Managing HIV Exposure in Health Care Settings

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In 1985, a health care worker at San Francisco General Hospital contracted HIV after a needlestick exposure to infected blood. This tragic event had a tremendous impact on health care personnel at the hospital. What had been a theoretical possibility suddenly became a real, life-threatening, hazard encountered daily by many employees.

Staff reacted to the initial announcement with anger, amazement, fear, sadness, denial, and very often, a demand for a "zero risk" work environment. In response, San Francisco General Hospital (SFGH) created a forum for discussing the essential facts surrounding the exposure, reviewing the risk of HIV transmission, and reinforcing the importance of infection control precautions to minimize risk. In addition, the hospital organized support groups to allow workers to express individual fears and concerns.

In 1989, the hospital created the HIV Counseling and Testing Service (CTS), a comprehensive program to optimize patient and employee HIV antibody testing procedures. The goals of the accidental exposure management program are:

- to improve reporting of occupational exposures by increasing incentives and decreasing barriers to reporting;
- to optimize post-exposure counseling, education, treatment and prophylaxis;
- to identify risk factors for exposure, and to develop targeted interventions to prevent exposures;
- to evaluate the success of risk reduction interventions;

This article presents the essential features of the CTS program with the hope that the SFGH experience may benefit other institutions struggling to cope with similar occupational risks.

Statistical Risk of Infection

Researchers at SFGH have been among the most active in determining statistical risk of infection after an accidental exposure. Among blood-borne pathogens, hepatitis B virus (HBV) continues to pose the largest risk to health care workers by virtue of its high prevalence among patients and its easy transmissibility. An estimated 200 health care workers in the United States die from the acute or chronic consequences of HBV infection each year despite the widespread availability of a safe and effective vaccine. While HIV is far less transmissible than HBV, accidental exposures to this pathogen elicit much greater apprehension among health care providers.

The exact number of health care providers infected with HIV as a result of occupational transmission is not known. The Centers for Disease Control (CDC) have tabulated more than 25 providers who have seroconverted after HIV exposure on the job, but additional undocumented, unreported, and unrecognized cases no doubt exist. Prospective studies have found the average risk from a needlestick or similar exposure through the skin to be .4 percent; five infections after more than 1,200 HIV needlesticks. The risk from contamination of mucous membrane and non-intact skin—no infections in more than 2,500 exposures—has been too low to reliably measure in recent studies, but it is not zero.

CTS Organization, Criteria, and Access

The CTS is funded by the hospital, the City and County of San Francisco Department of Public Health, and a grant from the CDC. Five physicians, a hospital administrator, and a nurse experienced in HIV counseling and substance abuse, comprise the executive staff of the service. In conjunction with the AIDS Health Project, the service supports three trained counselors responsible for providing pre- and post-test counseling and education to patients and employees. Two nurse practitioners from the employee health service provide clinical follow-up for the health care worker exposure management team. All employees and students at SFGH are eligible to receive CTS services, which are free of charge. The city of San Francisco is developing plans to expand these free services to city employees outside of the hospital.

A multidisciplinary approach to accidental exposures ensures that the psychological as well as the medical needs of health care workers are met.

CTS defines reportable exposures as exposures of blood, body fluids, tissues, research laboratory specimens, or other potentially infectious materials through needlesticks, cuts, mucous membranes, and non-intact skin. CTS also estimates exposure severity. Massive exposures include transfusions and inoculations with materials containing high concentrations of HIV as may be found in research laboratories. Definite exposures include needlestick injuries, when intramuscular penetration, injection of blood, or large-bore hollow needles are involved. Probable exposures include superficial needlesticks and mucosal inoculations with blood or bloody body fluids. Doubtful exposures include those involving non-bloody body fluids, or contamination of non-intact skin with small volumes of infectious material for brief intervals.

Non-parenteral exposures are defined as contact with blood or bloody body fluids. These categories, while subjective, are useful to facilitate post-exposure counseling and intervention.

