. These house officers were more concerned than their counterparts ( $p < 0.01$ , Wilcoxon rank sum test). Furthermore, 36 per cent of medical and 19 per cent of pediatric residents believed their AIDS experience made them less likely to care for AIDS patients in their future.

### Beliefs about Appropriate Policy

Twenty-four per cent of the house officers believed that refusing to care for AIDS patients was not unethical, 34 per cent believed that house officers should be allowed to decide for themselves whether to treat AIDS patients, and 53 per cent believed medical students should be offered a similar choice. Seventy-four per cent felt the public was not aware of physicians' concerns about acquiring AIDS, and 82 per cent believed their hospital administration was not concerned about the risk of AIDS for house officers. Ninety-two per cent of the respondents felt housestaff training program administrators should formally address housestaff concerns regarding AIDS and HIV testing, and 84 per cent felt that similar efforts were needed to address concerns of spouses of house officers.

### Discussion

Throughout medical history, physicians have had to contend with the risk of contracting communicable diseases from

TABLE 3—Effect Upon Patient Care and Future Plans

Survey Questions	Medicine	Pediatrics
	(N = 129)	(N = 121)
	Per Cent	Per Cent
1. Degree to which concern about AIDS affects patient care by decreased tendency to draw blood or perform invasive procedures		
None	69	63
Mild	24	28
Moderate	6	7
Major	1	1
2. Issue of AIDS influenced choice of residency		
Yes	6	2
No	94	98
3. Issue of AIDS would have greater effect on residency choice now		
Yes	43	12
No	57	88
4. Resentful of having to take care of AIDS patients		
Not at all	47	56
Mildly	39	37
Moderately	12	7
Extremely	3	1
5. Would continue to take care of AIDS patients if given choice		
Yes	76	74
No	24	26
6. Effect of AIDS experience on future career choice		
Plan to choose career path <i>more</i> likely to involve AIDS patients	5	6
Plan to choose career path <i>less</i> likely to involve AIDS patients	36	19
Neither	50	64
Don't know	9	12

their patients. Fortunately in recent years, serious infectious diseases have generally become preventable or treatable, diminishing their risks to health workers. AIDS, however, presents to the current generation of health workers a new communicable disease which is presently incurable and uniformly fatal. Given the number of unresolved questions about HIV transmission and the striking lethality of the disease, it can be anticipated that health workers may remain uneasy about their own safety, despite reassuring information to the contrary. The present study confirms this hypothesis.

It might be postulated that the respondents were unduly concerned about acquiring AIDS because they overestimated their true risk. This does not appear to be the case; 80 per cent of respondents estimated their risk as equal to or less than 1/10,000, an assessment which is not especially alarming and certainly not exaggerated when compared to the literature. The discrepancy between objective estimates of personal risk and degree of concern expressed by the respondents serves to emphasize the complex and subjective nature of these responses, and suggests that simply educating house officers about the true risk of HIV transmission will not suffice to relieve their concerns. Interestingly, house officers who had experienced needlestick exposures did not express greater concern or estimate a higher numerical risk than those who did not, suggesting that other types of exposures are considered equally significant, and that any efforts directed toward alleviating these concerns should not be limited only to those who have experienced needlestick injuries.

A substantial proportion (30 per cent) of house officers expressed a desire to know their current HIV antibody serology. For many of those who did not do so, the potential negative personal consequences resulting from knowledge of seropositivity apparently outweighed any interest in determining their true status. Since relatively few house officers indicated they felt certain they were HIV antibody negative, the great majority of respondents appear to have at least some doubt about their status as a result of their contact with AIDS patients. This uncertainty could obviously contribute to anxieties about AIDS experienced by these house officers and, as these data indicate, may not be relieved simply by provision of information or education. Voluntary anonymous HIV antibody testing may therefore be indicated for the purpose of reassuring house officers who are most concerned, even those who have not experienced an adverse exposure. Ideally, the rationale that knowledge of seropositivity is personally undesirable should not overcome the need to assess the potential for HIV transmission to uninfected contacts by those who are seropositive, and to alleviate concerns in those who are not.

