HIV Screening Practices in U.S. Hospitals, 2009–2010

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ABSTRACT

Objective. A 2004 national survey of hospitals showed that 23.4% of hospitals screened for HIV in at least one department, most frequently in labor and delivery departments. However, less than 2% of these hospitals screened patients in inpatient units, urgent care clinics, or emergency departments. In 2006, the Centers for Disease Control and Prevention (CDC) recommended HIV screening for all individuals 13–64 years of age in health-care settings. We determined the frequency of hospital adoption of these CDC recommendations.

Methods. We surveyed hospital infection-control personnel at a randomly selected sample of U.S. general medical and surgical hospitals in 2009–2010.

Results. Of the 1,476 hospitals selected for the survey, 754 (51.1%) responded to the survey; of those responding, 703 (93.2%) offered HIV tests for patients at the hospital and 206 (27.3%) screened for HIV in at least one department. Screening was most common in larger hospitals (45.7%), hospitals in large metropolitan areas (50.5%), and teaching hospitals (44.4%); it was least common in public hospitals (19.1%). By department, screening was most common in labor and delivery departments (34.6%) and substance abuse clinics (20.7%); it was least common in emergency departments (11.9%), inpatient units (9.6%), and psychiatry/mental health departments (9.4%). More than half of hospitals were not considering implementing CDC's recommendations within the next 12 months.

Conclusions. Since 2004, HIV screening in hospitals increased overall and by department. However, the majority of U.S. hospitals have not adopted the CDC recommendations.

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Of the estimated 1.2 million people aged ≥13 years living with human immunodeficiency virus (HIV) infection in the United States, an estimated 20.1% are unaware of their infection.[1] Early diagnosis of HIV infection allows infected individuals to obtain treatment that can improve the quality and duration of their lives, lead to reductions in high-risk behaviors, and prevent transmission.[2] To increase the number of people who are aware of their HIV infection, the Centers for Disease Control and Prevention (CDC) in 2006 recommended HIV screening for all individuals aged 13–64 years, regardless of risk, in all health-care settings with a prevalence of undiagnosed HIV infection ≥0.1% and screening at least annually for patients likely to be at high risk for HIV infection.[3] CDC defines screening as performing an HIV test for all people in a defined population. CDC further recommends that neither a separate consent form nor prevention counseling be required for HIV screening in health-care settings.

Of the estimated 14.6 million people tested for HIV in 2006, 83% were tested in a clinical setting and nearly 18% were tested in a hospital, emergency department (ED), or outpatient clinic.[4] However, the extent to which HIV screening is being conducted in hospital settings nationally is unknown. Surveys conducted before the 2006 CDC recommendations showed that few hospitals screened patients for HIV outside of labor and delivery[5] and that HIV screening in EDs was uncommon,[6,7] despite evidence of missed opportunities for diagnosis of HIV in health-care settings.[8–10]

To assess hospital adoption of CDC HIV screening recommendations, we surveyed a sample of American Hospital Association (AHA) member hospitals during 2009–2010.

METHODS

Survey sample

Nonfederal, short-stay hospitals that provide general medical and surgical services and general children's services were eligible for this survey (n=4,554). We identified these hospitals using the 2006 AHA Annual Survey Database, which contains data for all of the more than 6,000 hospitals in the U.S. and associated territories. A simple random sample of 1,500 hospitals was selected for participation. Initially, 1,000 hospitals randomly selected from the 1,500 were mailed questionnaires. The remaining 500 hospitals would have been surveyed if the response rate was less than 50%. The initial mailing and data collection took place between July and October 2009. Although the response rate in the first round of data collection was 56%, a computer error had resulted in hospitals located in the western region of the U.S. having a lower probability of selection than the other hospitals during the initial mailing. Therefore, the remaining 500 hospitals in the original sample were targeted for a second mailing, and data collection from that mailing took place between January and March 2010. Of these 500 hospitals, 476 were in operation and were mailed questionnaires.

Survey administration

Questionnaires were mailed to each sampled hospital's chief executive, who was instructed to direct the survey to the hospital's infection-control coordinator. Participation in the survey was voluntary and no compensation was provided for completing the survey. Respondents had the option of completing a paper questionnaire and returning it via prepaid business reply envelope or completing the survey online via a password-protected website. Surveys were mailed again to hospitals that did not return a completed survey within 30 days of the first mailing. After 60 days, hospitals that did not return a completed survey were contacted by phone to encourage participation. To increase participation, we worked closely with the staff of state hospital associations, the Association for Professionals in Infection Control, and the Society for Healthcare Epidemiology of America to promote the survey to their members.

