

Universal Precautions in the Family Physician's Office

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Background. The risk of occupational exposure to the human immunodeficiency virus (HIV) may be one of the important issues facing family physicians in the 1990s. The use of universal precautions has been shown to reduce the incidence of exposures to blood-borne pathogens. Studies indicate, however, that these guidelines are not being followed consistently by physicians or their staffs.

Methods. A survey of 3568 randomly sampled members of the American Academy of Family Physicians was performed using a questionnaire that was designed by the authors. Three mailings were conducted.

Results. The total response rate was 39%. Approximately 80% of the respondents reported that they used gloves appropriately and disposed of sharp instruments in a puncture-resistant container. Only 39% "always"

or "almost always" used eye protection when indicated, and only 35% "almost never" or "never" recapped used needles. There was a significant number of physicians who reported that they or their office staff had had an occupational exposure to bloodborne pathogens within the last year.

Conclusions. Family physicians and their staffs do not uniformly follow universal precaution guidelines and, as a result, many have been exposed to blood products. If the physician or the office staff would not recap used needles and would place used sharp instruments in a puncture-resistant container, the greatest risks of occupational exposure would be reduced.

Key words. Protective devices; safety precautions; human immunodeficiency virus, occupational exposure; Centers for Disease Control. *J Fam Pract* 1992; 35:163-168.

The risk of exposure to and transmission of the human immunodeficiency virus (HIV) may be one of the most important issues facing family physicians and their office staffs in the 1990s. As of December 31, 1989, there had been 1948 reported cases of health care workers who had had a significant exposure to blood products or bodily secretions from patients who were HIV positive.¹ Of these reported exposures, six had seroconverted to HIV-positive status after the exposure.¹ Even though this constitutes a low seroconversion rate (0.29%), 30% to 40% of these exposures could have been prevented by following the universal precaution guidelines established in 1985 by the Centers for Disease Control (CDC)^{2,3} to reduce the risk of transmitting HIV and other blood-borne pathogens to health care workers (Table 1).^{4,5}

Studies have demonstrated that physicians and their staffs are at risk for exposure to bloodborne pathogens because they do not follow CDC guidelines. In one study

of an emergency department,⁶ universal precautions were observed only 44% of the time. Another study demonstrated that universal precautions were not followed in 57% of the observed procedures in a surgical area,⁷ and 74% of the blood contacts were preventable by simple barrier techniques during surgery.⁸ With regard to an office-based practice, a recent study of a random sample of physicians' offices in Minnesota revealed that over 40% of the respondents had had a needlestick injury in the previous year.⁹ This study also found that the majority of the physicians and their staff members were not following the CDC guidelines for the handling of used sharp instruments and needles.

Another issue that has recently developed is the risk of the patient being exposed to the bloodborne pathogens of the physician. In a recent publication,¹⁰ the CDC established a probable link between a health care worker and the transmission of HIV to his patients. This finding led the CDC to reaffirm the need for following the universal precautions guidelines to protect both patients and health care workers from exposure to bloodborne pathogens.¹¹

The purpose of the present study was to determine the following: (1) whether universal precautions are being observed in family physicians' offices; (2) whether

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Table 1. Universal Precaution Guidelines

1. Do not recap used needles by hand.
2. Place used disposable syringes and needles, scalpel blades, and other sharp items in puncture-resistant containers for disposal.
3. Use protective barriers to prevent exposure to blood, body fluids containing visible blood, and other fluids to which universal precautions apply.
4. The type of protective barrier(s) should be appropriate for the procedure being performed and the type of exposure anticipated.
5. Immediately and thoroughly wash hands and other skin surfaces that are contaminated.

NOTE: These guidelines are paraphrases of guidelines issued by the Centers for Disease Control.^{4,5}

any family physicians or members of their staffs were exposed to bloodborne pathogens in the previous year; (3) the number of family physicians who had an exposure to a known HIV-positive patient; and (4) the number of family physicians who have a protocol established for follow-up of exposure to blood products or bodily secretions.

This study is unique because it examines adherence to universal precautions, the incidence of occupational exposures, and the established protocols when these exposures occur in the family physician's ambulatory-based office practice.

Methods

The subjects of this study were active members of the American Academy of Family Physicians (AAFP) excluding those involved in academic medicine or military service. These subjects were selected from a random sample taken from the AAFP membership list. A total sample population of 3568 was established using a power analysis. There were approximately 68,000 active members in the AAFP at the time of this study.

