Idealized Models or Incremental Program Evaluation: Translating Emergency Department HIV Testing Into Practice

As the human immunodeficiency virus (HIV) epidemic in the United States continues, it is estimated that over 1 million individuals are infected, and approximately 250,000 remain undiagnosed.[1] Last year, the estimate of incidence was revised upward to approximately 56,000 new HIV infections annually.[2] Past prevention efforts have been incompletely effective, and screening is increasingly recognized as a powerful prevention intervention.[3,4] Accordingly, in 2006 the Centers for Disease Control and Prevention (CDC) revised their recommendations for performing HIV testing in health care settings with significant focus on emergency departments (EDs).[4] These recommendations called for performing nontargeted, opt-out, rapid HIV screening as an integrated part of medical care for *all* patients aged 13 to 64 years in clinical settings where the estimated prevalence was 0.1% or higher. To overcome barriers to HIV screening, the CDC also recommended integrating consent for HIV testing into the general medical consent process and uncoupling prevention counseling from testing. This multifaceted approach represents a dramatic paradigm shift and offers the promise of significantly changing the HIV testing landscape *if* it can be implemented in a widespread fashion.

PROGRESS TO DATE

In the 3 years since the release of the CDC recommendations, there has been a substantial increase in efforts to better understand the intersection of HIV screening and emergency medical care.[5] Most notably, the CDC embarked on a large campaign to engage EDs across the country with the goal of broad implementation of the recommendations. Activities have included demonstration projects, direct and indirect support of scientific investigations, and various educational opportunities for emergency physicians. A considerable amount of CDC funding for expanded testing has also filtered through state health departments to EDs.

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In 2007, the National Emergency Department HIV Testing Consortium was created to bring together clinicians, scientists, policy-makers, administrators, and other advocates, with a mission to facilitate, on a national level, the translation of population-based HIV testing and screening in emergency medical practice. A major milestone in the history of the Consortium was a 2-day consensus conference held in Baltimore, Maryland, in 2007. This conference was attended by 98 participants from 42 health care institutions and a variety of specialty organizations including state health departments, advocacy organizations, and foundations. The meeting resulted in the development of standardized nomenclature and definitions for reporting of HIV testing programs in EDs.[6] Additional work related to the conference is still in process, including critical evaluation of legal, financial, and ethical issues and the clinical and public health impact of ED-based HIV testing.

Also in 2007, the American College of Emergency Physicians (ACEP) published a policy statement on HIV testing and screening in EDs in response to the release of the CDC recommendations.[7] That statement indicated that HIV testing should be available in an expeditious and efficient manner in EDs for potential acute HIV-related conditions and that HIV screening should be available when deemed appropriate by the emergency physician and when a set of conditions are met. Those conditions relate primarily to compliance with legal regulations, lack of interference in ED operations, and appropriate reimbursement.

In recent years, research efforts have also increased as demonstrated by the number of peer-reviewed original research publications and the number of extramural grants funded to support these efforts. To identify previous publications and federally funded research related to HIV surveillance, screening, or intervention in the ED, we performed systematic searches of several publication search engines (including PubMed, EMBASE, CINAHL, and the Web of Science) and the Computer Retrieval of Information on Scientific Projects (CRISP) database.

The first search was performed to identify all ED-related HIV testing publications from the beginning of each database to the present using the following criteria: ''hiv'' or ''human immunodeficiency virus,'' and ''diagnosis,'' ''testing'' or ''screening,'' and ''emergency

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department,'' ''emergency room,'' ''emergency ward,'' or ''emergency medical services.'' This search resulted in 923 unique citations from 1984 to present, of which nearly half were published in the past 5 years. Acceleration of work in this area as represented by the number of publications per year appears quite evident (Figure 1).

