Engaging HIV-Positive Individuals in Specialized Care from an Urban Emergency Department

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Abstract

Linking patients who test positive for HIV in an emergency department (ED) setting to HIV care can be challenging. The aim of this study was to assess whether a multimedia HIV testing model utilized in an inner-city ED can effectively link HIV-positive individuals into specialized medical care. A prospective cohort study was performed from October 2005 to January 2009 at an urban academic hospital with a Level 1 trauma center and in-house specialized HIV clinic. Patients were HIV tested in the ED using a multimedia video counseling program which included computer-assisted data collection. Patients who tested positive were linked to care by the same counselor who gave the test result. Linkage was immediate for discharged patients during clinic hours and patients tested during off-hours were scheduled a visit on the next business day. All follow-up was conducted through chart review. The public health advocates (PHAs) tested 24,495 patients over the course of the study, of whom 116 (0.47%) were HIV positive and 93 were newly diagnosed. A total of 83.6% (97/116) of HIV-positive individuals were linked into specialized care, defined here as an outpatient clinic visit within 30 days of diagnosis in the ED. The findings suggest that a multimedia testing model that includes a counselor who acts as tester and navigator can successfully link a high percentage of patients into specialized care.

Introduction

THE UNITED STATES CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC) recommends routine HIV screening for individuals aged 13–64 in medical settings including emergency departments (EDs), which tend to have high rates of undiagnosed HIV infection.^{1,2} Current CDC recommendations focus on HIV counseling and testing (C&T) as the primary mechanisms for HIV prevention; once an individual is identified as being infected with HIV, they should be informed of their status and engaged into specialized HIV treatment in a timely manner.¹ The CDC recommends engagement in treatment within 6 months, and standard ED protocol defines linkage as engagement into primary care within 30 days of diagnosis.^{3,4} Engagement in HIV treatment, including highly active antiretroviral therapy (HAART), has been shown to reduce HIV transmission by encouraging adoption of risk reduction behaviors and decreasing plasma HIV-RNA levels.^{5,6} It is clear that identification of existing HIV infection alone is not sufficient to improve patient outcomes and delayed entry into medical care is associated with worse disease progression.^{7,8} HIV C&T programs have a significant challenge linking patients into HIV care from an

ED setting.^{9,10} Limited resources and the incident-specific nature of the ED visit could contribute to low linkage rates, which range between 60–80% of patients establishing care within 6 months.^{9,11}

The highest rate of linkage was found in a study by Gardner et al.¹² in which the researchers conducted a randomized controlled trial to assess the efficacy of a case management intervention to ensure linkage into care as compared with the standard of care of passive referral to outpatient treatment. The case manager in this study acted as a client navigator in order to address client needs and barriers to care and accompany the patient to the clinic, if desired.¹² These researchers defined linkage as one outpatient clinic visit in two consecutive 6-month periods, for a total of at least two clinic visits in 12 months. In this study, 78% of the intervention group was linked to care, while only 60% of the control group visited an outpatient HIV clinic in the six months following diagnosis.¹² This multisite study did not focus specifically on patients who tested for HIV in an ED setting but it provides encouraging evidence that a low-cost case manager-type intervention can have a significant impact on bringing HIV patients into care.

While Gardner et al.¹² defined linkage to care as two clinic visits in 12 months, this study applied the consensus definition

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used by the Society for Academic Emergency Medicine, which defines successful linkage as "linkage less than 30 days after the initial ED encounter; includes patients hospitalized after the ED encounter, provided that the inpatient physician was aware of the diagnosis while the patient was in the hospital."¹³ The importance of patient engagement in HIV care, in addition to successful linkage, has been recognized by the United States Health Resources and Services Administration and has established a continuum by which patient engagement can be measured.¹⁴

The goal of this investigation was to assess effectiveness of linkage to care in our ED model of HIV testing. Our process involves public health advocates (PHAs) serving in a dual role: an actively recruiting HIV counselor/tester who approaches patients in a non-targeted fashion (assisted and armed with a state-of-the-art tablet PC for HIV counseling and automated touch screen data entry allowing for increased capacity to work with several patients in parallel) and a navigator of the health care system who links patients diagnosed with HIV into care immediately. The PHA component of our model is complemented by a frequently scheduled open access outpatient expert HIV clinic which permits absorption of patients into medical care, minimizing barriers and allowing expedited expert evaluation of newly diagnosed HIV patients by HIV experts.