A total of three mailings were made. The first mailing included a questionnaire with a cover letter and a response postcard. The postcard allowed respondents to indicate that they had returned the survey but wished to remain anonymous. The second mailing, approximately 3 weeks later, was a postcard reminder to those who had not responded to the first mailing. Finally, copies of the survey questionnaire, cover letter, and response postcard were mailed 3 weeks later to the remaining nonresponders.

The study questionnaire was designed by the authors and consisted of five sections. The first section

requested information about the demographics of the physician and his or her practice. The second section requested responses to four statements concerning compliance with universal precautions in the family physician's office. The four statements were as follows: (1) I wear gloves when I am exposed to bodily secretions or blood products. (2) I wear eye protection when I may be exposed to bodily secretions or blood products. (3) Do you recap syringe needles prior to disposal after an injection or blood draw? (4) I place used needles and/or scalpels in protective plastic containers after they are used. Responses to these statements were based on a five-point scale, ranging from "always" to "never." The third section consisted of 12 questions about exposure of the physician or his or her staff members to blood products or bodily secretions in the office or hospital during the last year. The fourth section asked about the physician's or staff's exposure to known HIV patients. The final section consisted of 10 questions about the medical procedures the family physician performed in the office or hospital; it was not used for this study.

The study questionnaire was pilot tested on the faculty members and preceptors of the Toledo Hospital's family practice residency program. After each subject completed the survey, he or she was interviewed by the authors about the content of the questionnaire, the amount of time required to complete the questionnaire, whether the directions were easy to read and understand, and whether any questions should be added, deleted, or reworded. The questionnaire was then revised, based on the feedback from the pilot testing.

To answer the research questions, various statistical analyses were completed. Since the data were ordinal, Kruskal-Wallis one-way analysis of variance was performed to test the statistical significance of various universal precautions compared with the incidence of AIDS in the state where the subject's practice was located¹² and the number of known HIV-positive patients for which the family physician provided care. Descriptive statistics were used to describe the results of some of the research questions.

Results

The total sample size was 3568. Twenty-one surveys were unable to be delivered because of incorrect addresses. There were 464 respondents who refused to participate in the survey. A total of 1409 surveys were completed and returned for a response rate of 39%.

One third (34%) of the respondents were from cities with populations of over 100,000. Forty percent of the respondents were from cities with populations between

Table 2. Percentage of Adherence to Universal Precautions in 1409 Family Physician Offices

Survey Items	Response Scale				
	Always	Almost Always	Sometimes	Almost Never	Never
Wear gloves	32	48	16	3	1
Use eye protection	27	11	16	23	23
Recap needles*	24	18	23	18	17
Use sharp instruments container	80	13	4	1	2

*Used needles should not be recapped.

10,000 and 100,000, and 26% were from towns with populations of less than 10,000. The mean age of the respondents was 45 years (ages ranged from 29 to 72 years; standard deviation ± 11.1 years).

Eighty-two percent of the respondents were board certified, and 65% were residency trained.

The first objective of the study was to determine whether universal precautions were being observed in family physicians' offices. Eighty percent of the respondents stated that they always or almost always wore gloves when appropriate, and 80% always used a puncture-resistant container for disposal of used sharp instruments. Only 38% used eye protection always or almost always, and only 35% almost never or never recapped needles after use. A complete summary of the responses to questions about use of universal precaution procedures is given in Table 2.

The second research objective was to determine whether family physicians and their staffs had been exposed to bloodborne pathogens in the previous year (Table 3). Thirty-six percent of the physicians and 38% of their staff members had at least one exposure. Twenty-four percent of family physicians also reported that one or more of these exposures occurred in the hospital or emergency department.

The third research objective was to determine how many family physicians had been exposed to a known HIV-positive patient within the previous year. Fifty-one

Table 3. Exposure of Health Care Providers (N = 1409) to Bloodborne Pathogens Within the Last Year (%)

Route of Exposure	Physician in the Office	Physician in the Hospital/ER	Office Staff
Open-bore needlestick	8	2	30
Unprotected eyes	7	5	3
Suture needlestick	19	15	5
Mucous membrane	13	9	11

ER denotes emergency room.

percent of the respondents stated that they did not provide care for any HIV-positive patients, 31% cared for 1 or 2 patients, 11% for 3 to 5 patients, 4% for 6 to 10 patients, and 3% for more than 10 patients. Of the respondents, 26 (2%) stated that they had been exposed to blood products or bodily secretions of a known HIV-positive patient within the last year.

