PREVENTING MOTHER-TO-CHILD TRANSMISSION OF HIV
A Practical Guide to the Prevention and Treatment of Sexually Transmitted Infections
2nd Edition

American International Health Alliance
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Prevention and Treatment of Sexually Transmitted Infections
Prevention and Treatment of Sexually Transmitted Infections

Sexually transmitted infections (STIs) are widespread throughout the world. They include more than 20 sexually transmitted pathogens, including bacteria, viruses, protozoa, yeast infections, and arthropods.

The fight against STIs remains one of the highest public health priorities in most countries of the world. Incidence of acute STIs is high in both industrialized and developing countries. If an STI is not diagnosed and treated early, it can cause serious complications and sequelae, including infertility in both men and women, miscarriage, premature birth, ectopic pregnancy, cancer of the genitals and rectum, small fetus size for gestational age, and infection of the child during pregnancy (i.e., congenital syphilis), birth (i.e., gonococcal conjunctivitis), and in the postnatal period (i.e., with syphilis or gonorrhea through contact).

The appearance of the human immunodeficiency virus (HIV) and the proliferation of the HIV epidemic throughout the world have focused particular attention on the problem of STIs. A direct link has been discovered between the spread
of traditional STIs and the spread of HIV. It has been established that the risk of transmission of HIV by sexual contact increases in the presence of any STI, not only those STIs that involve genital ulcerations.1

In the last decade, the considerable knowledge and expertise accumulated in the fight against HIV infection and STIs has enabled the development of effective prevention and medical care—care that must be implemented at the global, regional, and local levels.2-4

The protocols found in this guide are based on the clinical standards for the diagnosis and treatment of STIs developed by the US Centers for Disease Control and Prevention (CDC) adapted to conditions existing in Ukraine.5

References
2. ibid.
Sexually transmitted infections (STIs): Infections that are transmitted from one person to another during intercourse or intimate contact.

Syndrome: Specific combination of subjective and objective symptoms.

Syphilis: STI caused by Treponema pallidum; one of the causes of genital ulcers (hard chancres) during the onset of the illness.

Trichomoniasis: STI caused by Trichomonas vaginalis; one of the causes of typical vaginal discharge.

Urethritis: Inflammation of the urethra, usually caused by the causative agents of gonorrhea or chlamydiosis.

ACRONYMS
AIDS: acquired immunodeficiency syndrome
BV: bacterial vaginosis
CSF: cerebrospinal fluid
HBsAg: hepatitis B surface antigen
HBeAg: hepatitis Be antigen
HBV: hepatitis B virus
HIV: human immunodeficiency virus
Prevention and Treatment of Sexually Transmitted Infections

According to the most recent documents of the WHO and UNAIDS, the widespread prevalence of STIs makes them a high priority among public health issues. The appearance of HIV and the phenomenally rapid pandemic of the fatal disease it causes, AIDS, brought about an urgent reappraisal of STI control strategies.\(^1\)

The predominant mode of HIV and other STI transmission is sexual. Other transmission routes are blood, blood products, donated organs and tissues, and prenatal transmission from an infected mother to her fetus or newborn during pregnancy. STIs increase the risk of HIV transmission. For this reason, the early detection and effective treatment of STIs are important parts of strategy to prevent HIV transmission.

The main objectives of STI control are to:
- prevent the transmission of infections via sexual contact
- prevent the development of acute diseases, complications, and long-term effects
- reduce the risk of HIV infection

Chapter 1: Introduction and Background

Acronyms

**HSV:** herpes simplex virus

**IA:** immunoabsorbent assay

**IDU:** injecting drug user

**IT:** immunofluorescence test

**PCR:** polymerase chain reaction

**PHT:** passive hemagglutination test

**PID:** pelvic inflammatory disease

**RPR:** rapid plasma reagin

**RVVC:** recurrent vulvovaginal candidiasis

**STI:** sexually transmitted infection

**UN:** United Nations

**UNAIDS:** Joint United Nations Program on HIV/AIDS

**UNICEF:** United Nation’s Children’s Fund

**WHO:** World Health Organization
GOALS AND SCOPE OF THE PRACTICAL GUIDE

This guide was developed to reduce the incidence of STIs and to improve primary and secondary prevention and treatment of STIs in the city of Odessa and the oblast Odessa.

The use of this guide at clinics, as well as at dermatological, venereal, and prenatal care facilities, can serve as an important tool in reducing the incidences of STIs and preventing the transmission of HIV infection.

This guide defines a set of procedures for medical personnel to use in the prevention and treatment of STIs. It is intended for use by obstetricians and gynecologists, midwives, nurses, family physicians, venereologists, dermatologists, and internists specializing in infectious diseases.

This guide is recommended for use in women’s counseling centers, clinics, maternity hospitals, and dermatology and venereal disease treatment facilities in the city of Odessa and the Odessa oblast.

These objectives can be achieved through primary prevention directed at reducing incidence and secondary prevention directed at reducing prevalence by shortening the periods of STI treatment of acute diseases, thus minimizing the probability of complications or long-term effects.

At this time, efforts to improve medical care for people with STIs are focused primarily on providing effective treatment. In situations in which, for various reasons, a large number of infected people either do not receive treatment or are not cured, this approach has little effect. The figure below shows the proportion of patients who make a full recovery from STIs.

Figure 1. Proportion of persons cured of STIs.

Note: The proportion of persons cured depends on actions taken by the infected persons themselves or the health care professionals at each stage.
# Chapter 2: Primary Prevention of STIs

## PROCEDURES AND METHODS OF PREVENTION

### PREVENTION OF SEXUAL TRANSMISSION

<table>
<thead>
<tr>
<th>Prevention method</th>
<th>Recommended for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstain from sexual contact with an infected partner</td>
<td>Persons being treated for STIs or those whose partners are undergoing such treatment</td>
</tr>
<tr>
<td>Use a new condom for each act of sexual contact</td>
<td>Persons who wish to avoid the possible consequences of sexual contact (e.g., STI, HIV, and pregnancy)</td>
</tr>
</tbody>
</table>

### PREVENTION OF TRANSMISSION VIA INJECTION

<table>
<thead>
<tr>
<th>Prevention method</th>
<th>Recommended for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not, under any circumstances, use injection equipment that has been used by another person</td>
<td>Injecting drug users</td>
</tr>
<tr>
<td>If needles can be obtained legally, obtain sterile needles</td>
<td></td>
</tr>
<tr>
<td>Persons who use injection equipment that has been used by others should first clean the equipment with bleach and water</td>
<td></td>
</tr>
</tbody>
</table>

Note: Disinfection with bleach does not make syringes and needles sterile and does not ensure complete inactivation of HIV, however, among injecting drug users (IDUs) who share infection equipment, but regularly and thoroughly disinfect it, the likelihood of HIV infection is lower.

Adapted from: 1998 Guidelines for Treatment of Sexually Transmitted Diseases.
Male Condoms
When used consistently and correctly, condoms are an effective method of preventing many STIs, including HIV. Because they do not cover all contact surfaces, condoms are more effective in preventing infections transmitted through contact with mucous membranes than through skin contact. When high-quality condoms are used, breakage usually only occurs if a condom is used incorrectly, not because it is defective. Please note that condom usage applies to vaginal, anal, and oral sexual contact.

Advise patients that for maximum STI prevention, condoms must be used consistently and according to the following rules:

1. Use a condom with each act of sexual contact. Open the condom package carefully. Remember that teeth, fingernails, and jewelry can damage the condom. Use only water-based lubricants with a condom. Oil-based lubricants—petroleum jelly and lotions containing fats—reduce the protective qualities of the condom. Keep condoms in a cool, dry place; do not keep condoms in a pocket or in a compartment in a car because the high temperature will destroy the material from which the condom is made. Do not use a condom after its expiration date (shown on the box or the individual condom package). Never use a condom that is stuck together or torn.

Put the condom on after the penis is erect and before any genital contact with the partner. The foreskin should be pulled back before the condom is put on.

When putting the condom on, squeeze the tip so that no air remains in it. Leave a little room at the end of the condom for the sperm. Unroll the condom along the full length of the penis.

