7-10-2019

Screening For Sexually Transmitted Infections In Adolescents

Millicent Palacios
University of Missouri-St. Louis, mrpyt7@mail.umsl.edu

Screening for Sexually Transmitted Infections In Adolescents

Millicent Palacios

Bachelor of Science in Nursing, St. Louis University, 2010

A Dissertation Submitted to
The Graduate School at the University of Missouri-St. Louis
in partial fulfillment of the requirements for the degree
Doctor of Nursing Practice with an emphasis in Pediatric Nurse Practitioner

August
2019

Advisory Committee

Laura Kuensting, DNP, APRN, PCNS-BC, CPNP, CPEN
Chairperson

Elizabeth (Lisa) Merritt, DNP, APRN, CPNP-PC/AC, PMHS

Lauren Norrenberns, MSN, APRN, CPNP-PC

Abstract

Problem Adolescents are contracting sexually transmitted infections (STIs) with half of all new STIs occurring in those aged 15-24 years old. The American Academy of Pediatrics, recommended all sexually active adolescents be screened for STIs. Incorporation of a sexual behavior assessment may assist providers with identifying STI risk.

Methods A descriptive design comparing three cohorts of adolescents presenting for a well-exam. The cohorts analyzed were: urine screening on all adolescents, urine screening for only those reporting sexual activity, and a self-administered sexual history questionnaire tool, based on the HEEADSSS psychosocial assessments.

Results The majority (97%), of all three cohorts (N=60), had a documented sexual history in the medical record. A chi-square analysis between cohort one and two (n=49) comparing sexual history and urine STI testing ($\chi^2 = 5.72$, $p = .057$), and comparing urine STI testing with a positive urine test ($\chi^2 = 0.04$, $p = .837$) was essentially unremarkable. A statistical analysis could not be conducted comparing cohort three with cohort one or cohort two due to incomplete sampling. Overall, about 20% tested positive for an STI when screened routinely or if the adolescent reported sexual activity.

Implications For Practice Urine screening for STI improved the identification of an STI in adolescents and is of clinical significance. Assessment of sexual activity and STI risk may be improved when private time between the adolescent and provider are available, or through a paper assessment tool completed by the adolescent without a parent present.

Screening For Sexually Transmitted Infections In Adolescents

Because of high-risk behaviors, adolescents are at an increased risk of exposure to sexually transmitted infections (STIs). According to the Centers for Disease Control and Prevention (CDC), youth aged 15-24 years old account for half of the 20 million new STIs occurring in the US each year (CDC, 2017). *Chlamydia trachomatis* (chlamydia) and *Neiserria gonorrhoae* (gonorrhea) are the most common STIs reported in the adolescent population (CDC, 2017). The 2017 STI Surveillance Report, reported 62% of chlamydia infections where diagnosed in those aged 15-24 years old (CDC, 2017). Additionally, the CDC (2017) reported the rate of gonorrhea infections increased by 15% between 2016 and 2017 in the adolescent population. Hence, adolescents are engaging in high-risk sexual behaviors and contracting STIs at an alarming rate.

Despite these facts, STI screenings in the adolescent population may be inconsistent within the primary care setting. Many adolescents are reluctant to disclose sexual activity to their medical providers. Adolescents may be accompanied by a caregiver and the opportunity for time alone with providers is limited or nonexistent, concerns about confidentiality, and perceived stigma are all associated with adolescents' failure to disclose sexual activity (Cuffe, Newton-Levinson, Gift, McFarlane, & Leichliter, 2016). For these reasons and more, testing for STIs, early treatment, and education for risk reduction are delayed. When left untreated, STIs can lead to long-term complications such as pelvic inflammatory disease and infertility (AAP, 2014). Primary care providers have an opportunity to influence the sexual and reproductive health of adolescents.

The American Academy of Pediatrics (AAP) publication, *Bright Futures Guidelines for Health Supervision of Infants, Children, and Adolescents*, recommended screening for chlamydia and gonorrhea in all sexually active teens (AAP, 2017). A comprehensive psychosocial screening tool, the HEEADSSS (Home, Education, Eating, Activities, Drugs and Alcohol, Suicide and Depression, Sexuality and Safety) assessment, contains interview questions to assist providers in collecting a psychosocial history of the adolescent, including sexuality (Smith & McGuinness, 2017). This psychosocial assessment framework was first introduced by pediatrician Dr. Henry S. Berman in the 1970s. Over time, the evaluation questions have evolved to reflect current risk factors that affect the adolescent population and to help providers address psychosocial issues in a confidential and unbiased manner (Smith & McGuinness, 2017).

Testing for chlamydia and gonorrhea can be done easily using nucleic acid amplification tests (NAATs). NAATs have a high sensitivity and specificity for detecting these infections (AAP, 2017). Specimens can be collected through urine sample, urethral, vaginal, and/or cervical swabs. In the pediatric population, urine collection is the least invasive method, easily obtained, and less intimidating. Gonorrhea and chlamydia can usually be ordered as a combined test and completed on a single specimen (AAP, 2017). The AAP recommended all sexually active adolescents receive chlamydia and gonorrhea testing annually (AAP, 2017).