Housestaff programs should also consider other responses to these issues, including formal education programs (about HIV transmission as well as infection control guidelines) and optional personal counseling for those who are most concerned about their health risk. To openly discuss concerns about occupational risk of HIV transmission and HIV antibody testing of house officers may appear to heighten awareness and therefore anxiety among the very group they are intended to reassure. However, our findings indicate that such concerns already prevail among house officers caring for AIDS patients, many of whom hold definite opinions about their personal risk, HIV testing, and future career plans. Moreover, respondents overwhelmingly indicated the need for housestaff program administrators to formally respond to these concerns.

Although house officers generally believed patient care

was not significantly compromised by their concerns, a fourth of residents surveyed would choose not to continue to care for AIDS patients if given a choice. Although many reasons may contribute to a decision not to care for AIDS patients, the house officers who expressed this preference were substantially more concerned about contracting AIDS than their counterparts. In addition, 36 per cent of medical house officers planned to make career choices *less* likely to involve the care of AIDS patients, based upon their residency experiences. The finding that 24 per cent of respondents did not believe it was unethical to refuse to care for AIDS patients is particularly disturbing in that this viewpoint appears to undermine the tacit social contract that has long prevailed between physicians and their patient communities.<sup>11,12</sup> Moreover, there is no precedent for allowing house officers to select the patients they care for, a policy which was endorsed by a third of the respondents.

Although some of these responses may be difficult to reconcile with traditional views of the medical profession, it is not possible to consider them in their proper historical context since the attitudes of physicians in past epidemics are poorly documented. It should also be emphasized that these house officers have served in training programs under conditions in which avoidance or undertreatment of AIDS patients are unacceptable practices which have not been readily observed. Furthermore, the institutions involved in this study have exceptional reputations in the provision of medical care to AIDS patients. However, the responses to this survey suggest a preference or tendency of some physicians to avoid AIDS patients which may become expressed indirectly in planning of future specialty training or practice settings. Considering the increasing number of AIDS patients who will require medical care in the coming decade, these observations are disquieting. The extent to which they may adversely affect medical care of AIDS patients remains to be determined.

The conclusions derived from this survey are subject to several limitations. Questions relating to concern about acquiring AIDS were generally subjective and may have been interpreted ambiguously by respondents. The concern score was empirically derived from three such questions and may have failed to reflect accurately the true degree of concern. Furthermore, the concerns noted may reflect factors other than occupational exposure to AIDS patients. We attempted to limit this effect by excluding the results of those who stated they had specific risk factors, but it cannot be assumed that all independent sources of concern had been eliminated.

We consider our study to be only a preliminary investigation into these issues and believe more definitive studies will be required to determine the current level of these concerns (particularly in light of recent reports of HIV transmission to health workers without needlestick exposures) as well as the generalizability of these findings to other types of health workers. The subjects in this study were all house officers, subject to considerable stresses and adverse exposures to blood products, and the results may not be applicable to other types of health workers such as medical students, nurses, phlebotomists, and laboratory technicians. However, many of these other health workers, especially nurses, are also under considerable stress, are even more closely involved in care of individual patients, and are also subject to needlestick injuries. Furthermore, the results of this survey suggest that health workers need not experience needlestick exposures in order to have significant concerns.

Finally, although these respondents may be considered to have an unusually high degree of exposure to AIDS

patients, the number of AIDS patients reflected in this study will become more prevalent in major cities throughout the United States over the next several years. It is important for hospital and residency program administrators to realize that concerns about personal risk may continue to prevail among health workers caring for AIDS patients, and that these concerns not only have a significant impact upon their personal and professional lives, but may detract from the medical care available to AIDS patients at a time when increasing medical resources will be required.

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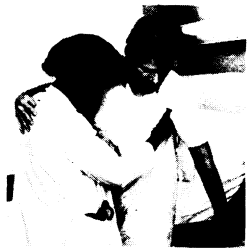
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