AIDS Education and Prevention, 16(2), 126–136, 2004

HIV TESTING IN A RESOURCE-POOR URBAN EMERGENCY DEPARTMENT

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In an effort to help fight the HIV epidemic, we offered standard HIV testing to high-risk and symptomatic patients attending an urban emergency department (ED) located in a high-prevalence area. We assessed rates of consent, HIV infection, and linkage into care by demographic and risk characteristics. Consent rates were consistently greater than 50% across the various demographics and risk groups. The HIV prevalence rate was 3% and ranged from 0% to 50% across groups. Of those eligible to enter care 69% attended their first infectious disease clinic appointment. One recommendation to increase the number of people who are aware of their serostatus is to offer HIV testing in underutilized venues, such as an urban ED. The results of this project offer suggestions for future pursuits.

Of the approximately 900,000 persons living with HIV in the United States, one third remains unaware of their serostatus (Centers for Disease Control and Prevention [CDC], 1999). Federal initiatives have been devoted to locating seropositive people and informing them of their status. For example, in 2001 the CDC announced a new effort to combat the AIDS epidemic in the United States, the Serostatus Approach to Fighting the Epidemic (SAFE) (Janssen, Holtgrave, Valdiserri, Shepard, Gayle, & De Cock, 2001). Through SAFE, the CDC calls for its prevention programs to include activities aimed at reducing HIV transmission. These programs would include persons infected with HIV. To accomplish this, SAFE has five interrelated steps, the first of which is to increase the number of HIV-infected persons who know their status. Learning one's HIV positive status can lead to treatment that can increase the length and quality of life. In addition, it may bring about positive behavioral changes, therefore potentially decreasing the spread of HIV to others (Janssen et al., 2001). In 2003 the CDC published "Advancing HIV Prevention: New Strategies for a Changing Epidemic." This initiative encourages offering HIV testing to all patients in high HIV prevalence clinical settings. This may be seen as the next logical step following SAFE with specific recommendations to make HIV testing a routine part of medical care and to implement HIV testing beyond "traditional" sites.

The epidemic's shape has continuously changed over the last 20 years. Jonathan Mann (1996) noted that although HIV enters society in many different ways (e.g., through the elite in Ethiopia, the jet set in Brazil, among men who have sex with men [MSM] in the United States): "With the passage of time, and as the epidemic matures,

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it evolves and moves along a clear and consistent pathway, which although different in its details within each society, nevertheless has a single, vital, common feature. In each society, those people, who, before HIV/AIDS arrived, were marginalized, stigmatized, and discriminated against, became over time those at highest risk of HIV infection" (p. 201).

This has indeed occurred in the United States and Chicago in particular. An epidemic that began among White men who have sex with men in Chicago, now affects an increasing proportion of women and people of color. For example, women accounted for 9% of Chicago's AIDS cases in 1990 but accounted for 24% in 2000; similarly, the proportion of cases among Black and Hispanic people increased from 60% to 81%. In addition, Black and Hispanic women account for 91% of all recent female AIDS cases (Chicago Department of Public Health [CDPH], 2002). Finally, the highest AIDS rates moved from the more affluent north lake-front communities of the city to some of the most destitute areas of the West and South Sides (Soofi & Benbow, 2002).

In this context, emergency departments (EDs) located in high prevalence areas may be an important venue for locating HIV-positive individuals. The CDC particularly recommends that hospitals and acute-care facilities with a high (=>1%) HIV seroprevalence rate routinely offer HIV counseling and testing to its patients. These recommendations were based on findings that revealed a high rate of undiagnosed and diagnosed HIV infection in these hospitals and acute-care settings (CDC, 1993). The ED is also potentially important in the SAFE strategy because people presenting at an ED may not regularly access the healthcare system or seek out HIV testing. Several reports, notably those by Kelen and his colleagues, have demonstrated that, although complicated, it is possible to test for HIV in urgent care settings (CDC, 2001c; Kelen et al., 1996; Kelen, Hexter, Hansen, Tang, Pretorious, & Quinn, 1995; Kelen, Shanan, & Quinn, 1999). Reports have also indicated that seroprevelence rates in EDs may be as high as 10% (CDC, 1993; Kelen, Johnson, DiGiovanna, Loring, & Siverston, 1990; Jui et al., 1990; Schoenbaum & Webber, 1993) compared with less than .3% in the general population (CDC, 1999).

