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Clinician Adherence to Recommendations for Screening of Adolescents for Sexual Activity and Sexually Transmitted Infection/HIV

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Abstract

Objectives—To evaluate clinician adherence to guidelines for documentation of sexual history and screening for sexually transmitted infection (STI)/HIV during routine adolescent well visits. Secondary objectives were to determine patient and clinician factors associated with sexual history documentation and STI/HIV testing.

Study design—Retrospective, cross-sectional study of 1000 randomly selected 13–19 year old routine well visits at all 29 pediatric primary care practices affiliated with a children's hospital. We evaluated frequency of documentation of sexual history and testing for gonorrhea/chlamydia (GC/CT) and HIV testing. Multivariable logistic regression was performed to identify factors associated with documentation and testing.

Results—Of the 1000 patient visits reviewed, 212 (21.2%; 95% CI 18.7, 23.7) had a documented sexual history, of which 45 adolescents' (21.2%; 95% CI 15.7, 26.8) encounters were documented as being sexually active. Overall, 26 (2.6%; 95% CI 1.6, 3.6) patients were tested for GC/CT and 16 (1.6%; 95% CI 0.8, 2.4) for HIV. In multivariable analyses, factors associated with sexual history documentation included older patient age, non-Hispanic Black race/ethnicity, non-private insurance status, and care by female clinician. Factors associated with GC/CT testing included male gender, non-Hispanic Black race/ethnicity, and non-private insurance. HIV testing was more likely to be performed on older adolescents, those of non-Hispanic Black race/ethnicity, and those with non-private insurance.

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The authors declare no conflicts of interest.

Conclusions—Pediatric primary care clinicians infrequently document sexual histories and perform STI and HIV testing on adolescent patients. Future studies should investigate provider beliefs, clinical decision-making principles, and perceived barriers to improve the sexual health care of adolescents and evaluate interventions to increase rates of adolescent sexual health screening.

Although adolescents comprise only 25% of the sexually experienced population, over half of new cases of sexually transmitted infections (STIs)(1) and almost 40% of all new human immunodeficiency virus (HIV) infections(2) affect people between the ages of 15 and 24. Furthermore, almost 50% of HIV-infected adolescents do not know they are infected.(3)

Given the high prevalence of STIs and HIV among adolescents, the Centers for Disease Control and Prevention (CDC)(4) and the American Academy of Pediatrics (AAP)(5) recommend universal and routine HIV screening rather than targeted testing. Similarly, the CDC(6) recommends STI screening for all sexually active adolescents. Furthermore, the AAP recommends that confidential sexual risk assessments and counseling are critical components of routine adolescent well visits and should be initiated in early adolescence.(7)

Currently, the extent to which adolescents are receiving recommended sexual health assessments and STI and HIV screening within the primary care setting remains understudied. This knowledge may help inform future interventions to address the adolescent STI epidemic. The primary objective of this study was to measure the frequencies of documentation of sexual history and screening for STI and HIV by clinicians during routine adolescent well visits across a diverse group of pediatric primary care practices. Our secondary objective was to identify patient and clinician factors associated with these practices.

Methods

This was a retrospective, cross-sectional study of routine adolescent well visits from a large pediatric primary care network. The study was approved by the Children's Hospital of Philadelphia (CHOP) institutional review board.

The study cohort was selected from outpatient encounters at all 29 CHOP owned primary care centers. These 29 practice sites represent diverse practice settings, with respect to provider role (eg, supervision of residents and fellows), patient demographics (e.g. race/ethnicity, insurance status), as well as geographic diversity (e.g. urban, suburban, rural). Of the approximately 40,000 adolescent patients cared for within the CHOP primary care network annually, through the use of a standard Oracle package (dbms_random) we randomly selected 1000 routine well visits of 13 to 19 years old adolescents at a CHOP primary care center for a routine well visit between January 1, 2011 and December 31, 2011. There was no duplication of patients in the study cohort. Selected visits were stratified by primary care site, patient gender, and age category (13–14; 15–16; and 17–19 years). Because the focus of this study was on primary care, the setting where the majority of adolescents receive preventive healthcare, we excluded adolescents who had visited CHOP adolescent medicine. Given the clinical expertise of adolescent medicine specialists, patients were excluded if they ever had a visit to a CHOP adolescent medicine specialist.

