RESEARCH ARTICLE

Acceptance of Routine HIV Testing by Hospitalized Adolescents and Young Adults

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ABSTRACT

BACKGROUND AND OBJECTIVES: Youth carry a disproportionate burden of new HIV infections. With our study, we aimed to characterize HIV testing experiences among adolescents and young adults admitted to a children's hospital that is located in a high HIV-prevalent community and implemented routine HIV testing for all patients ≥13 years of age.

METHODS: A total of 120 patients aged 13 to 24 years old who were admitted to our hospital and had a documented offer of routine HIV testing on admission were invited to complete a self-administered survey that asked about sex, race and/or ethnicity, HIV risk behaviors, and attitudes toward routine HIV testing in the hospital. Date of birth, admission diagnosis, and verification of HIV testing and results were collected by chart review.

RESULTS: Study participants ($N = 99$) were 17.4 ± 2.3 years old, 52% female, 47% Hispanic, and 29% African American. Additional characteristics include the following: 65% had previous sexual activity, 11% had a history of sexually transmitted infections, and 12% were worried about their risk for HIV. Forty-seven percent of participants accepted HIV testing, with older patients ($P < .01$) and those reporting previous sexual activity ($P < .01$) and a previous HIV test ($P < .01$) being more likely to accept testing. A total of 96% of participants agreed that the hospital is a good place to offer HIV testing.

CONCLUSIONS: Our findings support offering routine HIV testing to youth admitted to children's hospital. Given the high incidence of new and undiagnosed HIV infections among youth, additional venues for HIV testing are essential.

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Dr Bhalakia conceptualized and designed the study, designed the survey, approached patients for data collection, entered data, and drafted the initial manuscript; Dr Talib gave input on the study design and reviewed data collection tools; Dr Choi conducted the data analysis; Ms Watnick and Dr Futterman gave input on the study design; Dr Bochner approached patients for data collection and entered data; Dr Gross conceptualized the study, gave input on the study design, and reviewed data collection tools; and all authors reviewed and revised the manuscript and approved the final manuscript as submitted.

Youth aged 13 to 24 years old accounted for nearly a quarter of newly diagnosed HIV infections in 2014.[1] Routine HIV testing leads to earlier linkages in care, reduced morbidity and mortality associated with HIV and AIDS, and a reduction in HIV transmission.[2–4] Accordingly, in the past 12 years, members of the Centers for Disease Control and Prevention (CDC) and the US Preventative Services Task Force recommend routine HIV screening at all points of health care regardless of risk factors to provide early treatment to previously undiagnosed and often asymptomatic patients and to decrease HIV transmission rates.[2,5] The American Academy of Pediatrics also recommends routine HIV screening at least once during adolescence in communities in which the prevalence of HIV is >0.1%.[6]

Despite the high incidence of infection in youth, 44% of adolescents and young adults living with HIV are undiagnosed with HIV and testing prevalence remains low.[1,7–9] According to the CDC's 2015 Youth Risk Behavior Surveillance System, only 10% of high school students reported ever being tested for HIV,[9] which is a decrease from 13% in 2011.[9,10]

Although new HIV infection rates have decreased nationally, New York state has nearly 113 000 people living with HIV and accounts for ~10% of new HIV diagnoses in the United States.[11] In response to the high burden of HIV and AIDS, a 2010 New York state law requires that health care providers routinely offer HIV testing to all persons age 13 to 64 years old who receive hospital or primary care services to promote an increase in testing and early diagnosis across the state.[12]

Despite national and state-level recommendations for widespread screening and high rates of new and undiagnosed HIV infections in youth, little is known about the acceptance of routine HIV testing by hospitalized youth. With our study, we aimed to investigate adolescents' and young adults' acceptance of and attitudes toward routine HIV testing in an inpatient hospital setting. With this study, we also aimed to determine characteristics associated with accepting versus declining the test, as well as how youth would like to receive information about HIV testing.

