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June 2007 "Review of Sexually Transmitted Diseases" 707-000-07-006-H01

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**THIS MONTH--
"Review of STDs"**

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HAVE YOU RECENTLY MOVED? PLEASE NOTIFY US.

Sexually transmitted diseases are a major public health challenge. Our primary goals are to discuss prevention & therapeutic options. This lesson provides 1.25 hours (0.125 CEUs) of credit, and is intended for pharmacists in all practice settings.

The program ID # for this lesson is 707-000-07-006-H01.

Pharmacists completing this lesson by June 30, 2010 may receive full credit.

To obtain continuing education credit for this lesson, you must answer the questions on the quiz (70% correct required), and return the quiz. Should you score less than 70%, you will be asked to repeat the quiz. Computerized records are maintained for each participant.

If you have any comments, suggestions or questions, contact us at the above address, or call toll free 1-800-323-4305. (In Alaska and Hawaii phone 1-847-945-8050). **Please write your ID Number (the number that is on the top of the mailing label) in the indicated space on the quiz page** (for continuous participants only).

The objectives of this lesson are such that upon completion the participant will be able to:

1. Discuss ways to prevent STDs in persons of risk.
 2. Describe the new HIV testing guidelines.
 3. Comment upon the signs & symptoms of common STDs.
 4. List the common treatments for STDs.
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INTRODUCTION

Sexually transmitted Diseases (STDs) are a major public health challenge both in the United States and globally.^{1,2} According to the World Health Organization, there were 340 million new cases of STDs (not including HIV/AIDS) in 1999.³ There has been substantial progress made preventing, diagnosing and treating STDs, but the Centers for Disease Control (CDC) in the United States estimates there are approximately 19 million new infections every year. These diseases not only have physical and psychological consequences, they have a tremendous economic toll. In the United States, the direct medical costs associated with STDs are estimated to be up to \$14.1 billion annually.¹

PREVENTION STRATEGIES

The presence of an untreated STD enhances the acquisition and transmission of HIV by up to 10 times; therefore, STD treatment and prevention strategies are important in the general population and those of high risk. Physicians and other health-care providers (including pharmacists) play an important role in preventing and treating STDs.⁴ Primary prevention begins with changing the sexual behaviors.

PREVENTION GUIDELINES

Prevention is the key to controlling STDs. The CDC publishes guidelines for the treatment and prevention of STDs in order to guide healthcare professionals in United States.⁴

The prevention and control of STDs is based on five principles:

1. Education and counseling of persons at risk.
2. Identification of asymptomatic individuals and of symptomatic individuals unlikely to seek care.
3. Effective diagnosis and treatment of infected people.
4. Evaluation, treatment and counseling of sexual partners.
5. Preventative vaccines for persons at risk.

It is essential to counsel patients in a respectful, non-judgmental and compassionate manner in order to deliver the prevention messages. Some of these techniques suggested by the CDC are using open-ended questions, and understandable language. There are 5 key areas to focus on which include: Partners, Prevention of Pregnancy, Protection from STDs, Practices, and Past History of STDs. The following are some examples:

1. Partners:
 - a. "Have you had sex with men, women or both?"
 - b. "In the past 12 months, how many partners have you had?"
2. Prevention of Pregnancy:
 - a. "Are you or your partner trying to get pregnant, and if not, how are you preventing pregnancy?"
3. Protection from STDs
 - a. "What do you and your partner do to protect yourself from STDs?"
4. Practices:
 - a. "Do you use condoms? How frequently?"
 - i. If no, what situations or with whom do you not use condoms?
5. Past History of STDs
 - a. "Have you or any of your partners ever had an STD?"

It is important to emphasize to patients that treatment will be provided regardless of circumstances such as the ability to pay, citizenship, etc. It is important to evaluate for all common STDs, even if patients are seeking treatment for a specific STD.

PREVENTION METHODS⁴

Abstinence

The most reliable way to avoid transmission of STDs is to abstain from sexual activity or to be in a long-term, mutually monogamous relationship with an uninfected partner.