If the condom breaks or slips, stop immediately and put on a new condom. If a condom slips off, breaks, or leaks sperm, it is most often the result of human error versus a defect in the condom.

After ejaculation, the penis must be removed before it becomes soft. When withdrawing the penis, hold the condom firmly at its base to prevent sperm from leaking.

Do not reuse the condom.

Ongoing public education regarding the critical importance of using condoms for protection against STIs is strongly recommended.

Vaginal Spermicides, Contraceptive Sponges, and Diaphragms
Research has shown that the use of vaginal spermicides without condoms reduces the risk of cervical gonorrhea and chlamydia. Vaginal contraceptive sponges also protect against cervical
ing HIV. Nonbarrier contraceptive methods offer no protection against HIV or other STIs.

Women who are taking hormonal contraceptives, have been surgically sterilized, or have had a hysterectomy should be counseled on the use of condoms and the risk of STIs including HIV infection.

LEVELS OF STI PREVENTION
The following WHO and UNAIDS recommendations clearly define the goals and objectives of primary and secondary prevention of STIs.

Primary Prevention
The goal of primary prevention is to prevent infection and disease. This can be achieved by promoting

- safer sexual behavior and
- the use of condoms in penetrative sexual acts.

Remember that only primary prevention activities can prevent the presently incurable STIs that result from viral infections. Providing medical care for STIs offers excellent opportunities to promote primary prevention through health education, treatment, and effective cure of the individuals who are at increased risk of contracting or transmitting an infection. The treatment and cure of a patient with an STI constitutes primary prevention for that person's sex partner.
Primary Prevention of STIs

The majority of HIV prevention recommendations apply equally to STIs, but certain distinctions should be explained in public education materials:

- Many STIs can be treated successfully.
- Early treatment is essential to prevent complications.
- Certain STIs may not have noticeable symptoms, particularly in women, as a result of which the STI is not diagnosed until complications appear.

Health education materials should contain a

- clear description of the symptoms of STIs;
- questionnaire to evaluate the individual’s risk of STI infection and the risk of infecting sex partners with STIs (if the results of the survey indicate the possible presence of STI, counseling on STIs is recommended); and
- list of institutions that provide counseling on STIs (i.e., primary care centers), specialized medical facilities, and voluntary counseling centers.

Potential patients must also be assured that they are being treated with respect and their confidential information will not be disclosed.

Secondary Prevention

Secondary prevention involves providing medical care to people who are infected with or have been exposed to an STI. Secondary prevention should include:

- efforts to encourage people to seek medical care; these efforts should be directed not only at people with STI symptoms, but also at people at increased risk of contracting an STI, including HIV;
- accessible, acceptable, and effective medical care, including diagnostic services and effective treatment for both symptomatic and asymptomatic STI patients and their sex partners; and
- psychological support services and counseling for patients with STIs and HIV.

Partner Notification

Whenever an STI is diagnosed at any treatment facility, it is necessary to address the issue of notifying the patient’s sex partner(s). Health professionals should ensure that partner notification is voluntary and noncoercive and that confidentiality is maintained. Particular care should be taken to observe the rights and dignity of the patient and his/her partner(s). It should always be kept in mind that the effect of notification on the patient and their partner may be different depending on his or her gender.

Partner notification means informing the partner(s) of an STI patient about the possibility of
formation of personal identity. The primary features of maturation are emancipation, personal self-affirmation, and development of relationships with contemporaries. Experts describe more than 10 types of adolescent behavior, but these four are the most important:

- **Emancipation**, or the release from adult supervision, is one of the primary features of puberty, where the dominant idea in all relationships with adults is to prove one’s personal significance and freedom. The adolescent tries to resolve issues independently, particularly those that concern him/her personally, such as with whom to spend time, where, and for how long; how to dress; etc. Relationships between parents and children become less trustful, as if the adolescent is putting up a wall to keep adults out of his/her internal world.

- **Association with peers** is characterized by a shift in authority away from the family and to fellow adolescents. Here, the laws of the group become dominant. Groups of adolescents form according to interests (sports, entertainment, music, dance) or by location. When an adolescent joins one group or another, he/she strives to comply with its rules of behavior. Thus, if smoking, drinking alcohol, or sex with multiple partners is popular in the group, the adolescent follows the laws of the group, even if he/she does not want to, for one purpose: to maintain standing and “be grown up.” The leader of the group is usually a peer or an older adolescent.

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**Partner Notification Methods**

**Patient referral:** After appropriate health education and counseling, the patient is given the opportunity to contact his/her sex partner(s) and ask them to come in for an examination and treatment.

**Referral by medical staff:** The patient is asked to provide the health professional with the name(s) and address(es) of the partner(s). The health professional then invites the partner(s) to come in for examination and treatment.

**Prevention Work Among Adolescents**

Several reasons explain the rapid spread of STIs among adolescents: casual sex, frequent change of partners, disinclination to use condoms, flippant attitudes toward their own health, and finally, the frequently asymptomatic course of the disease and delay in seeking medical treatment.5

Puberty is a critical age not only in the development of the reproductive system but also in the infection and offering treatment and psychological support. Partner notification should aim to treat

- all of the STI patient’s sex partners—at least those he/she has been with in the previous three months, and
- the partner(s) for all of the STIs diagnosed in the “primary” patient.

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**Preventing Mother-to-Child Transmission of HIV**

Chapter 2

**Primary Prevention of STIs**
By studying the behavior of adolescents, psychologists have proposed an original method of influencing a group through its leader. The leader is taught about preventing contraception and protecting one’s self against STIs. As the main authority figure the leader then introduces new rules of behavior in the group and it becomes prestigious to use contraceptives, protect one’s self from STIs, and not to smoke or drink.

Opposition is resistance and disinclination to submit to adult rules of behavior. The adolescent may internally agree with arguments made by parents, teachers, doctors, and other adult authority figures, but by virtue of his/her character (or convictions) the adolescent acts in the opposite way, especially if the advice or request sounds dogmatic.

Imitation is when the adolescent blindly imitates his/her idol—movie star, sports figure, etc.—in style of dress, manner of speaking, and way of interacting.

Physicians who work with adolescents must understand these typical behavioral patterns and take them into account when talking with adolescents. It is very important for young patients to think of their physician as a friend and helper when talking about such intimate issues as contraception and STI protection. Discussions with adolescents should take place with no other people present, unless the adolescent wants someone else to be there. Explaining that only the patient has the right to decide whether anyone other than the physician will know about his/her problems is a way to emphasize from the start that the meeting is confidential. Physicians should be tolerant of loud clothing, multicolored hair, or excessive makeup, even if the patient’s appearance seems provocative. Physicians should treat adolescents as equals and with respect; discussions should touch on all aspects of the adolescent’s life in which the physician is interested. During the conversation, it should be emphasized—preferably more than once—that the patient will make the final decision on all issues discussed with the physician, and the physician should avoid speaking with a moralizing tone.

The condom is currently the only sufficiently effective means of preventing STI transmission and HIV infection from sexual contact. Therefore, explaining the need to use a condom every time one engages in sexual contact is one of the main goals of prevention work. Studies show that condom use has increased in the last decade, especially among young people. However, the same studies show that for many young people, condom use has not yet become a hard and fast rule. They stop using condoms to demonstrate trust in their partner or as a sign of a closer relationship. As a result, the number of people who use condoms during contact with new partners is growing, but at the same time a significant number of young people do not use condoms each time they engage in sexual contact.
Chapter 2

Experts believe that the following methods can increase the likelihood that adolescents will use condoms:

1. Giving the adolescent an adequate understanding of his/her risk of contracting an STI or HIV
2. Eliminating negative attitudes about condoms
3. Continually reminding the adolescent about how to use a condom correctly
4. Promoting positive perceptions of safe sex
5. Making adolescents and young people feel responsible for their health and the health of their sex partners
6. Teaching girls to stand up for their decision to have their partner use a condom each time they engage in a sexual act
7. Providing condoms to adolescents

Chapter 3: Treatment of STIs

CLASSIFICATION OF STIs

In recent years, perceptions about STIs have changed considerably as a result of changes in sexual behavior, contraceptive use, urbanization, and other social, medical, and demographic factors. In addition, the current situation has been exacerbated by international tourism; changes in the age structure of the population; changing attitudes toward sex and prostitution; and the appearance of antibiotic-resistant strains of pathogens.
There are currently more than 20 STIs. They are highly contagious, spread relatively rapidly among certain population groups, and are classified in the chart.