All occupational exposures, regardless of source patient infection status, are reported by calling the "Needlestick Hotline." This answering service operates 24 hours a day, seven days a week, and immediately forwards all exposure calls to an on-call physician. Weekdays from 9:00 a.m to 4:00 p.m., two Employee Health Service nurse practitioners specializing in exposure management answer these calls. At other times, one of five physicians carries the needlestick beeper, and more recently a cellular phone, to ensure prompt response to all calls. The on-call clinicians are experts in post-exposure management and provide immediate risk assessment, treatment referral, and counseling.

Protecting confidentiality is a primary concern at all phases of the post-exposure management system. Each exposed worker is assigned a confidential ID number. A special file containing all documentation related to the exposure event is labeled only with the ID number, and is accessible only to CTS clinicians. All laboratory specimens and test results, including those obtained in the emergency room, are labeled only with the ID number. Doctor's First Reports, Employer's First Reports, and other mandated documentation forms are completed in the Employee Health Service to minimize disclosure of unnecessary information.

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Immediate Medical Management

When an exposure is reported, the on-call clinician interviews the health care worker about the exposure event. The clinician discusses with the worker the severity of the exposure, the chances of HIV and HBV infection, and the options for medical care. If follow-up in Employee Health Services is not available 24 hours after the incident, all parenterally-exposed workers are referred to the emergency room (ER) for gamma globulin, when indicated, to prevent HBV and non-A, non-B hepatitis. To expedite ER treatment, registration is not required, and standing orders for prophylactic therapies are initiated by verbal order.

When the circumstances suggest potential HIV transmission, on-call clinicians also advise workers of the availability of zidovudine (ZDV)* prophylaxis and offer a current summary of the risks and benefits of this experimental treatment. CTS policy to use ZDV among health care workers is based on the premise that while insufficient data is available to establish the efficacy or toxicity of ZDV prophylaxis, informed health care providers who elect this experimental therapy should be treated accordingly to an established protocol that includes careful monitoring for drug toxicity. Clinicians also inform exposed workers that ZDV prophylaxis, while successful in some animal models, has reportedly failed twice in humans. The current dose—200 milligrams every four hours, five times a day, for four weeks—is decreased or discontinued if clinicians observe serious toxicities during follow-up.

Health care workers choosing ZDV treatment are referred immediately to the pharmacy, where they receive a starter packet containing 12 tablets of ZDV. Workers are required, within 24 hours of first dose, to execute written informed consent and a statement of intent to avoid pregnancy. Since, theoretically, ZDV prophylaxis is most effective when started soon after exposure, preferably within one hour, clinicians inform workers who are undecided that they may start treatment provisionally and discontinue it the next day if their desires change. Similarly, when a source patient's HIV infection status is unclear, a worker may elect to take ZDV pending clarification of HIV risk. A clinician evaluates all workers who start ZDV within 24 hours.

Employee Health Follow-up

All exposed workers are referred to the Employee Health Service for follow-up. During this follow-up, a clinician interviews the health care worker to establish the nature and severity of the exposure, and encourages baseline testing for HIV antibody. The results of a baseline test demonstrate the worker's antibody status before exposure. In addition, hepatitis B antibody testing is performed when indicated. Finally, clinicians discuss infection control and review the specific practices contributing to the exposure event in an effort to promote safer routines in the future.

A unique component of the SFGH program is the provision of professional counseling to the worker. The degree of anxiety, stress, and denial is assessed by the exposure management team's licensed counselor, who arranges follow-up counseling when needed. The counselor also addresses issues such as safer sex, blood donation, and other risks of HIV transmission. (See "Counseling Health Workers after Accidental Exposure," page 3.)

Health care providers sustaining exposures to HIV return for follow-up at six weeks, three months, and six months after exposure for counseling and HIV antibody testing. For those electing prophylactic treatment with ZDV, clinicians perform HIV testing and toxicity monitoring at two weeks, four weeks, six weeks, three months, six months, and one year after exposure. Interval visits for additional counseling are scheduled as needed.

