

2009 US Emergency Department HIV Testing Practices

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Objectives: We characterize HIV testing practices and programs in US emergency departments (EDs) in 2009.

Methods: A national Web-based survey of members of the National ED HIV Testing Consortium, participants in the 2007 Centers for Disease Control and Prevention (CDC)-sponsored ED HIV Testing Workshops, all US academic EDs, and a weighted random sample of US community EDs with snowball sampling to recruit additional testing sites was conducted. Data collected included geographic location, estimated seroprevalence, indications for testing, method of consent, weekly number of tests, funding, and costs.

Results: Of 619 sites surveyed, 338 (54.6%) responded. A total of 277 (82.0%) reported conducting any HIV testing, and 75 (22.2%) reported systematic HIV testing programs, operationally defined as having testing or screening organized at the departmental or institutional level. Systematic HIV testing programs were concentrated in the Northeast, at high-volume urban EDs, and in regions with higher HIV/AIDS prevalence. Most systematic HIV testing programs had existed for less than or equal to 3 years, and nearly one third reported using an opt-out approach for consent. Among systematic HIV testing programs, the number of patients tested ranged from less than 1 to 2,100 tests per week. Overall, universal screening was the most commonly reported screening method reported overall, and rates of HIV positivity were consistently above the CDC threshold of 0.1%.

Conclusion: The number of EDs conducting HIV testing has grown substantially since release of the 2006 CDC HIV testing recommendations. Although many EDs have systematic HIV testing programs, the majority do not. Ongoing surveillance will be required to quantify the evolution of ED-based HIV testing and the factors that facilitate or impede expanded translation. [Ann Emerg Med. 2011;58:S3-S9.]

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INTRODUCTION

The 2006 Centers for Disease Control and Prevention (CDC) recommendations for HIV testing advanced a strategy whereby screening for HIV would become part of routine medical practice.¹ To facilitate translation of this strategy into action, multiple operational barriers in previous guidelines, including several particularly problematic for emergency settings, were either removed or streamlined.¹ A survey of academic emergency departments (EDs) conducted shortly after the release of the 2006 guidelines found that 57% of academic EDs offered rapid testing under certain circumstances, only 13% recommended routine HIV screening, and only 4% had adopted routine screening practices.² A more comprehensive survey that included both academic and a representative sample of community EDs, conducted in 2007 and published in this issue,³ found that 65% of academic EDs and 50% of a sample of community EDs performed some type of HIV testing. Neither of these previous surveys captured information about the presence of systematic HIV testing programs, operationally defined here as EDs with testing or screening organized at the departmental or institutional level.

Since 2006, significant resources have supported ED-based HIV testing, including a large proportion of the \$35 million of federal funds allocated to expand HIV testing in minority populations.⁴ The CDC also organized regional strategic planning workshops to facilitate implementation of HIV screening in acute care settings, and new legislation has been passed in many states removing requirements for separate signed consent for HIV testing.⁵ Further, a National Consortium for ED HIV Testing has been created, which has informed implementation strategies,⁶ and the Centers for Medicare & Medicaid Services has released advisories indicating that HIV screening, including that in EDs, is reimbursable.⁷ Because of these initiatives and others, we expected that, as of 2009, the number of EDs offering HIV testing would have increased.

Importance

Previous national surveys about ED HIV testing practice were limited to mostly academic settings, conducted near or just after the release of the 2006 recommendations, and did not define presence or scope of systematic HIV testing programs.

Our results provide a crude estimate of the expansion of HIV testing nationally, describing the extent of systematic HIV testing programs in both academic and community settings.

Goals of This Investigation

This study was designed to characterize contemporary HIV testing practices in US EDs in 2009, 3 years after the release of the 2006 CDC guidelines. Specifically, we sought to describe the types and locations of EDs performing any testing, including systematic HIV testing programs, and characterize these within the broader context of the HIV epidemic.

METHODS

A cross-sectional Web-based survey was conducted from July 1, 2009, through September 5, 2009. The study was approved by the Johns Hopkins University Institutional Review Board.