The second search was performed using CRISP, a database maintained by the National Institutes of Health (NIH) that includes projects funded by the NIH, Substance Abuse and Mental Health Services, Health Resources and Services Administration, Food and Drug Administration, CDC, Agency for Healthcare Research and Quality (AHRQ), and the Office of Assistant Secretary of Health.[8] We used the following search criteria to identify all ED-based HIV-related funding from 1972 to present: ''hiv'' or ''human immunodeficiency virus,'' and ''diagnosis,'' ''testing,'' or ''screening,'' and ''emergency department,'' ''emergency room,'' ''emergency ward,'' or ''emergency medical services.'' In addition, all participants of the 2007 National Emergency Department HIV Testing Consortium consensus conference were individually searched by name to identify any other funded awards.

No awards were identified prior to 1999. From 1999 to present, 15 individual awards representing 59 cumulative years of funding were identified (Figure 2). The number of awards has steadily increased over the past decade, and of the 15 awards, five (33%) represented investigator-initiated grants (R category), five (33%) represented career development awards (K category), four (27%) represented cooperative agreements (U category), and one (7%) represented a fellowship grant (F category). Funding agencies included predominantly the National Institute of Allergy and Infectious Diseases, the CDC, and AHRQ.

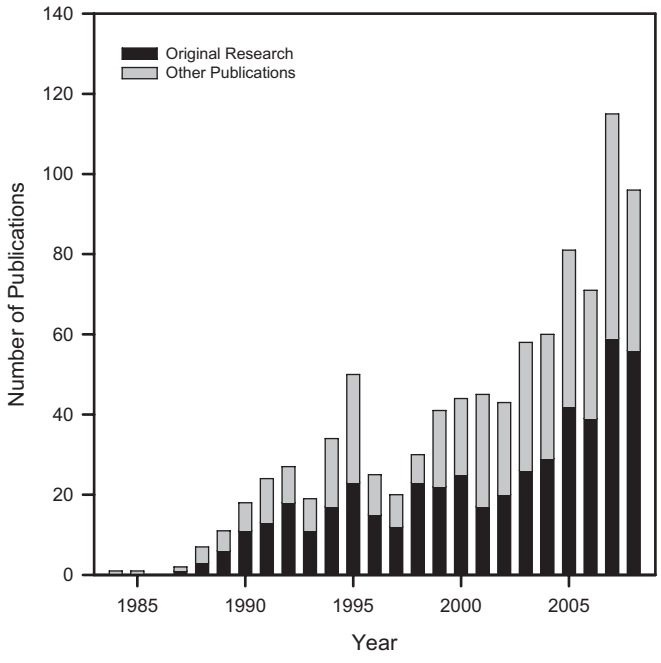

Figure 1. Peer-reviewed publications related to ED-based HIV testing by year.

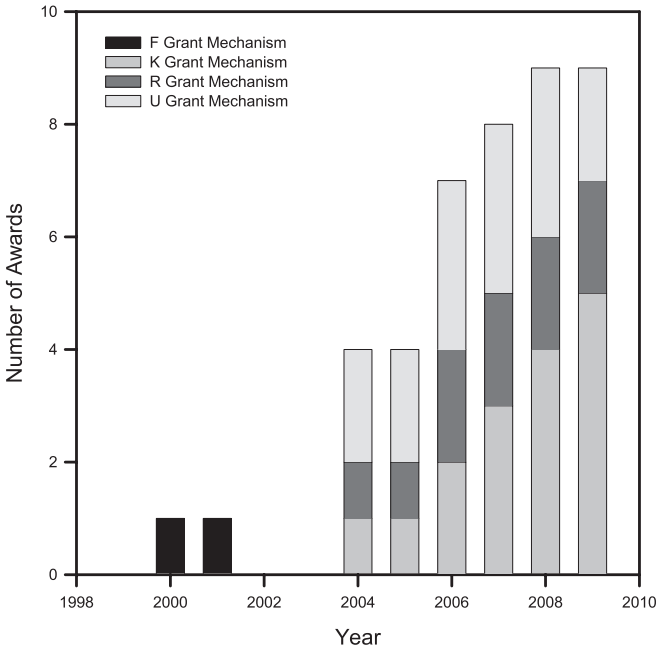

Figure 2. Federal research awards related to ED-based HIV testing by year.