Methods of fighting STIs are based on the following principles:

- Promote primary prevention and increase public awareness about the need to seek medical care when the first symptoms of a disease appear.

- Provide accessible and effective medical care, including:
  - Correct diagnosis
  - Effective treatment
  - Training and counseling on how to reduce risk
  - Recommendations on the most acceptable forms of treatment
  - Providing access to condoms
  - Encouraging sex partners to share information about STIs
  - Monitoring the effectiveness of treatment (including serological data)
  - Identifying latent diseases

It should be noted that the course of STIs can be much more severe in HIV-infected patients, and the effectiveness of traditional therapy can be significantly reduced.

SYNDROMIC APPROACH TO DIAGNOSIS AND TREATMENT

WHO and UNAIDS strongly recommend the use of syndromic diagnosis and treatment of STIs. Making an etiological diagnosis of an STI (i.e., detecting the pathogen) presents certain problems
WHO and UNAIDS strongly recommend the use of syndromic diagnosis and treatment of STIs.

Treatment of STIs

for many medical institutions. Establishing etiology takes time and resources. Moreover, the sensitivity and specificity of commercial diagnostic instruments varies considerably, which reduces the reliability of laboratory diagnoses of STIs. A laboratory must be staffed by qualified personnel who have received special training in performing the technically complex tests required for STI diagnosis; the operation of a laboratory should also be subject to independent quality control.

In developing countries, very few medical institutions have the laboratory equipment and qualified personnel necessary to be able to perform etiological diagnosis of STIs. To solve this problem, a syndromic STI treatment approach has been developed for and introduced in many developing countries. The syndromic approach is based on diagnosis of various syndromes (specific combinations of clinical signs) and treatment of the primary range of pathogens capable of causing a particular syndrome. To assist health professionals, WHO has developed simple procedures for treatment of patients with various syndromes.8

The protocols presented in this chapter are based on recommendations from the CDC’s Guidelines for Treatment of STIs.10

Need to Develop and Follow Standard Recommendations for Treatment

Effective treatment is one of the primary tools for fighting STIs, because treatment prevents the development of complications and long-term effects, slows the spread of STIs in the community, and provides a unique opportunity for targeted educational efforts to prevent HIV infection. Providing adequate treatment to STI patients the first time they seek medical care is very important from the perspective of public health. When an adolescent patient seeks care, an opportunity arises to influence the development of sexual behavior and encourage the patient to seek medical care in the future.

The use of standardized treatment regimens is strongly recommended, as it ensures the adequate treatment of patients at all levels of medical care. A standardized treatment approach simplifies the training of health professionals and the monitoring of medical treatment, slows the development of antibiotic-resistant STI pathogens, and ensures the reasonable use of drugs.11

Selection of Drugs for Treatment

The drugs prescribed for treatment of STIs should meet the following criteria to the extent possible:12

- high degree of effectiveness (minimum 95%)
- low cost
- acceptable side effects and good tolerance
- low probability or prolonged period of development of resistance
- single-dose treatment
- can be taken perorally
- not counterindicated for pregnant and breastfeeding women

Providing adequate treatment to STI patients the first time they seek medical care is very important from the perspective of public health.
Physicians often need to treat a patient before test results are available. In such circumstances, the clinician should treat for the diagnosis considered most likely. If the diagnosis is unclear, treatment for syphilis is recommended, or if the patient lives in a region where *H. ducreyi* is a frequent cause of genital ulcers, and especially if it is not possible to confirm or rule out a diagnosis of chancroid or syphilis by laboratory methods, combined treatment for syphilis and chancroid should be given. Even after a complete diagnostic evaluation, at least 25% of patients who have genital ulcers have no laboratory-confirmed diagnosis.

**Chancroid**

Chancroid increases the risk of HIV, which is why cases of HIV infection among patients who have chancroid are frequent. Approximately 10% of chancroid copatients were infected with *T. pallidum* or HSV.

To confirm a diagnosis of chancroid, *H. ducreyi* must be cultured, but even with the use of special culture media, the sensitivity of the culture method is ≤80%.

For purposes of treatment selection and subsequent observation, a probable diagnosis of chancroid can be made if the following criteria are met:

- The patient has one or more painful ulcers.
- No *T. pallidum* infection has been found in the patient by darkfield examination of the ulcer exudate or by a serologic test for syphilis.
performed at least seven days after the onset of the ulcers is negative.

The clinical picture, characteristics of genital ulcers, and regional adenopathy (if present) are typical for chancroid and a test for HSV is negative.

The combination of a painful ulcer and painful, swollen, regional lymph nodes that is found in a third of all patients, indicate a diagnosis of chancroid. Suppuration of lymph nodes is a pathognomonic sign.

Treatment
With effective treatment of chancroid, clinical manifestations disappear and the pathogen is eradicated from the body, which prevents further transmission of the disease. In advanced cases, scars may remain despite successful treatment. All four protocols described in the chart are effective for the treatment of chancroid in HIV-positive patients. The advantage of azithromycin and ceftriaxone is the use of a single-dose therapy. Several strains with intermediate resistance to ciprofloxacin and erythromycin have been detected worldwide.

Special Considerations
Pregnancy
At present, there are no data on the safety of azithromycin for pregnant or lactating women. Ciprofloxacin is contraindicated during pregnancy. There are also no data on the adverse effect of chancroid on the course of pregnancy or on the fetus.
HIV infection

HIV-positive patients with chancroid should be monitored. Such patients may need a longer course of treatment than patients with negative HIV test results. Healing may be slower among HIV-positive patients, and any given treatment protocol may prove to be ineffective for them. Because there are so few data on the effectiveness of the recommended protocols with ceftriaxone and azithromycin for HIV-positive patients, they should be used only when the patient can be monitored. The seven-day protocol for erythromycin is recommended for treating HIV-positive patients.

Genital Herpes Simplex Virus (HSV)

Genital herpes is a recurring, incurable, viral disease. Two serotypes of HSV have been identified: HSV-1 and HSV-2. Most cases of genital herpes are caused by HSV-2.

In most people infected with HSV-2, the disease is virtually asymptomatic and is not diagnosed, but the virus is shed intermittently in the genital tract. Many cases of genital herpes are transmitted by individuals who are unaware of their infection or who do not believe it is necessary to take precautions in periods of remission.

The use of antiviral drugs reduces the frequency of recurrences when taken permanently (long-term suppressive therapy) or the severity of clinical manifestations when taken episodically at the first sign of infection.

continued on page 30
HSV INFECTION (continued)

Reoccurrence of HSV Infection

Most patients with a first episode of genital HSV-2 infection will have recurrences.

When treatment is started during the prodromal period or during the first day after the onset of lesions, episodic therapy with antiviral drugs is effective for many patients with a recurrent infection. If episodic drug therapy is chosen for treatment of recurrences, the patient should be provided with antiviral drugs or be issued a prescription for them so that the patient can begin treatment at the first signs of prodrome or genital lesions.

Acyclovir 400 mg orally 3 times a day for 5 days, or
Acyclovir 200 mg orally 5 times a day for 5 days, or
Acyclovir 800 mg orally 3 times a day for 5 days, or
Famciclovir 125 mg orally 2 times a day for 5 days, or
Valacyclovir 500 mg orally 2 times a day for 5 days.

HSV INFECTION (continued)

Acyclovir 400 mg orally twice a day, or
Famciclovir 250 mg orally twice a day, or
Valacyclovir 500 mg orally once a day, or
Valacyclovir 1,000 mg orally once a day.

Patients with very frequent recurrences (≥ 10 episodes per year) generally require a high dose of valacyclovir (over 500 mg per day). Valacyclovir and famciclovir are comparable to acyclovir in clinical outcome. However, valacyclovir and famciclovir are easier to administer, which is important for prolonged use.