Although the strategy of testing for HIV in the ED is an attractive one for the aforementioned reasons, these important questions remain unanswered:

- Is it possible to implement such a strategy in a resource-poor urban hospital?
- Will patients agree to participate?
- Will the yield (identifying HIV-positive people) make such an effort advisable?
- Will it be possible to help those diagnosed as HIV-positive enter and stay in care?

To answer these questions we implemented a 1-year pilot project to test for HIV in the ED of Mount Sinai Hospital, located on the city's West Side, serving primarily poor populations in an area in which the HIV epidemic is rapidly expanding (Soofi & Benbow, 2002).

MATERIALS AND METHODS

PROJECT SITE

The project was implemented at an urban, inner-city hospital with a Level 1 trauma center certified to care for the most critically injured patients 24 hours a day, 7 days a week. This hospital serves a predominantly black and Hispanic population reflecting the community areas it neighbors. These community areas are among the

hardest hit by AIDS and HIV-associated mortality in Chicago. Some also have the highest rates of injection drug use, syphilis, gonorrhea, and chlamydia in the city (Soofi & Benbow, 2002). In 2000, 29,000 people made 44,000 ED visits at Mount Sinai Hospital. Over 60% of these patients were uninsured or underinsured.

PROJECT DESIGN

HIV testing was not routinely offered in the ED prior to the project. On January 15, 2001, we began to offer standard HIV testing in the ED to high-risk or symptomatic patients from approximately 11 A.M. to 9 P.M., Monday through Friday. These hours were chosen because they represent the busiest times in the ED and could reasonably be covered by the health educators. Two health educators (one of whom was bilingual in Spanish and English) were hired to conduct HIV counseling and testing (HIV CT). The health educators signed a confidentiality agreement in order to access patient medical records. To increase the number of eligible patients tested, ED physicians and nurses were encouraged to offer HIV testing. The health educators, physicians and nurses would let eligible patients know that free HIV testing was available and asked if the patients were interested in testing. Patients eligible for testing included those aged 15-54 and symptomatic or at high risk for acquiring HIV. Among those considered to be at high risk were patients who reported sexually transmitted disease (STD) symptoms or history, substance (alcohol or drug, including injection drug) abuse history, recent sexual assault, violent trauma (included: battery, gun-shot wound, and stab wound), or current pregnancy. Violent trauma was included because there was anecdotal evidence that many of these patients participated in risky drug and sex-related activities. Symptomatic patients included patients with a possible opportunistic infection (e.g., a young patient with pneumonia). Finally, patients who requested HIV testing or patients whose doctors suggested testing were included. A complete list of the risk factors considered is found in Figure 1.

To preliminarily determine the patient's risk and potential study eligibility, the health educator reviewed the patient's ED medical chart. An effort was made by the health educators to review each patient chart to determine eligibility. Patients were excluded from testing if they were known to be previously HIV infected, were critically ill, were unable to provide consent because of a psychiatric condition or were under the influence of drugs or alcohol. Patients who were "ineligible" but requested an HIV test were not denied one. These patients were however excluded from the data analysis.

The health educators were trained at CDPH training sites in accordance with CDC guidelines for HIV CT (CDC, 2001b). The pilot project lasted 1 year.