Questionnaire

The questionnaire consisted of 61 questions and required approximately one hour to complete. The questionnaire assessed the availability and frequency of HIV testing and screening in the entire hospital as well as within specific departments (EDs, inpatient units, labor and delivery, primary care clinics, urgent care, substance abuse treatment clinics, and psychiatry/mental health clinics). HIV screening was defined as offering an HIV test to all patients in some defined population. The questionnaire also assessed the hospital's current status and future plans regarding (*1*) offering HIV tests to all patients at high risk for HIV, (*2*) offering HIV tests to all patients regardless of risk, (*3*) incorporating consent for HIV testing into patients' general consent for medical care, and (*4*) removing requirements to provide HIV prevention counseling before testing.

The questionnaire was pretested for format and content by infection-control practitioners at five hospitals. The names of hospitals participating in the pilot testing were excluded from the sampling frame before the random sampling.

Analysis

We assessed differences in HIV testing availability and practice by type of hospital using the following hospital characteristics: (*1*) census region (Northeast, Midwest, South, or West; see Table 1 for states included in each region); (*2*) hospital size (categorized as 0 to <100, 100 to 300, or >300 beds); (*3*) teaching status (membership in the Council of Teaching Hospitals and Health Systems of the Association of American Medical Colleges or residency training approval by the Accreditation Council for Graduate Medical Education); (*4*) hospital ownership (public, for profit, or not for profit); and (*5*) U.S. Census metropolitan statistical area (MSA) type (population of <250,000, 250,000 to <1 million, ≥1 million, or non-MSA areas [defined as rural or frontier]). This information was obtained from the 2006 AHA Annual Survey Database.

Analysis was performed using SAS® version 9[11] to determine the extent to which HIV testing is being conducted in accordance with the 2006 CDC recommendations. We used Chi-square tests to determine significant differences ($p<0.05$) in proportions of outcomes by hospital characteristics. Results of the 2009–2010 survey were compared with a previous survey conducted in 2004. The 2004 survey was administered to all nonfederal, general medical, and surgical hospitals within the U.S. using a similar survey questionnaire, and was completed by "the person in the hospital most knowledgeable about HIV testing policies and practices in the hospital" (43% were completed by infection-control personnel and 25% by laboratory personnel). The response rate for the 2004 survey was 27%.[5]

RESULTS

HIV screening

Of the 1,476 hospitals that were selected for the 2009–2010 survey, 754 (51.1%) responded. Responding hospitals differed from nonresponding hospitals by region and hospital ownership (Table 1). Of the 754

Table 1. Characteristics of sampled and respondent U.S. hospitals from a national survey of HIV testing practices in 2009–2010

Characteristic	*All sampled hospitals* N *(percent)*[a]	*Response rate* N *(percent)*[b]
Hospital size		
<100 beds	714 (47.9)	357 (50.0)
100–300 beds	519 (35.7)	268 (51.6)
>300 beds	243 (16.4)	129 (53.1)
Type of metropolitan area		
Large (population ≥1 million)	208 (14.3)	99 (47.6)
Medium (population 250,000 to <1 million)	617 (42.2)	314 (50.9)
Small (population <250,000)	280 (18.7)	142 (50.7)
Nonmetropolitan/rural (rural and frontier areas)	371 (24.8)	199 (53.6)
Census region[c]		
Northeast	199 (13.7)	119 (59.8)[d]
Midwest	474 (31.7)	269 (56.8)
South	522 (35.6)	262 (50.2)
West	281 (18.9)	104 (37.0)
Teaching hospital		
Yes	288 (19.5)	142 (49.3)
No	1,188 (80.5)	612 (51.5)
Hospital ownership		
Public	368 (24.7)	189 (51.4)[d]
Not for profit	904 (61.1)	493 (54.5)
For profit	204 (14.3)	72 (35.3)
Total	1,476 (100.0)	754 (51.1)

[a]The percent for "all sampled hospitals" shows the column distribution by hospital characteristic.

[b]The percent for "response rate" shows the row percent by hospital characteristic.

[c]States in each census region are as follows: Northeast—Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont; Midwest—Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin; South—Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia; West—Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, Wyoming.