Vaccines

Pre-exposure vaccines are an effective method to prevent transmission of some STDs. The hepatitis B virus can be sex-

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ually transmitted, and therefore, the vaccination is recommended for all patients who are uninfected and unvaccinated. The hepatitis A vaccine is recommended for all men who have sex with men (MSM), and illicit drug users. Recently, a quadrivalent vaccine against human papillomavirus (HPV types 6, 11, 16, and 18) was approved by the FDA and is licensed for females aged 9 to 26 years old.

Male Condoms

Male latex condoms, when used routinely and correctly, are effective in preventing sexual transmission of HIV infections and other STDs including chlamydia, gonorrhea, and trichomoniasis. It may also reduce the risk of women developing pelvic inflammatory diseases. It may also reduce the risk for transmission of herpes simplex virus-2 and the risk for HPV-related diseases such as genital warts and cervical cancer, but the data is limited.

Condoms are considered medical devices and are regulated and tested by the FDA. Every latex condom manufactured in the United States is tested electronically for holes before it is packaged. Approximately two condoms break for every 100 used during sexual intercourse and withdrawal in the United States. Inconsistent or incorrect use is the most common reason for failure of condoms.

There are condoms available in the United States made from materials other than latex. There are those made from polyurethane and other synthetic materials that are protective against HIV, STDs and pregnancies similarly to latex condoms. This is an acceptable alternative for those with latex allergies. The second type of condom is a natural membrane condom usually made from lamb cecum. These condoms have larger pores not allowing sperm to cross, but may allow pathogens causing STDs, and therefore, are not recommended for STD prevention.

Male condoms are effective in protecting against STDs and pregnancies when used routinely and correctly. Patients must be instructed on the correct use of condoms.

Female Condoms

Female condoms consist of a lubricated polyurethane sheath with a ring on each end that is inserted into the vagina. They have been tested in laboratory studies and have demonstrated an effective barrier to viruses (including HIV) and semen, but there are limited clinical studies evaluating the efficacy of them providing protection against STDs. In situations where male condoms cannot be used properly, female condoms should be considered.

Spermicides

Spermicides containing nonoxynol-9 are not effective in preventing cervical gonorrhea, chlamydia or HIV infection. Frequent use of nonoxynol-9 containing spermicides has been associated with disruption of the genital epithelium which may be associated with an increased risk of HIV transmission. Condoms containing spermicides are not more effective than other lubricated condoms in protecting against HIV transmission or other STDs. Condoms containing the spermicide nonoxynol-9 are not recommended because they cost more, have a shorter shelf-life and have been associated with increased urinary infections in young women.

Diaphragms

In non-randomized studies, diaphragm use has demonstrated protection against cervical gonorrhea, chlamydia and trichomoniasis, but should not be used for HIV prevention.

Non-barrier Contraception, Surgical Sterilization and Hysterectomy

Women who are sexually active and are not at risk for pregnancy might think they are not at risk for STDs, but in fact they are. Women who use hormonal contraception, IUDs, have been surgically sterilized, or have hysterectomies should be counseled on the importance of prevention of HIV and STDs by using condoms.

Partner Management

Partner notification (also known as contact tracing) is a process that healthcare providers or public health officials learn from persons with STDs about their sexual partners and help arrange for the evaluation and treatment of them. This can be accomplished directly through the patient or with assistance from the state and local health department. The pursuit of treatment and evaluation of sex partners varies depending among providers, agencies and geographic areas.

Whether partner notification effectively decreases exposure to STDs or whether it changes the incidence and prevalence to STDs in the community is uncertain. Many persons individually benefit from partner notification because there is a reduced risk of reinfection. At the population level, it may interrupt the network of STDs and may reduce new infections, so it is important for healthcare providers to encourage patients to refer sex partners for evaluation and treatment. If the partner cannot make it in for treatment, there are additional options such as "patient-delivered therapy." This is when the partner of the infected individual is treated without evaluation or prevention counseling. There have been 3 clinical trials in heterosexual men and women with chlamydia or gonorrhea that indicated reinfection was reduced and partner notification was increased with patient-delivered therapy. It is important to include treatment instructions, warnings about the medications if pregnant, general health counseling and instruction when to seek additional medical attention (such as signs/symptoms of Pelvic Inflammatory Diseases, etc) when patient - delivered therapy is given. Patient-delivered therapy has a limited role in trichomoniasis, syphilis or in MSM patients with

chlamydia or gonorrhea infection.