Study Design (Survey Instrument and Outcomes Measures of Interest)

The survey was designed to elicit information about each ED's geographic location, patient demographics, whether HIV testing was conducted and under what circumstances, where HIV testing was conducted, the consent process, sources of funding, and the presence and duration of a systematic HIV testing program. For EDs with systematic HIV testing programs we sought additional information on methods of patient selection for testing and approximate numbers of patients tested and estimated annual programmatic costs. The survey instrument was pilot tested to assess feasibility, comprehensibility, and ease of use. The final survey consisted of 15 questions (Appendix E1, available online at <http://www.annemergmed.com>). Nomenclature related to HIV testing and screening was in accordance with published recommendations.⁶

Setting and Selection of Participants

We used multiple sources to identify the EDs most likely to conduct HIV testing and to achieve broad representation of all geographic regions across the United States. The 4 predetermined sources were (1) EDs represented at the National ED HIV Testing Consortium (N=26)⁶; (2) EDs that participated in the CDC Strategic Planning Workshops, a series of 2-day workshops held from 2007 to 2008, intended to engage priority EDs around the United States to adopt HIV screening (N=195)⁸; (3) all US academic EDs, as reported in July 2009 by the Society for Academic Emergency Medicine (N=139); and (4) a weighted, randomly generated geographic sample of approximately 20% of community EDs associated with a hospital with at least 100 inpatient beds (N=418). We also used snowball sampling, a process whereby all EDs that received a survey were asked to forward it to, and provide contacts for, other potential respondents (N=25).⁹ The final sample consisted of 619 sites.

Data Collection

Hospital sites were categorized as an academic site if they were listed on the Society for Academic Emergency Medicine

Web site as having active emergency medicine residency training programs, nonacademic teaching sites if they did not have an active emergency medicine residency training program but were listed as teaching institutions by the American Hospital Association, or community hospitals. HIV and AIDS prevalence data (made available with permission from the National Minority Quality Forum) were abstracted from the HIV/AIDS Atlas by the county in which the responding EDs were located; data were made available with permission from the National Minority Quality Forum.¹⁰ The National HIV/AIDS map¹⁰ was used to assess geographic distribution of testing sites in relation to HIV/AIDS prevalence. The number of ED visits for nonresponding sites was provided by the American Hospital Association's Health Research Education Trust (personal communication, Juliet Yonek, 2010). ED sites were also categorized according to whether they reported having a systematic HIV testing program.

Methods of Measurement

The survey was uploaded on Survey Monkey (SurveyMonkey.com, Portland, OR) and invitations to participate were initially disseminated by electronic mail on July 2, 2009. Written instructions provided the rationale for the survey, the link to the instrument, and instructions about preferred survey respondent, ranked most to least preferred, as follows: (1) director or program coordinator, if the site had a systematic HIV testing program; (2) ED director; (3) charge nurse or nursing director; (4) other ED personnel (eg, social worker). Each prospective respondent received 2 e-mails. For sites that did not complete the survey, at least 2 telephone contacts were attempted and, if contact was established, the survey was conducted by telephone. Interviews were conducted by trained research assistants. After initial data analysis, calls were made to verify apparent outliers and corrections were made as appropriate.

For sites performing no HIV testing, we requested only basic information about the ED and contact information for other ED sites at which HIV testing might be performed. For EDs with HIV testing but no systematic HIV testing program, we requested responses to an additional set of questions about testing practices and funding sources. For those with systematic HIV testing programs, we requested responses for all survey questions.

Primary Data Analysis

We used frequencies and percentages or median and interquartile range, as appropriate. Associations between categorical variables were assessed with χ^2 tests. Data were managed with Microsoft Excel (Microsoft, Redmond, WA), and statistical analyses were performed with SAS (version 9.1; SAS Institute, Inc., Cary, NC).

