

Sexually Transmitted Infections in Adolescents

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Sexually transmitted infections (STIs) are very common in teenagers and young adults, with adolescents making up a disproportionate percentage of cases. This article reviews the epidemiology of STIs in North Carolina adolescents and summarizes current recommendations for screening, testing, and treatment. Successful strategies for maintaining confidentiality around screening, notification, billing, and treatment are also discussed.

Sexually transmitted infections (STI) are among the most common illnesses in teenagers and may lead to serious health problems. Consequences of STIs include ectopic pregnancy, pelvic inflammatory disease, infertility, chronic pain, and increased risk of exposure to other STIs, including HIV. Data from the 2011 Youth Risk Behavior Surveillance System survey show that 49.3% of North Carolina high school students report having ever had sexual intercourse [1]. National data provided by the Guttmacher Institute show that by age 15, 13% of teens have had intercourse, and by age 19, 70% of teens have done so [2]. Because people are marrying later, in their mid to late 20s on average, teens and young adults tend to have more partners before marriage, and their risk for unplanned pregnancy and STIs is thus increased [2]. There are 19 million new STIs diagnosed in the United States every year [3]. North Carolina ranks 17th among the states in the rate of chlamydial infections and 8th in the rate of gonorrhea infections [4]. People 15-24 years of age constitute only about 25% of those in the United States who have ever had sexual intercourse, but nearly half of all new STIs occur in this age group [5]. In 2000, infections with human papillomavirus (HPV), *Trichomonas vaginalis*, and *Chlamydia trachomatis* accounted for 88% of new STI cases [5].

Many STIs are asymptomatic, so screening is especially important to detect disease. Screening for STIs in adolescents and young adults requires that providers discuss personal issues and risk-taking behaviors as well as responsible decision making with teen patients. It is normal developmentally for teens to become more independent individuals and to be responsible about decision making. Parents exert the most influence on teen choices and expectations, but it is the role of the medical provider to assist in making teens aware of healthy choices. Many teens believe that a person with an STI will always have symptoms of disease. This myth and the normal adolescent thought that "it can't happen to me" underscore the need for medical providers to educate

adolescent patients about risk-taking behavior *before* they have engaged in any form of sexual contact.

A medical provider should include the family in the care of a teenager, but there are some topics that should be discussed privately with the teen. These discussions make teens aware of their responsibility for their own health and inform parents that another adult is speaking with their child about responsible choices. Decisions with teens should be collaborative, but they should also be developmentally sensitive. It is imperative both that teens feel safe in discussing confidential topics and that they be aware of the circumstances under which confidentiality may be breached. It is helpful to have information about practice policy with regard to teen confidentiality available to parents even before their child becomes a teenager, so that questions and concerns may be addressed.

Under North Carolina Statute 90-21.5, a minor "may give effective consent to a physician licensed to practice medicine in North Carolina for medical health services for the prevention, diagnosis and treatment of 1) venereal disease and other diseases reportable under G.S. 130A-135, 2) pregnancy, 3) abuse of controlled substances or alcohol, and 4) emotional disturbance"[6]. Adolescent confidential care is supported by the American Academy of Pediatrics (AAP), the Society for Adolescent Health and Medicine (SAHM), the American College of Obstetricians and Gynecologists (ACOG), the American Medical Association (AMA), and the American Academy of Family Practitioners. The law does not state that a provider cannot tell a guardian that an adolescent has been treated for an STI; it lets that decision be part of the physician-patient relationship. Common reasons for breaking confidentiality include medical emergencies, life-threatening conditions, and concern that a patient may cause harm to self, be harmed by others (physical or sexual abuse, or neglect), or have plans to harm or hurt others.

Some practices explain that if the provider has information about critical medical results, and set methods for reaching the patient (eg, calling the patient's cell phone number or calling the school nurse) have been unsuccessful-

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ful, the practice may contact a guardian and ask the guardian to tell the patient to contact the practice. In most cases, the results are not shared with the guardian until after the patient has been informed and has given consent for the physician to speak to the guardian. It may be helpful to have safeguards in place, such as a password given only to the patient, so that patients can call about their test results. More recently, giving online access to records and results has been problematic, because parents have sometimes been able to gain unintended access to a young person's results. Texting is another mode of communication. Many automated reminder systems can use texts. Text communication is patient-friendly, but privacy of the sender and patient confidentiality should be addressed. In all methods of communication, providers should ensure that confidential results remain confidential.