[d]$p<0.05$, column comparison

HIV = human immunodeficiency virus

hospitals that responded to the survey, 703 (93.2%) offered HIV testing to patients and 206 (27.3%) screened for HIV in at least one department. Of the 703 hospitals that performed HIV tests, 497 (70.7%) obtained written consent from patients specifically for HIV testing, 156 (22.2%) obtained written consent for medical care including HIV testing, 81 (11.5%) obtained oral consent, and 33 (4.7%) used some other method to obtain consent. The proportion of hospitals that required written consent specifically for HIV testing decreased 19.2% (from 87.5% to 70.7%) between 2004 and 2009–2010. A total of 365 (51.9%) hospitals reported that state law required written informed consent be obtained from a patient for an HIV test, 180 (25.6%) reported that written consent was not required, 135 (19.2%) reported not knowing if written consent was required, and 23 (3.3%) reported that some other method for obtaining consent was required by state law (data not shown).

Conducting HIV screening differed significantly by hospital ownership, hospital size, teaching affiliation, and size of metropolitan area (Table 2). The proportion of hospitals that conducted HIV screening in at least one department increased 16.7% (from 23.4% to 27.3%) between 2004 and 2009–2010. The largest increases were seen in hospitals located in the western census region (15.5% to 32.7%), hospitals with >300 beds (27.6% to 45.7%), and hospitals in large metropolitan areas (29.4% to 50.5%) (Table 2).

HIV screening by hospital department

Overall, 41 (5.4%) hospitals conducted HIV screening in all departments, 165 (21.9%) conducted HIV screening in some departments, and 548 (72.7%) did not

Table 2. Number of hospitals and percentage conducting HIV screening by hospital characteristics and location among respondents to national surveys of HIV testing practices in U.S. hospitals in 2004 and 2009–2010

	2004 survey[a]		*2009–2010 survey*	
Characteristic	*Number of hospitals*	*Percentage conducting HIV screening*	*Number of hospitals*	*Percentage conducting HIV screening*
Hospital size				
<100 beds	305	15.6	357	18.2[b]
100–300 beds	249	21.3	268	30.6
>300 beds	663	27.6	129	45.7
Type of metropolitan area				
Large (population ≥1 million)	340	29.4	99	50.5[b]
Medium (population 250,000 to <1 million)	221	22.4	314	27.7
Small (population <250,000)	108	21.9	142	26.8
Nonmetropolitan/rural (rural and frontier areas)	548	20.0	199	15.6
Census region[c]				
Northeast	228	35.3	119	31.1
Midwest	411	20.4	269	25.7
South	397	25.2	262	25.2
West	181	15.5	104	32.7
Teaching hospital				
Yes	204	34.3	142	44.4[b]
No	1,013	21.3	612	23.4
Hospital ownership				
Public	314	19.6	189	19.1[b]
Not for profit	797	23.6	493	30.2
For profit	106	29.2	72	29.2
Total	1,217	23.4	754	27.3

[a]Torres GW, Yonek J, Pickreign J, Whitmore H, Hasnain-Wynia R. HIV testing and referral to care in U.S. hospitals prior to 2006: results from a national survey. Public Health Rep 2009;124:400-8.

[b]$p<0.05$, column comparison

[c]States in each census region are as follows: Northeast—Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont; Midwest—Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin; South—Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia; West—Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, Wyoming.

HIV = human immunodeficiency virus

conduct HIV screening in 2009–2010. By department, HIV screening ranged from 9.4% in psychiatry departments to 34.6% in labor and delivery departments. The proportion of hospitals that conducted HIV screening in selected departments increased since 2004 (Table 3). The proportion of EDs and urgent care clinics that conducted HIV screening increased from less than 2% in 2004 to 12% in 2009–2010.

Of the 514 responding hospitals with labor and delivery departments, 178 (34.6%) conducted HIV screening for all pregnant women (Table 3). Of the 514 hospitals, 216 (42.0%) had guidelines to screen any woman with undocumented HIV status at the time of labor with a rapid HIV test unless she declined, 199 (38.7%) had guidelines to document the HIV test result of the mother in the medical record of the newborn, and 165 (32.1%) had guidelines calling for HIV prophylaxis to be initiated immediately on the basis of a positive rapid HIV test result conducted in the labor and delivery department (data not shown).

Future HIV screening

Of the 754 hospitals that were included in the 2009–2010 survey, 25.7% reported offering HIV testing or planning to offer HIV testing within 12 months to all patients at high risk for HIV; 6.8% reported offering HIV testing or planning to offer HIV testing within 12 months to all patients regardless of risk or symptoms; 28.9% reported incorporating HIV testing consent into the patient's general medical consent (i.e., removing separate written consent for HIV testing) or planning to do so within 12 months; and 10.3% reported removing requirements for HIV prevention counseling before testing or planning to do so within 12 months (Table 4).