Current practice at a Midwestern, suburban, organizationally-owned pediatric primary care office is to collect adolescent sexual histories with parents at the bedside. In general, adolescents are not given private time with providers which may influence disclosure of high-risk behavior. At one time, a urine chlamydia or gonorrhea diagnostic test had been

performed on all adolescents, and at another time the urine test was reserved for those who had disclosed active sexual activity. The purpose of this quality improvement initiative was to assess for STI risk by implementing a self-administered sexual history questionnaire tool, based on the HEEADSSS psychosocial assessment, and perform a reflexive urine test if sexual risk was indicated. The primary aim was to improve STI screening and urine testing for adolescents at high risk within the practice. The questions of study were: During a well-child exam in adolescents aged 13-17 years,

1. What was the overall number of adolescents seen for a well-child exam from February-March 2018 (cohort one), August-September 2018 (cohort two), and February-March 2019 (cohort three)?
2. What was the number of those screened for an STI with a urine chlamydia and gonorrhea diagnostic test from February through March 2018 (cohort one)?
3. What is the number of those screened for an STI with a urine chlamydia and gonorrhea diagnostic test only when sexual activity was disclosed from August through September 2018 (cohort two)?
4. Of those screened with a urine chlamydia and gonorrhea test in cohort one and cohort two in 2018, how many tested positive for one or both diseases?
5. What was the number of those screened with the modified HEEADSSS questionnaire from February through March 2019 (cohort three)?
6. Of those who were screened with the modified HEEADSSS questionnaire in 2019 (cohort three), how many were found to be at risk for an STI?

7. Of those who were found to be at risk for an STI with the modified HEEADSSS questionnaire in 2019 (cohort three), how many had a urine chlamydia and gonorrhea test performed?
8. What was the rate of positive STI infection identified by urine testing between the three cohorts?

Review of Literature

A systematic literature review included the databases of Summon, PubMed, CINAHL, Google Scholar, and the Cochrane Library. The key words used were *sexually transmitted infections*, *adolescents*, *screenings*, *primary care*, *chlamydia*, *gonorrhea*, *HEEADSSS,* and *psychosocial assessments.* The literature review included research articles and studies from 2008 through 2018. The search was filtered for full text articles published in English, journal articles, and scholarly peer-reviewed publications. Articles were excluded if they were not related to the adolescent population, chlamydia trachomatis, and/or gonorrhea. Ultimately, 14 publications were chosen for this literature review.

Several organizations have released evidence-based practice guidelines and recommendations on STI screenings and treatment in adolescents (AAP, 2014; CDC, 2017, US Preventative Services Task Force [USPSTF], 2014). All agreed sexually active adolescents should be tested annually for chlamydia and gonorrhea. Despite these recommendations and guidelines, rates of chlamydia and gonorrhea remain highest among adolescents (CDC, 2017). Hence, opportunities exist in preventative sexual and reproductive health care that is provided to adolescents.

Office visits present opportunities for primary care providers to educate adolescents on sexual health. Schneider, FitzGerald, Byczkowski, and Reed (2016) conducted a study in a pediatric emergency department collecting urine samples for chlamydia and gonorrhea from 403 asymptomatic adolescents with non-genitourinary complaint. About 10% (*n*=40) were positive for at least one STI; moreover, about 90% of the subjects acknowledged having a primary care provider (Schneider et al., 2016). Because adolescents engage in high-risk sexual behaviors, vigilance in screening, identifying, and treating STI infections in adolescents in the primary care setting is recommended (AAP, 2017). While prevention is a primary goal, addressing the sexual and reproductive health needs of adolescents cannot be ignored (AAP, 2017).

Sexual activity is common in adolescence. Goyal, Witt, Hayes, Zaoutis, & Gerber (2014) conducted a study on clinical providers screening adolescents for sexual activity and STIs. Their study was conducted across 29 pediatric primary care offices and included a retrospective cross-sectional study of randomly selected adolescents, aged 13- to 19-years (Goyal et al., 2014). From 1,000 well-child encounters reviewed, only 21% (*n*=212) of adolescents had a documented sexual history and 21% (*n*=45) of those adolescents were identified as being sexually active; however, only 33% (*n*=15) of the adolescents documented as sexually active received testing for chlamydia and gonorrhea (Goyal et al., 2014). Goyal et al. (2014) found greater than 50% of the sexually active adolescents in their study did not get recommended STI testing. Additionally, nearly 80% of adolescent well-child visits reviewed did not have a sexual history documented (Goyal et al., 2014). Thus, when sexual histories are unknown, a missed opportunity for STI testing exists, and appropriate treatment does not occur.

Adolescents may feel invincible about acquiring an STI. Cuffe et al. (2016) surveyed over 3,000 adolescents and found 11.5% reported receiving an STI test in the last 12 months, and 34% reported having an STI test as part of their routine health visit. Of those sexually active and never tested, 41.8% did not seek testing on their own because of believing they were not at risk for an STI (Cuffe et al., 2016). Some adolescents (32.5%) reported not seeking STI testing because their medical provider did not suggest it (Cuffe et al., 2016). Adolescents may be influenced to be tested for an STI when a medical provider recommends it. Early identification of an STI may result in early treatment thereby preventing long-term sequelae.