Methods

Study participants

This prospective cross-sectional study was conducted from October 2005 to January 2009. Stable patients, aged 13 years and older and not already in HIV care, presenting to an inner-city municipal hospital Urgent Care Area (UCA) and ED were recruited. Previously developed and evaluated videos for HIV pre- and posttest counseling based on New York State Department of Health requirements were used.^{15,16} Over the course of 3 weeks, 1.5–8 full-time equivalent public health advocates (PHAs) were interviewed, hired, and trained in HIV counseling by clinical staff and through a formal training session from Cicatelli Associates. PHAs were required to pass a test developed and administered by clinical staff prior to performing tests. PHAs' lone responsibility was to actively recruit clinically stable patients aged 13 and above to participate in the rapid HIV testing program by approaching patients in a nontargeted manner in their rooms and offering the test. Clinical supervisors met regularly with PHAs to monitor performance. Documented informed consent was obtained from all patients and no incentives were offered. The research protocol received approvals from the institutional review boards at the Albert Einstein College of Medicine and the Health and Hospitals Corporation.

Patients who chose to participate in the intervention watched a pretest video after which point the PHA returned to answer any further questions and obtain informed consent for HIV testing. Patients were tested using the OraQuick ADVANCE[®] Rapid HIV- 1/2 Antibody Test (OraSure Technologies, Inc. Bethlehem, PA) and watched a posttest HIV prevention education video while the test was running. Patients also answered a risk factor questionnaire on the tablet computer and the results were downloaded wirelessly into a secure database. The PHA returned after approximately 20 min to answer questions about HIV prevention, provide

more focused counseling tailored to the needs of the individual based upon their self-reported risk factor profile and deliver the test results.

Data on demographic characteristics, risk factors, and sexual history were collected from those patients who both agreed to and refused testing. Data were also collected on the number of patients tested, number of HIV identified patients, and number linked to care. The risk factor and sexual history data collected included information on alcohol use, drug use, homelessness, condom use, number of sexual partners, and sexual practices. In keeping with the program's objective of providing a brief model of counseling and testing (C&T), patients were prompted to answer either the satisfaction survey or the knowledge measure, not both. Patients randomized to a satisfaction survey provided data on their satisfaction of with the model, including the ability of the videos to convey information, how they would prefer HIV testing in the future and the helpfulness of rapid HIV testing in the ED. Patients who were randomized to complete the knowledge measure answered a series of questions about material covered in pretest and posttest counseling, providing data on the amount of HIV education conveyed by the videos. The results of this study have been reported in detail elsewhere.¹⁷

The data collected on HIV-positive patients included CD4 and viral load levels at the time of diagnosis, time interval between diagnosis and the patient's first medical clinic appointment, time interval between diagnosis and the patient being placed on treatment, baseline resistance to antiretroviral treatment, reasons for the patients' ED visit, admitting diagnosis, presence of comorbid diseases, the number of patients eligible for highly active antiretroviral treatment (HAART), the number of patients eligible patients started on HAART and the outcomes of treatment. All medical data collected on positive patients were obtained through chart reviews by their medical provider.

Positive patient protocol

Patients who had a reactive rapid oral screening test result were given a rapid blood screening test via finger-stick using the OraQuick ADVANCE[®] Rapid HIV- 1/2 Antibody Test. The PHA also drew blood for a confirmatory Western blot, initial CD4 count and baseline viral load, but all preliminary positive patients were treated as if they were positive and staff did not wait for Western blot results to facilitate linkage. Patients who were tested between 9:00 AM and 5:00 PM were personally escorted by the PHA to the Adult Comprehensive Services (ACS) open-access HIV care clinic (Fig. 1). These patients had an initial encounter with a member of the HIV expert medical staff, either a nurse, social worker or case manager, who could answer medical questions, provide counseling and support and facilitate enrollment into insurance, as needed. Whenever possible, patients were also seen by a physician during this time, and if a physician was not available, a comprehensive medical visit was scheduled.

