



# Recommendations for managing sexually transmitted infections: Incorporating the 2021 guidelines

*Abstract: Sexually transmitted infections (STIs) are common and costly, with about 26 million STIs occurring each year in the US. Guidelines for the prevention and management of STIs are updated periodically. In 2021, the CDC updated its guidelines for the treatment of STIs. This article provides information on the most recent updates on managing STIs to help advanced practice nurses in their practice.*

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**T**he CDC released updates to clinical guidelines on prevention of sexually transmitted infection (STIs) in 2021, the first comprehensive guidelines proposed since the CDC's 2015 guidelines.<sup>1</sup> The COVID-19 pandemic resulted in a lack of progress in STI prevention and contributed to delayed treatment. Closing of clinics, lack of staff, public fear of seeking preventive care, and the view that STI care is not essential contributed to decreased STI services.<sup>1,2</sup> Catch-up services are critical to prevent widening health disparities in STI prevalence rates. The CDC has published guidance to assist providers in optimizing access to STI prevention and management when patient-provider contact is limited or services are disrupted.<sup>1,2</sup> Guidance

on self-testing, telehealth, phone triage, and treatment options for individuals with STI symptoms when clinic visits are not reasonable emerged during the COVID-19 pandemic.<sup>1,2</sup> Nationally, health department staff were deployed to COVID-19 response teams as contact tracers.<sup>2-4</sup> These activities shifted services away from other core public health services such as STI outreach, prevention, and treatment. In addition, there were shortages of diagnostic testing and lab supplies. Each of these pandemic-related changes may have impacted STI rates and time to treatment.

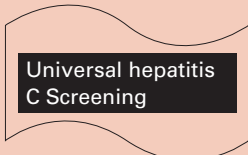
Populations most burdened by STIs include adolescents and young adults ages 15 to 24 years, racial and ethnic minority groups, and special populations such as men who have sex with

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## CDC recommendations for Hepatitis C screening

| Screening/Testing   | Recommendation   |
|---|--|
|  <p><b>Universal hepatitis C Screening</b></p>   | <p>Hepatitis C screening at least once in a lifetime for all adults age 18 years and older*</p> <p>Hepatitis C screening for all pregnant women during each pregnancy*</p>   |
| <p><b>One-time hepatitis C testing regardless of age or setting prevalence among people with recognized conditions or exposures</b></p>   | <ul style="list-style-type: none"> <li>• People with HIV</li> <li>• People who ever injected drugs and shared needles, syringes, or other drug preparation equipment, including those who injected once or a few times many years ago</li> <li>• People with select medical conditions, including maintenance hemodialysis and abnormal alanine aminotransferase levels</li> <li>• children born to mothers with HCV infection</li> <li>• Prior recipients of transfusions or organ transplants, including: <ul style="list-style-type: none"> <li>people who received clotting factor concentrates produced before 1987</li> <li>people who received a transfusion of blood or blood components before July 1992</li> <li>people who received an organ transplant before July 1992</li> <li>people who were notified that they received blood from a donor who later tested positive for HCV infection</li> </ul> </li> </ul> |
| <p><b>Routine periodic testing for people with ongoing risk factors, while risk factors persist</b></p>   | <ul style="list-style-type: none"> <li>• People who currently inject drugs and share needles, syringes, or other drug preparation equipment</li> <li>• People with select medical conditions, including people who ever received maintenance hemodialysis</li> </ul>   |
| <p>Any person who requests hepatitis C testing should receive it, regardless of disclosure of risk, because many persons may be reluctant to disclose stigmatizing risks</p>  |  |
| <p>Adapted from: Schillie S, Wester C, Osborne M, Wesolowski L, Ryerson AB. CDC recommendations for hepatitis C screening among adults - United States, 2020. <i>MMWR Recomm Rep.</i> 2020;69(2):1-17. doi:10.15585/mmwr.rr6902a1.<sup>31</sup></p> |  |
| <p>*Except in settings where the prevalence of HCV infection (HCV RNA-positivity) is less than 0.1%</p>   |  |

men (MSM), some transgender individuals, individuals who are incarcerated, and those who are homeless.<sup>1,4</sup> Some recommendations in the 2021 STI guidelines are specific to age, gender, sexual practices, or sexual preference. The information in this article incorporates updates from the guidelines. Notable updates include:

- Treatment recommendations for chlamydia, trichomoniasis, and pelvic inflammatory disease, as well as for uncomplicated gonorrhea in neonates, children, and other clinical situations
- Diagnostic tests for *Mycoplasma genitalium*, chlamydia, and gonorrhea
- Additional risk factors for syphilis testing in pregnant patients
- Testing for diagnosis of genital herpes simplex virus (HSV)
- Recommendations for human papillomavirus (HPV) vaccination
- Universal hepatitis C testing

## ■ Prevention of STIs

STIs are infections acquired through sexual contact. It is important for clinicians to be knowledgeable about evidence-based strategies for STI prevention. The three general levels of disease prevention strategies are primary, secondary, and tertiary levels.

### Primary prevention

Evidence-based strategies used to prevent STI exposure and acquisition include the use of technology platforms, mobile apps, and social media; behavior counseling; prevention education; and vaccination prior to sexual debut.<sup>1</sup> Examples of primary preventive methods include: pre-exposure vaccination (HPV, hepatitis A virus [HAV], and hepatitis B virus [HBV]); pre-exposure prophylaxis for HIV and HSV; condom use; post-exposure prophylaxis for HIV, chlamydia, and syphilis; and anticipatory guidance for adolescents and their parents. Research also supports the effectiveness of high-intensity behavioral counseling

and motivational interviewing to augment information provided in pamphlets, handouts, and videos.<sup>5-11</sup>

### Secondary prevention

Once exposure has occurred and before an individual becomes symptomatic, secondary prevention involves screening as early as possible to not only confirm disease, but also to minimize disease sequelae.<sup>5-9</sup> Examples of secondary prevention include treatment; counseling for individuals that are infected and their partners; expedited partner therapy; and periodic/follow-up screening. Screening should be age- and gender-appropriate and nonjudgmental.<sup>1</sup> During STI screening and treatment, nonjudgmental acknowledgment of adolescent, young, and older adults' engagement in behaviors that place them at high risk for STIs is a critical component of communication. Respect and compassion are fundamental in eliciting accurate and pertinent information during screening and treatment of STIs.<sup>1</sup>

The CDC and the Guttmacher Institute, a US research and policy organization dedicated to promoting sexual and reproductive health and rights, both recommend approaches to prevention and control of STIs. The Guttmacher Institute recommends attention to individual risk, combined with education and counseling toward behaviors that lower risk.<sup>7,12</sup> The CDC approach recommends systematic reviews of evidence in the literature specific to population risk for infection and development of prevention and management education.<sup>1</sup> Individualized risk assessment and a population approach to STI screening are important in asymptomatic individuals with STIs, similar to measures used in individuals with symptoms.<sup>7</sup>

Follow-up of individuals with an STI diagnosis should include evaluation, treatment, and counseling of sex partners.

### Tertiary prevention

A third type of prevention, tertiary prevention, involves the use of strategies directed at reducing death and disability, minimizing or delaying complications, and if possible, returning function with the intended goal of improving quality of life.<sup>5</sup> Examples of tertiary prevention include the use of antimicrobial and antiretroviral therapy; support groups; and rehabilitation programs.

### ■ Immunizations

Currently, immunizations are available for three STIs: HAV, HBV, and HPV.<sup>13</sup> There are no recent changes

#### Recommendations for HPV vaccine regimen<sup>1,32</sup>

| Two-dose   | Three-dose   |
|--|--|
| A two-dose schedule with the second dose given at 6-12 months after the first is recommended for persons ages 9 to 14 years who initiate vaccination before their 15th birthday. | A three-dose schedule with the second dose given at 1-2 months after the first, and the third given 6 months after the first is recommended for immunocompromised persons regardless of age of initiation and for persons initiating the vaccine at age 15 or older. |

in recommendations for the HAV vaccine. In 2018, the CDC issued updated recommendations for the HBV vaccine. These updates include recommendations regarding vaccination of newborns, testing of certain pregnant women and infants, indications for revaccination of infants, and vaccination for persons with chronic liver disease.<sup>1,14</sup>