Several barriers exist to adolescent STI screening and understanding them may clarify why there is a lack of screening and testing in this population. The largest barrier in preventing an adolescent from disclosing sexual activity and seeking STI screening, may be related to their concerns of confidentiality (Cuffe, Newton-Levinson, Gift, McFarlane, & Leichliter, 2016; Fuentes, Ingerick, Jones, & Lindberg, 2018; Marcell, & Burstein, 2017). Adolescents may fear adult judgement. To minimize confidentiality concerns, recommendations included using psychosocial assessment tools that screen for high-risk behaviors specifically addressing sexual activity (Bradford & Rickwood, 2012). Furthermore, screening tools conducted through private interview, pen/paper assessment tools, and technology devices on tablets and iPads were recommended (Bradford & Rickwood, 2012).

Respecting confidentiality gains trust from an adolescent. Kadivar et al. (2014) demonstrated adolescents were more likely to answer screenings with more honesty when done confidentially. In a systematic review by Bradford and Rickwood (2012), self-

administered tools were found to be the most accepted amongst adolescents, and their use improved engagement with the healthcare provider. Despite confidential screening with a self-administered tool, some practitioners did not complete follow-up with the adolescent on potential risks (Bradford & Rickwood, 2012).

The use of validated, standardized screening instruments can be beneficial for increasing the effectiveness of the care provided in busy primary care practices. Eade and Henning (2013) found the use of a comprehensive youth assessment tool, such as the HEADSS assessment tool, facilitated STI screenings. In their study, 85 adolescents had completed a HEADSS assessment with half (*n*=43) of the adolescents being screened for chlamydia due to identified risk, resulting in 25% (*n*=11) of them having a positive result (Eade & Henning, 2013). Incorporating high-risk behavior assessment tools may assist providers with education, testing, and treatment needed to improve health care for adolescents.

The framework to guide this clinical scholarship project was based on the Donnebedian model of structure, process, outcomes. Specifically, the Plan-Do-Study-Act (PDSA) was selected. The PDSA cycle is a four-step model for improving a process. The "plan" phase of this cycle involves developing a test for change. The "do" phase of this model is to implement the plan and document data. The "study" phase is to evaluate the data and determine if the plan was beneficial. The "act" phase involves adopting, adapting, and/or adjusting the intervention (Christoff, 2018). The PDSA is the most commonly used tool in healthcare quality improvement (Christoff, 2018). Utilizing the PDSA cycle to implement change has resulted in significant improvements in care and patient outcomes (Christoff, 2018).

Method

Design

An observational, descriptive, cohort design was utilized. The PDSA cycle to test the change of implementing a modified HEEADSSS assessment was done. The modified HEEADSSS assessment implementation began in February and ended in March 2019. In addition, a retrospective medical record review was done from February-March 2018, August-September 2018, and February-March 2019 to assess the effectiveness of screening all adolescents, screening only those who disclose sexual activity, and screening those who indicate sexual activity on a written assessment. A chlamydia and gonorrhea urine diagnostic test was used to compare results for identifying adolescents at risk for and/or who had an STI.

Setting

An organizationally-owned, pediatric primary care office located in a Midwestern suburb of a metropolitan area was selected for this study. This practice provided pediatric primary care services as well as behavioral health therapy services. Care was provided to those aged 0- through 18-years old. The practice consisted of two pediatricians, one pediatric nurse practitioner, one clinical social worker, three medical assistants, and two staff nurses. According to the most recent census, the estimated population of the service area is 41,649 with nearly 28% of the population being under 18 years of age (U.S. Census Bureau, 2017). Caucasians represent 69% of the population, African Americans 25%, Latinos 2%, and other races representing less than 1% (U.S. Census Bureau, 2017).

Sample

A retrospective record review was conducted on a convenience sample of adolescents during a well-child visit during three different periods in time. There were three cohorts: Cohort 1 representing practice with urine screening for STI was done on all adolescents, Cohort 2 representing practice with urine screening for STI was only done on adolescents reporting to be sexually active, and Cohort 3 representing practice utilizing a modified HEEADSSS assessment tool and a reflexive urine screening for STI. Inclusion criteria was 13-17 years of age; able to read, understand, and answer questions on the questionnaire; and scheduled for a well-child visit. Exclusion criteria was less than 13- or greater than 17-years of age; unable to read, understand, and/or answer questions on a questionnaire.

Procedures

A team of key stakeholders was formed and included the site manager, staff pediatric nurse practitioner, and medical assistants. After review and discussion of the current STI screening process, the modified HEEADSSS assessment was selected as the additional screening tool and if positive, a reflexive urine test would be performed. A modified HEEADSSS assessment was offered at the beginning of the visit to those who met inclusion criteria; however, the adolescent had the choice to complete (or not) the pen/paper assessment on their own. If completed, the modified HEEADSSS assessment was reviewed by the medical provider. If the questionnaire was found to indicate sexual activity or risk for STI, a chlamydia and gonorrhea urine diagnostic test was ordered.

