21. VAGINITIS AND SEXUALLY TRANSMITTED DISEASES (DIAGNOSIS AND TREATMENT)\(^1\)

Eve Kerr, M.D., M.P.H.

Approach

The general approach to reviewing vulvovaginitis and sexually transmitted diseases (STDs) was obtained from a general text on ambulatory medicine (Barker et al., 1991) and a text of diagnostic strategies for common medical problems (Panzer et al., 1991) and two textbooks on adolescent medicine (Friedman et al., 1992; McAnarney et al., 1992). Specific treatment recommendations were derived from the Centers for Disease Control 1993 Treatment Guidelines to Sexually Transmitted Diseases (CDC, 1993). The guidelines were based on systematic literature reviews by CDC staff and consensus opinions by experts. The literature reviews are summarized, in part, in the April 1995 Supplement to *Clinical Infectious Diseases*, which we reviewed to add greater detail to treatment controversies. Adolescents account for 3 to 6 million cases of sexually transmitted diseases annually.

VULVOVAGINITIS

IMPORTANCE

The most common causes of vulvovaginal infections are: *Gardnerella vaginalis*, *Candida albicans*, and *Trichomonas vaginalis*. An estimated 75 percent of women will experience at least one episode of vulvovaginal candidiasis in their lifetimes, and 40-45 percent will experience two or more episodes (CDC, 1993). There are an estimated 10 million visits to physicians' offices each year for vaginitis (Reef et al., 1995). *Vulvovaginal candidiasis* and bacterial vaginosis (*G. vaginalis*) are not considered sexually transmitted diseases, although women who are not

\(^1\)This chapter was originally written for the Women’s Quality of Care Panel.
sexually active are rarely affected by bacterial vaginosis (CDC, 1993). *T. vaginalis* is transmitted through sexual activity and is a common cause of vaginitis among adolescents who are sexually active. Gonorrhea and chlamydial infections, although not causative of vulvovaginitis, sometimes present with an abnormal discharge. In fact, as many as 25 percent of women with a discharge have cervical infections (Panzer et al., 1991).

Candidal vaginitis does not have important medical sequela but does cause discomfort that may impair the patient's quality of life. Bacterial vaginosis may be associated with pelvic inflammatory disease (PID) (Joesoef and Schmid, 1995). A recent randomized controlled trial (RCT) found a threefold decrease in the incidence of postabortion PID in women with bacterial vaginosis who had been treated with metronidazole (Joesoef and Schmid, 1995).

**EFFICACY AND/OR EFFECTIVENESS OF INTERVENTIONS**

**Screening**

There is no indication for general population screening for vaginitis.

**Diagnosis**

The approach to diagnosis is well summarized in Panzer et al. (1991). The history and physical examination have poor predictive value. For example, approximately 35 percent of symptomatic patients had no infection, 32 percent of asymptomatic patients had infection, and approximately 15 percent of infected patients had normal pelvic examinations. Risk factors for sexually transmitted diseases (STDs)—such as the number of sexual partners in the past month, history of sexually transmitted disease, presence of genitourinary symptoms, and sexual contact with an infected partner—increase the prior probability of a sexually transmitted cause for vaginal discharge.

It is difficult to determine fully the operating characteristics of diagnostic tests for vaginitis. See Table 21.1 for details.
Table 21.1
Operating Characteristics of Common Diagnostic Tests for Vaginal and Cervical Infection