Additionally, patients were excluded if they had a history of developmental delay; because we were unable to distinguish severity of developmental delay, we could not assess their ability to undergo a confidential sexual health discussion.

Data were abstracted from a shared, comprehensive electronic health record and included patient demographics, documentation of sexual histories, STI screening within the 12 months prior to the selected visits and up to 1 month after the selected encounter, any history of HIV screening since the patients' 13th birthday, and all STI and HIV test results (if conducted). STI testing included any testing for *Neisseria gonorrhoeae* (GC), *Chlamydia trachomatis* (CT). Data were abstracted and stored in a database created by the CHOP Center for Bioinformatics using the Research Electronic Data Capture (REDCap) tool.

The primary outcomes were frequency of sexual history documentation and performance of GC/CT and HIV testing. Secondary outcomes included factors associated with sexual history documentation and STI/HIV testing. Covariates of interest included patient age, gender, race/ethnicity, insurance status, caregiver accompaniment, clinician type, and clinician gender. Patient age was categorized as 13–14, 15–16, and 17–19 years. Race and ethnicity was coded as Non-Hispanic White, Non-Hispanic Black, Hispanic, and Other. Insurance status was categorized as private, public, and no insurance. Clinician type was categorized as mid-level provider (nurse practitioner/physician assistant) or attending physician.

Statistical Analyses

Descriptive statistics were used to calculate frequencies of sexual history documentation. GC/CT testing, and HIV testing. To identify factors potentially associated with each of these three outcomes, we first considered associations between these candidate factors and both documentation and testing using bivariable logistic regression. We then created separate models for each of the three outcomes and performed multivariable logistic regression to identify associations after adjusting for other factors. Variables with a p-value <0.10 in any of the bivariable analyses were retained in our final multivariable models. Estimates were derived from the multivariable model and included adjusted odds ratios (AOR) with 95% confidence intervals (95% CI). Data were analyzed using Stata 12.0 (Stata Corp, College Station, TX).

Results

Patient and clinician characteristics are shown in Table I. Of the 1000 patient visits reviewed, 212 (21.2%, 95% CI 18.7, 23.7) had a documented sexual history, of which 45 adolescents (21.2%; 95% CI 15.7, 26.8) were documented as being sexually active. Overall, 23 patients (2.3%; 95% CI 1.4, 3.2) had been tested for GC/CT at or within one year prior to the encounter or one month after the visit. Only 16 patients (1.6%; 95% CI 0.8, 2.4) had ever undergone HIV screening since their 13th birthday. Of the 23 patients who had undergone GC/CT testing, 11 (47.8%; 95% CI 25.7, 69.9) also had been screened for HIV. Among patients who were documented as being sexually active, 15 (33.3%; 95% CI 19.0, 47.7) underwent GC/CT testing and 10 (22.2%; 95% CI 9.6, 34.9) underwent HIV screening. Of

the 45 patients who were documented as sexually active, 8 (17.8%) had both GC/CT and HIV testing.

Documentation of a sexual history was associated with increased GC/CT testing (OR 19.3; 95% CI 6.5, 57.4), and documentation that a patient was sexually active was associated with both increased GC/CT testing (OR 20.4, 95% CI 6.3, 65.6) and HIV screening (OR 15.6; 95% CI 4.1, 59.7).