Severe Disease

Patients who have severe disease or complications necessitating hospitalization—disseminated infection, pneumonia, hepatitis, or central nervous system complications (meningitis, encephalitis) must take the drugs intravenously.

Acyclovir 5-10 mg/kg of body weight every eight hours for five to seven days or until symptoms resolve.
However, these drugs do not eradicate the latent virus and do not alter the risk, frequency, or severity of recurrences after the drug is discontinued. Randomized trials indicate that three antiviral drugs are clinically effective for the treatment of genital herpes: acyclovir, valacyclovir, and famciclovir. Valacyclovir is a valine ester of acyclovir with enhanced absorption when taken orally. Famciclovir, a prodrug of penciclovir, also has high oral bioavailability. Topical therapy with acyclovir is substantially less effective than the systemic drug, and for this reason its use is not recommended.

**Syphilis**

Syphilis is a systemic disease caused by *T. pallidum*. Patients who have syphilis may seek treatment for clinical manifestations of the primary infection (i.e., an ulcer or chancre at the infection site), secondary infection (i.e., a rash, mucocutaneous lesions, or adenopathy), or tertiary infection (i.e., disorders of cardiac activity, vision, or hearing, neurological symptoms, and gummatous lesions). The infection may also be detected by serologic testing in the latent stage.

Latent syphilis acquired within the preceding year is referred to as early latent syphilis. All other cases of latent syphilis are either late latent syphilis or syphilis of unknown duration. Theoretically, treatment of the late latent syphilis, as well as of tertiary syphilis, may require a longer course of treatment because the microorganisms are dividing more slowly. However, the clinical significance of this approach is not yet clear.

*continued on page 35*
SYPHILIS (continued)

Persons who had contact with the patient within the 90 days preceding the last diagnosis of primary, secondary, or early latent syphilis might be infected even if they have the serologic test is negative. Such persons should be treated presumptively.

Persons who had contact with the patient more than 90 days before the last diagnosis of primary, secondary, or early latent syphilis should be treated for syphilis if the serologic test cannot be performed immediately and the opportunity for follow-up of such persons is doubtful.

For purposes of notifying and treating sex partners, patients with syphilis of unknown duration who have a high nontreponemal (cardiolipin) antibody titer (i.e., ≥1:32) are considered to have early syphilis. However, serologic titers should not be used to differentiate early from late latent syphilis for the purpose of determining treatment (see section regarding treatment of latent syphilis).

Long-term sex partners of patients with late syphilis should be evaluated clinically and serologically for syphilis and treated on the basis of the findings of the evaluation.

Time periods before treatment used for identifying sex partners at risk for infection: a) three months plus duration of symptoms for primary syphilis, b) six months plus duration of symptoms for secondary syphilis, and c) one year for early latent syphilis.

Primary and Secondary Syphilis in HIV-positive Persons

Treatment

Treatment with a single dose of benzathine penicillin G 2.4 million units IM is recommended.

Some experts recommend additional treatment (for example, three weekly doses of benzathine penicillin G, as in late stages of syphilis) or other antibiotics in addition to 2.4 million units of benzathine penicillin IM.

Follow-up

HIV-positive patients must be evaluated clinically and serologically to verify the effectiveness of treatment 3, 6, 9, 12, and 24 months after treatment.

CSF examination and repeated treatment must be recommended for patients whose nontreponemal (cardiolipin) antibody titer does not decrease fourfold within 6-12 months.

Latent Syphilis in HIV-positive Persons

Diagnostic Considerations

HIV-positive patients with early latent syphilis should be treated according to the recommendations for HIV-negative patients with primary or secondary syphilis.

HIV-positive patients with late latent syphilis or syphilis of unknown duration should have a CSF examination before the beginning of treatment.

Treatment

Patients with late latent syphilis or syphilis of unknown duration and normal CSF results can be treated with a dose of 7.2 million units of benzathine penicillin G (3 weekly doses of 2.4 million units each). Patients who have CSF consistent with neurosyphilis must be treated according to the appropriate regimen.

Follow-up

Clinical and serologic examination must be repeated at 6, 12, 18, and 24 months after therapy. If at any time clinical symptoms develop or the nontreponemal (cardiolipin) antibody titer rises fourfold, a repeat CSF examination must be performed and treatment administered accordingly. If over 12-24 months the nontreponemal (cardiolipin) antibody titer fails to decline fourfold, the CSF examination should be repeated and appropriate treatment administered.
### SYPHILIS DURING PREGNANCY

#### Diagnosis
All women must be screened serologically for syphilis during the early stages of pregnancy. If the woman belongs to a population group that receives virtually no prenatal care, screening with VDRL/RPR and treatment (if the test is positive) must be done immediately after pregnancy is diagnosed. The serologic testing must be performed twice: in the third trimester (at 28 weeks gestation) and at delivery.

All women who deliver a stillborn infant after 20 weeks of gestation should be tested for syphilis.

No infant should leave the maternity home if the woman has not been tested serologically for syphilis at least once during pregnancy.

#### Treatment
Penicillin in doses appropriate for the stage of syphilis.

Some experts recommend administering additional doses of penicillin.

Women with primary, secondary, or early latent syphilis may be administered 2.4 million units of benzathine penicillin intramuscularly one week after the first dose. Ultrasonic signs of fetal syphilis (i.e., hepatomegaly and hydrops) indicate a greater risk of ineffective fetal treatment.

Women treated for syphilis during the second half of pregnancy have a high risk for premature labor and/or fetal distress because of the Jarisch–Herxheimer reaction. These women must be advised to consult an obstetrician/gynecologist after a treatment course if they notice uterine contractions or a decrease in fetal activity. The possibility of such a rare complication as stillbirth is not a reason to delay treatment. All patients with syphilis must be offered testing for HIV infection.

#### Follow-up
The antibody titer must be determined in the third trimester and at delivery. Serologic testing may be repeated monthly in women at high risk for repeat infection or in regions in which syphilis is encountered often. Clinical signs and the antibody titer should be appropriate for the stage of the disease. In most cases, women will deliver before their serologic response to treatment can be assessed accurately.

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### DISEASES CHARACTERIZED BY URETHRITIS AND CERVICITIS

#### Urethritis
Infectious urethritis, or inflammation of the urethra, is characterized by purulent or mucopurulent discharge from the urethra and a burning sensation during urination. Urethritis is frequently asymptomatic. In men, the primary pathogens of urethritis are *N. gonorrhoeae* and *C. trachomatis*. A physical examination is recommended to make the precise diagnosis. If it is not possible to perform laboratory tests (i.e., microscopic examination of a Gram-stained smear), patients must be treated for both infections. To avoid the additional costs of treating patients with nongonococcal urethritis, health professionals should try to distinguish gonococcal and nongonococcal urethritis when making the diagnosis.
Cervicitis

Mucopurulent cervicitis is characterized by the presence of purulent or mucopurulent endocervical exudates that are visible in the cervical canal in a mirror exam or endocervical smear. Some experts also diagnose cervicitis in cases of increased cervical bleeding. Although mucopurulent cervicitis is occasionally diagnosed on the basis of an increase in the number of polymorphonuclear leukocytes in a Gram-stained smear, this method is not included in the diagnostic standards—it has low positive prognostic value—and is not performed in all laboratories. Mucopurulent cervicitis is frequently asymptomatic, but some women experience pathological vaginal bleeding, for example, after sexual intercourse. Mucopurulent cervicitis can be caused by C. trachomatis and N. gonorrhoeae, but in most cases the pathogen is not identified. Mucopurulent cervicitis cannot be explained by recurrence of or new infection with C. trachomatis and N. gonorrhoeae, noninfectious factors (i.e., ectropion inflammation) may play a role in the pathogenesis of this disease.
Patients with mucopurulent cervicitis should be tested for *C. trachomatis* and *N. gonorrhoeae*, using the most specific and sensitive methods.