DISCUSSION

The results of the current national survey show that nearly half of large hospitals, teaching hospitals, and hospitals in large metropolitan areas reported screening for HIV in at least one department. Although CDC HIV testing recommendations are for all health-care settings, implementation is likely to occur first in health-care settings located in areas with high HIV prevalence.[12] Urban hospitals are more likely to encounter undiagnosed HIV-infected patients. In 2007, nearly half of the 52,755 people diagnosed with HIV infection in the U.S. lived in 12 large urban areas.[13] Previous experience with hospital-based HIV screening in Boston, New York City, and Washington, D.C., showed that 21%–53% of patients were offered HIV testing, <10%–59% of these patients were tested, and the prevalence of new HIV diagnoses was 0.8%–3.0%.[14–17]

CDC recommendations specify that HIV screening is warranted if the yield of undiagnosed HIV infection prevalence in the health-care setting is ≥1 per 1,000 patients tested. Our survey asked for the number of HIV tests conducted and the number of positive test results in 2008. These data were not reported for more than half of the hospitals surveyed (data not shown).

Table 3. Number of hospitals by department and percentage conducting HIV screening among respondents to national surveys of HIV testing practices conducted in U.S. hospitals in 2004 and 2009–2010

	2004 survey[a]		*2009–2010 survey*	
Department	*Number of hospitals*	*Percentage conducting HIV screening*	*Number of hospitals*	*Percentage conducting HIV screening*
Overall[b]	1,217	23.4	754	27.3
Emergency department	1,087	1.4	680	11.9
Inpatient units	1,217	1.7	687	9.6
Labor and delivery	861	17.8	514	34.6
Primary care clinic	886	2.2	464	12.7
Urgent care	306	0.8	277	12.3
Psychiatry/mental health	NA[c]	NA[c]	276	9.4
Substance abuse treatment	NA[c]	NA[c]	135	20.7

[a]Torres GW, Yonek J, Pickreign J, Whitmore H, Hasnain-Wynia R. HIV testing and referral to care in U.S. hospitals prior to 2006: results from a national survey. Public Health Rep 2009;124:400-8.

[b]At least one hospital department

[c]The percentages of substance abuse treatment and psychiatry/mental health departments that reported HIV screening were not available from the 2004 survey.

HIV = human immunodeficiency virus

NA = not available

Table 4. Number and percentage of hospitals that have implemented changes to HIV testing practices or plan to implement changes in the next 12 months among respondents to a national survey of HIV testing practices in U.S. hospitals in 2009–2010

HIV testing practice	*Current practice* N *(percent)*	*Plan to implement in next 12 months* N *(percent)*	*Not considered* N *(percent)*	*Don't know* N *(percent)*	*Not applicable/ missing* N *(percent)*
Offering HIV testing to all patients at high risk for HIV infection	167 (22.2)	26 (3.5)	450 (59.7)	62 (8.2)	49 (6.5)
Offering HIV testing to all patients regardless of risk or symptoms	28 (3.7)	23 (3.1)	605 (80.2)	55 (7.3)	43 (5.7)
Incorporating consent for HIV testing into the patient's general consent for medical care	160 (21.2)	58 (7.7)	421 (55.8)	59 (7.8)	56 (7.4)
Removing requirements to provide HIV prevention counseling before testing	60 (8.0)	17 (2.3)	477 (63.3)	85 (11.3)	115 (15.3)

HIV = human immunodeficiency virus

We were, therefore, unable to assess if the CDC recommendations were applicable to the surveyed hospitals. The prevalence of undiagnosed HIV in the local area may not be available or predictive of that in the hospital's patient population. Therefore, CDC recommends initiating screening to determine the prevalence of undiagnosed HIV in the facility. In its recommendation for screening, the American College of Physicians has suggested that screening 4,000 patients may be necessary to determine if the prevalence of undiagnosed HIV exceeds 0.1%.[18]

From 2004 to 2009–2010, HIV screening increased overall and by department. In EDs, HIV screening increased sevenfold (from <2% to 12%). The ED has been identified as an entry point for people at high risk for HIV. However, an analysis of National Ambulatory Medical Care data through 2005 showed that only 0.3% of ED patients were tested for HIV.[6] In addition, a survey of hospital-based physicians showed that ED physicians were less likely than physicians in other settings, such as primary care offices and ambulatory care clinics, to report testing patients for HIV and other sexually transmitted diseases.[19] Recent experience with HIV screening in EDs has shown that it is acceptable to patients[20–23] and effective for identifying HIV infections.[24,25] However, important barriers to implementation of CDC recommendations in EDs remain. One study of ED physicians found that after implementation of an ED screening program, only 38% of the physicians were willing to offer an HIV test to a patient in this setting, citing limited time, inadequate resources, and concerns about follow-up care.[26] Another study found that yield was lowest and cost per diagnosis of previously unreported HIV infection was highest in the ED compared with four other areas of the hospital.[16] Patients who are at increased risk of infection may opt out of ED screening programs, highlighting the need for EDs to continue to offer HIV testing on the basis of clinical manifestations, in addition to screening patients on an opt-out basis.[27,28]