If a patient was tested during clinic off-hours, the PHA exchanged contact information with the patient and scheduled to meet the patient in the ED the next business day. The PHA then personally escorted the patient to ACS at the patient's earliest possible convenience. Each PHA was personally responsible for linking each and every patient to medical

FIG. 1. Positive patient procedure. ED, emergency department; PHA, public health advocate.

care and following up with patients who did not attend appointments, as needed.

A patient was not considered successfully linked into medical care until he completed an initial comprehensive examination with an HIV expert physician, which was confirmed by retroactive chart review.

Results

The PHAs tested 24,495 patients over the course of the study, of whom 116 (0.47%) were HIV positive and 93 were newly diagnosed. The demographics of the HIV positive patients are as follows: average age 39.94 years $\pm$ standard deviation (SD) 11.18 years (range, 13–71 years); 69.8% male (including one transgender individual). One hundred one patients had an initial CD4 count drawn that indicated that 48.5% ($n = 49$) of these patients had AIDS at diagnosis. Complete demographic and risk factor data is summarized in Table 1.

There were 81 males, average age 40 years (range, 13–71). These patients were slightly older and had lower initial CD4 counts and viral loads than the female cohort. The males also had less contact with the North Bronx Healthcare Network (NBHN), which includes Jacobi Medical Center and North Central Bronx Hospital, than the females before their HIV diagnosis (Table 2). Of patients who had an initial CD4 count drawn ($n = 101$), 49 had AIDS at within 12 months of their initial diagnosis.

Eighty-four percent ($n = 97$) of patients were successfully linked into outpatient HIV care services. Of these, 88% ($n = 86$) were linked into HIV services at NBHN. In most cases, the patient was walked over to the ACS clinic immediately following diagnosis, but the patient was not considered linked into care until he or she received a comprehensive examination

TABLE 1. POSITIVE PATIENT CHARACTERISTICS

Gender (%)	
Male	69.8%
Female	30.2%
Race/ethnicity (%)	
Black/ African American	50.9%
Hispanic	40.5%
Multiracial	5.2%
White	2.6%
Language	
English	78.4%
Spanish	20.7%
Newly diagnosed	80.2%
HIV tested before	71.6%
Condom use (past 3 months) (%)	
Never	27.8%
Almost never	4.1%
Sometimes	16.7%
Almost every time	26.4%
Every time	25.0%
Ever had sex without a condom	79.3%
Vaginal sex (past 3 months)	62.8%
Men who have sex with men	25.9%
Sex with drug user	25.2%
Previous STI diagnosis	24.3%
Anal sex (past 3 months)	21.5%
Sex with partner with HIV	20.8%
Use street drugs before sex	17.2%
Consume more than 3 drinks before sex	17.2%
Exchanged sex for money/drugs	6.3%
Past intravenous drug use	4.5%
Homeless in the past 6 months	3.6%

STI, sexually transmitted infection.

TABLE 2. MALE AND FEMALE CHARACTERISTICS AT HIV DIAGNOSIS

	Male (n = 81)	Female (n = 35)	Total (n = 116)
Average age	40 (range, 21–71)	38 (range, 13–56)	40 (range, 13–71)
No. NBHN visits prior to diagnosis (total)	4.3	13.5	7.1
No. of patients newly diagnosed HIV positive	67	26	93
No. NBHN visits 1 year prior to diagnosis	1.8	2.8	2.1
Initial CD4 count (cells/mm ³)	291	374	316
Median initial viral load (copies/mL)	68,350	90,700	74,450

NBHN, North Bronx Healthcare Network.

by an HIV expert physician. Twenty-three patients were aware of their HIV-positive status and were tested in the ED either to confirm previous positive results or to be linked into care at ACS. Eligibility for HAART treatment was assessed using US HHS guidelines which indicate that HAART is appropriate when the patient's CD4 count is below 350 cells per milliliter. Outcome data is summarized in Table 3.

Limitations

Follow-up data were only available for those patients linked into care at NBHN. Patients who chose to enter care at another clinic or with their personal doctor could not be included because research staff was not able to access their medical record. This missing data could affect the overall average of days to first medical visit. Chart reviews were completed in January 2009 and the patients' most recent CD4 count and viral load were used. Any subsequent change has not been documented. The percentage of eligible patients started on HAART is limited by the number of patients who returned to outpatient clinic to assess their eligibility for HAART treatment.