**DISEASES CHARACTERIZED BY VAGINAL DISCHARGE**

**Management of Patients with Vaginal Infections**

Vaginitis is usually characterized by a vaginal discharge, itching, vulvar irritation, and vaginal odor. The three diseases most frequently associated...
Trichomoniasis

Trichomoniasis is caused by the protozoan *T. vaginalis*. Most men who are infected with *T. vaginalis* do not have symptoms of the infection, but a small number of them develop urethritis. By contrast, women with trichomoniasis generally experience symptoms. *T. vaginalis* usually causes a diffuse, malodorous, yellow-green discharge accompanied by vulvar irritation. Many women have more subtle symptoms. Vaginal trichomoniasis is the most prevalent cause of vaginal discharge or malodor; however, half of the women who suffer from BV are asymptomatic. The cause of the microbial alteration is not clear. Although BV is associated with having multiple sexual partners, it is unclear whether BV results from acquisition of a sexually transmitted pathogen. Women who have never been sexually active are rarely affected. Treatment of the male sexual partner has not been beneficial in preventing recurrences of BV.
Prevention and Treatment of Sexually Transmitted Infections

**VULVOVAGINAL CANDIASIS**

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>C. albicans, occasionally other Candida spp, Torulopsis spp, or other yeasts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Features</td>
<td>Pruritus, vulvovaginal erythema, and vaginal discharge. Other symptoms may include vaginal dryness, vulvar burning, dyspareunia, and external dysuria. None of these symptoms should be regarded as specific.</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Gram stain of a native vaginal discharge specimen demonstrates yeasts or pseudohyphae or Bacteriological culture or other test yields positive result of a yeast species. Candida vaginitis is associated with a normal vaginal pH (≤ 4.5).</td>
</tr>
<tr>
<td>Treatment</td>
<td><strong>Recommended treatment regimens</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Intravaginal agents:</strong></td>
</tr>
<tr>
<td></td>
<td>Butoconazole 2% cream 5 g intravaginally for 3 days, or</td>
</tr>
<tr>
<td></td>
<td>Clotrimazole 1% cream 5 g intravaginally for 7-14 days, or</td>
</tr>
<tr>
<td></td>
<td>Clotrimazole 100-mg vaginal tablet for 7 days, or</td>
</tr>
<tr>
<td></td>
<td>Clotrimazole 200-mg vaginal suppositories, 1 suppository for 3 days, or</td>
</tr>
<tr>
<td></td>
<td>Miconazole 2% cream 5 g intravaginally for 7 days, or</td>
</tr>
<tr>
<td></td>
<td>Miconazole 200-mg vaginal suppositories, 1 suppository for 3 days, or</td>
</tr>
<tr>
<td></td>
<td>Nystatin 100,000-unit vaginal tablet, 1 tablet for 14 days, or</td>
</tr>
<tr>
<td></td>
<td>Tioconazole 6.5% ointment, 5 g intravaginally in a single application, or</td>
</tr>
<tr>
<td></td>
<td>Terconazole 0.4% cream, 3 g intravaginally for 7 days, or</td>
</tr>
<tr>
<td></td>
<td>Terconazole 0.8% cream 5 g intravaginally for 3 days, or</td>
</tr>
<tr>
<td></td>
<td>Terconazole 80-mg vaginal suppositories, one suppository for 3 days</td>
</tr>
<tr>
<td></td>
<td><strong>Oral preparations:</strong></td>
</tr>
<tr>
<td></td>
<td>Fluconazole 150 mg tablet, 1 tablet in a single dose</td>
</tr>
</tbody>
</table>

**TRICHOMONIASIS**

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>T. vaginalis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Features</td>
<td>Profuse, malodorous, yellow-green vaginal discharge and vulvar irritation. Symptoms are subtle in many women.</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>May cause adverse pregnancy outcomes, particularly premature rupture of the membranes and preterm delivery.</td>
</tr>
<tr>
<td>Treatment</td>
<td><strong>Recommended Treatment Regimen</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Metronidazole 2 g orally in a single dose</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Alternatively treatment regimen</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Metronidazole 500 mg twice a day for 7 days</strong></td>
</tr>
<tr>
<td>Pregnancy</td>
<td>Metronidazole may be prescribed, 2 g orally in a single dose</td>
</tr>
</tbody>
</table>

Only topical azole therapy should be used to treat pregnant women. Of those treatments that have been investigated for use during pregnancy, the most effective are butoconazole, clotrimazole, miconazole, and terconazole. Many experts recommend seven days of therapy during pregnancy.
toms include itching and vaginal discharge. Other symptoms may include vaginal dryness, vulvar burning, dyspareunia, and external dysuria. None of these symptoms should be regarded as specific.

**Recurrent Vulvovaginal Candidiasis (RVVC)**
RVVC, which is usually defined as four or more episodes of symptomatic vulvovaginal candidiasis annually, affects a small number of women (probably <5%). The pathogenesis of RVVC has not been studied adequately. Risk factors include uncontrolled diabetes mellitus, immunosuppression, and corticosteroid use. In some women who have RVVC, the candidiasis becomes more acute after repeated courses of treatment with topical or systemic antibiotics. However, this association has not been proven in the majority of women. Most women who have RVVC have no apparent predisposing factors.

**Pelvic Inflammatory Disease (PID)**
PID encompasses the entire range of inflammatory disorders of the upper genital tract in women, endometritis, salpingitis, tubo-ovarian abscess, and pelvic peritonitis as separate clinical entities and in any possible combination; most cases of PID are caused by sexually transmitted pathogens, especially *N. gonorrhoeae* and *C. trachomatis*. However, microorganisms that are often part of the vaginal flora (e.g., anaerobes, *G. vaginalis*, *H. influenzae*, enteric Gram-negative rods, and *Streptococcus agalactiae*) can also cause PID. In addition, *M. hominis* and *U. urealyticum* can cause PID.

**PELVIC INFLAMMATORY DISEASE (PID)**

<table>
<thead>
<tr>
<th>Definition</th>
<th>Inflammatory disorders of the upper genital tract, including any combination of endometritis, salpingitis, tubo-ovarian abscess, and pelvic peritonitis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathogens</td>
<td><em>N. gonorrhoeae</em>, <em>C. trachomatis</em>, <em>M. hominis</em>, <em>U. urealyticum</em>, and microorganisms that are frequently part of vaginal flora (i.e., anaerobes, <em>G. vaginalis</em>, <em>H. influenzae</em>, enteric Gram-negative rods, and <em>Streptococcus agalactiae</em>).</td>
</tr>
</tbody>
</table>
| Minimum Diagnostic Criteria | • Lower abdominal tenderness  
• Adnexal tenderness  
• Cervical motion tenderness |
| Additional Criteria | • Elevated temperature (>38.3°C)  
• Abnormal cervical and vaginal discharge  
• Elevated ESR  
• Elevated C-reactive protein  
• Laboratory confirmation of cervical infection with *N. gonorrhoeae* or *C. trachomatis* |
| Definitive Criteria | • Histopathologic evidence obtained on endometrial biopsy  
• Transvaginal sonography or other imaging techniques showing thickened fluid-filled tubes with or without free pelvic fluid or tubo-ovarian complex  
• Laparoscopic abnormalities consistent with PID |
| Criteria for Hospitalization | • Possible surgical emergencies such as appendicitis  
• Pregnancy  
• Patient does not respond clinically to oral antimicrobial therapy  
• Patient unable to follow and tolerate outpatient oral treatment  
• Severe nausea, vomiting, and high fever  
• Tubo-ovarian abscess  
• Immunodeficiency (i.e., HIV infection with low CD4 counts, immunosuppressive therapy, or another disease) |
| Treatment Regimens | Treatment regimens should provide empiric, broad-spectrum coverage of all possible pathogenic microorganisms (*N. gonorrhoeae*, *C. trachomatis*, anaerobic microorganisms, Gram-negative facultative bacteria, and streptococci). |
PELVIC INFLAMMATORY DISEASE (PID) continued

**Parenteral Treatment**

**Regimen A**
- Cefotetan: 2 g IV every 12 hours, or Cefoxitin: 2 g IV every 6 hours plus Doxycycline: 100 mg IV or orally every 12 hours
- Parenteral therapy may be discontinued 24 hours after a patient improves clinically, and oral therapy with doxycycline (100 mg twice a day) should continue further for 14 days.
- When tubo-ovarian abscess is present, clindamycin with doxycycline is used for continued therapy, because it provides more effective coverage of anaerobic microorganisms.