METHODS

Study Design

We conducted a cross-sectional survey in a convenience sample of hospitalized patients age 13 to 24 years old admitted to the Children's Hospital of Montefiore, an urban, academic tertiary care center located in the Bronx, New York. In 2014, the Bronx had a 2% HIV prevalence rate.[13] The authors of our hospital's HIV testing policy recommend routinely offering HIV testing to all admitted adolescents and young adults 13 years of age and older. Providers offer testing to patients if they have not been tested in the last 12 months or if they have risk factors for HIV, including men who have sex with men, a sexually transmitted infection (STI), injection drug use, and/or sex with a partner who has any of the risk factors or who is infected with HIV. Providers also are encouraged to offer testing to pregnant patients and those who have recently emigrated from an HIV-endemic area. The testing policy outlines how providers should deliver negative and positive test results to all patients and includes information on linking newly identified HIV-infected patients to care. A routine offer of HIV testing relies on the admitting provider to remember to offer the test, preferably at the time of admission. Routine HIV testing in our hospital is done with a serum fourth generation test, which can detect both the p24 antigen and HIV-1 and HIV-2 antibodies. It has a rapid turnaround time of ~1 hour in the laboratory. Test results in our institution are available in the electronic medical record, on average, within 18 to 24 hours of the sample being drawn.

Inclusion criteria for the study were age 13 to 24 years old, admission within the last 24 hours, and documentation in the medical record that an HIV test was offered by the inpatient team. Patients were eligible to be in the study regardless of whether they had accepted or declined the HIV test. Patients who were critically ill, physically or mentally unable to complete a written survey by hand, or who were not fluent in English were excluded from participating. Although routine HIV testing was not offered in the emergency department during the study period, any patient who was tested in the emergency department was also excluded from participating. The study was conducted from June to October 2015.

Patients were approached by study personnel at the inpatient bedside. If there was a guardian at the bedside, they were told that the survey was regarding health services offered for adolescents and were asked for permission to speak to the patient alone. For guardians who wanted additional information, study personnel explained that the survey was regarding the New York state law for HIV test offering for patients ages 13 and older in all health care settings. Guardians were also given a handout containing information about HIV testing in youth and frequently asked questions regarding the law, consent, and confidentiality. Written consent was obtained from all patients.

All study participants completed the written survey alone at the bedside. They were given ~10 minutes to complete the survey. To help maintain confidentiality, they were asked to place their completed survey in a folder that was provided to them. This study was approved by the institutional review board, with a waiver for parental consent because minors are independently allowed to consent for an HIV test in New York state.

Measures

Patients who agreed to participate were given a self-administered, 15-question, written survey that we used to ask about sex, race and/or ethnicity, HIV risk behaviors, and their attitude toward routine HIV testing in the hospital setting. HIV testing and sexual behavior questions were adapted from the CDC's Youth Risk Behavior Survey.[14] The patient's date of birth, admitting diagnosis, verification of HIV testing, and test result were obtained by chart review.

Statistical Analysis

Descriptive analysis was performed on the demographic and clinical characteristics of survey participants and the variables related to HIV test acceptance, high-risk sexual behaviors, attitudes toward routine HIV testing in the hospital, and perceived barriers to HIV test consent. Bivariate associations of categorical variables with

HIV test acceptance were evaluated by using the χ^2 test or Fisher's exact test, and mean and median levels of continuous variables were estimated and compared between accepting and declining an HIV test by using the 2-sample *t* test or Wilcoxon rank test, depending on the distribution of the data. Multivariable logistic regression was used to identify factors associated with the likelihood of accepting an HIV test. The variables for which bivariate associations with the outcome (accepting or rejecting an HIV test) had *P* values <.2 were included in the multivariable analysis, except for condom use and interest in receiving information on HIV testing while hospitalized. A *P* value <.05 was considered statistically significant. Data were analyzed by using SAS software (version 9.4; SAS Institute, Inc, Cary, NC).

RESULTS

Survey Respondents' Characteristics and Acceptance of HIV Testing

Of 120 patients approached for the study, 99 (response rate = 83%) agreed to participate in the survey and were included in the analysis. Table 1 shows participants' characteristics and HIV testing rates in the hospital. The mean age of study participants was 17.4 ± 2.3 years, 52% (51 out of 99) were female, and 47% (46 out of 98) and 29% (28 out of 98) identified as Hispanic and African American, respectively. Eighty-one percent (80 out of 99) of respondents were admitted for nonsurgical diagnoses, of which 3 had a diagnosis of pelvic inflammatory disease. Sixty-five percent (62 out of 96) of all respondents reported having ever been sexually active. When asked about their personal risk for HIV, 88% (83 out of 94) reported being "not at all worried."

Of the participants, 47% (46 out of 99) accepted HIV testing in the hospital. Forty-two percent (41 out of 97) reported having never been tested for HIV, and of these patients, 29% (12 out of 41) accepted an HIV test for the first time during this hospitalization. Two male respondents reported having sex with men in the past, and both accepted HIV testing. No respondent reported intravenous drug use. None of the 46 patients tested positive for HIV.