In bivariable analysis, documentation of sexual history was associated with patient age (p=0.01), gender (p=0.012), race/ethnicity (p<0.01), insurance status (p<0.01), clinician type (p=0.01), clinician gender (p<0.01), and caregiver accompaniment (p=0.03) (Table II). Similarly, GC/CT testing was associated with patient age (p=0.03), race/ethnicity (p<0.01), insurance status (p<0.01), clinician gender (p=0.04), and caregiver accompaniment (p<0.01). STI testing was not associated with patient gender (p=0.07) or clinician type (p=0.55) (Table II). HIV screening was associated with patient age (p=0.01), race/ethnicity (p<0.01), insurance status(p<0.01), and caregiver accompaniment (p<0.01); but not patient gender (p=0.99), clinician type (p=0.25), or clinician gender (p=0.32) (Table II).

Based on our bivariable analyses, all covariates were retained in our multivariable model (Table III). There was no evidence of interaction between race/ethnicity and age for sexual history documentation (p=0.22), STI testing (p=0.99), or HIV testing (p=0.99). Additionally, there was no evidence of interaction between insurance status and age for sexual history documentation (p=0.30), STI testing (p=0.88), or HIV testing (0.77). On adjusted analyses, sexual history documentation was associated with the 15–16 year old age group versus 13–14 year olds, non-Hispanic Black adolescents, those with non-private insurance, and patients cared for by female clinicians. Male, non-Hispanic Black patients, and those with non-private insurance were more likely to undergo GC/CT testing. HIV testing was associated with older age, non-Hispanic Black race/ethnicity, and non-private insurance.

Discussion

In a large pediatric primary care network, adolescent sexual history documentation and STI/HIV screening are infrequently performed, which is inconsistent with AAP and CDC recommendations. Almost 80% of routine adolescent well visits did not have a cliniciandocumented sexual history, only 2.6% were tested for GC/CT within the year preceding and month following their visit, and only 1.6% underwent HIV screening at least once since their 13th birthday. Although we found higher rates of GC/CT and HIV screening among patients who were documented as being sexually experienced, screening rates among this subgroup of adolescents were still low; 33% underwent GC/CT screening and 22% underwent HIV screening.

Such low rates of sexual history documentation are particularly concerning given that the most recent Youth Risk Behavior Survey revealed that almost 50% of US high school students reported ever having sexual intercourse.(8) Our results differ from prior studies finding that between 60–70% of pediatric clinicians report discussing sexual activity with the majority of their adolescent patients.(9, 10) In contrast to these previous studies, we

directly measured compliance using chart audit, rather than depending on clinician surveys, which may be subject to recall bias and social desirability bias.

Despite AAP and CDC recommendations, our data suggest that little progress has been made in the last decade with regards to STI screening. Two surveys from 2000, one survey of sexually active adolescents who had a preventive care visit within the last year(11) and one survey of clinicians with regards to their sexually active adolescents,(10) found that only one-half of adolescents and clinicians, respectively, reported STI screening in the past year. Furthermore, Henry-Reid et al found that only 46% of clinicians report recommending STI testing and 28% recommend HIV screening to all sexually active patients.(9) Our findings that less than 20% of sexually active patients received recommended screening is even more disappointing. This lack of progress is concerning in the context of the continued disproportionately high burden of STIs among adolescents and the availability of more noninvasive STI tests that do not require pelvic examinations or urethral samples.

We found that certain patient factors were associated with both sexual history documentation and STI/HIV screening. Fifteen to 16 year old adolescents were more likely to have clinician-documented sexual histories than 13–14 year olds; 17–19 year olds were more likely to undergo HIV screening. This finding is similar to prior reports(12, 13) and may be related to clinicians' perceptions of when adolescents become sexually active, despite recent data revealing that nearly half of all high school students report being sexually experienced.(8) Although the average age of first intercourse is 17 years,(14) over 10% of all youth report having had intercourse by 15 years of age.(15) This suggests that clinician-initiated conversations about sexual activity should begin with the onset of adolescence. Furthermore, consistent with previous studies,(9, 12, 13, 16, 17) we found race/ethnicity and insurance status to be associated with sexual history documentation, GC/CT testing and HIV screening. These findings may reflect a form of clinician bias regarding perceived risk based on racial/ethnic groups and socioeconomic status.