The final research objective was to determine how many family physicians had a protocol established for follow-up of exposures to blood products and bodily secretions. A total of 867 (63%) of the respondents stated that they had a protocol established in their offices for this type of exposure.

To test the statistical significance of the research questions, the respondents were grouped into four categories by state in which the physician practiced according to the incidence of acquired immunodeficiency syndrome (AIDS) as reported by the CDC.¹² Since these data were nonparametric, a Kruskal-Wallis (KW) one-way analysis of variance¹³ was performed comparing the use of four universal precautions with reference to each state grouping. Results on the use of gloves (KW 55.91, $P < .01$), the use of eye protection (KW 45.43, $P < .01$), the recapping of needles (KW 49.14, $P < .01$), and the use of a sharp instruments container (KW 45.24, $P < .01$) were all statistically significant. Those physicians who practiced in a state with a high incidence of AIDS were more likely than their counterparts to adhere to the precautions.

Respondents were also grouped into categories based on the number of HIV-positive patients for whom they provided care. The groups were divided as follows: those with no known HIV-positive patients; those with 1 to 2 known HIV-positive patients; and those physicians who had 3 or more HIV-positive patients. A Kruskal-Wallis one-way analysis of variance was also performed on these data. Those physicians who provided care for three or more HIV-positive patients were more likely to take precautions than those physicians who had no infected patients or only 1 to 2 known HIV-positive patients. Use of gloves: KW 4603.99 $P < .01$; use of eye protection: KW 4174.89, $P < .01$; recapping used needles: KW 4147.17, $P < .01$; and use of sharp instruments containers: KW 4183.31, $P < .01$).

Discussion

The use of universal precautions can reduce occupational exposures to bloodborne pathogens. In two recent studies undertaken after implementation of universal precautions, the incidence of exposure to blood products or bodily secretions was reduced.^{14,15} One study also dem-

onstrated that averted exposures increased during the study period.¹⁴ The majority of the reductions in each of these studies was because of the increase in the use of barrier methods of protection.^{14,15}

This study demonstrates that family physicians are using only some of the universal precautions in their practices. They tend to wear gloves when it is appropriate and place used sharp instruments in puncture-resistant containers; however, they seldom wear eye protection when it is indicated, and a large percentage continue to recap used needles.

Looking at one aspect of these results, if family physicians and staff members did not recap used needles, they would potentially reduce the number of accidental needlesticks by over 35%.² The importance of this precaution becomes apparent when one considers that 8% of the respondents had suffered an open-bore needlestick injury in the office within the previous year. It is also vital to provide the family physicians' office staff members with this information, as 30% of the responding physicians stated that within their staff a needlestick injury had occurred within the last year. These statistics are probably lower than the actual incidence of open-bore needlestick injuries because the survey relied on self-reporting of physician exposures and on physician reporting of staff members exposures. This is one area where family physicians need to be diligent in their techniques of needle disposal and educate their staff about the importance of not recapping used needles.

Family physicians' offices are using puncture-resistant containers to dispose of used sharp instruments and needles. Using these containers can reduce the number of accidental exposures by up to 50%.¹⁶ The appropriate disposal of these items is also necessary to prevent exposure to bloodborne pathogens of the physicians' staff members as a large number of the needlestick or sharp instrument injuries occur during the cleanup process.¹⁷ These guidelines for disposal of these items are also established in the Occupational Safety and Health Administration (OSHA) regulations.¹⁸

Most of the family physicians surveyed did not use eye protection. This may reflect the physicians' belief that wearing eye protection while they are performing procedures is not important. This belief may be based on the rationale that the chance of seroconverting after an eye exposure is less than that after a needlestick injury,¹ and may be as low as 0.04% for each exposure.¹⁵ The only instances of seroconversion after a mucous membrane or cutaneous exposure to HIV have been anecdotal.¹⁹ Also, some authors believe that some of the guidelines established are not consistent with the scientific literature and need to be reexamined.²⁰