Specific screening recommendations vary by organization, and are summarized in Table 1. The Centers for Disease Control and Prevention (CDC) makes recommendations with the involvement of experts in the field, including rep-

resentatives from AAP, SAHM, ACOG, and the AMA, using data on prevalence, cost, and evidence [7, 8]. For example, the CDC does not recommend routine screening for *C. trachomatis* for all males, but it does make exceptions for areas of high prevalence and for high-risk populations such as adolescent males. Based on cost, comfort, and epidemiology, the CDC does not recommend routine screening for syphilis, bacterial vaginosis, hepatitis B, hepatitis A, or infection with *T. vaginalis* or with human papilloma virus. Again, there are exceptions for high-risk populations such as adolescents. Some medical practices do perform *T. vaginalis* screening in adolescents. The AAP and Bright Futures recommend routine screening for STIs in all sexually active teens [9]. The US Preventive Services Task Force (USPSTF) recommends counseling and education about STI prevention for all sexually active teens [10]. Bright Futures recommends gonorrhea and chlamydia testing for all sexually active teens, with HIV and syphilis screening for those who are at higher risk or live in a community where the prevalence is greater than 1% [12, 13]. Testing for other STIs such as *T. vaginalis*, herpes sim-

TABLE 1.
Routine Screening Recommendations for Sexually Transmitted Infections in Sexually Active, Asymptomatic Adolescents

Infectious agent	CDC ^a [7, 8]	Bright Futures [9]	USPSTF ^b [10]	ACOG [11]
<i>Chlamydia trachomatis</i>	Annual screening recommended for females and for high-risk males and males in areas of high prevalence	Annual screening recommended	Annual screening recommended for all females under 25 years of age	Annual screening recommended
<i>Neisseria gonorrhoeae</i>	Annual screening recommended	Annual screening recommended	Screening recommended for all females under 25 years of age	Annual screening recommended
HIV	Discussion and encouragement of testing recommended	Screening recommended in areas where prevalence is > 1%	Screening recommended for all pregnant females and for anyone engaging in high-risk sexual behavior	Recommended annually
Syphilis	Screening not recommended	Screening recommended in areas where prevalence is > 1%	Screening recommended for all pregnant females and for anyone at high risk ^c	Screening recommended if patient has been sexually assaulted or is HIV positive or pregnant
Herpes simplex virus	Screening not recommended	Examination recommended	Screening not recommended	Screening not recommended
Human papilloma virus	Screening not recommended; vaccination recommended	Examination and vaccination recommended	Balance of benefits and harms of screening cannot be determined; vaccination recommended	Screening not recommended; vaccination recommended
Hepatitis A	Screening not recommended; vaccination recommended	Vaccination recommended	Vaccination recommended	Screening not recommended; vaccination recommended
Hepatitis B	Screening not recommended; vaccination recommended	Vaccination recommended for all pregnant females; vaccination recommended for everyone	Screening recommended	Screening not recommended; vaccination recommended
<i>Trichomonas vaginalis</i> ^d	Screening not recommended	No recommendation	No recommendation	Screening not recommended

Note: CDC, Centers for Disease Control and Prevention; USPSTF, US Preventive Services Task Force; ACOG, American College of Obstetrics and Gynecology.

^aThe CDC recommends more thorough evaluation for pregnant teens and for males who have sex with males.

^bThe USPSTF advises physicians to consider demographics and social-contextual factors in making screening determinations and to consult with local public health officials and refer to epidemiologic data.

^cFemales and males at increased risk of syphilis are those who engage in high-risk sexual behavior or live in a community where prevalence is high.

^dMany practices that see adolescents screen for *T. vaginalis*.

TABLE 2.
CDC Treatment Guidelines for Sexually Transmitted Infections

Infectious agent	First-line treatment	Alternative treatment	Comments
<i>Chlamydia trachomatis</i>	A single dose of azithromycin 1 g orally OR doxycycline 100 mg orally twice a day for 7 days	Erythromycin base 500 mg orally 4 times a day for 7 days OR erythromycin ethylsuccinate 800 mg orally 4 times a day for 7 days OR levofloxacin 500 mg orally once a day for 7 days OR ofloxacin 300 mg orally twice a day for 7 days	
<i>Neisseria gonorrhoeae</i>	A single IM dose of ceftriaxone 250 mg PLUS a single dose of azithromycin 1 g orally, or doxycycline 100 mg orally twice a day for 7 days	If patient cannot present for ceftriaxone, a single dose of cefixime 400 mg orally may be substituted for it, but patient must then follow up for <i>N. gonorrhoeae</i> culture within 1 week	Penicillin, tetracycline, and quinolones are no longer treatment options for gonorrhea. Males who have sex with males must be treated with ceftriaxone plus azithromycin or doxycycline.
HIV	Referral to infectious disease specialist; treatment based on viral load and CD4, CD8 counts		
Syphilis (for treatment of tertiary or neurosyphilis, and for treatment of penicillin-allergic patients, see guidelines)	Benzathine penicillin G, 2.4 million units IM; 1 dose for early syphilis; 3 doses 1 week apart for late latent disease or latent disease of unknown duration	Quantitative nontreponemal serologic tests should be repeated at 6, 12, and 24 months	Treatment dose and duration based on duration of infection: primary, secondary, or early latent infection. CSF examination should be performed if titers increase 4-fold, or if an initially high titer ($\geq 1:32$) fails to decline at least 4-fold (ie, 2 dilutions) within 12-24 months of therapy, or if signs or symptoms attributable to syphilis develop.
Herpes simplex virus (for treatment of recurrent HSV, see guidelines)	Acyclovir 400 mg orally 3 times a day for 7-10 days OR acyclovir 200 mg orally 5 times a day for 7-10 days OR famciclovir 250 mg orally 3 times a day for 7-10 days OR valacyclovir 1 g orally twice a day for 7-10 days		Treatment can be extended if healing is incomplete after 10 days of therapy.
<i>Trichomonas vaginalis</i>	A single oral dose of metronidazole 2 g OR a single oral dose of tinidazole 2 g	Metronidazole 50 mg orally twice a day for 7 days	Patients should be counseled not to consume alcohol during treatment and until 24 hours after last dose of metronidazole or until 72 hours after last dose of tinidazole.