Interestingly, we found that gender of the clinician is associated with sexual history documentation, which is consistent with other studies demonstrating that female clinicians are more likely than male clinicians to conduct sexual risk assessments.(10, 18, 19) Although other studies have found higher rates of sexual history documentation among patients cared for by nurse practitioners and physician assistants than physicians,(10) we found no such association. Additionally, unlike other studies,(10, 16) we did not find any clinician factors associated with GC/CT or HIV testing.

There are some potential limitations to this study. We maintained a strict definition of sexual history documentation, with specific reference to sexual activity. Comments in clinician notes, such as "no concerns," "dating," or comments under HEADDS/SHADDS such as "no issues" were not categorized as documentation of a sexual history, and clinicians might not always record prior history of STIs. Furthermore, although it is possible that clinicians may have had sexual health discussions without documentation in the medical record, we have reviewed all available components of the medical record including those that are strictly confidential (e.g. "confidential" section in EPIC which remains confidential between the health care provider and patient).

Therefore, we do not know whether clinicians actually counseled adolescent patients regarding sexual health more often than is reflected in the medical record. However, if this were the case, we would not have expected there to be a difference in STI testing among patients who did and did not have sexual histories documented. Additionally, although we identified certain patient and clinician factors that were associated with sexual history documentation and GC/CT and HIV testing in adolescents, we did not directly evaluate clinician beliefs, clinical decision-making principles, and perceived barriers with regards to sexual health screening practices. Furthermore, generalizability to other geographic areas may be limited as we only abstracted data from patients cared for within one pediatric primary care network. However, the unique strength of using a large pediatric primary care network is that it is comprised of diverse practice characteristics with regards to staffing (teaching versus community), location (urban versus suburban), and patient population.

Despite these potential limitations, our study strengthens and supplements existing literature by demonstrating that a large discrepancy still remains between national guidelines and actual practice with respect to sexual health screening in the adolescent population. Because the AAP and CDC recommend universal HIV screening and STI screening for all sexually active adolescents, it is concerning that almost 80% of the patients did not have a documented sexual history. In the context of the disproportionate burden of STI/HIV among the adolescent population and the unique position of clinicians as a point of health care access, clinician STI/HIV screening practices warrant improvement. Given that routine well visits may be the only opportunity for clinicians and adolescents to discuss sexual activity and provide STI/HIV screening, these visits are often missed opportunities for prevention counseling and treating asymptomatic infection and reducing the STI/HIV epidemic. Furthermore, our findings of specific patient and clinician factors associated with sexual history documentation and STI/HIV screening may provide insight into potential clinician biases regarding adolescent sexual health. The development of standardized protocols, documentation templates, and electronic decision support for sexual health assessments and screening might help address these issues.

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Abbreviations

AAP	American Academy of Pediatrics
CDC	Centers for Disease Control and Prevention
CT	Chlamydia
CHOP	Children’s Hospital of Philadelphia
GC	Gonorrhea
HIV	Human Immunodeficiency Virus
STI	Sexually transmitted infection

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Table 1

Study Population Demographics

Patients		Frequency; n=1000 (%)
Age Category	**13–14 years**	416 (41.6)
	15–16 years	337 (33.7)
	17–19 years	247 (24.7)
Mean age (+/− SD)		15.14 (1.72) years
Gender	**Male**	501 (50.1)
	Female	499 (49.9)
Race/Ethnicity	**Non-Hispanic White**	656 (65.6)
	Non-Hispanic Black	217 (21.7)
	Hispanic	19 (1.9)
	Other	17 (1.7)
	Missing	91 (9.1)
Insurance Status	**Public**	144 (14.4)
	Private	839 (83.9)
	Self-pay	17 (1.7)
Parent/Guardian Accompaniment	**Yes**	886 (88.6)
	No	97 (9.7)
	Unknown	17 (1.7)
Clinicians		
Clinician type	**Attending MD**	822 (82.2)
	NP/PA	178 (17.8)
Clinician gender	**Male**	297 (29.7)
	Female	703 (70.3)