PATIENT COUNSELING AND TESTING

Once the patient was in an exam room, the HIV health educator approached him/her in a way that would not interfere with either the normal flow or length of the visit. Upon agreeing to test, the patient would receive HIV pretest counseling and sign a consent form (offered in English or Spanish) for HIV testing. Pretest counseling included risk assessment, a brief discussion of what a positive or negative HIV test result meant, and questioning about how the patient would feel if the test was positive. The consent included permission to have blood drawn and medical records reviewed. Patients who consented to HIV testing had their blood drawn by a nurse for a test with ELISA antibody. Positive results were confirmed using the Western blot.

After testing, patients were given an appointment to return for results and posttest counseling in 10 to 14 days. Patients received the phone number of the health

<> Sexually Transmitted Disease (STD)-Related
- <> History of STDs
- <> Symptoms of STDs

<> Substance Abuse History
- <> Alcohol Abuse
- <> Drug abuse

<> Possible Opportunistic Infection

<> Sexual Assault

<> Violent Trauma
- <> Battery
- <> Gun Shot Wound
- <> Stab Wound

<> Requested
- <> Patient Requested
- <> Doctor Requested

<> Current Pregnancy

FIGURE 1. Risk factors considered for HIV testing.

educator in case questions arose later or there was a need for rescheduling. The health educator sent reminder cards to patients regarding their follow-up appointments. All test results were given in person.

For patients who tested HIV-negative and returned, the health educator provided posttest counseling focusing on HIV prevention and risk reduction counseling. For patients who tested negative but did not return for results, only one follow-up phone call was attempted with over 95% of the patients (of whom few were reached). Those who tested HIV-positive and returned were referred to the infectious disease clinic for entry into care. In most instances, the health educator brought the patient to the clinic or introduced the patient to the HIV case manager who would then follow up with the patient to assist with the transition into care. Positive patients who did not return for test results received up to three follow-up calls and a certified letter stating that they should return to the hospital for lab results. If they did not return, their case was referred to the CDPH Counseling, Testing, Referral, and Partner Notification Program for follow-up.

To assess the effect of an incentive on the return rate for results, an incentive was added 27 weeks after the project began. Subsequent to testing, patients were informed they would receive $10 in cash upon returning for their test results to compensate for their time and transportation costs.

DATA COLLECTION

The health educators collected basic demographic characteristics and risk information on every individual they approached (and deemed eligible). Additional risk information was obtained upon conversation with the (eligible) patient. These data were added to the study record and the risk information was revised accordingly. For patients who tested HIV-positive, medical records were reviewed to determine recent (ED, clinic, and hospital) visits and history of opportunistic infections. Medical records were reviewed again at 6 and 12 months to determine the extent to which the patient had presented for care since diagnosis.

STUDY OUTCOMES

We compared the characteristics of the patients who accepted HIV testing with those who declined. Characteristics of those who tested positive and negative were also examined and compared. In addition, characteristics of those who returned for results were compared with those who failed to return. Risk factors were ordered hierarchically as follows: STD related, substance abuse, possible opportunistic infection, sexual assault, violent trauma, patient or doctor requested test, pregnancy, and "other" risks. Risk factors were thus treated as mutually exclusive and exhaustive. Reason for not testing was collected and explored for those who declined testing. Linkage into care was examined for those who tested positive. In addition, we assessed the effectiveness of the $10 compensation in increasing the return rates. Finally, we evaluated the medical staff's participation in recommending HIV testing.

STATISTICAL ANALYSIS

The data, excluding identifying information, were entered into a secured Microsoft Access database and were analyzed using SAS statistical software, version 8.2.

Comparisons were tested by using Yates-corrected χ^2 for proportions. Statistical significance was evaluated at $\alpha = 0.05$.

RESULTS

CONSENTED AND TESTED

Of the 897 high-risk patients that were approached, 60% were male, 71% were non-Hispanic (nH) Black, 24% were Hispanic, and 80% were between the ages of 15 and 39. The three most commonly reported risks in the hierarchy were STD related (39%), substance abuse history (29%), and violent trauma (12%). Approximately 20% of those approached reported having two or more risks (Table 1).