RESULTS

Of the 619 sites surveyed, 338 (54.6%) responded. Among them, 75 sites (22.2%) reported systematic HIV testing programs, 202 (59.7%) reported testing without a systematic

Table 1. Descriptive characteristics of the 338 ED sites that completed the survey.*

Characteristics	Categories	Presence of HIV Testing, No. (%), N=338			P Value [†]
		None, N=61 (18.0%)	Sites Without STPs, N=202 (59.7%)	Sites With STPs, N=75 (22.2 %)	
Region	Northeast	15 (24.6)	44 (21.8)	25 (33.3)	.03
	Midwest	11 (18.0)	41 (20.3)	12 (16.0)	
	South	29 (47.6)	70 (34.6)	31 (41.3)	
	West	6 (9.8)	47 (23.3)	7 (9.4)	
Location	Urban	33 (54.1)	91 (45.5)	64 (85.3)	<.001
	Suburban	19 (31.2)	77 (38.5)	9 (12.0)	
	Rural	9 (14.7)	32 (16.0)	2 (2.7)	
Annual census	<50,000	30 (49.2)	116 (57.4)	12 (16.0)	<.001
	50,000-99,999	27 (44.2)	70 (34.7)	41 (54.7)	
	100,000-149,999	4 (6.6)	14 (6.9)	13 (17.3)	
	≥150,000	0	2 (1.0)	9 (12.0)	
Status	Academic	11 (18.0)	36 (17.8)	49 (65.3)	<.001
	Teaching, nonacademic	8 (13.1)	15 (7.4)	10 (13.3)	
	Neither	42 (68.9)	151 (74.8)	16 (21.3)	
Population served	Pediatrics	0	3 (1.5)	2 (2.7)	<.001
	Adults	7 (11.5)	19 (9.4)	25 (33.3)	
	Both	54 (88.5)	180 (89.1)	48 (64.0)	
Ownership	Public	37 (60.7)	137 (67.8)	58 (79.4)	.05
	Private	24 (39.3)	65 (32.2)	15 (20.6)	

STP, Systematic HIV testing program.

*Two EDs without systematic HIV testing programs did not reply to the location question and 2 EDs with systematic HIV testing programs did not reply to the ownership question.

[†]P values refer to presence of HIV testing for each characteristic.

HIV testing programs, and 61 (18.0%) reported no HIV testing. Sites that responded did not differ from nonrespondents by geographic region, but responding sites were more frequently academic institutions and those with ED volumes greater than 50,000 visits per year. Of respondents, 33 (9.8%) were from nonacademic teaching hospitals, 96 (28.4%) were from academic institutions, and 209 (61.8%) were from community hospitals. Overall, 146 (43.2%) of respondents were recruited by their participation in the National ED HIV Testing Consortium or CDC Strategic Workshops, which comprised 40 of the 75 (53.3%) systematic HIV testing programs identified. Persons completing the survey included ED charge nurses or nurse managers (64.5%; N=218), HIV testing program coordinators or program directors (13.3%; N=45), ED directors or department chairs (12.4 %; N=42), and ED social workers (0.6%; N=2). The survey was completed anonymously by 31 respondents (9.2%). An HIV program coordinator or director completed the survey for 32 of the 75 (42.6%) sites with systematic HIV testing programs.

Characteristics of EDs that completed the survey are described in Table 1, stratified by the presence or absence of testing and whether sites reported having a systematic HIV testing program. Of the 75 sites reporting systematic HIV testing programs, 85.3% were located in urban settings, 65.3% were academic institutions, and 79.4% were publicly owned.

Of the 202 sites offering HIV testing without systematic HIV testing programs, nearly 40% were located in suburban areas and 74.8% were in community settings. The 61 sites that

reported having no HIV testing tended to be in community settings with annual volumes of less than 100,000. Of note, 90.5% of hospitals with an ED volume of at least 100,000 visits per year had HIV testing available (N=38), and more than half of these reported having a systematic HIV testing program (N=22).