From 2004 to 2009–2010, HIV screening of all pregnant women in labor and delivery departments increased by 94% (from 18% to 35%). However, nearly 60% of labor and delivery departments do not have written policies to test women without a documented HIV test result before delivery. Although the incidence of perinatal HIV infection has declined dramatically since 1992,[29] the estimated number of HIV-infected women giving birth increased by 30% from 2000 to 2006.[30] Screening pregnant women for HIV before delivery is essential so that HIV-infected women can be identified and appropriate therapy can be administered before delivery to prevent mother-to-child transmission. However, only about one-third of hospitals surveyed reported having specific guidelines to initiate therapy in labor and delivery departments consistent with guidelines of the American College of Obstetricians and Gynecologists.[31]

Less than one-fifth of surveyed hospitals had substance abuse treatment departments, and only 21% of these departments reported screening patients for HIV. A previous national survey of 138 residential drug treatment units showed that less than half offered onsite HIV testing to patients, although those with a hospital affiliation were more likely to offer testing,[32] and acceptance of HIV testing in substance abuse treatment centers may be less than in other clinical settings.[33]

The proportion of hospitals that reported requiring

specific written consent for HIV testing decreased in our survey compared with the 2004 survey, and nearly 30% of hospitals in the current survey indicated that they had incorporated consent for HIV testing into general consent for medical care or planned to do so within a year. Some hospitals may not have adopted CDC recommendations to eliminate written informed consent because of state laws requiring written informed consent.[34] Although laws in 46 states are compatible with the CDC recommendations, laws governing informed consent, pre- and posttest counseling, disclosure, and testing of minors vary by state.[35,36] Analysis of national Behavioral Risk Factor Surveillance System data showed that HIV testing rates were lower in states that required written patient consent for HIV testing.[37] Eliminating the requirement for written patient consent for HIV testing at the San Francisco Department of Public Health was associated with more than a fourfold increase in the average number of tests performed each month, compared with the predicted number if written consent had not been eliminated, and a 67% increase in the average number of new HIV diagnoses made each month.[38]

Limitations

Although this was a large national survey of hospital HIV testing practices, several important limitations should be noted. First, the findings in this survey may not be nationally representative of U.S. hospitals. Similar to the 2004 survey, for-profit hospitals and hospitals in the western region of the U.S. were less likely to respond to the 2009–2010 survey, and HIV testing practices may be different at nonresponding hospitals. Due to an error in sampling, data from hospitals predominantly located in the western region were collected several months after the other regions and for a slightly shorter interval. However, less than three months elapsed between the first and second data collection phases, and to our knowledge there were no major changes in policy or other factors that would differentially impact HIV screening practices in hospitals surveyed during the second phase.

Second, the methods used for the 2004 survey differed from those used in the 2009–2010 survey, limiting our ability to compare their results statistically. In addition, the response rates for the 2004 survey (27%) were lower than the 2009–2010 survey (51%). Third, although our survey defined terms such as screening that were used in the CDC recommendations, it is possible that respondents had different interpretations of the terms used. Fourth, the length of the questionnaire (one hour) and the need to consult with staff in multiple departments may have lowered the participation rate. Lastly, there may also have been bias in response by factors other than census region, hospital ownership, location, academic affiliation, or bed size that were not measured by the survey.

CONCLUSIONS

Although the results of the 2009–2010 survey show that the proportion of U.S. hospitals that conduct HIV screening has increased since the CDC revised recommendations for testing in health-care settings were published in 2006, only about one-quarter of hospitals conduct HIV screening. Costs associated with hospital-wide screening may limit the adoption of the CDC recommendations.[39] Previous studies of hospital-based screening programs have used rapid HIV testing, which is expensive and may be logistically impractical to perform at the point of care. To overcome these limitations, several new FDA-approved random access immunoassays are available that are fully automated, incorporate HIV testing into other routinely performed tests in hospital laboratories for individual patients, and return test results in less than one hour.[40] However, hospital patients[41–43] and providers[44–48] will likely continue to face legal, financial, and other barriers that will limit the full implementation of the CDC recommendations.

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