**Regimen B**
- Clindamycin: 900 mg intravenously every 8 hours plus Gentamicin: loading dose intravenously or intramuscularly (2 mg/kg of body weight), followed by a maintenance dose (1.5 mg/kg) every 8 hours. Single daily dosing may be used instead.
- Parenteral therapy may be discontinued 24 hours after the patient's clinical state improves, and oral therapy may be continued:
  - Doxycycline: 100 mg orally twice a day
  - Clindamycin: 450 mg orally 4 times a day to complete a full 14 days of treatment.
- When tubo-ovarian abscess is present, clindamycin is used because it provides more effective coverage of anaerobic microorganisms.

**Regimen C**
- Ofloxacin: 400 mg orally twice a day for 14 days plus Metronidazole: 500 mg orally twice a day for 14 days.

**Alternative Parenteral Regimen**
- Ceftriaxone: 250 mg IV once or Cefoxitin: 2 g IV plus probenecid 1 g orally in a single dose concurrently once or Other parenteral third-generation cephalosporins (for example, ceftriaxone or cefotaxime) plus
  - Doxycycline: 100 mg orally twice a day for 14 days (include this treatment regimen with one of the above regimens).

**Oral Treatment**

**Regimen A**
- Ofloxacin: 400 mg orally twice a day for 14 days plus
  - Metronidazole: 500 mg orally twice a day for 14 days.

**Regimen B**
- Cefixime: 250 mg IM once or Cefoxitin: 2 g IM plus probenecid 1 g orally in a single dose concurrently once or Other parenteral third-generation cephalosporins (for example, cefixime or cefotaxime) plus
  - Doxycycline: 100 mg orally twice a day for 14 days (include this treatment regimen with one of the above regimens).

**Follow-up**
- A follow-up examination should be performed within 72 hours.
- Clinical improvement should occur within three days after initiation of therapy (i.e., defervescence, reduction in direct or rebound abdominal tenderness, and decline in uterine, adnexal, and cervical motion tenderness).
- Patients who do not demonstrate improvement within this time period usually require additional diagnostic tests, surgical intervention, or both.
- Repeated screening for C. trachomatis and N. gonorrhoeae four to six weeks after therapy is completed.
- If polymerase chain reaction (PCR) or LCR is used to document a test of cure, re-screening should be delayed for one month after completion of therapy.

**Management of Sexual Partner(s)**
- Sexual partner(s) should be examined and treated if they had sexual contact with the patient within 60 days of the onset of symptoms in the patient.
- Sexual partner(s) should be treated empirically with regimens effective against both of these infections (C. trachomatis, N. gonorrhoeae), regardless of the apparent etiology of PID or pathogenic microorganisms isolated from the infected patient.

**Pregnancy**
- Because of the high risk of maternal morbidity, fetal death, and preterm deliveries, pregnant women who have suspected PID should be hospitalized and treated parenterally with antibiotics.

**HIV**
- Should be managed actively using one of the parenteral antimicrobial regimens.
PREGNANT WOMEN AND STIs

Intrauterine or perinatally transmitted STIs can have fatal or severely debilitating effects on a fetus. Pregnant women and their sexual partner(s) should be counseled about STIs, including about the risk of perinatal infections.

Recommended Screening Tests

- A serologic test for syphilis must be performed on all pregnant women at their first prenatal visit. If the woman does not intend to be under observation during her pregnancy—or she belongs to a population group that generally does not seek medical care—screening should be performed immediately after confirmation of pregnancy. For patients at high risk, syphilis screening should be repeated in the third trimester. No infant should be discharged from a maternity hospital unless the mother has had a serological test for syphilis at least once during the pregnancy, and preferably again at delivery. All women who deliver a stillborn infant should be tested for syphilis.

- It is advisable to perform a serologic test for hepatitis B surface antigen (HBsAg) in the blood serum of all pregnant women during their first prenatal visit. HBsAg testing must be repeated late in the pregnancy for women who were HBsAg negative at the time of the first test, but who are at high risk for hepatitis B infection (i.e., injecting drug users and women who have concomitant STIs).

SCREENING PREGNANT WOMEN FOR STIs

- Syphilis
  - First prenatal visit
  - Third trimester
  - At delivery
  - Populations in which prenatal care is not effective
  - Screening with use of rapid plasma reagin
  - Repeat

- HBsAg
  - Risk group
  - Women who have a negative result, but who are at high risk for HBV

- N. gonorrhoeae
  - Risk group

- C. trachomatis
  - Risk group

- HIV
  - All women

- Pap Smear
  - Risk group
  - All women
Pregnant women who have either a primary genital herpes infection, hepatitis B virus cytomegalovirus infection, or group B streptococcal infection, and women with syphilis who are allergic to penicillin must be referred to a specialist for treatment.

In the absence of clinical manifestations during the third trimester, cultures for herpes simplex virus (HSV) are not indicated for women who have a history of recurrent genital herpes. However, obtaining cultures at the time of delivery may be useful in providing proper neonatal care. A preventative cesarean section is not indicated for women who do not have active genital lesions at the time of delivery.

**SEXUAL VIOLENCE AND STIs**
The identification of STIs in sexually active adults who have survived sexual assault is more important for the psychological and medical management of the patient than for legal purposes because the infection could have been acquired before the assault.

Trichomoniasis, BV, chlamydiosis, and gonorrhea are the most frequently diagnosed infections in women who have been sexually assaulted. Because the prevalence of these STIs among sexually active women is high, their presence after an assault does not necessarily signify acquisition during the assault. Chlamydial and gonococcal infections are of special concern because of the possibility of ascending infection. In addition, vaccination...
against hepatitis B prevents the infection from developing in women to whom the virus was transmitted during an assault.

**Examination for STIs**

**Initial Examination**

An initial examination should include:

1. Bacteriologic tests for *N. gonorrhoeae* and *C. trachomatis* from specimens collected from any sites of penetration or attempted penetration. If a bacteriologic test for chlamydia is not performed, the nucleic acid amplification method is an acceptable substitute. The nucleic acid amplification method is highly sensitive, and if a positive result is obtained, the diagnosis should be verified by a method based on a different diagnostic principle. Enzyme immunoassay and direct fluorescent antibody tests are not recommended because they more frequently produce false negative results; false positive results have also been reported with these methods.

2. Microscopic examination of a native specimen and culturing of the vaginal material for *T. vaginalis*. If vaginal discharge and malodor are evident, the native specimen should be examined for the presence of BV and yeasts.


---

**Sexual Violence and STIs**

**Initial Examination**

- **Bacteriologic culture for**
  - *N. gonorrhoeae*
  - If not possible:
    - **Nucleic acid amplification test**
    - Confirmed by a method based on a different diagnostic principle. Enzyme immunoassay and direct fluorescent antibody tests are not recommended for this purpose.

- **Microscopic examination of a native specimen and culturing of the vaginal specimen for**
  - *T. vaginalis* infection.

- **Collection of a serum sample for immediate evaluation for**
  - HIV
  - Syphilis
  - Hepatitis B
  - Serologic tests repeated after 6, 12, and 24 weeks

- **Immunization against hepatitis B** during the initial examination. Subsequent doses of the vaccine should be given after 1–2 and 4–6 months.

**Prophylaxis**

- **Ceftriaxone** 125 mg IM in a single dose plus **Metronidazole** 2 g orally in a single dose plus **Azithromycin** 1 g orally in a single dose or doxycycline 100 mg orally twice a day for 7 days

**Clinical management** should be approached according to guidelines on occupational mucous membranes exposure.
Follow-up Examinations
Although it is often difficult for patients to comply with follow-up examinations several weeks after an assault, such examinations are essential to:
- detect new infections acquired during or after the assault,
- continue hepatitis B immunization, if indicated, and
- provide counseling and treatment for other STIs.

Follow-up Examination after Sexual Assault
Examination for STIs should be repeated two weeks after the assault. Because infectious agents acquired during the assault may not have produced a sufficient concentration of microorganisms to result in positive test results at the initial examination, cultures, a native specimen, and other tests should be repeated two weeks after the assault unless prophylactic treatment has already been provided.