Data Collection & Analysis

All data was retrieved from a retrospective medical record review. Demographic data included age, gender, and race/ethnicity. Additional data included a modified HEEADSSS assessment completion, urine diagnostic testing completion, and urine diagnostic testing results. Data was stored and collected on a password-protected computer and flash drive. All personal identifiers were removed and data was coded as 18-1, 18-2, 18-3, etc. and 18-1a, 18-2a, 18-3a, etc. for those records reviewed from 2018. In addition, 19-1, 19-2, 19-3, etc., for those records reviewed in 2019. Data was analyzed using descriptive and chi-square statistics.

Approval Processes

Administrative approval for project implementation was obtained from the pediatric primary care practice. Approvals from the doctor of nursing practice (DNP) committee, institutional review board (IRB), and graduate school from the University were obtained. There was minimal to no risk to the adolescents as this was retrospective medical record review. Parental consent was not needed due to state law requirements of those 12-years and older not needing parental permission to authorize health care services for the diagnosis and/or treatment of STIs (410 ILCS 210/4). Benefits of STI screening of adolescents included early identification and treatment of STIs.

Results

A retrospective medical record review was conducted with three cohorts (N=60): (1) February – March 2018 (representing practice with urine screening for STI on all adolescents), (2) August – September 2018 (representing practice with urine screening for STI only on adolescents reporting to be sexually active), and (3) February – March

2019 (representing practice utilizing a modified paper HEEADSSS assessment tool and reflexive urine screening for STI). In the first cohort, 16 adolescent medical records were reviewed (*n*=16). The age of the adolescent ranged from 13- to 17-years, with a mean age of 15 (*sd*=1.5) years with the most frequently occurring age being 13-years. Of these 16 adolescents, 56% were female (*n* = 9) and 44% were male (*n*=7). Adolescent race/ethnicity were White (*n* = 7, 44%), Black (*n*=6, 37%), and Hispanic (*n*=3, 19%) in this cohort. All adolescents had a sexual history documented by the provider (*n* = 16). Just over 6% (*n*=1) were documented as being sexually active, 87.5% (*n*=14) were documented as not being sexually active, and 6% (n=1) neither reported nor denied sexual activity. Nearly 56% (*n*=9) of the adolescents had a urine screen for STI completed while 44% (*n*=7) did not. Of the nine urine screens, 22% (*n*=2) had urine testing positive for an STI (Appendix A).

In the second cohort, 33 medical records were reviewed (*n*=33). The age of the adolescent ranged from 13- to 17-years, with a mean age of 15 (*sd*=1.2) years with the most frequently occurring age being 14-years. Of these 33 adolescents, 45% were female (*n* = 15) and 55% were male (*n*=18). Adolescent race/ethnicity were White (*n* = 10, 30%), Black (*n*=17, 52%), Hispanic (*n*=4, 12%), and Other (*n*=2, 6%) in this cohort. Nearly 94% of these adolescents had a sexual history documented by the provider (*n* = 31) while two (6%) did not. Only 15% (n=5) were documented as being sexually active, 79% (*n*=26) were documented as not being sexually active, and 6% (*n*=2) neither reported nor denied sexual activity. Nearly 84% (*n*=5) of the adolescents had a urine screen for STI completed while one (17%) did not. Of the five urine screens, 20% (*n*=1) had urine testing positive for an STI (Appendix B).

The combination of cohorts one and two (*n*=49) represent the comparison sample for the effectiveness of the HEEADSSS assessment and reflexive urine screening for STI. Within these first two cohorts, the age of the adolescent ranged from 13- to 17-years, with a mean age of 15 (*sd*=1.3) years with the most frequently occurring age being 14-years. Of these 49 adolescents, 49% were female (*n* = 24) and 51% were male (*n*=25). Adolescent race/ethnicity were White (*n* = 17, 35%), Black (*n*=23, 47%), Hispanic (*n*=7, 14%), and Other (*n*=2, 4%) in this sample. Nearly 94% of these adolescents had a sexual history documented by the provider (*n* = 46) while three (6%) did not. Only 12% (*n*=6) were documented as being sexually active, 82% (*n*=40) were documented as not being sexually active, and 6% (*n*=3) neither reported nor denied sexual activity. Nearly 29% (*n*=14) of the adolescents had a urine screen for STI completed while 71% (*n*=35) did not. Of the 14 urine screens, 21% (*n*=3) had urine testing positive for an STI and nearly 79% (*n*=22.5) were negative for STI (Appendix C).

The third cohort represented HEEADSSS assessment and a reflexive STI urine screen (*n*=11) for which the combined first two cohorts were compared. Within this cohort, the age of the adolescent ranged from 13- to 17-years, with a mean age of 15 years (*sd*=1.5) years with the most frequently occurring age being 14-years. Of these 11 adolescents, 36% were female (*n*=4) and 64% were male (*n*=7). Adolescent race/ethnicity were White (*n* = 1, 9%), Black (*n*=9, 82%), and Hispanic (*n*=1, 9%). All 11 of these adolescents had a sexual history documented by the provider that was collected using the modified HEEADSSS assessment tool on a paper document. Only 9% (n=1) reported being sexually active, 90% (*n*=10) reported not being sexually active. One adolescent had a urine screen for STI ordered while 90% (*n*=9) did not (Appendix D).