Source Patient Evaluation

If the source patient—the patient to whose blood or tissue the health care worker has been exposed—is known but has not been evaluated for the presence of blood borne infections, the nurse practitioner contacts a trained counselor who initiates a source patient investigation. All source patient HIV testing at SFGH is coordinated by the CTS. The physician caring for the patient is contacted and asked to provide a clinical and epidemiological assessment of the probability of HIV infection. If infection has not previously been diagnosed and is not extraordinarily unlikely, the source patient is requested to consent to antibody testing. This promotes voluntary testing of source patients, without involving the exposed worker in the consent process, and helps ensure that the source patient is informed of the risks and benefits of testing.

Education and Training

The CTS program goes beyond crisis management and provides education to all hospital staff regarding ways to avoid and to deal with accidental exposures. Among the educational forums the CTS uses are annual infection control training sessions, and grand rounds and other lectures. In addition, the program distributes to employees fluorescent green wallet-size cards containing simple instructions for accessing post-exposure services and laminated file cards summarizing post-exposure services as well as protocols for patient HIV counseling and antibody testing.

Summary

The CTS post-exposure management program provides prompt, efficient, state-of-the-art comprehensive services to SFGH health care personnel. The multi-disciplinary approach ensures that both medical and psychological needs can be met. The response to the service has been dramatic; in addition to nearly doubling the number of reported exposures, individual providers have expressed enthusiasm and appreciation for the program.

Implementing such a program requires resources and the support of a committed administration. In an environment like SFGH, where occupational HIV exposure is a frequent event and health care providers are increasingly concerned about HIV, optimizing post-exposure care is an essential component of occupational health and safety.

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References


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Counseling Health Workers after Accidental Exposure

James W. Dilley, MD

Health care workers accidentally exposed to HIV on the job face psychological concerns that go beyond the conflicting emotions and intellectual uncertainties that normally accompany the possibility of HIV infection. Because they often can pinpoint the time of exposure, workers have the opportunity and the burden of making an immediate decision about zidovudine (ZDV) prophylaxis. Because the exposure is work-related, health care workers may have difficulty returning to their jobs, and because those few workers who seroconvert may require disability benefits, they may have to prove they were not HIV-infected before the accident.

The primary goals of counseling in such a situation are to help the worker cope with the immediate emotional crisis that may follow exposure, to ensure that the worker has accurate information about implications of the accident on health and way of life, and to help workers make some fundamental decisions about disease management, including antibody testing and ZDV use.

This brief report discusses the range of psychological issues these workers face and describes the counseling interventions employed by the HIV Counseling and Testing Service (CTS) at San Francisco General Hospital (SFGH). To clarify these points, it focuses on the hypothetical case of a worker accidentally exposed to HIV. Note that this discussion is geared to this specific case.

Jane and her boyfriend move several thousand miles so that Jane can begin her medical internship in San Francisco. On the second night of her assignment to the SFGH emergency room, she sustains a deep muscle needlestick with a needle she has just used to draw blood from a HIV-infected patient. She washes the bleeding wound, tells herself that the stick was superficial and nothing to worry about, and finishes caring for her patient.

Several hours later, Jane thinks about what had happened. “It was like someone punching me in the stomach,” she said. “I suddenly had this horrifying image of dying of AIDS.”

After consulting with the CTS physician on call, Jane decides to forego initiation of ZDV, which she believes is too experimental, and is referred for baseline antibody testing and test counseling.

Coping with Immediate Psychological Reactions

Several issues are relevant to counseling health care workers after exposure. Among these are the worker’s level of anxiety, the seriousness of the exposure, whether the serostatus of the source patient is known, and whether the health care worker is interested in taking ZDV. Jane’s counselor is aware of several important pieces of information. First, Jane believes that she may be HIV-infected and is emotionally shaken. Second, Jane had a definite exposure: a deep needlestick with a needle used to draw HIV-infected blood. Finally, Jane has declined ZDV.

Jane’s reaction is common. While some health care workers have immediate anxiety reactions to a possible HIV exposure, many health care workers—who have developed strong psychological defenses to crisis—respond only minimally following an accident. Like Jane, they continue caring for their patients. Once they realize the potential gravity of the event, however, workers become anxious and exhibit a need to take immediate action, particularly regarding initiation of ZDV. In addition, they want an answer to the difficult question: “Have I been infected with HIV?”