The CDC recommends HPV vaccination for all adolescents age 11 or 12 years and for individuals up to age 26 years not previously vaccinated.<sup>1</sup> Adults ages 27 to 45 years not previously vaccinated may elect to receive the vaccine through shared clinical decision-making. The 9-valent vaccine (Gardasil 9) is the only vaccine available in the US and targets HPV types 6, 11, 16, 18, 31, 33, 45, 52, 58 (see *Recommendations for HPV vaccine regimen*).<sup>1</sup> It is approved for the prevention of certain cancers, precancerous or dysplastic lesions, and genital warts caused by HPV.<sup>1,15</sup> HPV vaccines are not recommended for use in pregnant women.<sup>1</sup> Initiatives such as the Vaccines for Children program are available for underinsured or uninsured children younger than 19 years of age. HPV vaccination is not a reason to stop routine cervical cancer screening.<sup>1</sup>

### ■ Viral STIs

#### HPV

High-risk HPV (genotypes 16 and 18) is a cancer-causing STI.<sup>1</sup> High-risk HPV is a common cause of cervical, vulvar, vaginal, anal, and oropharyngeal cancers and precancers.<sup>1</sup> Low-risk genotypes 6 and 11 cause genital warts, which are mostly benign in nature.<sup>1</sup> Benign warts caused by low-risk genotypes do cause great emotional distress.<sup>1</sup> Prevention of HPV infections and disease has been well established through vaccination, as discussed earlier.

## HIV

HIV is a virus transmitted through sexual intercourse, blood, and breast milk.<sup>1</sup> Symptoms of early acute HIV infection that are usually flulike (for example, fever, chills, night sweats, myalgia, sore throat, malaise, lymphadenopathy) typically appear within 2 to 4 weeks after infection.<sup>1,9</sup> However, not all individuals who become infected experience symptoms. Those who are chronically infected with HIV and not on treatment will eventually progress to late-stage HIV infection, referred to as AIDS, in which the body's immune system is significantly weakened and cannot fight off opportunistic infections.<sup>1,9,10</sup>

A patient who presents for suspected HIV infection should be screened with a lab-based HIV 1/2 antigen/antibody combination assay or rapid testing through oral or blood specimens in which patients receive their results within 20 minutes. Rapid testing can be performed in community-based settings or at home; however, results should be followed with a lab confirmatory test. If preliminary HIV test results are negative or indeterminate and there is concern for early or acute infection (for example, sexual exposure within the last few weeks and infection in the sexual partner cannot be ruled out), testing for HIV RNA should be conducted.<sup>1</sup> If this is also negative, repeat testing in a few weeks is recommended.



***Pre-exposure prophylaxis (PrEP) taken daily is recommended for HIV prevention for those at high risk.***

HIV screening is recommended at least once for everyone ages 15 to 65 years.<sup>1</sup> Additionally, all patients presenting to a healthcare center for STI evaluation should receive HIV testing, and those presenting for HIV screening and who confirm a history of unprotected sex should be offered additional STI testing.<sup>1,11</sup> All patients, regardless of whether they test positive or negative for HIV, should receive safer sex and risk reduction counseling from a healthcare provider.

Pre-exposure prophylaxis (PrEP) taken daily is recommended for HIV prevention for those at high risk.<sup>1,9-11,16</sup> Studies have established that the risk of HIV transmission during sex and I.V. drug use are substantially lowered when PrEP is used consistently.<sup>1,10,11,16</sup> PrEP may also be taken on demand (following

a specific dosing schedule before and after sex) for certain individuals; however on-demand dosing is off-label, currently not part of the CDC guidelines, and must be discussed in consultation with a healthcare provider.<sup>17</sup> Two drugs are currently approved for PrEP: Truvada (emtricitabine and tenofovir disoproxil fumarate) and Descovy (emtricitabine and tenofovir alafenamide).<sup>11,17</sup> Truvada is approved for use by all people at risk for HIV through sex. Descovy is approved for use by people at risk for HIV through sex, except for people at risk from receptive vaginal sex.