<table>
<thead>
<tr>
<th>Test</th>
<th>Sensitivity (Percent)</th>
<th>Specificity (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vaginal infection</strong></td>
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<td></td>
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<tr>
<td><em>Trichomonas vaginalis</em></td>
<td></td>
<td></td>
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<tr>
<td>Saline wet mount</td>
<td>50-75</td>
<td>70-98</td>
</tr>
<tr>
<td>Direct fluorescent antibody</td>
<td>80-86</td>
<td>98</td>
</tr>
<tr>
<td><strong>Vaginal candidiasis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium hydroxide preparation</td>
<td>30-84</td>
<td>90-99</td>
</tr>
<tr>
<td><strong>Bacterial vaginosis</strong></td>
<td></td>
<td></td>
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<tr>
<td>Vaginal pH</td>
<td>81-97</td>
<td>...</td>
</tr>
<tr>
<td>Clue cells</td>
<td>85-90</td>
<td>80</td>
</tr>
<tr>
<td>&quot;Whiff&quot; test</td>
<td>38-84</td>
<td>...</td>
</tr>
<tr>
<td>Thin homogeneous discharge</td>
<td>80</td>
<td>...</td>
</tr>
<tr>
<td>Gram stain of vaginal wash</td>
<td>97</td>
<td>79</td>
</tr>
<tr>
<td>Abnormal amines by chromatography</td>
<td>98</td>
<td>...</td>
</tr>
<tr>
<td><strong>Cervical infection</strong></td>
<td></td>
<td></td>
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<tr>
<td><em>Chlamydia trachomatis</em></td>
<td></td>
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<tr>
<td>Direct fluorescent antibody</td>
<td>70-87</td>
<td>97-99</td>
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<tr>
<td>Enzyme immunoassay</td>
<td>80-85</td>
<td>98</td>
</tr>
<tr>
<td>Culture (single cervical swab)</td>
<td>70-80</td>
<td>98</td>
</tr>
<tr>
<td><em>Neisseria gonorrhoeae</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cervix gram stain</td>
<td>50-79</td>
<td>98</td>
</tr>
<tr>
<td>Culture (single cervical swab)</td>
<td>85-90</td>
<td>98</td>
</tr>
<tr>
<td><strong>Herpes simplex virus</strong></td>
<td></td>
<td></td>
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<tr>
<td>Tzanck smear: vesicular; pustular; crusted</td>
<td>67; 54; 17</td>
<td>85</td>
</tr>
<tr>
<td>Culture: vesicular; pustular; crusted</td>
<td>70; 67; 17</td>
<td>...</td>
</tr>
</tbody>
</table>

Source: Panzer et al., 1991.

Summary of diagnostic tests - Refer to Table 20.1

*Trichomonas vaginalis*

The wet mount is highly specific (70-98 percent) but not particularly sensitive (50-75 percent).

*Candida albicans*
The potassium hydroxide preparation has varied sensitivity (30-84 percent) compared with culture, but is highly specific (90-99 percent).

**Bacterial vaginosis/Gardnerella vaginalis**

Amsel et al. (1983) have developed criteria for diagnosis that are widely accepted (Panzer et al., 1991; Joesoef and Schmid, 1995). The diagnosis in a symptomatic patient is usually based on the presence of at least three of the four following criteria:

1) pH greater than 4.5;  
2) positive whiff test;  
3) clue cells on wet mount; and  
4) thin homogeneous discharge.

See Table 20.1 for a summary of the sensitivity and specificity of these tests.

Diagnostic strategy in the evaluation of acute vulvovaginitis is often governed by the need to institute antimicrobial therapy. The first decision point lies in determining the source of infection (i.e., whether the infection is cervical or vaginal). An assessment of risk factors for sexually transmitted disease and a careful pelvic examination will help determine this. If the discharge is thought to be vaginal in origin, then a saline wet mount, potassium hydroxide wet mount, and the application of Amsel's criteria should be used to determine the cause of vaginitis.

A small proportion of women have recurrent vulvovaginal candidiasis (i.e., three or more episodes of symptomatic vulvovaginal candidiasis annually). These women should be evaluated for predisposing conditions, such as diabetes, immunosuppression, broad spectrum antibiotic use, corticosteroid use, and HIV infection. However, the majority of women with recurrent vulvovaginal candidiasis have no identifiable risk factors (Reef et al., 1995).
**Treatment**

**Bacterial Vaginosis/Gardnerella vaginalis**

These recommendations are based, in part, on randomized controlled studies and meta-analyses reviewed by the CDC (Joesoef and Schmid, 1995). Based on the CDC review, a 7-day treatment regimen is preferred over the single-dose regimen of metronidazole. The CDC notes that topical formulations require further study. However, all of the following have been rated as appropriate treatments for non-pregnant women (CDC, 1993):

- Metronidazole 500 mg orally 2 times per day for 7 days (95 percent overall cure rate); or
- Metronidazole 2 g orally in a single dose (84 percent overall cure rate); or
- Clindamycin cream at night for seven days; or
- Metronidazole cream twice a day for 5 days; or
- Clindamycin 300 mg orally twice a day for seven days.

These treatment recommendations are endorsed by the CDC (which provided the estimates of cure rates) and have been found effective in randomized controlled trials.¹

**T. Vaginalis**

For T. Vaginalis, it is necessary to treat both the patient and sex partner(s) with:

- Metronidazole 2 g orally in a single dose; or
- Metronidazole 500 mg twice daily for 7 days;

Both regimens have been found to be equally effective in RCTs and result in a cure rate of approximately 95 percent (CDC, 1993; RCTs not reviewed).