A chi-square test was conducted on the combinations of cohort one and two (*n*=49) to compare sexual history and STI urine testing. There was no statistical difference between the samples regarding the rate of STI urine screening on all adolescents when compared to urine screening on only those who disclosed sexual activity ($\chi^2 = 5.72$, $p = .057$) (Appendix E). A second chi-square test was conducted with the same cohorts' comparing the rate of STI urine testing and those testing positive on the urine test. There was no difference in the rate of urine testing positive between those who were automatically screened and those who were screened only if sexual activity was disclosed ($\chi^2 = 0.04$, $p = .837$) (Appendix F). A statistical analysis could not be conducted between cohort three with cohort one or cohort two due to the lack of urine results for the third cohort.

Discussion

There were 60 adolescent well-child visits during the selected periods of study with an average age of 15-years. The first cohort resulted in 16 patients for whom STI urine screening was routine for all adolescent patients regardless of the report of sexual activity. The second cohort resulted in 33 patients where STI urine screening was only performed on those reporting sexual activity. Finally, the third cohort resulted in 11 patients screened with the modified HEEADSSS assessment and reflexive STI urine screen.

All three cohorts demonstrated a majority (97%) of adolescent patients had a documented sexual history in the medical record during the study periods and is clinically significant. Because the practice did not typically provide private time between the provider and the adolescent, most adolescents denied sexual activity (83%). In addition,

all STI risk assessments and sex histories were performed with the parents at the bedside. In the first cohort, all patients had a sexual history documented with nearly 88% denying sexual activity, one reported sexual activity, and one neither reported nor denied sexual activity. However, two of the adolescents who denied sexual activity had a positive urine screen for chlamydia. In the second cohort, nearly 79% denied sexual activity, 15% reported sexual activity, and two patients neither reported or denied sexual activity. Finally, nearly all adolescents screened with the HEEADSSS assessment and reflexive STI urine screen in the third cohort denied being sexually active. Hence, most adolescents denied sexual activity when caregivers were present. Sexual activity and STI risk may have been more accurately identified if confidential, private time between the adolescent and provider were available. Furthermore, a paper assessment tool or technology device provided to and completed by the adolescent without a parent present may have provided some privacy for the adolescent.

During the study period for the first cohort when all adolescents were to have a STI urine screen, just over half of the patients (*n*=9, 56%) completed the diagnostic test. Of the STI urine screens in this cohort, 22% (*n*=2) tested positive for chlamydia or gonorrhea. In the second cohort when adolescents were to have a STI urine screen if they reported being sexually active, 100% (*n*=5) had the diagnostic test completed. Of those, 20% (*n*=1) of the five, tested positive for chlamydia. In the third cohort, 9% (*n*=1) screened positive for STI risk with the HEEADSSS assessment. This patient did have a urine sample ordered and collected, however, the specimen was not sent to the lab for testing due to miscommunication between the provider and the medical assistant. Overall,

it appeared about one in five (20%) had tested positive for an STI when screened routinely or if the adolescent reported sexual activity and is of clinical significance.

Several limitations were identified in this study. The first limitation was the sample size. Only 11 adolescents were screened with the modified HEEADSSS assessment with one reflexive urine test that was ordered and collected, but not resulted. This made it difficult to determine the effectiveness of utilizing this for screening and determining if urine testing was needed. Also, the modified HEEADSSS screening was only conducted by the pediatric nurse practitioner. With only one provider in the practice using this screening tool, the sample may not have been representative of the entire practice. Another limitation was the urine sample obtained reflexively after the HEEADSSS assessment was ordered and collected but never resulted. No determination could be made between screening with the modified HEEADSSS assessment and reflexive urine testing as an alternative to the routine screening of all adolescents.

Recommendations for further study include a larger sample size and the impact of age on reported sexual activity. While most patients denied sexual activity, the effect of age on sexual activity and rate of STI may be of interest. Regardless, the routine STI urine screening and STI urine screening only if sexual history was reported resulted in the identification of 20% of adolescents having an STI. The modified HEEADSSS assessment with a reflexive STI urine screen was unable to be determined as effective in identifying those who may have had an STI; therefore, more study is needed.

An implication for practice includes urine testing for STI to identify the presence of STI in some adolescents regardless of their sexual activity disclosures. Perhaps the availability of a urine sample before the provider has verbally screened the patient for

STI risk may aid in the completion of a STI urine screen when ordered. Finally, when sexual histories are obtained, STI risk may be better assessed if the parent or caregiver are asked to leave the room. The AAP (2017) recommended privacy when providing medical care to adolescents and to begin preparing pre-teens and parents on changes to the visit during the 12-year old well child visit.

Conclusion

In summary, most of the adolescent patients undergoing a well-child exam had a sexual history documented and nearly 1/5 of those adolescents tested positive for STI. While the effects of screening using a modified HEEADSSS assessment with reflexive STI urine screen were unable to be obtained in this study, screening of some sort improves the identification of STI. The identification of adolescents having an STI may enhance early treatment and delay or eradicate long-term consequences occurring from an STI. Ideally, best practice is to obtain sexually histories without caregivers at the bedside. This promotes disclosure and can aid in identification of STI risk.