SPECIAL POPULATIONS⁴

There are certain populations in which STDs have increased consequences or increased prevalence. It is important to address specific STDs and diagnostic tests when counseling these patient populations.

PREGNANCY

STDs during pregnancy can have grave consequences on the female, their partners and the fetus. All pregnant women and their partners should be asked about STDs, especially women at risk such as those with a history of multiple or new partners. The following is a list of recommended screening tests:

Screening Test	Timing
HIV ⇒ all women	<ul style="list-style-type: none"> As early as possible but before 36 weeks Retest high risk women in the 3rd trimester
Serologic test for syphilis ⇒ all women	<ul style="list-style-type: none"> First prenatal visit Retest in high risk women in third trimester (live in areas with high prevalence, previously untested, or had previously positive test in 1st trimester)
Hepatitis B surface antigen ⇒ all women even if vaccinated or tested	<ul style="list-style-type: none"> First trimester
<i>Chlamydia trachomatis</i> ⇒ all	<ul style="list-style-type: none"> First prenatal visit
Gonorrhea ⇒ all women at risk and high prevalence areas	<ul style="list-style-type: none"> First prenatal visit
Hepatitis C ⇒ All women at high risk (history of injection drug-use, h/o blood transfusion or organ transplantation before 1992)	<ul style="list-style-type: none"> First prenatal visit
Bacterial Vaginosis ⇒ Not routine testing	<ul style="list-style-type: none"> First prenatal visit of women with history of preterm delivery

ADOLESCENTS

The rates of STDs are the highest among adolescent patients. The reported rates of chlamydia and gonorrhea are highest among females aged 15 to 19. HPV infection is mostly acquired during adolescent years. In order to eliminate hepatitis B virus (HBV) transmission the ACIP (Advisory Committee on Immunization Practices) has recommended that all children and adolescents receive the HBV vaccine. Adolescents are most susceptible to STDs because they frequently have unprotected sex, are biologically more susceptible to infection, are engaged in sexual relationships with a short duration and face multiple obstacles accessing medical care.

All adolescents in the United States can legally consent to confidential diagnosis and treatment of STDs (with only a few exceptions), and adolescents can be provided medical care for STDs without parental consent or knowledge. Also in the majority of states, HIV counseling and testing can be performed in adolescents without parental consent or knowledge. Often providers neglect to address sexual behavior or address risk reduction or screen for asymptomatic infections during clinical encounters with adolescents.

MEN WHO HAVE SEX WITH MEN (MSM)

Some MSM are at high risk for HIV and other STDs. Overall, the incidence of unsafe sex practices, STDs and HIV has declined since the 1980s thru the 1990s in this population. During the last 10 years, there have been increased rates of syphilis, gonorrhea and chlamydial infections and unsafe sex practices globally in industrialized countries. Routine testing for common STDs is indicated for all sexually active MSM and should be performed at least annually. These tests include HIV and syphilis serology, and *N.gonorrhoeae* and *C.trachomatis* culture of the urethra and rectum. In addition, vaccination against hepatitis A and B are recommended for all MSM without previous infection or immunization.

WOMEN WHO HAVE SEX WITH WOMEN (WSW)

There is not much data available on the risk of STDs acquired by sex between women. The risk of STDs varies by sexual practice and specific STD. The majority of self-identified WSW has had sex with men and might continue this practice, so it is recommended that all women should undergo Pap smear screening and STD testing as routinely recommended.

HIV TESTING^{4,5}

Recently, the CDC revised the recommendation for HIV testing in the healthcare setting. The recommendations aim to make HIV testing a routine part of medical care in addition to diagnosing HIV infection among pregnant women. These recommendations were established because 25% of HIV infected individuals in the United States are unaware that they are infected. The key points made by the recommendations are:

- HIV screening is recommended for patients in all health-care settings after the patient is notified that testing will be performed unless the patient declines (opt-out screening).
- Persons at high risk for HIV infection should be screened for HIV at least annually.
- Separate written consent for HIV testing should not be required; general consent for medical care should be considered sufficient to encompass consent for HIV testing.
- Prevention counseling should not be required with HIV diagnostic testing or as part of HIV screening programs in health-care settings.