¹The individual randomized controlled trials were not reviewed.
Candida albicans

A number of topical formulations of the azole class (e.g., butoconazole, clotrimazole, miconazole, tioconazole, terconazole) provide effective treatment for vulvovaginal candidiasis with relief of symptoms and negative cultures among about 90 percent of patients after therapy is completed (CDC, 1993). These recommendations are based on clinical trials reviewed by the CDC (Reef et al., 1995).

In addition, several trials have demonstrated that oral azole drugs (e.g., fluconazole, ketoconazole, and itraconazole) may be as effective as topical agents. The FDA has approved single-dose fluconazole for the treatment of vulvovaginal candidiasis (Wall Street Journal, 1994). Practicing physicians report this therapy to be an effective treatment (Inman et al., 1994). Use of fluconazole is contraindicated for treatment of vaginal candidiasis in pregnancy. Optimal treatment for recurrent vulvovaginal candidiasis is not well established, but a role for oral agents is being investigated (Reef et al., 1995).

Follow-up Care

Follow-up is unnecessary for women whose symptoms resolve after treatment (CDC, 1993).

DISEASES CHARACTERIZED BY CERVICITIS

IMPORTANCE

Mucopurulent cervicitis is most often caused by N. Gonorrhoea and C. trachomatis—two sexually transmitted infections. C. trachomatis is the most common cause of cervical infection, with a prevalence ranging from about 9 to 35 percent in asymptomatic adolescents and 20 to 30 percent in women treated in sexually transmitted disease clinics. The incidence of chlamydia infection in 1988 was 215 per 100,000 (USDHHS, 1990). Approximately 13 percent of women with chlamydial infection have concurrent gonococcal infection and approximately 30 percent of women
with gonococcal infection have chlamydial infection (Panzer et al., 1991). Transmission of gonorrhea from infected men to uninfected women occurs in 90 percent of exposures. The prevalence of gonorrhea infection among adolescents is 3 to 20 percent (Elster and Kuznets, 1994). Initially, both gonococcal and chlamydial infections may be asymptomatic, or present with vaginal symptoms (e.g., mucopurulent vaginal discharge, vaginal itching, dyspareunia, dysuria, vague lower abdominal pain), anorectal symptoms, and pharyngeal symptoms. However, both have the potential to cause pelvic inflammatory disease, the sequelae of which include ectopic pregnancy and infertility.

**Efficacy and/or Effectiveness of Interventions**

**Screening**

Screening for both *N. gonorrhoea* and *C. trachomatis* should be performed with the yearly pelvic examination for all women with multiple sexual partners or with other sexually transmitted diseases (Barker, 1991), and perhaps for all sexually active women age 24 or younger (CDC, 1993).

**Diagnosis**

The presence of symptoms (i.e., mucopurulent vaginal discharge, vaginal itching, dyspareunia, dysuria, vague lower abdominal pain) in the right clinical context (i.e., a sexually active woman) would lead one to suspect cervicitis. Physical exam may reveal red, edematous and friable cervix with mucopurulent cervical discharge.

**C. Trachomatis**

Diagnosis in patients with symptoms of cervicitis is confirmed by direct fluorescent antibody testing (sensitivity 70-87 percent, specificity 97-99 percent; Panzer et al., 1991) or enzyme immunoassay (sensitivity 80-85 percent, specificity 98 percent; Panzer et al., 1991).
**N. Gonorrhoea**

Suspected gonococcal infection may be initially confirmed by gram stain (sensitivity 50-79 percent, specificity 98 percent; Panzer et al., 1991) and subsequently by culture (sensitivity 85-90 percent, specificity 98 percent; Panzer et al., 1991).

**Treatment for Cervicitis**

In patients with inconclusive symptoms and/or physical exam, one must take into account the pre-test probabilities of infection when determining the need for treatment. Therefore, in populations with a high prevalence of sexually transmitted diseases, and in women with known or suspected exposures, or if the patient is unlikely to return for treatment, one should treat without waiting for confirmatory cultures. Otherwise, results of tests should dictate the need for treatment (CDC, 1993).

According to the CDC, treatment for mucopurulent cervicitis should include the following:

- Treatment for gonorrhea and chlamydia in patient populations with high prevalence of both infections, such as patients seen at many STD clinics;
- Treatment for chlamydia only, if the prevalence of *N. gonorrhoea* is low but the likelihood of chlamydia is substantial;
- Await test results if the prevalence of both infections are low and if compliance with a recommendation for a return visit is likely.