Some MSM practice HIV seroadaptive strategies to prevent HIV transmission. These include serosorting (limiting anal sex without a condom to partners with the same HIV status and using a condom only with HIV serodiscordant partners) and seropositioning (avoiding insertive anal sex if HIV positive).<sup>1</sup> Serosorting and other seroadaptive practices carry greater HIV risk than consistent condom use.<sup>1</sup> The CDC guidelines recommend against serosorting because people may be unaware of their HIV status if they haven't been tested recently, not accurately share their status, or incorrectly assume their partner's status. Patient education regarding seroadaptive strategies should include that home-testing HIV kits detect antibodies, and not acute HIV infection; that consistent condom use is superior for preventing HIV; and that there is an increased risk of other STIs using these strategies.<sup>1,11,16</sup>

## Hepatitis

Sexual transmission of hepatitis C is higher among individuals who engage in traumatic and high-risk sexual practices; men who are HIV-

positive and have sex with men, engage in group sex, or use drugs during sex; and heterosexual persons with multiple partners.<sup>18</sup> Universal screening for hepatitis C is recommended for adults in the 2021 guidelines, as well as for women during each pregnancy, if local prevalence is 0.1% or greater (see *CDC recommendations for hepatitis C screening*).<sup>1</sup>

## Zika virus

Although the Zika virus is not discussed in the updated CDC STI guidelines, it is notable as it can be sexually transmitted. As of 2019, eighty-seven countries or territories reported current or previous local transmission.<sup>19,20</sup> Although the reasons for the sudden emergence of the virus around 2014 are not clear, it has

been postulated that the effect of climate change on the distribution of the vector may have played a significant part. The main mode of Zika virus transmission to humans is via mosquitos, although human-to-human transmission routes, such as perinatal transmission, sexual transmission, and breastfeeding, have been described.<sup>19,21-25</sup>

Most Zika virus infections are characterized by subclinical or mild influenza-like illness. However, severe neurologic manifestations have been described, including Guillain-Barré syndrome in adults; fetal risks in mothers infected with Zika virus include microcephaly and other severe fetal brain defects, among others.<sup>19,21-25</sup> Prevention strategies for Zika include avoidance of exposure to mosquito bites and use of condoms, especially for pregnant persons and those of childbearing potential.

There are 5 serologic assays and 14 molecular assays for Zika virus with FDA Emergency Use Authorization.<sup>25</sup> Currently, no vaccines or antiviral treatments have been approved to cure Zika infection and patient care is mainly supportive in nature.

## HSV

Diagnosis of genital herpes, which is caused by HSV-1 and HSV-2, can be challenging because, due to the chronic, often recurrent nature of the infection, lesions may not be present when a patient is being evaluated. If lesions are present, confirmation of clinical diagnosis by type-specific viral testing via culture or nucleic acid amplification testing (NAAT) should be completed.<sup>1</sup> In persons without lesions who are suspected to have HSV-2, a two-step serologic test is preferred. Enzyme immunoassay (EIA) testing (that is, HerpeSelect HSV-2 EIA) should be followed by confirmation testing because of poor specificity and high false-positive rates in EIA tests.<sup>1,26</sup> Use of confirmatory tests (BioKit or Western blot) increases accurate identification of HSV-2. Clear diagnosis of HSV-2, which is almost always sexually acquired, provides opportunity for focused education to reduce spread.<sup>1,26</sup>

## ■ Bacterial STIs

### Gonorrhea and chlamydia

Sexually active women under the age of 25 years should be routinely screened for gonorrhea (caused by *Neisseria gonorrhoeae*) and chlamydia (caused by *Chlamydia trachomatis*) as prevalence is highest among this age group.<sup>1</sup> In addition, women older than 25 years of

age at high risk for infection and sexually active MSM should also be screened annually.<sup>1</sup> MSM at high risk for infection should be screened at all anatomic sites of exposure every 3 to 6 months.<sup>1</sup>

For treatment of gonorrhea, a single dose of ceftriaxone I.M. is the gold standard. Providers should take care to also promptly treat patients for chlamydia if it has not been ruled out. Treatment for chlamydia has been updated in the 2021 guidelines.<sup>1</sup> The recommended regimen for nonpregnant adolescents and adults is doxycycline 100 mg orally 2x/day for 7 days, with other regimens used only by exception.<sup>1</sup> Providers should keep in mind that men and women in younger age groups may be less likely to use condoms than older adults, increasing the risk of repeated chlamydia and/or gonorrhea infections.<sup>1</sup> Retesting at 3 months after treatment is recommended.