For pregnant women:

- HIV screening should be included in the routine panel of prenatal screening tests for all pregnant women.
- HIV screening is recommended after the patient is notified that testing will be performed unless the patient declines (opt-out screening).
- Separate written consent for HIV testing should not be required; general consent for medical care should be considered sufficient to encompass consent for HIV testing.
- Repeat screening in the third trimester is recommended in certain jurisdictions with elevated rates of HIV infection among pregnant women.

HIV DIAGNOSTIC TESTING

HIV infection is usually diagnosed by tests for antibodies against HIV-1, but there are some tests that test for antibodies against HIV-2 (which is predominantly found in West Africa.) Antibody testing begins with a screening test such as the enzyme immunoassay or rapid test. The rapid test allows healthcare providers to make a presumptive diagnosis of HIV within 30 minutes. Positive rapid test results must be confirmed with supplemental testing such as a Western blot (WB) or an immunofluorescence assay (IFA). HIV antibodies are detectable within 3 months after an infection. There are two rapid HIV antibody tests currently approved by the FDA. The following are available for clinical use: the OraQuick Rapid HIV-1 Antibody Test and the Reveal HIV-1 Antibody Test. The UniGold Recombigen HIV Test is expected to become available shortly. Information on the availability of rapid HIV tests is routinely updated on the CDC Web site, at http://www.cdc.gov/hiv/rapid_testing/ and is also available on the FDA Web site, at <http://www.fda.gov/cber/products/testkits.htm>.

Healthcare-providers should be aware of the signs and symptoms of acute retroviral syndrome. These are characterized by fever, malaise, lymphadenopathy and skin rash which occur within the first few weeks after infection. Patients with acute infection might be highly contagious because of increased plasma and genital HIV RNA. It is important to refer patients immediately to a HIV provider if acutely infected. It is also important that patients who test positive for HIV be counseled, either on site or through referral, concerning behavioral, psychosocial and medical implications of HIV infection.

REVIEW OF SPECIFIC STDs DISEASES CHARACTERIZED BY GENITAL ULCERS

Common causes of genital ulcers in the U.S. include genital herpes, syphilis or chancroid. Frequency of each condition varies by geographic area and patient population. Of the above diseases, genital herpes is the most prevalent. It is estimated that 1 in 5 Americans (more than 45 million) are infected with Herpes simplex virus type 2 (HSV-2). All three diseases are associated with an increased risk of HIV infection.

Chancroid caused by *Haemophilus ducrey*, commonly presents with a painful genital ulcer and regional lymphadenopathy. Single dose treatment with azithromycin 1 gm orally or ceftriaxone 250 mg intramuscularly (IM) can cure and prevent transmission of chancroid infection. Ciprofloxacin 500 mg twice daily for 3 days or erythromycin base 500 mg three times daily for seven days are also effective treatment options. Follow-up exam 3-7 days after completion of treatment is recommended.

Genital herpes is a chronic, life-long viral infection. There are 2 types of HSV identified: HSV-1 and HSV-2. HSV-2 accounts for the majority of cases of recurrent genital herpes. The majority of persons infected with HSV have not been diagnosed with genital herpes. Many cases are mild or unrecognized, with intermittent viral shedding in the genital tract. Table 1 summarizes antiviral treatment options for genital herpes. These agents offer control of signs and symptoms of herpes episodes, but none of these drugs offer a cure for this infection. Topical antiviral agents have minimal to no clinical benefit compared to oral treatments, and its use should be discouraged. Suppressive therapy is an effective strategy to decrease the frequency of recurrent episodes. It can reduce recurrences by 70-80% in patients who have them (≥ 6 recurrences per year). This strategy is not only considered safe, but is associated with quality of life improvements⁴. Suppressive therapy does not eliminate the risk of

transmission to uninfected partners. Sexual transmission of HSV can occur during asymptomatic periods. It is important to educate patients on the risk for recurrent episodes, asymptomatic viral shedding, and risk of sexual transmission. All persons with HSV are encouraged to inform their current partners and to inform future partners. Sexual abstinence is recommended when lesions or prodromal symptoms are present.