The counselor’s first task is to help workers cope with their reactions to the event by encouraging them to tell the story of the accident and express their feelings about it. Counselors should be prepared to deal with the response of some health care workers that they were “stupid enough” to accidentally expose themselves and may counter this reaction by commenting on the inevitability of accidents. Conversely, in cases where accidents might have been avoidable, counselors may review universal precautions. Counselors should also be prepared to help health care workers deal with anxiety, sleeplessness, depression, fear, and anger evoked by the incident.

The counselor’s second task focuses on providing information and developing plans for coping with the possibility that a worker has been infected. While counselors need to know current data about the likelihood of seroconversion among exposed health care workers, they should not expect that this information alone will ease a particular worker’s anxiety. A discussion about the difficulty of living with uncertainty is usually more helpful, and through direct questioning by the counselor, workers are able to identify strategies that have been helpful in dealing with uncertain situations earlier in their lives.

Acknowledging Potential Infection

While small, there is a risk Jane could have been infected with HIV, and because of the potential lag in antibody development, even an initial negative test result does not eliminate this possibility. Her counselor must discuss with Jane the potential for transmitting HIV, and advise her about safer sex practices and to adhere to them for at least six months. In addition, Jane’s counselor will remind her not to donate blood, not to attempt to become pregnant during this period, and, if Jane is breast feeding, will advise her to stop. If Jane’s antibody test results continue to be negative for six months, her counselor will tell her that the likelihood of infection is very small, and that she can probably discontinue safer sex practices with her steady partner. If Jane feels most comfortable continuing these practices, however, her counselor would support that decision and recommend reevaluating the situation in three months.

Should Jane report the accident to others: her dentist, physician, colleagues, her boyfriend? Jane’s long-standing relationship with a supportive boyfriend makes her decision to talk to him easy. For workers who are not in stable, monogamous relationships, however, the decision is more difficult. Counselors should recommend that workers inform others who they may place at a potential risk of infection, and might offer to meet with a worker’s sexual partner if the worker believes this may help the process of disclosure. In Jane’s case, there seems to be no real need to tell her health providers, unless she develops symptoms, or her co-workers or friends unless Jane is clear that they would be a source of emotional support. Counselors should review with workers the possibility of discrimination—in employment, insurance, and even housing—as a result of notification.

Sometimes, exposed workers have feelings of anger and fear about returning to the scene of the accident. Rarely, workers feel the need for time off and are interested in stress-related disability leave. In addition, counselors may wish to clarify the limits of their roles with workers who may want counselors to act as advocates for them in the workplace.

Conclusion

Throughout history, those who have cared for the sick have provided a public service and accepted a certain risk of becoming ill themselves. Providing counseling, health care, and benefits to those who have been exposed to HIV on the job is both a humane response to a potentially tragic situation and an investment in helping to maintain a committed staff of health care professionals.

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Recent Reports


Zidovudine (ZDV) administered immediately to a hospitalized patient who was accidentally injected with HIV-infected blood did not prevent HIV infection. This incident has possible implications for the use of ZDV prophylaxis following accidental HIV exposure among health care workers.

The patient, a 58-year-old male heterosexual in a European hospital, was accidentally inoculated with 0.1 to 0.2 milliliters of blood from another patient with late-stage HIV disease who had never received ZDV. Doctors began ZDV treatment of the patient within 45 minutes of exposure. Treatment consisted of 500 milligrams orally every six hours for the first two days, followed by 2.5 milligrams per kilogram of body weight intravenously every four hours for the next 18 days, 500 milligrams orally every six hours for the next 17 days, and 250 milligrams orally every six hours for the final two months. After 41 days, the patient tested positive for HIV antibody. Virus isolated from both the patient and the index patient was fully sensitive to ZDV.

Researchers suggest that the failure of prophylaxis in this case may be due to the unusually large amount of blood injected into the patient, and the fact that the index patient was at the end stage of disease and therefore had a higher virus load in his blood.