There were no significant differences between those that accepted testing and those that declined in terms of gender, race/ethnicity, age, and number of risk factors (see Table 1). However, there were statistically significant differences in risk factors. Those who tested were more likely to have an STD related factor, possible opportunistic infection, requested HIV testing, or been sexually assaulted. They were also less likely to have a substance abuse history or be pregnant.

The overall consent rate was 55%. Consent rates across demographic and risk groups were greater than 50% with the exception of those reporting a substance abuse history (48%), or pregnancy (31%).

NOT TESTED

Among the 403 (45%) patients who declined testing, 43% reported having been recently (in the last 6 months) tested. An additional 25% did not test because they did

TABLE 1. Characteristics of the Study Population at the Mount Sinai ED, Chicago, 2001

	Approached		Tested		Not Tested	
Characteristics	No.	(%)	No.	(%)	No.	(%)
Gender						
Male	354	(39.5)	207	(41.9)	147	(36.5)
Female	543	(60.5)	287	(58.1)	256	(63.5)
Race/Ethnicity						
nH White	40	(4.5)	23	(4.7)	17	(4.2)
nH Black	638	(71.1)	351	(71.1)	287	(71.2)
Hispanic	215	(24.0)	118	(23.9)	97	(24.1)
Age						
<18	50	(5.6)	33	(6.7)	17	(4.2)
18–29	446	(49.7)	244	(49.4)	202	(50.1)
30–39	224	(25.0)	122	(24.7)	102	(25.3)
40–49	150	(16.7)	75	(15.2)	75	(18.6)
>=50	27	(3.0)	20	(4.1)	7	(1.7)
Risk factors						
STD–related	351	(39.1)	212	(42.9)	139	(34.5)
H/O substance abuse	259	(28.9)	125	(25.3)	134	(33.3)
Possible opportunistic infection	14	(1.6)	12	(2.4)	2	(0.5)
Sexual assault	24	(2.7)	23	(4.7)	1	(0.3)
Violent trauma	107	(11.9)	56	(11.3)	51	(12.7)
Requested	51	(5.7)	38	(7.7)	13	(3.2)
Pregnancy	91	(10.1)	28	(5.7)	63	(15.6)
No. of risk factors						
1	722	(80.5)	394	(79.8)	328	(81.4)
2	164	(18.3)	94	(19.0)	70	(17.4)
3	11	(1.2)	6	(1.2)	5	(1.2)
Total	897	(100.0)	494	(100.0)	402	(100.0)

Note. nH= non–Hispanic, H/O = history of. *$p < .001$.

not perceive themselves to be at risk for HIV even though 47% reported a substance abuse history, 28% had STD symptoms or history, and another 16% had experienced a violent trauma (data not shown). The third most common reason for declining testing was "lack of interest" (14%).

THOSE WHO TESTED HIV-POSITIVE

Among the 494 people who were tested for HIV, 15 (3.0%) tested positive (Table 2). Of these, 8 (53%) were women, 14 (93%) were nH Black, 10 (67%) were aged 30-49, and 7 (47%) had a substance abuse history. In addition, 9 (60%) had two or more risks. There were no significant differences between those who tested negative versus those who tested positive in terms of gender and race/ethnicity. However, compared with those who tested negative, those testing positive tended to be older, were more likely to report a substance abuse history, a possible opportunistic infection, two or more risks but less likely to have an STD related risk (data not shown, $p < .05$).

The highest positivity rates were among males (3.4%), nH Blacks (4.0%), 40-49-year-olds (6.7%) and those with a possible opportunistic infection (25%), substance abuse history (5.6%), and two or more risk factors (see Table 2). HIV-positivity rates did not differ significantly by gender or race/ethnicity. However, there were significant differences by age group ($p < .05$) and risk group ($p < .0001$), and number of risk factors ($p < .001$).