Serologic tests for syphilis and HIV infection should be repeated 6, 12, and 24 weeks after the assault if initial test results were negative.

Counseling
At the initial examination and, if indicated, at follow-up examinations, patients should be told:
- about the symptoms of STIs and the need for immediate examination if they occur,
- to abstain from sexual contact until the preventive treatment has been completed.

Risk of Acquiring HIV Infection
Although seroconversion has been reported among persons whose only known risk factor was sexual assault or attempted assault, the risk of acquiring HIV through sexual assault is low. The probability of HIV transmission from an HIV-positive person during a single act of sexual contact depends on many factors. These factors may include the type of sexual contact (oral, vaginal, or anal); the presence of oral, vaginal, or anal trauma; site of exposure to ejaculate; the viral load in the ejaculate; and the presence of an STI in both parties.

The likelihood of HIV transmission may also be affected by postexposure therapy with antiretroviral agents. A study involving healthcare workers who had exposure to HIV-infected blood showed that postexposure preventive therapy with zidovudine reduces the risk of HIV infection.

On the basis of these study results and the biological likelihood that antiretroviral agents would be effective in preventing HIV infection, postexposure preventive therapy has been recommended for health-care workers after hazardous exposure to HIV-infected materials. However, it is not known whether these findings can be extrapolated to other types of exposure to HIV-infected bodily fluids, including sexual assault. No recommendations can be made on the basis of available information regarding the appropriateness of postexposure antiretroviral therapy after sexual exposure to HIV.

Although HIV-antibody seroconversion has been reported among persons whose only known risk factor was sexual assault or attempted assault, the risk for acquiring HIV infection through sexual assault is low.
Healthcare providers who consider offering post-exposure therapy to their patients should take into account the likelihood of exposure to HIV, the potential benefits and risks of such therapy, and the interval between the exposure and initiation of therapy. Because timely determination of the HIV status of the assailant is not possible in many cases of sexual assault, the healthcare provider should assess the nature of the assault, any available information about HIV-risk behaviors exhibited by persons who are sexual assailants (e.g., high-risk sexual practices and injection drug use), and the local epidemiological situation for HIV infection.

If postexposure antiretroviral prophylaxis is offered, the following issues should be discussed with the patient:

1. The unknown effectiveness and known toxicity of antiretroviral drugs
2. The critical need for frequent dosing of the medications
3. The need for careful observation
4. The importance of strict compliance with the drug regimen
5. The need to begin treatment immediately to ensure maximum effectiveness

References

5. CDC, 1998.
7. ibid.
12. ibid.

Additional Reading

Additional Reading


APPENDIX: STD TREATMENT GUIDELINES FOR ADULTS AND ADOLESCENTS, 2002*

These guidelines for the treatment of patients with STDs reflect the 2002 CDC STD Treatment Guidelines and the Region IX Infertility Clinical Guidelines. The focus is primarily on STDs encountered in office practice. These guidelines are intended as a source of clinical guidance; they are not a comprehensive list of all effective regimens. Notes for these charts are found on page 66.

* Source: California STD/HIV Prevention Training Center
<table>
<thead>
<tr>
<th>DISEASE/SYNDROME</th>
<th>RECOMMENDED REGIMENS</th>
<th>DOSE/ROUTE</th>
<th>ALTERNATIVE REGIMENS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chlamydia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Uncomplicated Infections Adults/Adolescents</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Azithromycin or</td>
<td>1 g po</td>
<td>• Erythromycin base  500 mg po qid × 7 d or</td>
<td></td>
</tr>
<tr>
<td>• Doxycycline2</td>
<td>100 mg po bid × 7 d</td>
<td>• Erythromycin ethylsuccinate  800 mg po qid × 7 d or</td>
<td></td>
</tr>
<tr>
<td>Pregnant Women3</td>
<td>1 g po</td>
<td>• Ofloxacin1 300 mg po bid × 7 d or</td>
<td></td>
</tr>
<tr>
<td>• Azithromycin or</td>
<td>500 mg po po qid × 7 d</td>
<td>• Levofloxacin2 250 mg po qid × 7 d or</td>
<td></td>
</tr>
<tr>
<td>• Amoxicillin or</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>• Erythromycin base</td>
<td>800 mg po po qid × 7 d</td>
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<td>100 mg po po bid × 7 d</td>
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<td>250 mg po po qid × 7 d</td>
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<tr>
<td></td>
<td>300 mg po po qid × 7 d</td>
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</tr>
<tr>
<td><strong>Gonorrhea4</strong></td>
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<tr>
<td>Uncomplicated Infections Adults/Adolescents</td>
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<td></td>
</tr>
<tr>
<td>• Cefixime or</td>
<td>400 mg po</td>
<td>• Spectinomycin4,5 2 g IM or</td>
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</tr>
<tr>
<td>• Ceftriaxone plus† chlamydia</td>
<td>125 mg IM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>recommended regimen listed above</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnant Women</td>
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<tr>
<td>• Ceftriaxone 400 mg po</td>
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<td>• Cefixime† plus† chlamydia</td>
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<tr>
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<tr>
<td>Pelvic Inflammatory Disease7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parenteral†</td>
<td>2 g IV q 12 hrs 2 g IV q 6 hrs 100 mg po or IV q 12 hrs 900 mg IV q 8 hrs 2 mg/kg IV or IM followed by 1.5 mg/kg IV or IM q 8 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Either Cefotetan or Cefoxitin plus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clindamycin plus Gentamicin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral/IM</td>
<td>250 mg IM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Either Ceftriaxone or Cefoxitin with Probenecid plus Doxycycline2</td>
<td>2 g IM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 100 mg po po bid × 14 d</td>
<td>100 mg po po bid × 14 d</td>
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<tr>
<td><strong>Mucopurulent Cervicitis7</strong></td>
<td></td>
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</tr>
<tr>
<td>• Azithromycin or</td>
<td>1 g po</td>
<td></td>
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</tr>
<tr>
<td>• Doxycycline2</td>
<td>100 mg po bid × 7 d</td>
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<tr>
<td><strong>Nongonococcal Urethritis7</strong></td>
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<tr>
<td>• Azithromycin or</td>
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<td>100 mg po bid × 7 d</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Epididymitis7</strong></td>
<td>Likely due to Gonorrhea or Chlamydia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ceftriaxone plus</td>
<td>250 mg IM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doxycycline</td>
<td>100 mg po po bid × 10 d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likely due to enteric organisms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ofloxacin1 or</td>
<td>300 mg po bid × 10 d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Levofloxacin1</td>
<td>300 mg po po bid × 10 d</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes for these charts are found on page 66.
### DISEASE/SYNDROME