References

American Academy of Pediatrics. (2014). *Bright Futures Guidelines for Health Supervision of Infants, Children, and Adolescents.* Retrieved from https://brightfutures.aap.org/Bright%20Futures%20Documents/BF4_Introduction.pdf

American Academy of Pediatrics. (2014). *Policy Statement: Screening for Nonviral Sexually Transmitted Infections in Adolescents and Young Adults*. Retrieved from http://pediatrics.aappublications.org/content/pediatrics/134/1/e302.full.pdf

Bradford, S., & Rickwood, D. (2012). Psychosocial assessments for young people: A systematic review examining acceptability, disclosure and engagement, and predictive utility. *Adolescent Health, Medicine and Therapeutics, 3*, 111-125. doi:10.2147/AHMT.S38442

Centers for Disease Control and Prevention. (2017). Sexually Transmitted Disease: Adolescents and Young Adults. Retrieved November 17, 2018 from https://www.cdc.gov/std/lifestagespopulations/adolescents-youngadults.htm

Centers for Disease Control and Prevention. (2017). Sexually Transmitted Disease Surveillance 2017. Retrieved from https://www.cdc.gov/std/stats17/2017-STD Surveillance-Report_CDC-clearance-9.10.18.pdf

Christoff, P. (2018). Running PDSA cycles. *Current Problems in Pediatric and Adolescent Health Care, 48*(8), 198-201. doi:10.1016/j.cppeds.2018.08.006

Cuffe, K. M., Newton-Levinson, A., Gift, T. L., McFarlane, M., & Leichliter, J. S. (2016). Sexually transmitted infection testing among adolescents and young

adults in the united states. *Journal of Adolescent Health, 58*(5), 512519.doi:10.1016/j.jadohealth.2016.01.002

Eade, D. M., & Henning, D. (2013). Chlamydia screening in young people as an outcome of a HEADSS; home, education, activities, drug and alcohol use, sexuality and suicide youth psychosocial assessment tool. *Journal of Clinical Nursing, 22*(2324), 3280-3288. doi:10.1111/jocn.12393

Fuentes, L., Ingerick, M., Jones, R., & Lindberg, L. (2018). Adolescents' and young adults' reports of barriers to confidential health care and receipt of contraceptive services. *Journal of Adolescent Health, 62(*1), 3643.doi:10.1016/j.jadohealth.2017.10.011

Goyal, M., Witt, R., Hayes, K., Zaoutis, T., & Gerber, J. (2014). Clinician adherence to recommendations for screening of adolescents for sexual activity and sexually transmitted Infection/Human immunodeficiency virus. *The Journal of Pediatrics, 165*(2),343-347. doi:10.1016/j.jpeds.2014.04.009

Kadivar, H., Thompson, L., Wegman, M., Chisholm, T., Khan, M., Eddleton, K., Muszynski, M., & Shenkman, E. (2014). Adolescent views on comprehensive health risk assessment and counseling: Assessing gender differences. *Journal of Adolescent Health, 55*(1), 24- 32. doi:10.1016/j.jadohealth.2013.12.002

Marcell, A. V., & Burstein, G. R., (2017). Sexual and Reproductive Health Care Services in the Pediatric Setting. *Pediatrics*, *140*(5), 28-58.doi:10.1542/peds.2017 2858

Schneider, K., FitzGerald, M., Byczkowski, T., & Reed, J. (2016). Screening for asymptomatic gonorrhea and chlamydia in the pediatric emergency department.

Sexually Transmitted Diseases, 43(4), 209-215.doi:10.1097/OLQ.0000000000000424

Smith, G. L., & McGuinness, T. M. (2017). Adolescent psychosocial assessment: The HEEADSSS. *Journal of Psychosocial Nursing and Mental Health Services, 55*(5), 24-27. doi:10.3928/02793695-20170420-03

U.S. Preventive Services Task Force (USPSTF). (2014). Screening for Chlamydia and Gonorrhea: U.S. Preventive Services Task Force Recommendation Statement. Retrieved November 17, 2018, fromhttp://www.uspreventiveservicestaskforce.org

United States Census Bureau. (2017). *QuickFacts, Belleville City Illinois*. Retrieved from https://www.census.gov/quickfacts/fact/table/bellevillecityillinois/PST045217

Appendix A

Table 1

STI Urine Screen For All Adolescents (Cohort One)

Variable	*n*	%	Cumulative %
Documented Sexual History			
Yes	16	100	100
Reported or Denied Sexual Activity			
Denied	14	87.50	87.50
Neither Reported Nor Denied	1	6.25	93.75
Reported	1	6.25	100
STI Testing Done			
Yes	9	56.25	56.25
No	7	43.75	100
Positive Urine Test			
Yes	2	22.22	22.22
No	7	77.78	100
Race			
Black	6	37.50	37.50
White	7	43.75	81.25
Hispanic	3	18.75	100
Gender			
Female	9	56.25	56.25
Male	7	43.75	100

Variable	*M*	*SD*	*n*	*Mdn*	Mode
Age	14.81	1.47	16	15.00	13.00

Appendix B

Table 2

STI Urine Screen Only For Adolescents Reporting Sexual Activity (Cohort Two)