**Specific treatments**

*C. trachomatis*

As recommended by the CDC based on RCTs (Weber and Johnson, 1995):

- Doxycycline 100 mg orally twice a day for 7 days; or
- Azithromycin 1 g orally in a single dose.

Alternatives:

- Ofloxacin; Erythromycin; Sulfisoxazole
The partner(s) should be referred for therapy.

N. gonorrhoea

As recommended by the CDC based on RCTs (Moran and Levine, 1995). All women treated for gonorrhea should also be treated for chlamydia (see regimens for chlamydia).

Recommended regimens:
- Ceftriaxone 125 mg IM in single dose; or
- Cefixime 400 mg orally in a single dose; or
- Ciprofloxacin 500 mg orally in a single dose; or
- Ofloxacin 400 mg orally in a single dose.

Other effective antimicrobials may be used (e.g., spectinomycin, other cephalosporins, other quinolones).

Follow-up Care

For chlamydia, follow-up cultures are not necessary for women completing treatment with doxycycline or azithromycin unless symptoms persist or re-infection is suspected (CDC, 1993). For other antibiotic regimens, testing may be considered three weeks after completion of treatment. Similarly, women who are symptom free after treatment for gonorrhea with any recommended antibiotic do not need follow-up cultures (CDC, 1993).

PELVIC INFLAMMATORY DISEASE (PID)

IMPORTANCE

PID represents a spectrum of upper genital tract inflammatory disorder, including endometritis, salpingitis, tubo-ovarian abscess, and pelvic peritonitis. More than one million cases of PID are diagnosed and treated each year in the U.S. (US DHHS, 1990). Adolescents may be at greater risk than other groups for developing PID; estimates from one
source suggest that a sexually active 15-year-old has a 1-in-8 chance of developing acute salpingitis as compared to 1-in-80 for a 24-year-old (Rosenfeld and Litman, in Friedman et al., 1992). The cost of PID and associated ectopic pregnancy and infertility exceed $2.7 billion (Walker et al., 1993). If one takes into account the medical consequences of PID, including infertility, ectopic pregnancy, and chronic pelvic pain, the direct and indirect costs of PID exceed $4.2 billion annually (Walker et al., 1993).

EFFICACY/EFFECTIVENESS OF INTERVENTIONS

Diagnosis

The diagnosis of PID is usually made on the basis of clinical findings. In some cases, women may have atypical PID, with abnormal bleeding, dyspareunia, or vaginal discharge. The CDC suggests that empiric treatment of PID should be instituted on the basis of the presence of all of the following clinical criteria for pelvic inflammation and in the absence of an established cause other than PID (e.g., ectopic pregnancy, acute appendicitis):

- Lower abdominal tenderness;
- Adnexal tenderness; and
- Cervical motion tenderness (CDC, 1993).

The specificity of the diagnosis can be increased if the following signs are also present:

- Oral temperature above 38.3° Centigrade;
- Abnormal cervical or vaginal discharge;
- Elevated erythrocyte sedimentation rate;
- Elevated C-reactive protein;
- Laboratory documentation of cervical infection with *N. gonorrhoea* or *C. Trachomatis* (CDC, 1993).

However, algorithms based only on clinical criteria fail to identify some women with PID and misclassify by others (Walker et al., 1993). Assessment by endometrial biopsy, laparoscopy, or both is more specific but less sensitive (Walker et al., 1993).
Treatment

Hospitalization for antimicrobial treatment of PID is recommended by the CDC under the following circumstances:

- The diagnosis is uncertain and surgical emergencies such as appendicitis and ectopic pregnancy cannot be excluded;
- Pelvic abscess is suspected;
- The patient is pregnant;
- The patient is an adolescent;
- The patient has HIV infection;
- Severe illness or nausea and vomiting preclude outpatient management; or
- Clinical follow-up within 72 hours of starting antibiotic treatment cannot be arranged (CDC, 1993; MMWR, 1991).

These guidelines are based primarily on expert opinion.

Treatment with antibiotics has been well studied for inpatient regimens (Walker et al., 1993). Based on RCTs, the CDC supports the use of two antibiotic regimens for inpatient treatment of PID, both with cure rates above 90 percent (CDC, 1993; Walker et al., 1993).

Regimen 1

- Cefoxitin 2 g IV q 6 or cefotetan 2 g IV q 12 (for at least 48 hours) and
- Doxycycline 100 mg IV or orally every 12 hours (for 14 days).

or

Regimen 2

- Clindamycin 900 mg IV every 8 hours, and
- Gentamicin.