TABLE 2. HIV Positivity among High–Risk Patients Attending the Mount Sinai ED, Chicago, 2001

	No.	(%)
Gender		
Male	7	(3.4)
Female	8	(2.8)
Race/Ethnicity		
nH White	0	(0.0)
nH Black	14	(4.0)
Hispanic	1	(0.8)
Age*		
<18	0	(0.0)
18–29	3	(1.2)
30–39	6	(4.9)
40–49	5	(6.7)
>=50	1	(5.0)
Risk Factors**		
STD–related	4	(1.9)
H/O substance abuse	7	(5.6)
Possible opportunistic infection	3	(25.0)
Sexual assault	0	(0.0)
Violent trauma	0	(0.0)
Requested	1	(2.6)
Pregnancy	0	(0.0)
Other	0	(0.0)
No. of risk factors**		
1	6	(1.5)
2	6	(6.4)
3	3	(50.0)
Total	15	(3.0)

Note. *$p < .05$; **$p < .0001$. nH = non–Hispanic. H/O = history of.

Of the 15 who tested positive, 13 were eligible to enter into care (2 died shortly after diagnosis). Nine of the 13 patients attended their first appointment at the infectious disease clinic. After 6 months, 7 of those 9 patients were still in care and one patient originally not in care had begun treatment for a total of 8 in care at 6 months (Figure 2). Ten of the 15 patients had been to Mount Sinai Hospital in the year prior to diagnosis but were not tested for HIV. Eight of the patients had multiple visits (averaging 3.8 visits) to the Mount Sinai ED, clinics or hospital.

RETURN RATES

The overall return rate was 40%. There were some significant differences between those patients who returned for test results and those who did not (data not shown). For instance, men were more likely to return than women (47% vs. 36%, $p < .01$). Those who requested testing or had a possible opportunistic infection or had an STD related risk, were also more likely to return. Those who had experienced sexual assault or violent trauma had the lowest return rates, 13% and 25%, respectively ($p < .001$). Finally, those who received the $10 compensation were more likely to return than those without the compensation (45% versus 33%, $p < .01$).

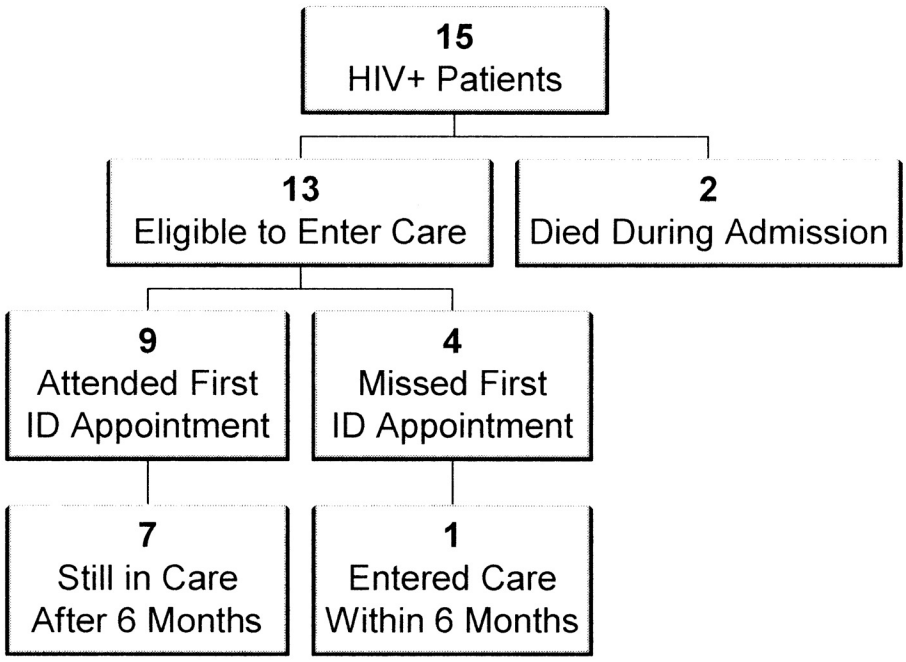

FIGURE 2. Linkage into HIV care.