Characteristics of the HIV testing process for sites that conduct testing are shown in Table 2, grouped by the presence or absence of a systematic HIV testing program. For EDs without systematic HIV testing programs, nearly all tested for occupational exposures and 74.3% reported physician-initiated testing, versus EDs with systematic HIV testing programs, which reported 73.3% occupational exposure testing and 57.3% physician-initiated testing outside of the systematic HIV testing program. Opt-in, separate, and written consent methods were reported most frequently, regardless of whether a systematic HIV testing program was in place. However, nearly one third of sites with a systematic HIV testing program reported using an opt-out approach. Overall, about half of the systematic HIV testing programs required separate informed consent, but 40.0% indicated that a patient's signature was not required for HIV testing. Fewer than 10% of systematic HIV testing programs had been in operation for more than 5 years; more than one third had been in operation for less than a year.

Overall, 73 of 338 (21.6%) sites performed HIV screening of any sort. Testing approaches reported by 75 sites with systematic HIV testing programs (including 27 sites that reported using multiple approaches) included universal

Table 2. Characteristics of HIV testing at sites that reported conducting any testing.

Characteristics	Categories	Non-STP Testing, No. (%), N=202	STP Testing, No. (%), N=75
Situations testing performed*	Occupational exposure	191 (94.6)	55 (73.3)
	Nonoccupational exposure	105 (52.0)	44 (58.7)
	Sexual assault	121 (60.0)	50 (66.7)
	Patient request	68 (33.7)	49 (65.3)
	Physician initiated	150 (74.3)	43 (57.3)
Method of consent*	Patient's signature is required	176 (87.1)	45 (60.0)
	Separate informed consent	169 (83.7)	37 (49.3)
	Opt out	8 (4.0)	21 (28.0)
	Opt in	182 (90.1)	53 (70.7)
Testing duration	<6 mo	NA [†]	13 (17.3)
	6-11 mo	NA	13 (17.3)
	1-3 y	NA	34 (45.3)
	4-5 y	NA	10 (13.3)
	>5 y	NA	5 (6.7)
Type of testing program	Diagnostic testing	NA [†]	26 (34.7)
	Targeted screening	NA	23 (30.7)
	Nontargeted screening	NA	30 (40.0)
	Universal screening	NA	32 (42.7)
Funding sources*	External	29 (14.4)	68 (90.7)
	Research grant	0	19 (25.3)
	Program grant	2 (1.0) [‡]	43 (57.3)
	State or city health department	25 (12.4) [§]	46 (61.3)
	Local AIDS administration	0	8 (10.7)
	Reimbursed	160 (79.2)	16 (21.3)
	Private donation	2 (1.0)	1 (1.3)
	Worker's compensation	51 (25.2)	4 (5.3)
	Patient's bill	150 (74.3)	13 (17.3)

NA, Not applicable.

*Nonexclusive categories.

[†]These questions applied only to sites reporting programmatic testing.

[‡]Met operational definition of "nonprogram" sites; reported recently receiving a program grant.

[§]External funding from local health departments for sexual assault exposure testing.

Table 3. Characteristics of EDs that reported having systematic testing programs (N=75).

	Median Number (Interquartile Range; Range)			
	Diagnostic Testing, N=19	Targeted Screening, N=20	Nontargeted Screening, N=26	Universal Screening, N=26
Estimated numbers of tests (weekly)	10 (5-20; 1-100)	20 (5-50; 0-100)	50 (21-100; 12-300)	150 (78-300; 20-2,100)
Estimated positivity rate, %*	2.2 (1-10; 0.08-50)	1.0 (0.5-3; 0-25)	1.4 (0.5-2.5; 0.2-25)	0.9 (0.55-1.55; 0.02-3)

*The numbers of respondents of EDs with eligible estimated positivity rate for diagnostic testing, targeted screening, nontargeted screening, and universal screening programs were 19, 17, 22, and 20, respectively. Data about tests performed and estimated positivity rates were entirely self-reported and were not independently verified.

screening (42.7%), nontargeted screening (40.0%), targeted screening (30.7%), and diagnostic testing (34.7%) (Table 3). Of these 75, 48 (64.0%) indicated that they used only 1 approach for patient selection: 2 (4.2%) diagnostic testing, 19 (39.6%) universal screening, 18 (37.5%) non-targeted screening, and 9 (18.8%) targeted testing.