The above regimen should be continued for at least 48 hours, followed by oral doxycycline or clindamycin.

There is limited experience from clinical trials with outpatient regimens for PID (Walker et al., 1993). Further, no specific comparisons have been done on outpatient versus inpatient treatment.
The second regimen noted below provides broader coverage against anaerobic organisms (because of the addition of clindamycin or metronidazole) but is more expensive. Patients who do not respond to outpatient therapy within 72 hours should be hospitalized, since by 72 hours patients should have improvement of subjective complaints and be afebrile (Peterson et al., 1990).

**Regimen 1**
- Cefoxitin 2 g IM plus probenecid, 1 g orally in a single dose concurrently, or ceftriaxone 250 mg IM or other parenteral third-generation cephalosporin, and
- Doxycycline 100 mg orally 2 times a day for 14 days.

**Regimen 2**
- Ofloxacin 400 mg orally 2 times a day for 14 days, and
- Either clindamycin 450 mg orally 4 times a day, or metronidazole 500 mg orally 2 times a day for 14 days.

Further research must be done before the use of limited spectrum antibiotics (such as quinolone alone) can be recommended (Walker et al., 1993).

**Follow-up Care**

Patients receiving outpatient therapy should receive follow up within 72 hours to document clinical improvement and should have a microbiologic re-examination 7-10 days after completing therapy.

Patients receiving inpatient therapy should have a microbiological re-examination 7-10 days after completing therapy to determine cure. Some experts advocate another microbiologic evaluation in 4-6 levels (USDHHS, 1991).

Sex partners should be empirically treated for *C. trachomatis* and *N. gonorrhoea*. 
DISEASES CHARACTERIZED BY GENITAL ULCERS

IMPORTANCE

In the United States, most persons with genital ulcers have genital herpes, syphilis or chancroid, of which genital herpes is the most common. More than one of these diseases may be present among at least 3-10 percent of patients with genital ulcers. Each of the conditions is associated with an increased risk for HIV infection (CDC, 1993).

GENITAL HERPES SIMPLEX INFECTION

On the basis of serologic studies, approximately 30 million persons in the United States may have genital herpes simplex virus (HSV) infection (CDC, 1993).

EFFICACY AND/OR EFFECTIVENESS OF INTERVENTIONS

Screening

There is no literature that suggests a useful role for screening.

Diagnosis

Diagnosis is most often made on the basis of history and physical exam and confirmed by HSV culture or antigen test. The sensitivity of the culture decreases with the age of the lesion (sensitivities for vesicular, pustular and crusted lesions are 70 percent, 67 percent, and 17 percent respectively) (Panzer et al., 1991). Further, specimens from primary lesions and cutaneous lesions are more likely to grow herpes simplex virus.

Treatment

As summarized by the CDC, RCTs demonstrate that acyclovir is effective in decreasing symptoms and signs of HSV in first clinical episodes and when used as a suppressive (daily) therapy (CDC, 1993; Stone and Whittington, 1990). The CDC does not generally recommend acyclovir treatment for recurrent episodes because early therapy can rarely be instituted. The CDC also recommends that after one year of
continuous suppressive therapy, acyclovir should be discontinued to allow assessment of the patient's rate of recurrent episodes. If recurrence rate is low, suppressive treatment may be discontinued permanently or temporarily.

**Other Management Issues**

Patient education is important in preventing the transmission of HSV. Patients should abstain from sexual activity while lesions are present and use condoms during all sexual exposures.

All patients with genital ulcers should receive a serologic test for syphilis. HIV testing should be considered in the management of patients with known or suspected HSV.

**CHANCROID**

Chancroid is caused by the bacterium *Haemophilus ducreyi*. As many as 10 percent of patients with chancroid may be coinfected with *T. pallidum* or HSV (CDC, 1993).

**Efficacy and/or Effectiveness of Interventions**

**Screening**

Screening is not indicated.

**Diagnosis**

With lack of readily available means to culture for *H. ducreyi*, the diagnosis rests on clinical grounds. The CDC states that a probable diagnosis can be made if the patient has one or more painful genital ulcers and:

1) no evidence of *T. Pallidum* infection by dark-field exam or by a serologic test for syphilis performed at least 7 days after onset of ulcers; and

2) the clinical presentation of the ulcer(s) is either not typical of HSV or the HSV test results are negative.