Discussion

This study is the first to analyze linkage to care from the ED using existing testing staff as the facilitators of linkage. Bradford et al.¹⁸ examined the efficacy of four types of programs that used a navigator to engage HIV-positive patients into care based on similar models used for patients with cancer. These patients were not newly diagnosed and the navigator's role was to engage the patient into care not establish initial contact with primary HIV care. Another crucial difference is that all of these studies used nonclinical staff as the navigators, while our study used the testers as navigators. Another important difference is that these studies continued to use the navigators over longer periods of time as patient advocates while our PHAs were navigators on a more temporary basis and then handed off the long-term care to social workers and case managers at the HIV clinic. Given the different roles of navigators between these two studies, they are not entirely comparable but Bradford et al.¹⁸ showed statistically significant improvement in the number of patients who

TABLE 3. OUTCOME DATA

Newly diagnosed patients (n = 93)	
Linked to care (n = 78)	84%
Linked at ACS (n = 71/78)	91%
No. of days to comprehensive examination	Mean: 12.6 Median: 6 Range (0–79)
No. of patients eligible for HAART	52
No. of days from HIV diagnosis to HAART	Mean: 46 Median: 38 Range: (1–160)
Eligible patients started on HAART	67%
No. of patients with viral load <400 cells/mL	29
No. of patients with viral load <50 cells/mL	18
Known positive patients (n = 23)	
Linked to care (n = 19)	83%
Linked at ACS (15/19)	79%
No. of days to comprehensive examination	Mean: 108 Median: 21 Range (0–696)
No. of patients eligible for HAART	11
No. of days from HIV diagnosis to HAART	Mean: 45 Median: 27 Range: (1–116)
Eligible patients started on HAART	91%
No. of patients with viral load <400 cells/mL	5
No. of patients with viral load <50 cells/mL	1

ACS, Adult Comprehensive Services; HAART, highly active antiretroviral therapy.

had received HIV primary care in the past 6 months and the number of patients who had undetectable viral loads over baseline.

The use of the tester as navigator is the factor that differentiates this testing program from others that offer routine testing in the ED. The high rates of linkage to care should alleviate some of the concerns of testing in the ED without having a linkage mechanism that has been proven to be effective.^{19,20} By changing a passive referral process to an active seamless engagement in care using the PHA as facilitator, we have changed the role of the ED HIV tester. The PHA can provide focused counseling to high risk patients when needed and becomes a client navigator to immediately engage a person who tests positive into care. The PHA can elucidate the process of receiving HIV care in a community with low health literacy. Uninsured or underinsured patients frequently do not realize that they are eligible for AIDS Drug Assistance Program (ADAP) insurance which covers both HIV primary care and prescription medications. Patients are fearful of the expense involved in HIV care until the PHA clarifies the process and the resources that are available to them.

It is likely that the fact that patients are linked into care immediately following their HIV diagnosis contributes to their likelihood of attending their first clinic appointment and remaining in care. We believe that this instant access to HIV clinic services is extremely important to patients. Highly trained social workers are available to immediately address the stress and anxiety that patients can feel when they are newly diagnosed HIV-positive. We believe that rapid HIV testing in the ED necessitates rapid access to care. The HIV clinic at Jacobi Medical Center has been structured to

accommodate open access by having each attending available for walk in patients for 1 h each day. The clinic has also been organized to provide comprehensive care including expert nursing, mental health, social work, and nutrition services in addition to medical care in order to further ease patient access to care. Gardner et al.¹² found that there was a 60% increase in linkage-to-care rates for patients who were contacted by a case manager within 6 months of their HIV diagnosis compared with those who had been diagnosed with HIV between 6 and 12 months earlier. It is encouraging that the linkage rates for both newly diagnosed patients and known positive patients are similar and provides evidence that this type of linkage mechanism may be more effective for all types of patients.

Implementation of a successful linkage mechanism within an ED HIV testing program could help to alleviate the disproportionate burden of poor HIV outcomes that currently rests upon minority groups of lower socioeconomic status.²¹ A high rate of successful linkage to outpatient care within 30 days of diagnosis in the ED using existing staff could be replicated by other ED testing programs by making testers responsible for linkage and becoming a resource for the patients.

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Author Disclosure Statement

No competing financial interests exist.