Characteristics of Those Accepting HIV Testing

Patients in our cohort who accepted testing were older (18 vs 16.9 years, $P < .01$), had previous HIV testing (60% vs 39%, $P = .01$), were sexually active (89% vs 44%, $P < .01$), and were interested in receiving information on HIV testing while hospitalized (62% vs 22%, $P < .01$). Admission diagnosis (medical versus surgical) and self-reported sex, race and/or ethnicity, and number of sexual partners did not significantly differ between the groups. From the multivariable analysis, only 1 factor, previous sexual activity, was identified as being significantly associated with a higher likelihood to accept routine HIV testing ($P < .01$) (Table 2). The odds of accepting HIV testing in patients who are sexually active was ~6 times that of patients who are not sexually active when adjusting for age, race, previous HIV testing, previous history of STI, and being "very" or "somewhat worried" about HIV.

Reasons for Accepting and Declining an HIV Test

The most common self-reported reason for accepting testing was "everyone should know their HIV status" (85%). None of the 46 participants reported "I think I am high risk" as a reason for testing, yet 54% (24 out of 46) accepted testing because "I think I am low risk so I do not mind being tested." Thirty-seven percent (17 out of 46)

TABLE 1 Participants' Characteristics Associated With Acceptance of HIV Testing

Characteristics	Total	Accepted Testing *n* = 46	Declined Testing *n* = 53	*P*[a]
Age, y, *N* = 99	17.4 ± 2.3	18.0 ± 2.1	16.9 ± 2.3	.01
Female sex, *N* = 99	51 (52)	26 (57)	25 (47)	.35
Race and/or ethnicity, *n* = 98				
African American	28 (29)	10 (22)	18 (35)	.09
Hispanic	46 (47)	27 (59)	19 (37)	
Other (Asian American, white, multiracial)	24 (25)	9 (20)	15 (29)	
Nonsurgical admission, *N* = 99	80 (81)	37 (80)	43 (81)	.93
Previous HIV testing, *n* = 97	47 (48)	27 (60)	20 (39)	.01
Ever been sexually active, *n* = 96	62 (65)	39 (89)	23 (44)	<.01
≥4 sexual partners, *n* = 62	25 (40)	18 (46)	7 (30)	.22
No condom use at last sexual encounter, *n* = 60	18 (30)	14 (36)	4 (19)	.17
Previous history of an STI, *n* = 91	10 (11)	7 (17)	3 (6)	.18[b]
Very or somewhat worried they might be at risk for HIV, *n* = 94	11 (12)	8 (19)	3 (6)	.06[b]
Interest in receiving information on HIV testing while hospitalized, *n* = 93	37 (40)	26 (62)	11 (22)	<.01

Data are presented as *n* (%) except for age, which is presented as mean ± SD. *N/n* vary because of some incomplete survey responses.
[a] *t* tests and χ^2 tests were used for continuous and categorical variables unless otherwise specified.
[b] Fisher's exact test was used.

TABLE 2 Multivariable Analysis Results for Accepting HIV Testing ($n = 81$)

Characteristics	Odds Ratio	95% CI	*P*
Age	1.093	0.819–1.459	.55
Race and/or ethnicity			
Hispanic versus African American	1.391	0.410–4.718	.60
Other versus African American	0.659	0.144–3.022	.60
Previous HIV testing	1.097	0.313–3.852	.88
Previous sexual activity	5.812	1.430–23.620	.01
Previous history of STI	1.977	0.338–11.550	.45
Personal risk: very or somewhat worried they might be at risk for HIV	2.275	0.391–13.221	.36

CI, confidence interval.

cited "the test is confidential" as a reason to be tested. The most common reason for declining testing was "I do not think I am at risk for getting HIV" (56%). None of the respondents cited lack of confidentiality or cost as a reason they declined the test. The most frequently reported reasons to accept and decline an HIV test are shown in Figs 1 and 2.

Attitudes Toward HIV Testing and Information in the Hospital

A total of 96% (90 out of 94) of respondents either strongly agreed or somewhat agreed that the hospital is a good place to offer HIV testing. Forty percent of respondents (37 out of 93) wanted to receive information about HIV testing while hospitalized and were more likely to accept than decline an HIV test. Among respondents, the 2 most preferred ways to receive HIV testing information was from a health care professional (72 out of 95), and through written information (24 out of 95) such as a brochure.