Extramural funding for HIV testing was reported by 97 of the EDs that conducted any HIV testing (35.0%). External funding was reported by 68 (90.7%) EDs with systematic HIV testing programs compared with 29 (14.4%) EDs without systematic HIV testing programs. Sites with systematic HIV testing programs were most commonly funded by government grants. Only 25.3% of programs reported explicit research grant

funding. Nearly 20% of sites with systematic HIV testing programs indicated that some form of HIV testing was billed to the patient, and 2 systematic HIV testing programs reported patient billing exclusively. Of sites with systematic HIV testing programs, 21 (28.0%) estimated their operating costs for systematic HIV testing, ranging from \$10,000 to \$325,000 per year, with a median of \$60,000 (interquartile range \$40,000 to \$150,000).

For sites with systematic HIV testing programs, the median estimated number of tests per week varied according to the testing approach; diagnostic testing was associated with the lowest number (median 10 tests per week) compared with a median of 150 per week for sites that reported universal

Table 4A. Association of ED-based HIV testing program and ED county's HIV prevalence.*

Total N=322*	Proportion of EDs with HIV Testing Program by HIV Prevalence						
	≤0.026 n=26	0.027-0.059 n=65	0.06-0.105† n=69	0.106-0.194 n=65	0.195-0.379 n=64	0.38-0.703 n=17	≥0.704 n=16
A, HIV prevalence. 62 (19.3%)	3 (11.5%)	3 (4.6%)	10 (14.5%)	10 (15.4%)	22 (34.4%)	7 (41.2%)	7 (43.8%)

Table 4B. Association of ED-based HIV testing program and ED county's AIDS prevalence.*

Total N=333†	Proportion of EDs with HIV Testing Program by AIDS Prevalence						
	≤0.016 n=16	0.017-0.035 n=18	0.036-0.059 n=29	0.06-0.103 n=67	0.104-0.247 n=127	0.248-0.592 n=51	≥0.593 n=25
65 (19.5%)	2 (12.5%)	1 (5.6%)	1 (3.4%)	6 (9.0%)	25 (19.7%)	16 (31.4%)	14 (56.0%)

*Grouped according to the National HIV/AIDS prevalence map.¹⁰

†CDC threshold for recommending routine HIV screening for outpatients is 0.1%.

*HIV and AIDS prevalence data by county were available for 322 and 333 sites, respectively.

screening (Table 2). The largest number of tests per week was 2,100, about 80% of the ED census, at a site conducting universal screening. The median number of tests per week at 133 of 202 (65.8%) EDs without systematic HIV testing programs was 1 (interquartile range 1; range 1 to 150). Estimated HIV positivity rates were unknown for the majority (196/202 [97.0%]) of sites without systematic HIV testing programs. The estimated HIV positivity rate at sites with a systematic HIV testing program was highest for diagnostic testing models (median 2.2%) and lowest for those reporting universal screening (median 0.9%).

EDs located in regions with HIV prevalence above the CDC-recommended threshold for screening of 0.1% (which represented approximately 50% of our sample population) accounted for 74% of those with HIV testing programs (Table 4A). However, only 28.4% of EDs in regions in which the HIV prevalence was greater than 0.1% reported having a systematic HIV testing program. Similar associations were observed between AIDS prevalence and ED HIV testing; nearly 80% of systematic HIV testing programs were at sites with AIDS prevalence rates of greater than 0.1% (Table 4B).

LIMITATIONS

The results of this survey are subject to several limitations. First, although our sample attempted to include all academic sites and geographically representative nonacademic sites, our list was not comprehensive. It is also possible that our findings may be subject to response biases. Specifically, we may have oversampled hospitals likely predisposed to offer HIV testing through their participation in either the National ED HIV Testing Consortium or representation at the CDC Strategic Planning Workshops. Further, the numbers of sites recruited by snowball sampling was also much lower than anticipated (25 of the 619 sites). Accordingly, our results serve principally to provide a sense of the rapid expansion of ED-based HIV testing nationally, rather than an accurate representation of the complete scope of testing currently performed.