**Treatment**

The CDC recommends treatment with single-dose Azithromycin or IM Ceftriaxone or a 7-day course of Erythromycin.
Patients with Chancroid should be tested for HIV and syphilis, and retested three months later if initial results are negative (CDC, 1993). Sexual partners (within 10 days before onset of the patient's symptoms) should be examined and treated.

**Follow-up Care**

Patients should be re-examined 3-7 days after initiation of treatment to assess clinical improvement.

**PRIMARY AND SECONDARY SYphilis**

**Importance**

Syphilis is a systemic disease caused by *T. pallidum*. The incidence of primary and secondary syphilis in the United States has been steadily rising, with 118 cases per 100,000 reported in 1989 (USDHHS, 1990). In addition, there is an association between genital ulcer disease and the transmission of HIV through sexual contact.

**Efficacy and/or Effectiveness of Interventions**

**Screening**

Screening of the general population is not indicated (except in pregnancy). At-risk populations (i.e., with other sexually transmitted diseases) should be screened using a non-treponemal test, as discussed below (CDC, 1993).

**Diagnosis**

Primary syphilis should be diagnosed on the basis of presence of (usually nonpainful) genital ulcer (or recent history of same), and laboratory testing for syphilis. Twenty percent of patients will have a negative non-treponemal test (VDRL or RPR) at the time of presentation, but direct examination of the chancer (dark-field microscopy or direct fluorescence antibody) will be positive (Panzer et al., 1991). Secondary syphilis is a systemic illness with a prominent rash, beginning six weeks to several months after exposure.
Treatment

Treatment for primary and secondary syphilis should be initiated with benzathine penicillin G (2.4 units IM in single dose) in the absence of allergy. One should not wait for test results to initiate treatment.

Follow-up Care

Treatment failures occur in approximately 5 percent of cases treated with penicillin regimens and more frequently with other regimens (Rofls, 1995). According to the CDC, patients should be re-examined clinically and serologically at three months and again at six months for evidence of successful treatment (CDC, 1993).

Management of sexual partners

Persons sexually exposed to a patient with syphilis in any stage should be evaluated clinically and serologically according the CDC recommendations.
## RECOMMENDED QUALITY INDICATORS FOR VAGINITIS AND SEXUALLY TRANSMITTED DISEASES

The following criteria apply to nonpregnant, non-HIV-infected adolescents who are sexually active.