DISCUSSION

IS IT POSSIBLE TO IMPLEMENT SUCH A STRATEGY IN A RESOURCE-POOR URBAN HOSPITAL?

This study provides evidence that testing high-risk ED patients for HIV is both feasible and advisable. This corresponds to the work by Kelen and collegues (Kelen et al., 1996; Kelen et al., 1999), as well as the CDC and others (CDC, 2001c; Irwin, Olivo, Schnable, Weber, Janssen, & Ernst, 1996), who have demonstrated that EDs are not only an important venue for HIV testing but can also play a valuable role in increasing the number of HIV-infected persons who know their status.

One of the questions we sought to answer was whether routinely testing high-risk ED patients for HIV was possible in a resource-poor urban hospital. With modest funding of $75,000 we acquired two health educators and paid for HIV tests for 1 year. Two health educators assured proper counseling, testing, and patient follow-up that would have been difficult in an otherwise very busy and overburdened ED. This included approaching almost 900 high-risk patients and testing almost 500.

The study data also suggest that with some encouragement and support, the medical staff can help offer testing to ED patients. During the study year the proportion of patients offered testing by the medical staff (primarily nurses) significantly increased from 25% in the first 6 months to 34% in the last 6 months ($p < .01$). This is particularly important when considering the possibility that even modest grant funding for such a strategy could cease. The fact that only high-risk or symptomatic patients were identified and then approached for testing further minimized the cost, time, and effort

needed. However, it is also likely that some HIV-positive people were missed as a result of this targeted approach. Finally, a simple cost analysis by Kelen et al. (1999) showed that offering HIV CT in the ED is not more costly than other HIV CT sites and may even be more cost beneficial.

WILL PATIENTS AGREE TO PARTICIPATE?

Our consent rate (57%) for HIV testing was slightly higher than that found in other studies in similar venues (CDC, 2001c; Irwin et al, 1996; Kelen et al., 1999). Therefore, there is evidence that patients in this environment are indeed willing to test for HIV during their ED visit.

WILL THE YIELD (IDENTIFYING HIV+ PEOPLE) MAKE SUCH AN EFFORT ADVISABLE?

The question whether such an effort is advisable, that is, whether it yields enough newly identified HIV-positive individuals given the effort, is more difficult to answer with this study data. Our screening and testing strategy yielded a larger proportion of HIV-positive individuals than publicly funded HIV CT sites in the United States and Chicago (CDC, 2001a). For instance, in 1998 the positivity rate was 1.3% for the United States and 1.2% for Chicago. The Sinai ED rate was more than twice as high (3.0%). This means that by screening high-risk and symptomatic patients, the Sinai ED would only need to test less than half as many patients as the city to yield the same number of HIV-positive individuals. In terms of return rates for results and post- test counseling, the Sinai ED was less successful. In 1998 the United States and Chicago had a higher return rate (56% and 55%, respectively) than Sinai's ED (40%).

WILL IT BE POSSIBLE TO HELP THOSE DIAGNOSED AS HIV-POSITIVE ENTER AND STAY IN CARE?

Consistent with the SAFE strategy (Janssen et al, 2001), we found that it was possible to bring patients into care and to keep them in care. Nine of the 13 eligible patients were brought into care and 8 were in care 6 months later. The combined efforts of the health educators and HIV case managers made follow-up effective. Because many (8 of 15) of the HIV-positive patients had an AIDS-related illness at the time of diagnosis, they were probably more likely to seek care. Insurance coverage for patients who entered care varied. Some had no insurance; others had Medicaid, Medicare, or HMO coverage. Because of the availability of Ryan White funding, no patients were denied medical care based on insurance coverage.