References

- Branson B, Handsfield H, Lampe M, et al. Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-care Settings: US Department of Health and Human Services, Centers for Disease Control and Prevention, 2006.
- Lyss SB, Branson BM, Kroc KA, Couture EF, Newman DR, Weinstein RA. Detecting unsuspected HIV infection with a rapid whole-blood HIV test in an urban emergency department. *J Acquir Immune Defic Syndr* 2007;44:435–442.
- Branson BM, Handsfield HH, Lampe MA, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR Recomm Rep* 2006;55:1–17; quiz CE11–14.
- Haukoos JS, Mehta SD, Harvey L, Calderon Y, Rothman RE. Research priorities for human immunodeficiency virus and sexually transmitted infections surveillance, screening, and intervention in emergency departments: consensus-based recommendations. *Acad Emerg Med* 2009;16:1096–1102.
- Marks G, Crepaz N, Senterfitt JW, Janssen RS. Meta-analysis of high-risk sexual behavior in persons aware and unaware they are infected with HIV in the United States: Implications for HIV prevention programs. *J Acquir Immune Defic Syndr* 2005;39:446–453.
- Castilla J, Del Romero J, Hernando V, Marincovich B, Garcia S, Rodriguez C. Effectiveness of highly active antiretroviral therapy in reducing heterosexual transmission of HIV. *J Acquir Immune Defic Syndr* 2005;40:96–101.
- Samet JH, Freedberg KA, Savetsky JB, Sullivan LM, Stein MD. Understanding delay to medical care for HIV infection: The long-term non-presenter. *AIDS* 2001;15:77–85.
- Giordano TP, White AC, Jr., Sajja P, et al. Factors associated with the use of highly active antiretroviral therapy in patients newly entering care in an urban clinic. *J Acquir Immune Defic Syndr* 2003;32:399–405.
- Molitor F, Kuenneth C, Waltermeyer J, et al. Linking HIV-infected persons of color and injection drug users to HIV medical and other services: The California Bridge Project. *AIDS Patient Care STDs* 2005;19:406–412.
- Molitor F, Walsh RM, Leigh JP. Determinants of longer time from HIV result to enrollment in publicly funded care and treatment in California by race/ethnicity and behavioral risk. *AIDS Patient Care STDs* 2002;16:555–565.
- Ulett KB, Willig JH, Lin HY, et al. The therapeutic implications of timely linkage and early retention in HIV care. *AIDS Patient Care STDs* 2009;23:41–49.
- Gardner LI, Metsch LR, Anderson-Mahoney P, et al. Efficacy of a brief case management intervention to link recently diagnosed HIV-infected persons to care. *AIDS* 2005;19:423–431.
- Lyons MS, Lindsell CJ, Haukoos JS, et al. Nomenclature and definitions for emergency department human immunodeficiency virus (HIV) testing: Report from the 2007 conference of the National Emergency Department HIV Testing Consortium. *Acad Emerg Med* 2009;16:168–177.
- Cheever LW. Engaging HIV-infected patients in care: Their lives depend on it. *Clin Infect Dis* 2007;44:1500–1502.
- Calderon Y, Haughey M, Leider J, Bijur P, Bauman L. The Evaluation of an Educational Video Program for HIV Testing: A Comparative Analysis. Paper presented at: Academic Emergency Medicine, Orlando, FL 2004.
- Calderon Y, Haughey M, Bijur PE, et al. An educational HIV pretest counseling video program for off-hours testing in the emergency department. *Ann Emerg Med* 2006;48:21–27.
- Calderon Y, Leider J, Hailpern S, et al. High-volume rapid HIV testing in an urban emergency department. *AIDS Patient Care STDs* 2009;23:749–755.
- Bradford JB, Coleman S, Cunningham W. HIV System Navigation: An emerging model to improve HIV care access. *AIDS Patient Care STDs* 2007;21(Suppl 1):S49–58.
- Burke RC, Sepkowitz KA, Bernstein KT, et al. Why don't physicians test for HIV? A review of the US literature. *AIDS* 2007;21:1617–1624.
- Arbelaez C, Wright EA, Losina E, et al. Emergency provider attitudes and barriers to universal HIV Testing in the emergency department. *J Emerg Med* (in press).
- Mugavero MJ. Improving engagement in HIV care: What can we do? *Top HIV Med* 2008;16:156–161.

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