INCREMENTAL PROGRAM EVALUATION

In this issue of *Academic Emergency Medicine*, three articles describe important but different aspects of performing HIV testing in EDs.[9–11] The article by Freeman et al.[9] provides a detailed account of a nontargeted opt-out rapid HIV screening program in a busy, urban ED. In doing so, they expand our understanding of obtaining consent in the context of closely adopting the CDC recommendations. The investigators succeeded in screening a high percentage of the available population present during program hours and report the highest consent rate to date in an ED environment. The basic programmatic outcomes are important, and operational details provided by the authors categorically improve our understanding of performing nontargeted opt-out rapid HIV screening in the ED. However, this accomplishment required separate, dedicated HIV prevention counselors in addition to ED staff, a common strategy used in prior program evaluations. It remains unclear how this work will translate into EDs with limited financial or personnel support to sustain such an endeavor. In fact, an improved understanding of how best to fully integrate HIV screening into existing ED operations is still urgently needed.[10]

Merchant et al.[11] expand the reported experience using computer-based technologies to interact with patients in the ED. These technologies are promising in that they may accomplish tasks related to HIV testing without further exacerbating provider time constraints. The work explores risk perception among ED patients and interventions to modify that risk perception. The risk of ED patients and their perceptions of that risk have broad implications related to patient selection, consent rates, and the ability of programs to intervene among at-risk populations. However, these issues might be considered to be of lesser importance when so many

patients remain untested, not because of issues related to risk or risk perception, but simply because testing was not offered.

The work by Hsieh et al.[12] explores provider perceptions and the impact of education and familiarity on those perceptions. Understanding the degree to which perceptions are fixed or modifiable, and the means to modify such perceptions, are important prior to endorsing HIV screening in EDs. These findings also provide some of the first evidence that initiation of testing, even if imperfect, can influence acceptance. If improved acceptance leads to further translation, then a positive feedback loop could be created. However, caution may be wise before recommending partial implementation as a pathway to progress. The reality of fixed operational barriers would inevitably limit the degree to which provider perceptions can be improved, just as was found in this study. In addition, opposite results might be found if an attempt at partial implementation came to be viewed as a failure.

Thus, we see that the three articles share a common focus of increasing HIV testing uptake by providers and patients within settings that have implemented some form of HIV testing. They contribute importantly to broad questions such as ''what should be done?,'' ''how should it be done?,'' and ''what is the impact of doing so?'' However, these investigations are less able to directly address the system-level barriers that inhibit uptake by new medical centers not previously engaged in HIV testing or screening.

NEXT STEPS IN TRANSLATION

Recently, the scientific community has extended the concept of translational research to include health services and community-based research.[13] Increased efforts to understand the ''comparative effectiveness'' of diagnostic, therapeutic, and preventive strategies have also provided a foundation for work in this area.[14] However, despite our considerable progress in the science of ED HIV screening and the more recent focus on translational and comparative research, there has been relatively little progress towards the ultimate goal of incorporating HIV testing or screening into usual practice. We could scarcely suggest that as a specialty, our practice or culture has been fundamentally altered, and not surprisingly, complex operational and financial constraints remain the primary barriers to providing HIV testing in EDs. Moreover, frequent philosophical resistance (both in and out of emergency medicine) augments real and perceived barriers. Many continue to argue that integration of large-scale public health initiatives in the ED will create an untenable strain on a health care system already at the brink.[15,16] Nonetheless, if we accept the fundamental hypothesis that *all EDs should provide some form of HIV testing*, how then should we approach further translation? We propose framing this question in light of two distinct but potentially overlapping constructs.

Policy: a critical foundation

The first construct includes a broad perspective rooted in policy. We have previously described diagnostic testing, or testing in the pursuit of an explanation of an individual's signs or symptoms, as clearly within the scope of an emergency physician's practice.[17] However, with respect to HIV screening, there may be no real translation into everyday practice without directly addressing the system-level barriers that impede the implementation of this service. In such a scenario, further research, education, and other academic endeavors would be interesting, but irrelevant. All such efforts and the external funding that supports them may then be seen only as further demonstration that substantial external administrative, financial, and political support is needed. As such, advocacy and legislation would be the necessary activities for translation. Efforts would likely be characterized by a steady push to resolve the barriers preventing implementation of the CDC recommendations, rather than adaptation of those recommendations in acceptance of local barriers.