The survey was pilot tested by experts in emergency medicine, infectious disease, and public health, but it is possible that not all respondents interpreted the survey questions in the same manner. It is possible that certain elements may have been confusing. For example, some sites with systematic HIV testing programs may have failed to report physician-initiated diagnostic testing, even though the survey instrument explained that response categories were independent and not mutually exclusive. In addition, some of the quantitative responses, especially estimates of prevalence, test volumes, and costs, may not be entirely accurate. Finally, although we attempted to reach the most knowledgeable individual at each site about HIV testing practices, the majority of respondents were nursing professionals who may have had less knowledge of the details of their departments' HIV testing practices than HIV program coordinators. At sites with systematic HIV testing programs, the majority of respondents were either physician program directors or HIV program coordinators.

DISCUSSION

In this study, we found that 82.0% of participating EDs offer HIV testing, including 88.5% of academic EDs and 79.4% of nonacademic EDs. Further, we found that 21.6% (73/338) of participating sites reported that they offer HIV screening, using a universal, nontargeted, or targeted approach. These results represent a recent increase in the availability of HIV testing in US EDs and a steady increase in HIV screening.

In the first national survey of HIV testing in US EDs conducted in 1996, Wilson et al¹¹ reported that slightly more than 50% of academic EDs tested for HIV under "special" circumstances, principally occupational and nonoccupational exposure. However, only 3% were "screened" for HIV, even in situations that clearly warrant screening, such as with a diagnosis of other sexually transmitted infections. Since that survey, the CDC has released 2 sets of recommendations. The most recent recommendations emphasize the pivotal role of US EDs in HIV screening.^{1,12} Although results of surveys of different target populations are not

directly comparable, crude trends can be suggestive. Surveys from 2004 (all hospital settings),¹³ 2006 (rapid testing in academic EDs),² and 2007 (academic and community EDs)³ reported remarkably similar proportions where HIV testing was available: 57%, 57%, and 56%, respectively. The proportions conducting HIV screening were reported as 2% (all hospital settings),¹³ 13% (all academic EDs),² and 17% (academic and community EDs [personal communication, J. Haukoos]).³ In 2009, more than a decade after the initial national survey by Wilson et al¹¹ and 3 years after release of the 2006 CDC recommendations, we found significantly higher rates of HIV test availability (82.0%) and slightly higher rates of screening than that reported by Haukoos et al³ in 2007 (21.6%). Restricting comparisons to the subgroup of academic EDs, more consistently represented in the surveys, the overall proportion conducting any HIV testing increased from 57% in 2006² to 65% in 2007³ and 89% in 2009. The proportion of the academic subgroup conducting screening increased from 13% (2006)² to 35.9% (2007)³ and 49% (2009).

Systematic HIV screening was introduced into most EDs recently. More than 80% of EDs with systematic HIV testing programs reported they had existed for fewer than 3 years; more than a third existed less than 1 year. Of EDs without systematic HIV testing programs, only 14.4% reported external funding for HIV testing (principally for sexual assault cases); most relied on billing patients for testing costs. In comparison, 90.7% of EDs with systematic HIV testing programs reported external funding for their programs.