ADDITIONAL OBSERVATIONS

The fact that a large number of patients already had AIDS upon this initial diagnosis of HIV seropositivity is disconcerting; of the 15 who tested positive for HIV, 8 had AIDS and 3 had asymptomatic HIV (stage of the disease was unknown for 4 patients). Notably, 10 of the 15 patients who tested positive had previous contact with Sinai medical providers in the year prior to diagnosis but had not been tested for HIV. Whether these patients were offered testing and refused is unknown. Regardless, this raises the question of whether HIV testing was being offered broadly and effectively enough. Both patients and providers may not perceive the need for HIV testing until the patient is sick. In a recent CDC (2003) recent report, the reason many (42%) people gave for seeking HIV testing is illness whereas 10-17% tested because it was recommended by a healthcare facility or provider.

Providing a modest incentive to help compensate the patients for their time and transportation costs proved effective. The proportion of patients who returned for test results during the last 6 months (when an incentive was provided) increased by 36%. If an incentive would have been offered to all the patients (in the first 6 months), an additional 26 patients may have returned for results and posttest counseling. This brings to question whether a slightly higher incentive would increase the return rates further or, rather, what type of incentive would increase the rates to a more acceptable level.

The results of this study indicate the importance of the SAFE strategy (Janssen et al, 2001), in particular its first two objectives: to locate previously undiagnosed cases of HIV infection and link them into care. On a similar note, the Institute of Medicine (IOM, 2001) issued a clarion call to a related prevention approach in its seminal report, "No Time to Lose: Getting More from HIV Prevention." Noting that its overall goal must be to "avert as many new HIV infections as possible with the resources available for HIV prevention" (p. 4) the IOM cited the importance of using the clinical setting for prevention: "Prevention services for HIV-infected persons should be a standard of care in all clinical settings" (p. 6). Noting that close to half a million people are now receiving clinical care for HIV, the IOM pointed out that this would be an ideal venue for prevention among HIV-positive individuals (p 50).

SAFE, the IOM (2001) report, and "Advancing HIV Prevention" (CDC, 2003) individually and jointly suggested that (a) we must go where the cases are (such as institutions that serve the marginalized populations), not where it is easiest to work and where we have been working all along; (b) we must help these cases enter care; and (c) we must then deliver prevention services to those who are at high risk of transmitting the HIV virus, including those which have been largely omitted from HIV prevention efforts. However, presently, "the Committee finds that current prevention programs do not effectively target individuals who are HIV-infected and who may still engage in risky behavior" (p. 63).

This latter observation on prevention is supported by a recent study implemented by the AIDS Policy Research Center in San Francisco, which found that 21% of those who [are in primary care for HIV and] who have been sexually active were worried that they might have given HIV to someone else (Morin, 2002). It also found that a very small proportion of people (fewer than 10%) received even the most basic prevention messages (Morin, 2002). As the Center noted elsewhere, "The success of new treatments for HIV infection mean that there are now more people living with HIV disease than ever before, and many of these individuals are feeling healthier and better able to participate in the normal activities of life, including sex" (Collins, Morin, Shriver, & Coates, 2000). Other "normal activities of life" can be (injection) drug use, such as the case with Sinai ED patients.

One final observation may be offered about efforts to overcome the "old paradigm" of HIV prevention. This paradigm exists for reasons related to the early shape of the epidemic in the United States but also because of ineffective funding mechanisms. For example, as the IOM (2002) report noted, "treatment" and "prevention" have been heretofore separated by funding initiatives as well as perceived programmatic needs. According to the IOM, "Funding policies need particular attention; the current separate funding streams for prevention and clinical care services discourage grantees from integrating these services" (p. 63)

Clearly, this situation must not continue. In urban centers like Chicago the ED can be an essential venue for HIV CT. The results of this study, and others like it

(CDC, 2001b; Kelen et al, 1995; Kelen et al., 1999), show that such HIV CT programs can be effective even in the most chaotic, resource-poor urban EDs. This environment makes implementation difficult. At the same time, it makes it essential.

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