Variable	*n*	%	Cumulative %
Documented Sexual History			
Yes	31	93.94	93.94
No	2	6.06	100
Reported or Denied Sexual Activity			
Denied	26	78.79	78.79
Reported	5	15.15	93.94
Neither Reported Nor Denied	2	6.06	100
STI Testing Done			
Yes	5	83.33	83.33
No	1	16.67	100
Positive Urine Test			
No	4	80	80
Yes	1	20	100
Race			
White	10	30.30	30.30
Black	17	51.52	81.82
Hispanic	4	12.12	93.94
Other	2	6.06	100
Gender			
Male	18	54.55	54.55
Female	15	45.45	100

Variable	*M*	*SD*	*n*	*Mdn*	Mode
Age	15.06	1.20	33	15.00	14.00

Appendix C

Table 3

Cohort One and Two Combined

Variable	*n*	%	Cumulative %
Documented Sexual History			
Yes	46	93.88	93.88
No	3	6.12	100
Reported or Denied Sexual Activity			
Denied	40	81.63	81.63
Neither Reported Nor Denied	3	6.12	87.76
Reported	6	12.24	100
STI Testing Done			
Yes	14	28.57	28.57
No	35	71.43	100
Positive Urine Test			
Yes	3	21.43	21.43
No	11	78.57	100
Gender			
Female	24	48.98	48.98
Male	25	51.02	100
Race			
Black	23	46.94	46.94
White	17	34.69	81.63
Hispanic	7	14.29	95.92
Other	2	4.08	100

Variable	*M*	*SD*	*n*	*Mdn*	Mode
Age	14.98	1.28	49	15.00	14.00

Appendix D

Table 4

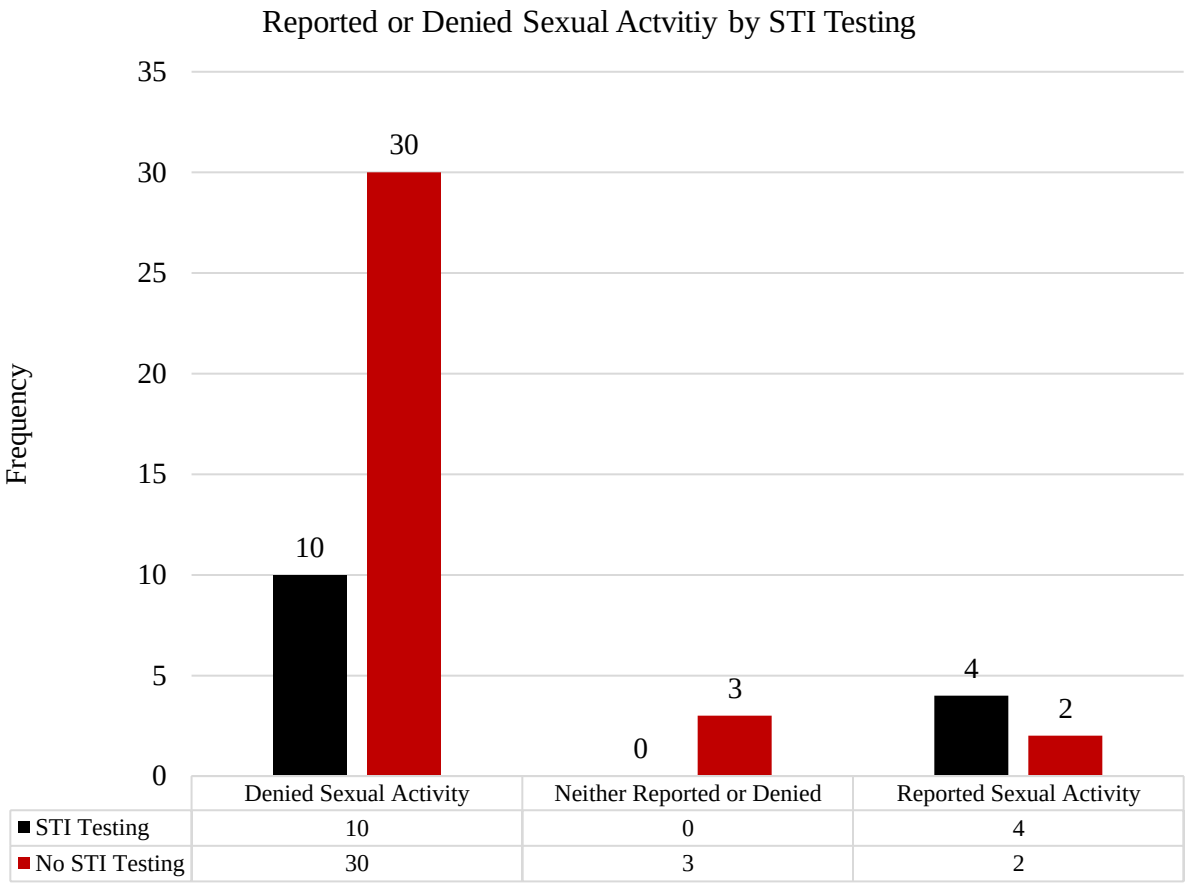
STI Urine Screen For Adolescents Reporting Sexual Activity On HEEADSSS (Cohort Three)