DISCUSSION

In this study, we investigated adolescents' and young adults' acceptance of and attitudes toward routine HIV testing while hospitalized in a children's hospital. In our cohort, nearly half (47%) of hospitalized adolescents and young adults accepted routine HIV testing. Those more likely to accept HIV testing reported previous sexual

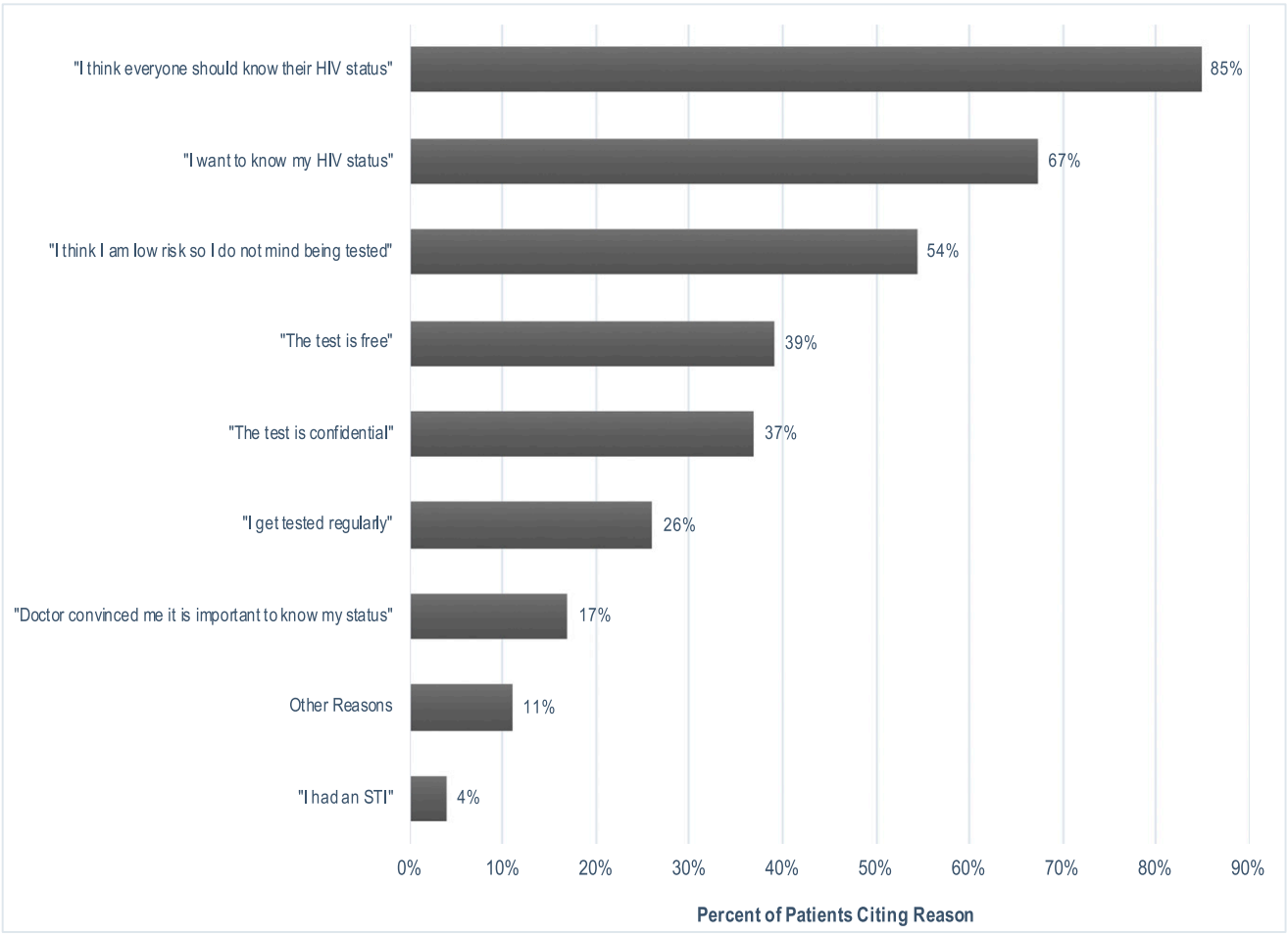

FIGURE 1 Frequency of self-reported reasons to accept an HIV test ($n = 46$). Survey respondents could select more than one answer.