<table>
<thead>
<tr>
<th>Disease/Syndrome</th>
<th>Recommended Regimens</th>
<th>Dose/Route</th>
<th>Alternative Regimens</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trichomoniasis</strong>&lt;sup&gt;10&lt;/sup&gt;</td>
<td>• Metronidazole</td>
<td>2 g po</td>
<td>• Metronidazole 500 mg po bid × 7 d</td>
</tr>
<tr>
<td><strong>Bacterial Vaginosis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adults/Adolescents</td>
<td>• Metronidazole or Clindamycin cream&lt;sup&gt;11&lt;/sup&gt; or Metronidazole gel</td>
<td>500 mg po bid × 7 d 2%, one full applicator (5g) intravaginally qhs × 7 d 0.75%, one full applicator (5g) intravaginally bid × 7 d</td>
<td>• Metronidazole 2 g po or Clindamycin 300 mg po bid × 7 d or Clindamycin ovoides 100 mg intravaginally qhs × 3 d</td>
</tr>
<tr>
<td>Pregnant Women</td>
<td>• Metronidazole or Clindamycin</td>
<td>250 mg po tid × 7 d 300 mg po bid × 7 d</td>
<td></td>
</tr>
<tr>
<td><strong>Chancroid</strong></td>
<td>• Azithromycin or Erythromycin base</td>
<td>1 g po 250 mg IM</td>
<td>• Erythromycin base 500 mg po tid × 7 d</td>
</tr>
<tr>
<td></td>
<td>• Ceftriaxone or Ciprofloxacin&lt;sup&gt;2&lt;/sup&gt;</td>
<td>500 mg po bid × 3 d</td>
<td></td>
</tr>
<tr>
<td><strong>Lymphogranuloma Venereum</strong></td>
<td>• Doxycycline&lt;sup&gt;2&lt;/sup&gt;</td>
<td>100 mg po bid × 21 d</td>
<td>• Erythromycin base 500 mg po qid × 21 d or Azithromycin 1 g po qd × 21 d</td>
</tr>
<tr>
<td><strong>Human Papillomavirus</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External Genital/Perianal Warts</td>
<td>Patient Applied • Podophlox&lt;sup&gt;12&lt;/sup&gt; 0.5% solution or gel or • Imiquimod&lt;sup&gt;13&lt;/sup&gt; 5% cream</td>
<td></td>
<td>• Intralosional interferon or Laser surgery</td>
</tr>
<tr>
<td></td>
<td>Provider Administered • Cryotherapy or Podophyllin&lt;sup&gt;12&lt;/sup&gt; resin 10%-25% in tincture of benzoin or • Trichloroacetic acid (TCA) or Bichloroacetic acid (BCA) 80-90% or • Surgical removal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mucosal Genital Warts • Cryotherapy or TCA or BCA 80-90% or Podophyllin&lt;sup&gt;13&lt;/sup&gt; resin 10-25% in tincture of benzoin or • Surgical removal</td>
<td>Vaginal, urethral meatus, and anal Vaginal and anal Urethral meatus only Anal warts only</td>
<td></td>
</tr>
<tr>
<td><strong>Herpes Simplex Virus</strong>&lt;sup&gt;14&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Clinical Episode of Herpes</td>
<td>• Acyclovir or Acyclovir or Famiclovir or Valacyclovir</td>
<td>400 mg po tid × 7-10 d 200 mg po 5/day × 7-10 d 250 mg po tid × 7-10 d 1 g po bid × 7-10 d</td>
<td></td>
</tr>
<tr>
<td>Episodic Therapy for Recurrent Episodes</td>
<td>• Acyclovir or Acyclovir or Famiclovir or Valacyclovir</td>
<td>400 mg po tid × 5 d 200 mg po 5/day × 5 d 125 mg po bid × 5 d 500 mg po bid × 3-5 d 1 g po qd × 5 d</td>
<td></td>
</tr>
</tbody>
</table>

<sup>10</sup> Notes for these charts are found on page 66.
### Prevention and Treatment of Sexually Transmitted Infections

#### STD Treatment Guidelines for Adults and Adolescents, 2002

<table>
<thead>
<tr>
<th>DISEASE/SYNDROME</th>
<th>RECOMMENDED REGIMENS</th>
<th>DOSE/ROUTE</th>
<th>ALTERNATIVE REGIMENS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suppressive Therapy</td>
<td>• Acyclovir or</td>
<td>400 mg po bid</td>
<td>• Doxycycline(^{1,16}) 100 mg po bid × 2 weeks or *</td>
</tr>
<tr>
<td></td>
<td>• Famciclovir or</td>
<td>250 mg po bid</td>
<td>• Tetracycline(^{1,16}) 500 mg po qid × 2 weeks or *</td>
</tr>
<tr>
<td></td>
<td>• Valacyclovir or</td>
<td>500 mg po bid</td>
<td>• Ceftriaxone(^{1,16}) 1 g IM or IV q1d × 8-10 d or *</td>
</tr>
<tr>
<td></td>
<td>• Valacyclovir</td>
<td>1 g po qd</td>
<td>• Azithromycin(^{1,16}) 2 g po</td>
</tr>
<tr>
<td>HIV Infection</td>
<td>Episodic Therapy for Recurrent Episodes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Acyclovir or</td>
<td>400 mg po tid × 5-10 d</td>
<td>• Doxycycline(^{1,16}) 100 mg po bid × 2 weeks or *</td>
</tr>
<tr>
<td></td>
<td>• Acyclovir or</td>
<td>200 mg po 5/day × 5-10 d</td>
<td>• Tetracycline(^{1,16}) 500 mg po qid × 2 weeks or *</td>
</tr>
<tr>
<td></td>
<td>• Famciclovir or</td>
<td>500 mg po bid × 5-10 d</td>
<td>• Ceftriaxone(^{1,16}) 1 g IM or IV q1d × 8-10 d or *</td>
</tr>
<tr>
<td></td>
<td>• Valacyclovir</td>
<td>1 g po bid × 5-10 d</td>
<td>• Azithromycin(^{1,16}) 2 g po</td>
</tr>
<tr>
<td></td>
<td>Suppressive Therapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Acyclovir or</td>
<td>400-800 mg po bid-tid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Famciclovir or</td>
<td>300 mg po bid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Valacyclovir</td>
<td>500 mg po bid</td>
<td></td>
</tr>
<tr>
<td>Syphilis</td>
<td>Primary, Secondary, and Early Latent</td>
<td>• Benzathine penicillin G</td>
<td>2.4 million units IM</td>
</tr>
<tr>
<td></td>
<td>Late Latent and Unknown Duration</td>
<td>• Benzathine penicillin G</td>
<td>7.2 million units, administered as 3 doses of 2.4 million units IM, at 1-week intervals</td>
</tr>
<tr>
<td></td>
<td>Neurosyphilis(^{1,17})</td>
<td>• Aqueous crystalline penicillin G</td>
<td>18-24 million units daily, administered as 3-4 million units IV q 4hrs × 10-14 d, *</td>
</tr>
<tr>
<td></td>
<td>Pregnant Women(^{1,18})</td>
<td>• Benzathine penicillin G</td>
<td>2.4 million units IM</td>
</tr>
<tr>
<td></td>
<td>Late Latent and Unknown Duration</td>
<td>• Benzathine penicillin G</td>
<td>7.2 million units, administered as 3 doses of 2.4 million units IM, at 1-week intervals</td>
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<tr>
<td></td>
<td>Neurosyphilis(^{1,17})</td>
<td>• Aqueous crystalline penicillin G</td>
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</tr>
<tr>
<td>HIV Infection</td>
<td>Primary, Secondary, and Early Latent</td>
<td>• Benzathine penicillin G</td>
<td>2.4 million units IM</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

\* Notes for these charts are found on page 66.
Appendix STD Treatment Guideline

Notes

1. Women with chlamydia should be rescreened 3-4 months after treatment.
2. Contraindicated for pregnant and nursing women.
3. Test-of-cure follow-up is recommended because the regimens are not highly efficacious (Amoxicillin and Erythromycin) or the data on safety and efficacy are limited (Azithromycin).
4. Co-treatment for chlamydia infection is indicated unless chlamydia infection is ruled out using sensitive technology or if 2 g Azithromycin dose is used.
5. Not recommended for pharyngeal gonococcal infection.
6. Test-of-cure follow-up is recommended to ensure patient does not have an untreated infection from a resistant gonorrhea strain.
7. Testing for gonorrhea and chlamydia is recommended because a specific diagnosis may improve compliance and partner management.
8. Discontinue 24 hours after patient improves clinically and continue with oral therapy for a total course of 14 days.
9. If gonorrhea is documented, test-of-cure follow-up is recommended to ensure patient does not have untreated resistant gonorrhea infection.
10. Documented infection with treatment failure should be evaluated for metronidazole-resistant T. vaginalis.
11. Might weaken latex condoms and diaphragms because oil-based; not recommended in pregnancy.
13. Safety in pregnancy has not been well established.
14. Counseling about natural history, asymptomatic shedding, and sexual transmission is an essential component of herpes management.
15. If lesions persist or recur while receiving antiviral therapy, HSV resistance should be suspected and a viral isolate should be obtained for testing.
16. Because efficacy of these therapies has not been established and compliance of some of these regimes difficult, close follow-up is essential. If compliance or follow-up cannot be ensured, then patient should be desensitized and treated with benzathine penicillin.
17. One dose of 2.4 million units of Benzathine penicillin G recommended at completion of neurosyphilis therapy.
18. Patients allergic to penicillin should be treated with penicillin after desensitization.