Variable	*n*	%	Cumulative %
Documented Sexual History			
Yes	11	100	100
Reported or Denied Sexual Activity			
Denied	10	90.91	90.91
Reported	1	9.09	100
STI Testing Done			
No	10	90.91	90.91
Yes	1	9.09	100
Race			
White	1	9.09	9.09
Black	9	81.82	90.91
Hispanic	1	9.09	100
Gender			
Male	7	63.64	63.64
Female	4	36.36	100

Variable	*M*	*SD*	*n*	*Mdn*	Mode
Age	14.55	1.51	11	14.00	13.00

Appendix E

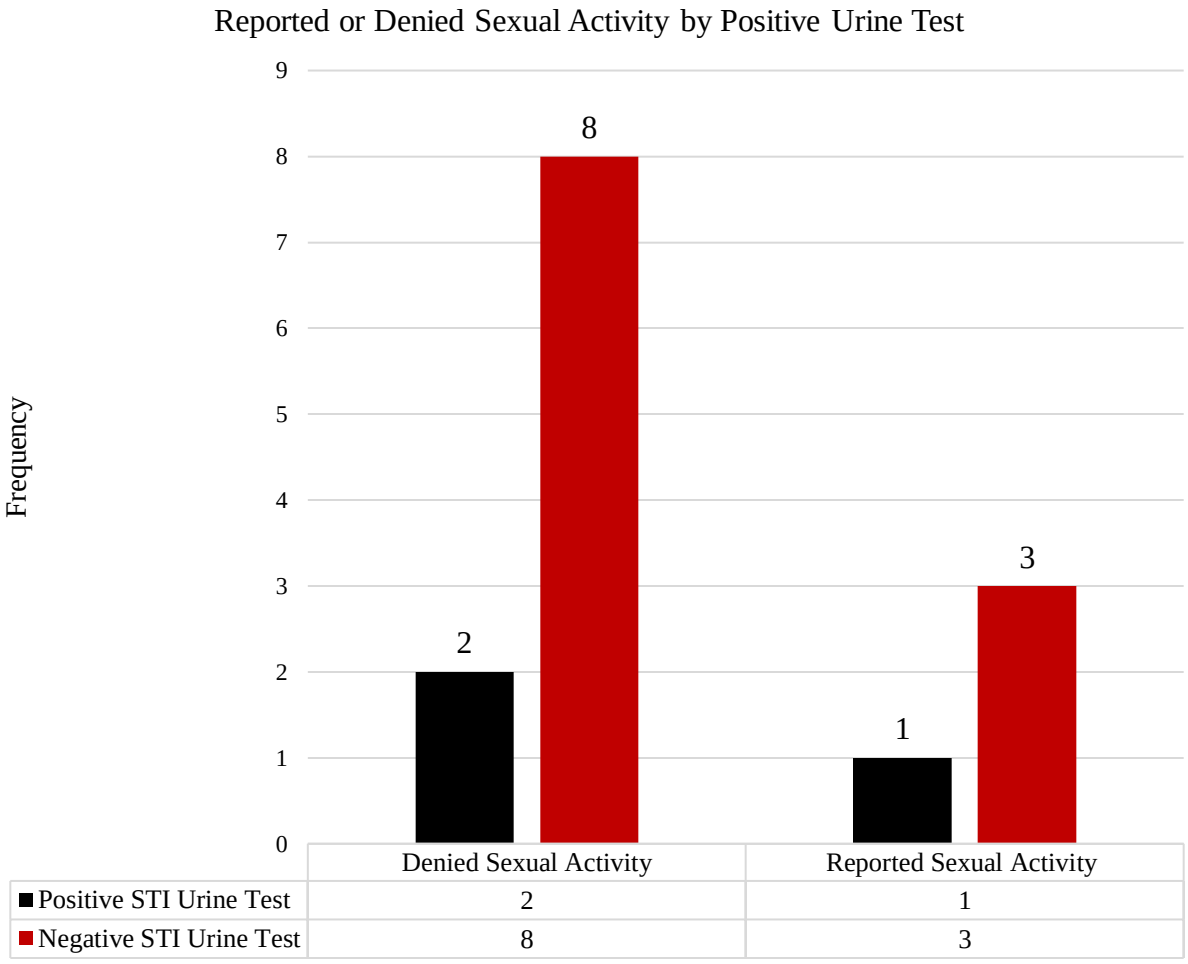
Figure 1. Chi-square Test of Cohort 1 and 2 – reported sexual activity & STI testing completed



	STI Testing Done				
Reported or Denied Sexual Activity	Yes	No	χ^2	*df*	*p*
Denied	10[11.43]	30[28.57]	5.72	2	.057
Neither Reported or Denied	0[0.86]	3[2.14]			
Reported	4[1.71]	2[4.29]			

Appendix F

Figure 2. Chi-square Test of Cohort 1 and 2 – reported sexual activity & positive urine test



	Positive Urine Test				
Reported or Denied Sexual Activity	Yes	No	χ^2	*df*	*p*
Denied	2[2.14]	8[7.86]	0.04	1	.837
Reported	1[0.86]	3[3.14]			