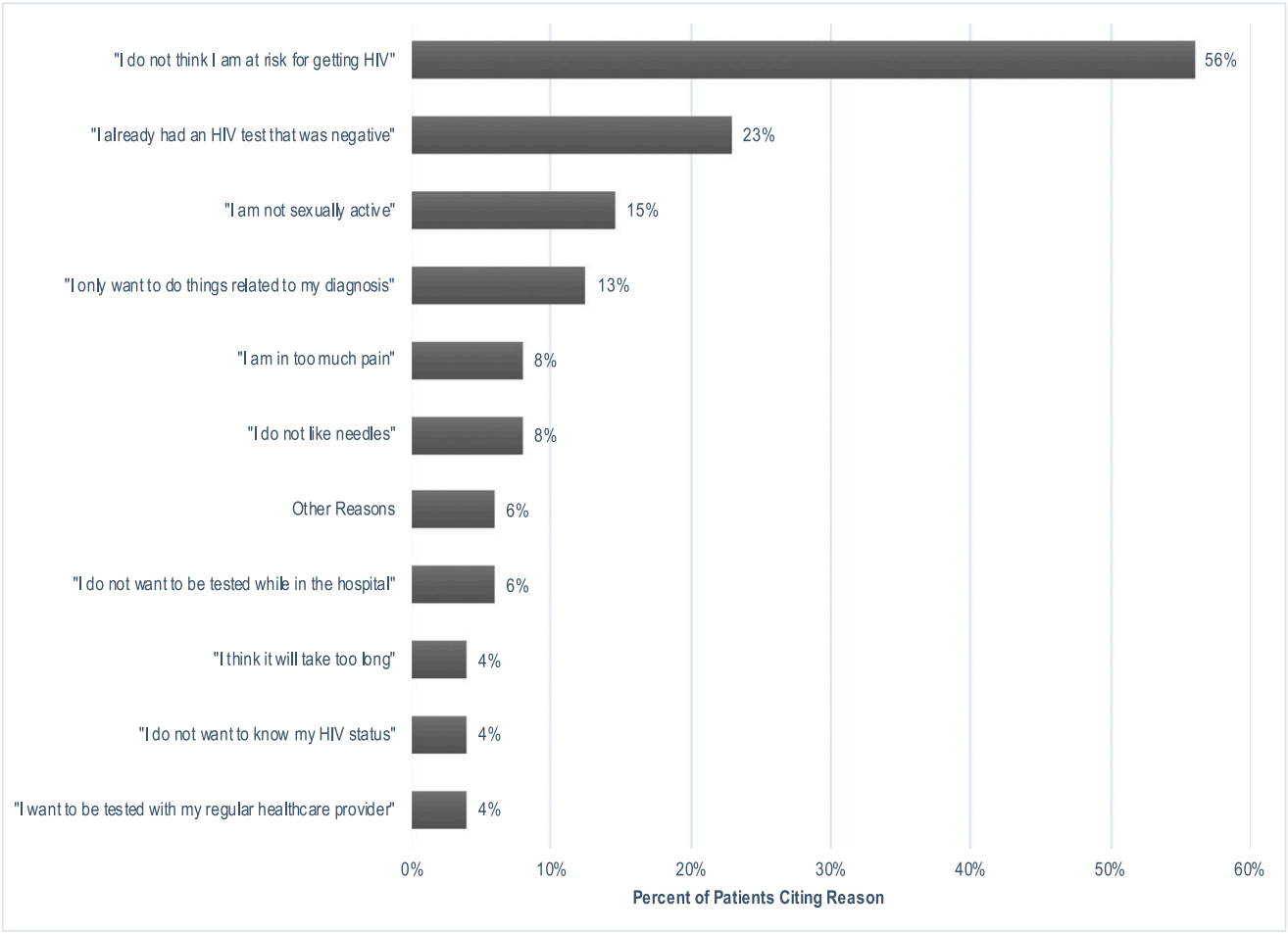

FIGURE 2 Frequency of self-reported reasons to decline an HIV test ($n = 48$). Survey respondents could select more than one answer.

activity, consistent with earlier studies.[15–17] Additionally, 96% agreed that the hospital is a good place to offer HIV testing.