Table 1. Treatment recommendations for genital herpes⁴

Primary episode

- Acyclovir 400 mg P.O. three times a day for 7-10 days OR
- Acyclovir 200 mg P.O. five times a day for 7-10 days OR
- Famciclovir 250 mg P.O. three times a day for 7-10 days OR
- Valacyclovir 1 gm P.O. twice daily for 7-10 days

Suppressive therapy for recurrent genital herpes*

- Acyclovir 400 mg P.O. twice daily OR
- Famciclovir 250 mg P.O. twice daily OR
- Valacyclovir 500 mg P.O. once daily OR
- Valacyclovir 1 gm P.O. once daily

Episodic therapy for recurrent genital herpes*

- Acyclovir 400 mg P.O. three times a day for 5 days OR
- Acyclovir 800 mg P.O. twice a day for 5 days OR
- Acyclovir 800 mg P.O. three times a day for 2 days OR
- Famciclovir 125 mg P.O. twice a day for 5 days OR
- Famciclovir 1000 mg P.O. twice a day for 2 days OR
- Valacyclovir 500 mg P.O. twice a day for 3 days OR
- Valacyclovir 1 gm P.O. twice a day for 5 days

* Separate treatment recommendations are available for HIV infected individuals.

Syphilis is a disease caused by *Treponema pallidum* with a variety of clinical manifestations. The majority of the cases of syphilis are sexually transmitted, although it can also be acquired by passage through the placenta (congenital syphilis), by kissing, by transfusion of human blood or accidental inoculation. The disease is classified as primary (ulcer or chancre at site of infection), secondary (includes: skin rash, skin lesions, lymphadenopathy and many constitutional symptoms like fever, malaise, pharyngitis and arthralgias) and tertiary infection (can affect any organ in the body and symptoms occur years after initial infection. Commonly referred to as neurosyphilis, cardiovascular syphilis or gummatous syphilis). Latent infection is detected by serological test but lacks any clinical symptoms. If latent disease is detected within the first year of acquisition, it is referred to as early latent syphilis. If the time of infection is greater than 1 year or unknown, it is referred to as late latent syphilis.

Control and prevention of syphilis has been the focus of many government programs in the U.S. Despite these efforts, syphilis remains a major public health concern. Cases of primary and secondary syphilis are on the rise in recent years, and it is estimated that more than 60% of new infections occur in MSM.⁷ Syphilis can be effectively treated with the use of penicillin. Table 2 summarizes treatment options. Neither oral penicillin nor the combination of benzathine penicillin and procaine penicillin are adequate treatment options. There have been reports of incorrect dispensing of the combination of benzathine penicillin and procaine penicillin (Bicillin C-R[®]), instead of the standard benzathine penicillin (Bicillin L-A[®]).⁸ Pharmacists should be aware of the differences in the various products and recognize that similar names exist for some of the penicillin formulations to avoid dispensing errors. Parenteral penicillin G is the only therapy with documented efficacy for the treatment of syphilis during pregnancy. Penicillin allergic pregnant patients should be desensitized and treated with penicillin.

Table 2. Treatment recommendations for syphilis in Adults⁴

Primary and Secondary Syphilis

- Benzathine penicillin G 2.4 million units IM in a single dose

For penicillin allergic, non-pregnant patients alternatives include:

- Doxycycline 100 mg P.O. BID x 14 days or
- Tetracycline 500 mg P.O. QID for 14 days or
- Ceftriaxone 1 gm IM or IV daily for 8-10 days

Early Latent Syphilis

- Benzathine penicillin G 2.4 million units IM in a single dose

For penicillin allergic, non-pregnant patients alternatives include:

- Doxycycline 100 mg P.O. BID x 28 days or
- Tetracycline 500 mg P.O. QID for 28 days

Late latent syphilis or latent syphilis of unknown duration

- Benzathine penicillin G 7.2 million units total, administered as 3 doses of 2.4 million units IM each at 1 week intervals

For penicillin allergic, non-pregnant patients alternatives include:

- Doxycycline 100 mg P.O. BID x 28 days or
- Tetracycline 500 mg P.O. QID for 28 days

Tertiary syphilis (not neurosyphilis)

- Benzathine penicillin G 7.2 million units total, administered as 3 doses of 2.4 million units IM each at 1 week intervals

For penicillin allergic, non-pregnant patients alternatives include:

- Doxycycline 100 mg P.O. BID x 28 days or
- Tetracycline 500 mg P.O. QID for 28 days

Neurosyphilis

- Aqueous crystalline penicillin G 18-24 million units per day, administered as 3-4 million units IV every 4 hours or via continuous infusion for 10-14 days

If compliance can be ensured, an alternative regimen will be:

- Procaine penicillin 2.4 million units IM once daily plus probenecid 500 mg P.O. QID, both for 10-14 days.