Previous national surveys did not distinguish between HIV testing in EDs with systematic HIV testing programs and those without. We recognized that external funding for systematic HIV testing programs might have prompted some EDs to establish HIV screening programs, but many EDs are likely expanding HIV testing as an integrated component of usual clinical practice without a separate effort. Our findings highlight the importance of this distinction. EDs that test for HIV but do not have a systematic HIV testing program tend to perform fewer tests each week than sites with a systematic HIV testing program and are also more likely to require separate, written, informed consent, to use the more traditional opt-in approach to consent, and to rely on reimbursement instead of external funding for HIV testing. These differences suggest that EDs with systematic HIV testing programs screen a larger number of patients in a manner more consistent with the intent of the 2006 CDC recommendations. Whether ED HIV screening programs will be predominantly directly integrated into routine clinical care is a continuing question. The higher frequency of systematic HIV testing programs in urban, high-prevalence, high-volume EDs is consistent with the practical considerations for ED HIV screening programs outlined in the policy statement from the American College of Emergency Physicians.¹⁴

Overall, our findings demonstrate the importance of monitoring HIV screening programs not only by volume of testing but also by the methods used, the importance of individualized and incremental approaches, and the need to

understand factors and ED characteristics that drive decisions about HIV screening in EDs.

CONCLUSIONS

The number of EDs conducting HIV testing has increased substantially since 2006. This increase corresponds temporally to the release of revised CDC recommendations for HIV testing in health care settings, changes in health policy that have removed many barriers to testing, and availability of expanded funding. However, implementation is still sporadic and variable. A representative, reproducible methodology can provide better insight into the evolution and specific characteristics of ED HIV testing on a national level.

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REFERENCES

1. 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.
2. Ehrenkranz PD, Ahn C, Metlay J, et al. Availability of rapid human immunodeficiency virus testing in academic emergency departments. *Acad Emerg Med*. 2008;15:144-150.
3. Haukoos JS, Hopkins E, Hull A, et al. HIV testing in emergency departments in the United States: a national survey. *Ann Emerg Med*. 2011;58:S10-S16.
4. Centers for Disease Control and Prevention. Expanded and integrated human immunodeficiency virus (HIV) testing for populations disproportionately affected by HIV, primarily African Americans, billing code: 4163-18-P. Available at: <http://www.cdc.gov/od/pgo/funding/PS07-768.htm>. Published July 2007. Accessed November 3, 2009.
5. National HIV/AIDS Clinicians' Consultation Center. Compendium of state HIV testing laws. Available at: <http://www.nccc.ucsf.edu/StateLaws/Index.html>. Accessed November 3, 2009.
6. Lyons MS, Lindsell CJ, Haukoos J, et al. Nomenclature and definitions for emergency department human immunodeficiency virus

- (HIV) testing: report from the 2007 conference of the national HIV testing consortium. *Acad Emerg Med*. 2009;16:168-177.
7. Centers for Medicare & Medicaid Services. Decision memo for screening for HIV infection. (CAG-00409N). Available at: <http://www.cms.hhs.gov/mcd/viewdecisionmemo.asp?id=229>. Published December 8, 2009. Accessed February 18, 2010.
 8. Centers for Disease Control and Prevention. Implementation of HIV Screening in Acute Care Settings Strategic Planning Workshops for Hospitals. 2008.
 9. Goodman L. Snowball sampling. *Ann Math Stat*. 1961;32:148-170.
 10. National Minority Quality Forum. HIV/AIDS atlas, 2009. Available at: <http://www.maphiv.org/>. Accessed September 2, 2009.
 11. Wilson SR, Mitchell C, Bradbury DR, et al. Testing for HIV: current practices in the academic ED. *Am J Emerg Med*. 1999;17:354-356.
 12. Centers for Disease Control and Prevention. Revised guidelines for HIV counseling, testing, and referral. *MMWR Morb Mortal Wkly Rep*. 2001;50:147-155.
 13. Torres G, Yonek J, Pickreign J, et al. HIV testing and referral to care in US hospitals prior to 2006: results from a national survey. *Public Health Rep*. 2009;124:400-408.
 14. American College of Emergency Physicians. HIV testing and screening in the emergency department. Available at: <http://www.acep.org/practres.aspx?id=29512>. Published April 2007. Accessed October 27, 2009.

APPENDIX E1.

Survey instrument.

1. ED HIV SURVEY

Please complete as much of the survey as possible (15 questions total). If you don't know the exact answer to any question, please provide your best estimate. Thank you for participating!