Those respondents who practiced in a state with a

high incidence of AIDS¹² or who had three or more known HIV-positive patients were more likely to follow universal precautions than their counterparts. These physicians were either more cautious or more aware of the universal precaution guidelines. This may place those who perceive a lower risk in danger of contracting a bloodborne pathogen from exposure to an HIV-positive patient. Recent statistics demonstrate that the number of AIDS cases is shifting to smaller communities and to the southern United States.^{12,21,22} Furthermore, the medical literature states that AIDS is at least as prevalent or more prevalent in a primary care setting than in the general population.²³

This study demonstrates that there were a large number of occupational exposures for both family physicians and their office staff members, a finding that is consistent with an earlier study of physicians' offices in Minnesota.⁹ With the low likelihood of seroconverting after mucous membrane exposure,¹⁵ using barrier protection may not be cost-effective in the family physician's office.²⁴ However, needlestick injuries and cuts from used sharp instruments can be reduced inexpensively by simply not recapping used needles and by supplying a puncture-resistant container for easy disposal of all used sharp instruments.

According to this study, there is a substantial number of family physicians who provide care for patients who are HIV-positive. Only slightly less than half provide care for one or more known HIV-positive patient. There were 3% who provided care for more than 10 HIV-positive patients. These data agree with those of a recent study that suggests that HIV and AIDS are becoming more prevalent in the primary care specialties.²³ One critical point to remember is that despite vigorous assessment of risk factors for HIV-positive patients, very few of these patients can be identified.⁶ Also, the number of known HIV-positive patients is an underestimate of the actual number of patients who have seroconverted in a population.²⁵ Therefore, family physicians may not be able to perform an adequate risk assessment of their patients, and physicians' estimates of the number of their patients who are HIV-positive may be inaccurately low. The family physicians in this study may have been caring for more HIV-positive patients than they reported. Those physicians who perceive that they have none or few HIV-positive patients may have a false sense of security and may need to be more diligent in following all of the universal precaution guidelines.

If the physician or the physician's staff members are exposed to bloodborne pathogens, it is recommended that there be a protocol established for follow-up care. It is also recommended that any health care worker who is exposed to HIV-contaminated blood products should be

offered zidovudine prophylaxis.²⁷ Despite these recommendations, a significant number of family physicians do not have a protocol established. Without a protocol physicians and their staffs place themselves at a disadvantage if they are accidentally exposed to bloodborne pathogens.

Two percent of the respondents indicated that they had been exposed to blood products or bodily secretions from a known HIV-positive patient. At the present time, the number of active AAFP members is reported to be 44,000. This could mean that as many as 880 family physicians have been exposed to the blood of a known HIV-positive patient. Based on the 0.29% rate of seroconversion estimated by the CDC,² three family physicians in the last year could have seroconverted to HIV-positive as a result of an occupational exposure. These statistics are just an estimate, but they indicate that exposure to HIV and subsequent seroconversion to HIV-positive are possible. Because of this possibility, it is vital that family physicians reduce the number of exposures of themselves and their office staff.

Finally, recent OSHA standards were made law in November 1991.²⁸ These standards are applicable to physicians' offices, and are as follows: (1) there must be a written "exposure control plan" designed to eliminate or reduce employee exposures; (2) hepatitis B vaccine must be made available to all employees who are at risk for occupational exposure; (3) there can be no food or drink in patient care areas, laboratories, and areas where decontamination and disinfection occur; (4) education of health care workers must ensure understanding of universal precautions and the utilization of barrier equipment; (5) a policy must be developed for the management of a health care worker who has been exposed to bloodborne pathogens; and (6) the waste material that poses a risk to health care workers must be handled appropriately and labeled properly to avoid accidental exposure. These standards should now be fully implemented.

There are some limitations to this study. The response rate was less than 50%. This rate indicates that the study may have had nonresponder bias. While response rates of physicians generally tend to be lower than those of other groups, the low response rate in this study may reflect the reluctance of physicians to share information concerning HIV issues. There continues to be an emotional response from both the public and the medical community to the subject of HIV. Even though the responses were anonymous and every effort was made to assure confidentiality, physicians may have been hesitant to share their experiences or policies concerning HIV.

Because of these results and the need for family physicians to protect themselves and their staffs from

bloodborne pathogens, it is imperative that family physicians adhere to the universal precaution guidelines and instruct their office staff members concerning these precautions. If this does not occur, family physicians may be placing themselves and their staffs at risk for contracting HIV from an occupational exposure.

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