For penicillin allergic, non-pregnant patients alternatives include:

- Ceftriaxone 2 gm IV or IM daily for 10-14 days. Possibility for cross-reactivity between ceftriaxone and penicillin exist.

The Jarisch-Hersxheimer reaction is systemic and occurs within the first 24 hours after treatment for syphilis. It is characterized by an acute sudden onset of fever, chills, myalgias, vasodilation with flushing, headache, tachycardia, hyperventilation and hypotension.⁸ This reaction occurs more frequently in patients with early syphilis. Supportive therapy can be used but has not proven to prevent this reaction.

DISEASES CHARACTERIZED BY URETHRITIS AND CERVICITIS

Urethral inflammation which is characteristic of **urethritis** can be the result of infectious or non-infections conditions. Symptoms include urethral discharge of mucopurulent material, dysuria, or pruritus. Asymptomatic infection is common. Common pathogens for urethritis include *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. All patients with confirmed or suspected urethritis should be tested for these pathogens. Initial treatment should include recommended agents for these pathogens. See tables 3 and 4 for treatment recommendations. If recurrent and persistent urethritis occurs, one must rule out inadequate treatment adherence or re-exposure from an untreated partner. If any of the above is confirmed, repeat treatment should be adequate. Recurrent and persistent urethritis, despite adequate treatment adherence and lack of re-exposure, can be treated with either metronidazole 2 gm PO as a single dose or tinidazole 2 gm PO in a single dose plus azithromycin 1 gm PO in a single dose.

Table 3. Treatment Recommendations for Chlamydial Infections⁴

Recommended regimens

- Azithromycin 1 gm PO in a single dose OR
- Doxycycline 100 mg PO BID for 7 days

For pregnancy

- Amoxicillin 500 mg PO TID for 7 days

Alternative regimens

- Erythromycin base 500 mg PO QID for 7 days OR
- Erythromycin ethylsuccinate 800 mg PO QID for 7 days OR
- Ofloxacin 300 mg PO BID x 7 days OR
- Levofloxacin 500 mg PO daily for 7 days

Table 4. Treatment Recommendations for Uncomplicated Gonococcal Infection⁴

Recommended regimens

- Ceftriaxone 125 mg IM in a single dose OR
- Cefixime 400 mg PO in a single dose (available as a suspension only) OR
- Ciprofloxacin* 500 mg PO in a single dose OR
- Ofloxacin* 400 mg PO in a single dose OR
- Levofloxacin* 250 mg PO in a single dose

Alternative regimens

- Spectinomycin 2gm in a single IM dose OR
- Ceftizoxime 500 mg IM in a single dose OR
- Cefoxitin 2 gm IM in a single dose OR
- Cefotaxime 500 mg IM in a single dose OR
- Gatifloxacin* 400 mg PO in a single dose OR
- Norfloxacin* 800 mg PO in a single dose

* Quinolones should not be used for infections in MSM or recent foreign travel, infection acquired in California or Hawaii or in other areas with increased quinolone resistance.

Cervicitis is frequently asymptomatic, but some women may complain of abnormal vaginal discharge and intermenstrual vaginal bleeding. Common etiologic organisms similar to urethritis include *N. gonorrhoeae* and *C.trachomatis*. Because cervicitis might be a symptom for upper genital tract infection (endometritis), women should be evaluated for pelvic inflammatory disease (PID). They should also be tested for bacterial vaginitis and trichomoniasis. Initial treatment of cervicitis should cover these pathogens, and concomitant treatment for trichomoniasis or symptomatic bacterial vaginosis should be included if these pathogens are also detected. Treatment recommendations for bacterial vaginitis and trichomoniasis can be found in table 5. If metronidazole is used, it is important to remember the potential for disulfiram-like reaction when combined with alcohol. Patients should be counseled regarding the potential adverse reaction and need to avoid concomitant alcohol (either in beverages or other OTC products that may contain alcohol), while receiving treatment with metronidazole.