### Diagnosis

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Quality of evidence</th>
<th>Literature</th>
<th>Benefits</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vaginitis</strong></td>
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<tr>
<td>1. In adolescent girls presenting with complaint of vaginal discharge, the practitioner should perform a speculum exam to determine the source of discharge.</td>
<td>III</td>
<td>Panzer et al., 1991</td>
<td>Decrease discharge, itching and dysuria.</td>
<td>Since implications of and treatment for these two entities differ substantially, physical exam must be performed.</td>
</tr>
<tr>
<td>2. At a minimum, the following tests should be performed on the vaginal discharge: normal saline wet mount for clue cells and trichomads; KOH wet mount for yeast hyphae.</td>
<td>III</td>
<td>Panzer et al., 1991</td>
<td>Decrease discharge, itching and dysuria.</td>
<td>pH determination is also sensitive, but its specificity is unknown. Therefore, at a minimum, the two wet mounts should be performed.</td>
</tr>
<tr>
<td>3. A sexual history should be obtained from all women presenting with a vaginal discharge. The history should include: a. No. of sexual partners in previous 6 months; b. Absence or presence of symptoms in partners; c. Use of condoms; and d. Prior history of sexually transmitted diseases.</td>
<td>III</td>
<td>Panzer et al., 1991; CDC, 1993</td>
<td>Decrease discharge, itching and dysuria. Decrease PID and abdominal pain. Decrease infertility. Decrease mortality from ectopic pregnancy.</td>
<td>In patients with one or more risk factors, probability for a STD (i.e., chlamydia or gonorrhea) as a cause of discharge is increased and culture for the causative organisms may be appropriate. This is important because cervicitis has more significant long-term consequences than vaginitis, such as PID, infertility and ectopic pregnancy.</td>
</tr>
<tr>
<td>4. If three of the following four criteria are met, a diagnosis of bacterial vaginosis or gardnerella vaginosis should be made: pH greater than 4.5; positive whiff test; clue cells on wet mount; thin homogenous discharge.</td>
<td>III</td>
<td>Panzer et al., 1991; Amsel et al., 1983</td>
<td>Decrease discharge, itching and dysuria.</td>
<td>Based on Amsel et al., the presence of three criteria is highly sensitive and specific for bacterial vaginosis.</td>
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<tr>
<td><strong>Cervicitis</strong></td>
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<tr>
<td>5. Routine testing for gonorrhea and chlamydia trachomatis (culture and antigen detection, respectively) should be performed with the routine pelvic exam in all adolescent girls.</td>
<td>III</td>
<td>CDC, 1993; ACOG, 1993 (The Obstetrician Gynecologist Primary Preventive Healthcare)</td>
<td>Alleviate pain. Alleviate fever. Decrease infertility. Decrease mortality from ectopic pregnancy.</td>
<td>This recommendation is based upon epidemiologic studies of transmission and prevalence, as summarized by the CDC. Women with multiple sexual partners are at higher risk for STDs, and these may be asymptomatic. Because adolescent girls may not be honest about the number of sexual partners, and their partners are likely to have multiple partners, screening adolescents routinely is suggested.</td>
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<tr>
<td>PID</td>
<td>6. If a patient is given the diagnosis of PID, a speculum and bimanual pelvic exam should have been performed.</td>
<td>III</td>
<td>CDC, 1993</td>
<td>Alleviate pain. Alleviate fever. Decrease infertility. Decrease mortality from ectopic pregnancy.</td>
</tr>
<tr>
<td>Genital Ulcers</td>
<td>7. If a patient is given the diagnosis of PID, at least 2 of the following signs should be present on physical exam: - lower abdominal tenderness - adnexal tenderness - cervical motion tenderness.</td>
<td>III</td>
<td>CDC, 1993</td>
<td>Alleviate pain. Alleviate fever. Decrease infertility. Decrease mortality from ectopic pregnancy.</td>
</tr>
<tr>
<td>STDs—General</td>
<td>8. If a patient presents with genital ulcer(s) of any cause, HIV testing should be recommended.</td>
<td>III</td>
<td>CDC, 1993</td>
<td>Delay progression to AIDS. Prevention of HIV spread.*</td>
</tr>
<tr>
<td>STDs—General</td>
<td>9. If a patient presents with any sexually transmitted disease (gonorrhea, chlamydia, trachomatis, herpes, chancroid, syphilis) a non-treponemal test (VDRL or RPR) for syphilis should be obtained.</td>
<td>III</td>
<td>CDC, 1993</td>
<td>Prevention of late complications of syphilis.**</td>
</tr>
<tr>
<td>Indicator</td>
<td>Quality of evidence</td>
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<td><strong>Vaginitis</strong></td>
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<td>10. Treatment for bacterial vaginosis should be with metronidazole (orally or vaginally) or clindamycin (orally or vaginally) per the CDC recommendations.</td>
<td>I</td>
<td>CDC, 1993</td>
<td>Decrease discharge, itching and dysuria.</td>
<td>These are the only proven effective regimens. RCTs reviewed by the CDC show that the evidence for efficacy of oral treatment is better than for topical treatment. CDC recommends the 7-day over the single-dose regimen.</td>
</tr>
<tr>
<td>11. Treatment for <em>T. vaginalis</em> should be with oral metronidazole in the absence of allergy to metronidazole.</td>
<td>I</td>
<td>CDC, 1993</td>
<td>Decrease discharge, itching and dysuria.</td>
<td>Based on RCTs reviewed by the CDC, this is the only known effective treatment.</td>
</tr>
<tr>
<td>12. Treatment for non-recurrent (three or fewer episodes in previous year) yeast vaginitis should be with topical &quot;azole&quot; preparations (e.g., clotrimazole, butoconazole, etc.) or fluconazole.</td>
<td>I</td>
<td>CDC, 1993; ADD REF.</td>
<td>Decrease discharge, itching and dysuria.</td>
<td>Based on RCTs reviewed by the CDC. These regimens are approved by the FDA.</td>
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<td><strong>Cervicitis</strong></td>