1. Is there any HIV testing done in your Emergency Department?

- Yes (please answer all remaining questions)
- No (please answer questions #2, 3, 14 and 15 only).

2. Type of Emergency Department:**(Please check all that apply)**

- | | |
|---|--|
| <input type="checkbox"/> Adult | <input type="checkbox"/> Rural |
| <input type="checkbox"/> Pediatric | <input type="checkbox"/> Suburban |
| <input type="checkbox"/> Both Adult and Pediatric | <input type="checkbox"/> <50,000 visits per year |
| <input type="checkbox"/> Public | <input type="checkbox"/> 50,000 - 100,000 visits per year |
| <input type="checkbox"/> Private | <input type="checkbox"/> 100,000 - 150,000 visits per year |
| <input type="checkbox"/> Urban | <input type="checkbox"/> >150,000 visits per year |

3. Where is your ED located?

City/Town:

State:

ZIP:

4. What type of HIV testing does your ED provide? (Please check all that apply)

- Occupational exposures
- Sexual assault victims
- Other acute/recent non-occupational exposure situations
- Patient request
- Individual physician-initiated testing BUT NOT as part of an organized departmental or institutional program
- HIV testing program (may include testing or screening organized at the departmental or institutional level)

5. What kind of consent is obtained? (Please check all that apply)

- Patient's signature is required
- Consent is separate to consent for medical care
- Opt-out (Patient is tested unless they decline)
- Opt-in (Patient is asked to participate)

Other (please specify)

6. Please estimate what proportion of your ED patients has previously undiagnosed HIV?

Cancel Copy

7. Please indicate the source of your estimate in Question 6

- ED Data
- Hospital Data
- Local Data

Other (please specify) **8. If you have an HIV testing program, which of the following do you employ? (Please check all that apply)**

- Diagnostic testing (testing based on patient's clinical signs and symptoms)
- Targeted screening (testing subpopulation of ED-based on increased likelihood of infection)
- Non-targeted screening (testing ED population without targeting but not intended to reach all of ED population)
- Universal screening (testing ED population without targeting and intended to reach all ED population)
- N/A
- Other (please specify)

9. For each of the approaches listed in Question 8 that you employ at your site, please estimate the annual positivity rateDiagnostic testing: Targeted Screening: Non-targeted
screening: Universal screening: Other: **10. When did your ED begin doing any form of systematic HIV testing?**

- <6 months ago
- 6 - 11 months
- 1-3 years
- 4-5 years
- > 5 years
- N/A

11. On average, how many tests are currently performed each week?**Please input weekly estimate for each of approaches you employ in your ED**

Diagnostic testing:	<input type="text"/>
Targeted Screening:	<input type="text"/>
Non-targeted screening:	<input type="text"/>
Universal screening:	<input type="text"/>
Other	<input type="text"/>

12. How is the HIV testing you do currently funded?**(Please check all that apply)**

<input type="checkbox"/>	Research grant
<input type="checkbox"/>	Program Grant
<input type="checkbox"/>	State or City Health Department
<input type="checkbox"/>	Local AIDS Administration
<input type="checkbox"/>	Private donation
<input type="checkbox"/>	Patient is billed for service
<input type="checkbox"/>	N/A
Other (please specify)	<input type="text"/>

13. What are your fixed operating costs to conduct systematic HIV tests? (Rounded to the nearest thousand)

<input type="checkbox"/>	N/A
<input type="checkbox"/>	\$
<input type="text"/>	

14. Your contact information

Name:	<input type="text"/>
Institution:	<input type="text"/>
Email Address:	<input type="text"/>
Phone Number:	<input type="text"/>

15. Because we are trying to comprehensively determine the current state of ED HIV Testing, we need to include as many active programs as we can. Please forward the email inviting you to participate in this survey to any ED colleagues conducting ED HIV testing at other sites that you might be aware. Please also list the individual's name and institution for anyone else we should contact (up to 5).

- 1.
- 2.
- 3.
- 4.
- 5.