Table 5. Treatment Recommendations for Bacterial Vaginosis & Trichomoniasis⁴

Bacterial vaginosis, recommended regimen

- Metronidazole 500 mg PO BID for 7 days* OR
- Metronidazole gel, 0.75%, one full applicator (5gm) intravaginally, once a day for 5 days OR
- Clindamycin cream, 2 %, one full applicator (5gm) intravaginally, once a day for 7 days

Alternative regimen

- Clindamycin 300 mg PO BID for 7 days* OR
- Clindamycin ovules 100 g intravaginally once at bedtime for 3 days

Trichomoniasis, recommended regimen

- Metronidazole 2 gm PO in a single dose* OR
- Tinidazole 2 gm PO in a single dose

Alternative regimen

- Metronidazole 500 mg PO bid x 7 days

* Recommended regimen during pregnancy.

Co-infection with *N. gonorrhoeae* and *C.trachomatis* is common. It is recommended to treat for both infections unless a negative chlamydial test is available. Quinolone resistance to *N. gonorrhoeae* (QRNG) continues to spread. Common in parts of Europe, the Middle East, Asia, and the Pacific, it is now being reported in the U.S. with increased frequency. High prevalence of QRNG in California and Hawaii has led to the CDC recommendation to avoid the use of quinolones for treatment in these states. QRNG is more common among MSM than among heterosexual males. It is for this reason that quinolones should not be used in this group of patients.⁴ It is important to obtain travel and sexual history to ensure adequate antibiotic therapy.

Partners should be tested and treated. To avoid re-infection, patients and their partners should refrain from sexual intercourse until therapy is completed. With the exception of pregnant women, repeat testing 3-4 weeks after completing treatment is not needed. Reasons to repeat testing include: questionable adherence to therapy, symptoms persist or reinfection is suspected.

It is important to remember that fluoroquinolones and tetracyclines are contraindicated in pregnant women. Azithromycin or amoxicillin are recommended during pregnancy. Alternatively, erythromycin can be used; however, gastrointestinal side effects may be a concern for this population. If a cephalosporin cannot be used for the treatment of *N. gonorrhoeae* in pregnant women, spectinomycin IM as a single 2 gm dose should be used.

HUMAN PAPILLOMA VIRUS (HPV) INFECTION AND GENITAL WARTS

There are more than 100 types of HPV of which more than 30 types can infect the genital area. Genital HPV infection, causing genital warts, is usually associated with types 6 and 11. Other types that infect the anogenital area are associated with cervical cancer (types 16, 18, 31, 33 and 35). Types 16 and 18 account for 70% of cervical cancers.⁹

Routine treatment for subclinical HPV infection without genital warts or cervical SIL is not recommended. None of available treatment options eradicate the virus. Management of cervical SIL should be guided on histopathology findings. The treatment goal of visible genital warts is removal of the warts. In many cases warts will resolve without treatment, and many patients may opt for treatment deferral. Treatment may help reduce, but not eradicate, HPV infectivity. It is unknown if treatment has any impact on reducing future transmissions. Table 6 lists available treatment options for genital warts. There is no one treatment of choice, as efficacy is similar among treatments. Choice should be based on patient preferences and available resources. If a patient fails to respond to one treatment, another treatment modality should be explored. Most warts will respond to treatment after 3 months of therapy. There is no clinical data on the use of combination therapy. Despite the lack of data, some centers may use more than one treatment modality simultaneously. This approach may increase the risk for adverse events. Pedophilic, imiquimod and podofilox should not be used during pregnancy. Other treatment modalities should be considered for pregnant women.

Treatments are divided into patient applied regimens and provider administer regimens. Patient applied regimens can cause mild to moderate irritation, and some patients may experience mild to moderate pain. It is important to educate patients on the correct use of these topical products, to limit application to warts only and to avoid exposure to healthy areas. Complications common to ablative treatment modalities include hypopigmentation or hyperpigmentation. Scars are rare but can occur.