In a comprehensive study of patients admitted to the Veterans Administration Medical Center, researchers found that selective precautions—identifying those patients who were already infected or who were at high risk of being infected—were not effective in distinguishing all patients infected with either HIV or hepatitis B (HBV). These results suggest that a system of universal blood and body fluid precautions remains the best strategy for avoiding infection among health care workers.

The study found that 23 of 616 individuals (3.7 percent) tested positive for HIV antibody, and 12 of 612 individuals (2 percent) tested positive for HBV surface antigen. Two patients were infected with both HBV and HIV.

Researchers tested the blood—drawn for other purposes—of all but 20 patients admitted during one month in 1987. Almost all of the subjects in the study were men, 65 percent were Black, and the median age of all subjects was 59.5 years. One-quarter of the group had received blood products during the past 10 years, and 54 of 540 subjects who consented to interviews participated in intravenous (I.V.) drug use or male homosexual activity.

Eight of the 23 HIV seropositive individuals, including four individuals with AIDS, were known beforehand to have been HIV-infected. Seventeen of the seropositive subjects were either I.V. drug users or male homosexuals, one was known to be infected through a blood transfusion, one was demented and could not be interviewed, and one subject reported his only risk as having sex with a prostitute. Three patients denied any high-risk behavior. Similarly, seven of the 12 HBV antigen positive subjects reported no HBV-related risk factors.


Surgical personnel at San Francisco General Hospital (SFGH) were exposed 117 times to blood or other body fluids during 84 of 1,307 (6.4 percent) consecutive surgical procedures that took place over two months in late 1988. From these data and estimates of the numbers of surgical subjects who were HIV infected, researchers projected that at SFGH the theoretical risk of HIV infection in surgery is .125 infections each year, or one infection every eight years. In other words, since there are approximately 8,000 surgical procedures a year at SFGH, the risk is about one HIV infection in 64,000 procedures. In areas with a lower incidence of HIV, researchers estimated an even lower risk: once every 80 years. The authors did not estimate the risk per person since there were many people involved in each procedure.

Risk of exposure was associated with procedures lasting longer than three hours, loss of more than 300 milliliters of blood, and major vascular and intra-abdominal surgery. Exposure rate did not vary based on awareness of a patient's HIV infection or risk status.

Sixth International Conference on AIDS. Related presentations from the conference, held in San Francisco, June 20-24, 1990.

New medical products could eliminate as many as 50 percent of needlestick accidents. Among the improved devices that are being marketed are prefilled syringes and syringes with sliding-sleeve mechanisms that cover the needle. Such products are often five times more costly than commonly used products. (University of Virginia, Abstract F.C.37).

A study of 1,018 emergency-room patient interactions over 270 hours found that providers often failed to follow universal precautions for protection from HIV. Personnel wore gowns 12 percent of the time, masks two percent of the time, and gloves 80 percent of the time that it would have been appropriate to use these precautions. In separate data, personnel wore gloves for only 55 percent of I.V. placements and 44 percent of phlebotomy procedures, and discarded needles as recommended only 43 percent of the time. Workers cited lack of dexterity, lack of time, and lack of perceived risk as reasons for ignoring the guidelines. (University of Minnesota Medical School, Abstract F.C.38).

Next Month

Pain is emerging as a critical symptom of HIV disease, and as people with AIDS live longer, mediating pain has become a greater challenge. In the August issue of FOCUS, William Breitbart, MD, a psychiatrist at Memorial Sloan-Kettering Cancer Center in New York, discusses the psychiatric aspects of pain in patients with HIV disease. He defines pain, the types of pain associated with HIV disease, the effects of psychological influences on pain and on pain on emotional state, and the psychiatric treatment of pain.

Also in the August issue, Allen H. Lebovits, PhD, Clinical Associate Professor of Anesthesiology and Psychiatry, and Mathew Leikowitz, MD, Director, Pain Management Service, and Clinical Assistant Professor of Anesthesiology, both at SUNY Health Science Center at Brooklyn, discuss the medical management of pain.

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