Individualized and progressive evaluation

The second construct does not include specialtywide adoption of a single approach to HIV screening or necessarily require resolution of existing barriers. Instead, translation would proceed in conjunction with progressive exploration of various approaches to the ultimate goal of expanded screening within the context of existing barriers. In this conceptualization, incremental scientific or programmatic progress would propel our understanding of the impact of testing or screening. This includes the possibility that multiple models or approaches to HIV testing would contribute to what is considered best practice. The implicit hope of this approach is that over time, whether in research or in practice, there would be an ongoing expansion of HIV testing and that the impact or potential impact of these efforts would be demonstrated. These efforts would then spur further implementation.

TRANSLATION IN A NONIDEAL WORLD

The comprehensive approach proposed by the CDC represents an *idealized* means to achieve the ultimate objective of reducing the number of people with undiagnosed HIV infection. Expanded testing should ideally result in identifying more patients with HIV infection and sooner in their disease courses. This affords the opportunity to connect them with appropriate long-term care and prevention counseling, resulting in decreased morbidity and transmission and overall improved public health. EDs provide a unique opportunity to perform expanded screening because of their inherent access to the general population. In our nonideal world, however, the CDC recommendations do not tell us in practical terms how we *can* or *will* maximize identification of patients with HIV infection or identify them earlier in their disease courses. The gap between this theoretical construct and the practice of widespread ED HIV screening therefore remains substantial.

Paradoxically, the effort to accomplish, to any degree, the overarching goals set forth by the CDC has made it

necessary to functionally bypass the recommendations themselves. Faced with the realization that comprehensive and instantaneous adoption of CDC recommendations is not realistic, the community of emergency academicians has been relatively innovative in its efforts toward incremental investigation and implementation. Rather than any zealous endorsement of any one approach, emergency physicians have embraced variability and creativity in the effort to search for the next ''toe-hold.'' Any conceivable combination of patient selection, consent method, staffing model, assay, or other operational element has been suggested by the National Emergency Department HIV Testing Consortium as worthy of support or investigation if it promises to overcome local barriers and increase the frequency of testing. The three articles contained within this issue of *Academic Emergency Medicine* represent the next entries in this ongoing effort.

There are barriers to the success of this incremental approach, however. The acceleration of work in the area of ED HIV testing and screening has indeed begun to chart a path toward a more fundamental understanding of the best approaches to this public health intervention. But the best approach remains illusive. The endorsement of a vast and growing array of variability in practice and research leads to more testing, visibility, and innovation. But is there a danger of rendering HIV screening prohibitively complex when the message should be that obtaining an HIV test should be as ''routine'' as testing blood for sugar or electrolytes? In addition, we do not know that our stepwise process of diverse investigation will ultimately promote sustained translation. It is theoretically possible that without evidence of some translation, interest and momentum in this area could wane. If the system-level barriers to ED HIV screening come to be deemed by consensus permanent or intractable, will funding agencies and peer-reviewed journals continue to view ED HIV screening as a priority area?

Should the incremental approach currently pursued by the academic emergency medicine community ultimately succeed in advancing our knowledge and application of ED HIV testing, the aggregate translational experience might serve as a model for future areas of emergency practice, particularly in the arena of public health and health services. There are undoubtedly optimists and pessimists, but only time will tell. For the sake of those with undiagnosed HIV, those not yet infected, and our public's health, we maintain the hope that HIV testing and screening will someday be an incorporated and not abandoned part of our specialty's usual clinical practice.

Jason S. Haukoos, MD, MSc
(Jason.Haukoos@dhha.org)
Department of Emergency Medicine
Denver Health Medical Center
Denver, CO
University of Colorado Denver School of Medicine
Aurora, CO
Department of Epidemiology
Colorado School of Public Health
Aurora, CO

Michael S. Lyons, MD
Department of Emergency Medicine
University of Cincinnati
Cincinnati, OH

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