Table 2

Bivariable Analyses of Factors Associated with Sexual History Documentation, GC/CT screening, and HIV screening

Variable		Sexual History Documentation OR (95% CI)	GC/CT Testing OR (95% CI)	HIV Testing OR (95% CI)
Patient Age Category	**13–14 years**	Reference	Reference	Reference
	15–16 years	**1.7 (1.2, 2.5)**	2.5 (0.75, 8.4)	6.3 (0.73, 53.8)
	17–19 years	1.4 (0.95, 2.1)	**4.8 (1.5, 15.2)**	**17.5 (2.2, 137.6)**
Patient Gender	**Female**	Reference	Reference	Reference
	Male	**0.68 (0.50, 0.92)**	2.3 (0.95, 5.7)	1.0 (0.37, 2.7)
Patient Race/Ethnicity	**White**	Reference	Reference	Reference
	Black	**8.5 (6.0, 12.2)**	**66.5 (8.9, 498.6)**	**41.7 (5.4, 321.0)**
	Hispanic	0.86 (0.19, 3.8)	n/a*	n/a[a]
Insurance status	**Private**	Reference	Reference	Reference
	Non-Private	**4.5 (3.1, 6.4)**	**27.9 (9.4, 83.3)**	**16.8 (5.4, 52.8)**
Clinician type	**Attending**	Reference	Reference	Reference
	NP/PA	**1.6 (1.1, 2.3)**	0.69 (0.20, 2.3)	0.30 (0.04, 2.3)
Clinician gender	**Male**	Reference	Reference	Reference
	Female	**2.7 (1.8, 4.1)**	**4.5 (1.1, 19.5)**	1.8 (0.52, 6.6)
Caregiver Accompaniment	**No**	Reference	Reference	Reference
	Yes	**0.59 (0.38, 0.94)**	**0.16 (0.07, 0.37)**	**0.17 (0.06, 0.49)**

[a] No Hispanic patients underwent GC/CT or HIV testing.

Table 3

Multivariable Analyses of Factors Associated with Sexual History Documentation, GC/CT screening, and HIV screening

Variable		Sexual History Documentation OR (95% CI)	GC/CT Testing OR (95% CI)	HIV Testing OR (95% CI)
Patient Age Category	**13–14 years**	Reference	Reference	Reference
	15–16 years	**2.1 (1.4, 3.2)**	2.2 (0.58, 8.5)	5.1 (0.54, 48.1)
	17–19 years	1.3 (0.79, 2.2)	2.0 (0.42, 9.7)	**15.3 (1.5, 153.6)**
Patient Gender	**Female**	Reference	Reference	Reference
	Male	0.77 (0.52, 1.1)	**4.8 (1.5, 15.3)**	1.2 (0.36, 3.9)
Patient Race/Ethnicity	**White**	Reference	Reference	Reference
	Black	**7.4 (4.9, 11.2)**	**13.2 (1.5, 114.9)**	**15.4 (1.6, 147.0)**
	Hispanic	1.1 (0.22, 4.7)	n/a*	n/a[a]
Insurance status	**Private**	Reference	Reference	Reference
	Non-Private	**1.9 (1.2, 3.1)**	**17.3 (3.6, 84.1)**	**10.0 (1.9, 51.7)**
Clinician type	**Attending**	Reference	Reference	Reference
	NP/PA	1.5 (0.96, 2.4)	0.82 (0.41, 1.7)	0.31 (0.04, 2.8)
Clinician gender	**Male**	Reference	Reference	Reference
	Female	**1.9 (1.2, 3.3)**	2.9 (0.56, 14.5)	0.73 (0.16, 3.3)
Caregiver Accompaniment	**No**	Reference	Reference	Reference
	Yes	0.83 (045, 1.6)	0.25 (0.06, 1.1)	0.66 (0.15, 2.9)

[a] No Hispanic patients underwent GC/CT or HIV testing.