Note: IM, intramuscular; CSF, cerebrospinal fluid.

Source: 2010 CDC Sexually Transmitted Disease Treatment Guidelines [7].

*CDC recommendations for treatment of *N. gonorrhoeae* were updated in August 2012 [8].

plex virus, or HPV is not recommended as part of routine screening.

Most organizations also encourage prevention of STIs through education and vaccination. The CDC and Bright Futures specifically recommend the following for all adolescents: immunization against HPV, hepatitis A, and hepatitis B; education about HIV infection, testing, transmission; and the incorporation of education about sexuality into patient care [12, 13]. Bright Futures and USPSTF also recommend education about STIs for all adolescents.

Testing for STIs is generally noninvasive. For screening for gonorrhea and chlamydia, nucleic acid amplification tests (NAATs) are the most sensitive method. Testing

can be done on urine or on cervical or vaginal swabs if the patient is female. It is important to note that the urine used for NAAT should not be obtained using the "clean catch" method. Testing for gonorrhea or chlamydia using rectal and oropharyngeal swabs has not been approved by the US Food and Drug Administration. *C. trachomatis* can be cultured if collected in viral media. *Neisseria gonorrhoeae* can be cultured on Thayer-Martin plates (other media allow for many other normal flora bacteria to grow and obscure *N. gonorrhoeae*). *T. vaginalis* can be seen on wet prep or detected with commercially available rapid tests. Syphilis and HIV testing is done on blood samples. Both a positive treponemal and nontreponemal test are required for the diagnosis

of syphilis. Positive results on rapid HIV testing or enzyme-linked immunoabsorbent assay (ELISA) should be verified by Western blot test [14].

The CDC's treatment guidelines for sexually transmitted disease [7] are the best resource for treatment of STIs. The guidelines are based on cost, efficacy, epidemiology, and resistance data. The CDC's treatment recommendations are summarized in Table 2. Due to the emergence of resistant *N. gonorrhoeae*, dual therapy with intramuscular ceftriaxone and oral azithromycin (or doxycycline) is now recommended [8]. Also, oral antibiotics are not the recommended treatment for gonorrhea [15]. If a patient cannot come in for an intramuscular injection, oral antibiotics may be used, but the recommendation is for any patient so treated to return for a culture for *N. gonorrhoeae* within 1 week. Oral antibiotics are not recommended for the treatment of gonorrhea in males who have sex with males. Patients should be counseled to have no sexual contact until 7 days after completion of treatment both for themselves and for their partners. Regardless of whether patients believe their sex partners have been treated, patients should be retested for gonorrhea and chlamydia within 12 weeks after treatment. It should be noted that NAAT tests will remain positive for up to 3 weeks after eradication of infection; for that reason, most practitioners wait at least 4 weeks after treatment if using NAAT as the test of treatment.

Many reinfections with STIs are the result of not treating sexual partners. Expedited partner treatment (EPT) is legal in North Carolina and is approved by the North Carolina Medical Board and the North Carolina Board of Pharmacy. Providers should document on the prescription that the patient is receiving EPT and should ask the pharmacist to verify allergies and educate female partners to seek care if they experience any abdominal pain (out of concern regarding the possibility of pelvic inflammatory disease). The EPT prescription should also recommend seeking treatment for further STI testing. The CDC guidelines state that use of EPT for gonorrhea is acceptable, and that if the partner cannot come in for treatment, use of cefixime plus azithromycin is acceptable except for males who have sex with males.

Notification of adolescent patients should respect their patient rights and follow North Carolina law. Issues of billing and confidentiality may make adhering to guidelines difficult. If laboratory tests ordered for a minor are included on statements sent to policyholders, it may be prudent to have a list of other venues for testing available. These resources may include health department STI clinics and community resources or organizations. Teens are very technologically savvy, and there are many Web sites and text-messaging hosts that may be helpful in educating them. Providers using electronic medical records may want to consider extra safeguards on confidential information. These safeguards may include building "walls" into some records or labeling certain notes "Confidential" in a large, boldface font, so that other professionals accessing the record are aware of the need

to retain patient confidentiality. Confidential information about adolescents should not be made available through online patient portals that might be accessed by parents.

In summary, STIs are a very common problem among sexually active adolescents. Knowledge among teens about transmission of and testing and treatment for STIs is poor. Providers are in a unique position to provide education, prevention, screening, and treatment of teens and young adults. Through education, providers can support patients' goals and influence and modify their risk-taking behaviors. **NCMJ**

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