## Syphilis

Screening tests for syphilis, which are classified as nontreponemal tests, remain the same as in the previous guideline and include the rapid plasma reagin and the Venereal Disease Research Lab tests.<sup>1</sup> Definitive, treponema-specific (treponemal) tests are done in specialized labs. Definitive diagnosis requires both a nontreponemal test and a treponemal test.<sup>1</sup> Testing for HIV is important for anyone who has received a diagnosis of syphilis.<sup>1,27</sup>

Penicillin G is the preferred drug for treatment of syphilis, and for patients who are pregnant, it is the only recommended treatment.<sup>1</sup> The preparation of penicillin G used as well as dosage and treatment length vary based on the stage of disease and other factors. Those receiving treatment for syphilis should be informed about the possibility of a Jarisch-Herxheimer reaction, which may include symptoms of headache, myalgia, and fever, after starting therapy. This is not an allergic reaction to penicillin, but rather a reaction to treatment.

All individuals treated for primary and secondary syphilis should have follow-up clinical evaluation and serologic testing at 6- and 12-months following treatment.<sup>1,27</sup> Clinicians should refer to the guidelines for more detailed information on recommended follow-up and evaluation of treatment response.

## Trichomoniasis

Although trichomoniasis is a parasitic protozoal infection, it is included in this section as it is



conventionally discussed along with bacterial infections. Because trichomoniasis is the most common nonviral STI, CDC guidelines recommend screening women who seek care for vaginal discharge concerns, and consideration of annual screening for those in high-prevalence settings and those at high risk.<sup>1</sup> Routine annual screening for *Trichomonas vaginalis* in asymptomatic women with HIV infection is also recommended because of adverse events associated with trichomoniasis and HIV infection.<sup>1</sup> Evidence does not support routine screening for *T. vaginalis* among asymptomatic pregnant women.<sup>1</sup>

Use of highly sensitive and specific NAAT is now recommended for detecting *T. vaginalis*.<sup>1</sup> The 2021 CDC treatment guidelines no longer include tinidazole as a recommended treatment option, although it remains as an alternative regimen.<sup>1</sup> Trichomoniasis in women should be treated with metronidazole 500 mg P.O. twice a day for 7 days. In men, a one-time 2 g dose of metronidazole orally is indicated.<sup>1,27</sup> Retesting 3 months after treatment of trichomoniasis is recommended to detect repeat infection.<sup>1</sup>

### *Mycoplasma genitalium*

Since being isolated in 1980, *M. genitalium* has become known as a significant source of nongonococcal urethritis in men and cervicitis and urethritis in women, and it has been associated with upper pelvic infections (pelvic inflammatory disease [PID]) in women.<sup>1</sup> Untreated, the disease has been associated with preterm birth, spontaneous abortion, and/or PID.<sup>1</sup> A history of PID appears to be associated with subsequent development of noninvasive tumors of uncertain malignant potential. Rasmussen et al. noted that women with two or more episodes of PID had double the risk of developing these tumors.<sup>28</sup> Major symptoms in women can include abdominal pain and dyspareunia. In men, urethritis and penile discharge are the most common symptoms.<sup>1</sup>

The only way of specifically diagnosing *M. genitalium* infection is by NAAT.<sup>1</sup> *M. genitalium* has become increasingly resistant to azithromycin and resistance to other antimicrobials has been noted. As a result, the 2021 CDC guidelines call for treatment plans based on whether resistance testing is available:

- For patients with macrolide-sensitive infections, doxycycline followed by azithromycin
- For patients with macrolide-resistant infections, doxycycline followed by moxifloxacin

- If resistance testing is not available, doxycycline followed by moxifloxacin<sup>1</sup>

Specific guidelines for dosage and timing of *M. genitalium* treatment can be found in the CDC pocket guide.<sup>27</sup> Timely and appropriate treatment has a significant role in decreasing potential sequelae of PID.