Previous studies done in health care settings that serve adolescents reveal varying HIV testing rates. Emergency department settings generally have the highest HIV testing acceptance rates (74%–93%), whereas primary care clinics generally have lower acceptance rates (35%–50%).[17–22] Our study in the inpatient setting had an acceptance rate that is comparable to many outpatient primary care clinics, suggesting that adolescents are willing to accept testing even when they feel acutely ill and are admitted to the hospital.[17,20–22]

A previous survey study revealed that hospitalized adolescents have an interest and desire to receive reproductive health education and STI testing during the inpatient stay; however, the researchers of the study did not specifically ask about routine HIV testing.[23] In our cohort, hospitalized adolescents agreed that the hospital is a good venue to offer HIV testing. Additionally, other studies have revealed that adolescents value HIV testing when it is free, offered by a provider, and designed to respect confidentiality and privacy.[24–27] Assurance of confidential testing was one of the reasons that study participants agreed to be tested. Ensuring confidentiality while providing HIV screening is an essential component for quality health care for adolescents, and for some, it leads them to agree to be tested.[3,25,28,29] The inpatient setting is an important venue that can provide confidential discussion and test offering to hospitalized youth, especially among those who are generally willing to receive the information.

Although our cohort reveals an encouraging acceptance rate for HIV testing (47%), we cannot overlook that more than half declined wanting information on HIV testing and declined the test. In our study, 88% of all respondents reported being "not at all worried about having HIV," and the most common reason for declining an HIV test was "I do not think I am at risk for getting HIV." It is well documented that adolescents have a low perceived risk of HIV infection, even when they participate in high-risk behaviors, including unprotected sex.[25,27,30,31] Additional strategies are needed to improve adolescents' and young adults' acceptance of HIV testing in the hospital.

Adolescents want to talk to health care providers about HIV testing, and, in fact, having a provider talk with them increases their likelihood of test acceptance.[3,25–27]

A discussion initiated by health care providers regarding HIV infection and testing, supplemented with a brochure, may increase the number of adolescents and young adults that accept an HIV test.[23,30] Additionally, reoffering the test to those who initially decline on admission to the hospital is another strategy that may improve test acceptance.[32] Incorporating HIV testing as a routine part of care, such as through opt-out HIV screening, is widely recommended and would likely increase test acceptance as well.[2,5,6,18,19,33] According to the CDC, opt-out HIV screening includes notifying the patient orally or in writing that an HIV test will be done unless they defer or decline the test.[2]

Future studies are needed to determine best practices for opt-out HIV screening in a pediatric inpatient setting. In planning to implement routine or opt-out testing, careful thought should be given to the issues among our findings, specifically, to getting health care providers' involved in discussions around HIV testing, educating youth on risky behaviors and the benefits of HIV testing, and ensuring patient confidentiality. Other strategies, such as improved education and training of health care providers on how to offer the test and use of electronic medical records, are beyond the scope of our study but warrant evaluation because they have been shown to improve HIV test acceptance.[18,32,33]

There are several limitations to this study. Our sample was limited to a convenience sample that depended on study personnel's availability, which often excluded patients admitted on the weekend. The study participants were all fluent in English, excluding non-English-speaking patients who may have differing views of HIV testing. Also, only serum HIV testing is available at our institution. Despite fourth-generation serum HIV tests having greater sensitivity to early HIV infection, "rapid" or point-of-care tests in which saliva or finger stick samples are used and give quick results are preferred by youth. Point-of-care HIV tests may improve acceptability in the inpatient setting as they have been shown to do in other settings.[17,24,25,30,34] In our cohort, however, only 4% of those that declined testing cited the reason that "it would take too long," presuming that they would want their results sooner. Also, only a few respondents cited a fear of needles as a reason to decline testing, although the authors of other studies have suggested this.[20,25]

With our findings, we support that offering routine HIV testing to hospitalized youth is well accepted and supported by patients in a children's hospital inpatient setting. Given the high rates of new and undiagnosed HIV infections among youth, additional venues to implement HIV screening recommendations by the CDC, US Preventative Services Task Force, and the American Academy of Pediatrics are essential to reach as many adolescents and young adults as possible.

CONCLUSIONS

Routine HIV testing was accepted by nearly half of the hospitalized youth surveyed, and participants with a previous sexual activity were more likely to accept testing. The hospital inpatient setting provides an important opportunity for adolescents and young adults to receive HIV testing and be linked to early care and treatment when needed. Despite adolescents' low perceived risk for HIV, further efforts are needed to improve overall acceptability of HIV testing, including educating youth on the benefits of testing, as well as the implementation of universal opt-out testing within the hospital setting. Additionally, continued efforts are needed to ensure that the hospital setting allows for confidential discussion about HIV testing with a health care provider. The authors of quality improvement studies may outline best practices for developing and implementing routine opt-out HIV screening in all children's hospitals.

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