In 2006 a quadrivalent HPV recombinant vaccine (Gardasil[®]) received FDA approval. The vaccine offers protection against 4 types of HPV 6, 11, 16 and 18. The vaccine is delivered through a series of 3 IM injections over a 6-month period at 0, 2 and 6 months. This vaccine was found to be effective in preventing dysplasia and genital warts associated with the vaccine HPV types in women. The vaccine did not offer protection to subsequent HPV-related diseases to women with prior exposure and acquisition of HPV. The CDC Advisory Committee on Immunization Practices recommends routine administration of the HPV vaccine in girls 11-12 years of age. This vaccine is not yet approved for use in boys, but trials are ongoing to evaluate its use in this population. Implementation of the panel's recommendations has created controversy and debate among ethical, religious and political groups.

Table 6. Treatment Recommendations for Genital Warts⁴

Patient Applied

- Podofilox 0.5% solution or gel
 - Apply BID x 3 days followed by 4 days of no therapy, repeat up to 4 cycles
- Imiquimod 5% cream
 - Apply QHS 3 times a week for up to 16 weeks. Wash treatment area 6-10 hours after the application.

Provider Administered

- Podophyllin resin 10-25% in a compound tincture of benzoin
 - Treatment can be repeated weekly, if necessary. To avoid systemic exposure: limit to < 0.5 ml per session and avoid on open lesions. Some experts recommend washing area 1-4 hours post application.
- Trichloroacetic acid (TCA) or bichloroacetic acid (BCA) 80-90%
 - Treatment can be repeated weekly, if necessary. Sodium bicarbonate or liquid soap preparation should be applied if excess amount of acid is applied.
- Cryotherapy with liquid nitrogen or cryoprobe
 - Treatment can be repeated every 1-2 weeks, if necessary.
- Surgical Removal
 - Excision or electrocautery
- Alternative treatments
 - Intralesional interferon or laser surgery

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UPCOMING TOPICS

Smoking Cessation	Insect Bites & Stings
Asthma	Worldwide Pharmacy Resources & the Internet
OTC Antidiarrheals	<i>H. pylori</i> & Ulcer Disease

Fill in the information below, answer questions and return **Quiz Only** for certification of participation to:
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LESSON EVALUATION

1. Does the program meet the learning objectives?
 Discuss ways to prevent STDs Yes No
 Describe the new HIV testing guidelines Yes No
 List signs & symptoms of common STDs Yes No
 Describe common treatments for STDs Yes No
2. Was the program independent & non-commercial Yes No
 Poor Average Excellent
 1 2 3 4 5 6 7
3. Relevance of topic
4. What did you like most about this lesson? _____
5. What did you like least about this lesson? _____

Please Select the Most Correct Answer

- | | |
|---|--|
| <p>1. Which of these can male condoms effectively prevent?
 A. N.gonorrhoeae
 B. Trichomoniasis
 C. HSV-1
 D. A and B only</p> <p>2. Which of these populations is the Hepatitis B vaccine recommended for?
 A. MSM
 B. Adolescents previously infected with HSV
 C. Unvaccinated pregnant women
 D. A and C</p> <p>3. Why are nonoxynol-9 spermicides not recommended for routine use?
 A. Short half-life
 B. Increased risk of HIV transmission
 C. Costs more than spermicides
 D. All of these</p> <p>4. Regarding the new HIV test regulation, separate written consent for HIV testing is required.
 A. True B. False</p> <p>5. What is correct regarding Gardasil®?
 A. Administered subcutaneously
 B. Offers protection against 4 types of HPV
 C. Recommended for boys & girls 9-15 y.o.
 D. Requires a series of 2 vaccines</p> | <p>6. Which of these penicillin formulations is not an adequate treatment option for syphilis?
 A. Benzathine penicillin
 B. PenVK
 C. Aqueous crystalline penicillin G
 D. Procaine penicillin</p> <p>7. The following antibiotics should be avoided during pregnancy.
 A. Amoxicillin
 B. Tetracyclines
 C. Fluoroquinolones
 D. B and C</p> <p>8. Cervical cancer is associated with HPV types:
 A. All HPV types
 B. 6 and 11
 C. 16 and 18
 D. B and C</p> <p>9. Topical antivirals are an effective treatment strategy for genital herpes virus.
 A. True
 B. False</p> <p>10. Increasing incidence of quinolone resistance to N.gonorrhoeae limits its use in certain geographic areas.
 A. True B. False</p> |
|---|--|

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