### PID

A variety of organisms can cause PID. The 2021 guidelines have updated treatment recommendations for PID, which can lead to infertility.<sup>1</sup> Parenteral, I.M., and oral treatment regimens for PID exist. Patients with a diagnosis of PID may require initial hospitalization for parenteral therapy, with transition to oral therapy to complete 14 days of antimicrobial therapy.<sup>1</sup> I.M. and oral therapy can be given to those with mild to moderate disease and typically consists of a combination of a third-generation cephalosporin, doxycycline, and—specific to anaerobic organisms—metronidazole. PID treatment regimens should include broad-spectrum coverage against *N. gonorrhoeae* and *C. trachomatis*. Follow-up within 72 hours for reevaluation and confirmation of diagnosis is suggested for those receiving I.M. or oral regimens; hospitalization with parenteral treatment is recommended for those not improving. Dosage and timing of treatment can be found in the complete guidelines or the pocket guide.<sup>1,27</sup>

## ■ Special populations

### Adolescents

All 50 states and the District of Columbia allow minors to consent for their own health services for STIs.<sup>29</sup> No state requires parental consent for STI care, nor is there a requirement that providers notify parents that their adolescent minor has received STI services.<sup>1,29</sup>

### Older adults

Men and women are living longer, healthier lives and are sexual beings into older adulthood, as reflected in a rise in STI and HIV rates in the US and internationally among this age cohort.<sup>1</sup> Education during clinical encounters should include consistent condom use, biological risk factors such as decreased immune response, decreased estrogen, and psychosocial changes, which have a role in STI prevention among older adults.<sup>1</sup> The CDC's routine HIV screening recommendations ends at age 64 years.<sup>1</sup> In adults older than 65 years of age, screening is based on sexual risk assessment.<sup>1</sup>

## Transgender individuals

Transgender individuals have a gender identity that differs from the sex that they were assigned at birth. Transgender women are born with male anatomy but identify as women. This population has concerning rates of HIV infection in the US.<sup>1</sup> Transgender men are born with female anatomy but identify as men.<sup>1</sup> It is important to note that gender identity is independent of sexual orientation.

There is a great deal of anatomic diversity in both populations. Some individuals have gone through medical and/or surgical steps to transition from sex assigned at birth to the opposite sex, while many others have not. Transgender men may still have a vagina and cervix, and thus are susceptible to diseases of the female genital tract.<sup>1</sup> The same may be true for transgender women with regard to prostate cancer, for example. Establishing a rapport with the individual and discussing anatomic screening needs and sexual behavioral practices is key to ensuring appropriate care.<sup>1</sup>


## ■ Reporting, confidentiality, and discrimination

Reportable STIs in every state include syphilis, congenital syphilis, gonorrhea, chlamydia, chancroid, and HIV.<sup>1</sup> STI and HIV reports are confidential.

People with HIV are protected against discrimination under provisions of the Americans with Disabilities Act, which states that those with HIV, whether symptomatic or asymptomatic, “have physical impairments that substantially limit one or more major life activities or major bodily functions.”<sup>30</sup>

## ■ Implications for advanced practice nurses

As noted by the CDC, World Health Organization, and FDA, the prevention, management, and treatment of STIs is a rapidly evolving area requiring advanced practice nurses (APNs) to remain up-to-date on guidelines. APNs serve as an essential component of the healthcare workforce addressing the increasing STI rates in the US through STI testing and treatment and ensuring delivery of indicated preventive services (such as, immunizations and PrEP). APNs should refer to the guideline for more in-depth information and information on other topics such as medication allergies and sexual assault and abuse.<sup>1</sup> A wall chart and pocket guide of the guidelines are available on the CDC website. A mobile app is under construction. However, an interim mobile site is available.

An understanding of health consequences of missed or inappropriately diagnosed STIs can help prevent development of disease sequelae. APNs using targeted education campaigns geared to specific age groups and special populations—such as adolescents—are champions for preventing and decreasing STIs. Patient encounters assessing risk of STIs (sexual exposures, practices) provide APNs an opportunity for focused patient education. Furthermore, educating individuals about the signs and symptoms of STIs reinforces the importance of early treatment if an infection should occur. 

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