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<td>13. All women treated for gonorrhea should also be treated for chlamydia per the CDC recommendations.</td>
<td>II-2; III</td>
<td>CDC, 1993</td>
<td>Prevent PID. Decrease infertility. Decrease mortality from ectopic pregnancy.</td>
<td>Women with gonorrhea are likely to be coinfected with chlamydia. Since the sensitivity of chlamydia assays is variable, concurrent treatment is recommended.</td>
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<tr>
<td><strong>PID</strong></td>
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| 14. Patients with PID and any of the following conditions should be hospitalized:  
- appendicitis;  
- ectopic pregnancy;  
- pelvic abscess is present or suspected;  
- the patient is pregnant;  
- the patient is an adolescent (under age 18);  
- the patient has HIV infection;  
- uncontrolled nausea and vomiting;  
- clinical follow-up within 72 hours of starting antibiotic treatment cannot be arranged; or  
- the patient does not improve within 72 hours of starting therapy. | III                  | CDC, 1993             | Alleviate pain. Alleviate fever. Prevent sepsis. Decrease infertility. Decrease mortality from ectopic pregnancy.                         | While other reasons for hospitalization may exist (i.e., cannot rule out appendicitis), these have been recommended by the CDC and should be discernable by chart review. The purpose of hospitalization is to ensure effective treatment in persons at risk of complications (e.g., HIV infection) or poor follow-up (e.g., adolescents). |
<p>| 15. Total antibiotic therapy for PID should be for no less than 10 days (inpatient, if applicable, plus outpatient). | III                  | CDC, 1993; Peterson et al., 1991 | Alleviate pain. Alleviate fever. Prevent sepsis. Decrease infertility. Decrease mortality from ectopic pregnancy.                         | The standard of care is 10-14 days, although RCTs have not specifically addressed duration of treatment. Shorter treatment periods may result in lower cure rates. |
| <strong>Genital Ulcers</strong>        |                     |                     |                                                                          |                                                                                                                                          |
| 16. All patients with genital herpes should be counseled regarding reducing the risk of transmission to sexual partners. | III                  | CDC, 1993             | Prevent spread of genital herpes.                                                                                                          | Genital herpes is transmissible even in the absence of current outbreak. Unlike most other STDs, there is not effective cure for herpes. Therefore, prevention of transmission is of prime importance. |</p>
<table>
<thead>
<tr>
<th></th>
<th>In the absence of allergy, patients with chancroid should be treated with Azithromycin, Ceftriaxone, or Erythromycin.</th>
<th>I</th>
<th>CDC, 1993</th>
<th>Decrease pain. Heal ulcer. Limit transmission of chancroid.</th>
<th>These have been shown in RCTs reviewed by the CDC to be effective.</th>
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<tbody>
<tr>
<td>18.</td>
<td>In the absence of allergy, patients with primary and secondary syphilis should be treated with benzathine penicillin G (IM).</td>
<td>I</td>
<td>CDC, 1993</td>
<td>Prevention of late complications of syphilis.**</td>
<td>Penicillin is the best studied of all regimens and known to be effective through single IM administration. This recommendation is based on RCTs reviewed by the CDC.</td>
</tr>
<tr>
<td>19.</td>
<td>If a patient has a primary ulcer consistent with syphilis, treatment for syphilis should be initiated before laboratory test results are received.</td>
<td>III</td>
<td>CDC, 1993</td>
<td>Prevention of late complications of syphilis.**</td>
<td>Not all patients will return for follow-up. Because effective treatment exists and consequences of untreated syphilis are serious, treatment should be initiated at the time of first presentation. This is particularly important for adolescents.</td>
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<td><strong>STDs—General</strong></td>
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<td>20.</td>
<td>Sexual partners of patients with new diagnoses of gonorrhea, chlamydia, chancroid and primary or secondary syphilis should be referred for treatment.</td>
<td>III</td>
<td>CDC, 1993</td>
<td>Effective treatment and prevention of complications of STDs in partners. Prevention of STD spread.*</td>
<td>Patients with STDs have either contracted them from their current sexual partner or may have infected their current sexual partner. In either case, the most recent sexual partner should be referred for therapy. While there are specific guidelines for which partners should be referred, based on the time period from last sexual activity with the partner and infection, at least some indication that the patient was told to refer her sexual partner(s) for treatment should be in the chart.</td>
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</table>
**Follow-up**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Quality of evidence</th>
<th>Literature</th>
<th>Benefits</th>
<th>Comments</th>
</tr>
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<tbody>
<tr>
<td><strong>PID</strong></td>
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<tr>
<td>22. All patients being treated for PID should have a microbiological re-examination (e.g., cultures) within 10 days of completing therapy.</td>
<td>III</td>
<td>CDC, 1993</td>
<td>Decrease infertility. Decrease mortality from ectopic pregnancy.</td>
<td>A small percentage of patients may not have complete resolution even after treatment (successes with various regimens vary, ranging from 80-99%).</td>
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<tr>
<td><strong>Genital Ulcers</strong></td>
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<td>23. Patients receiving treatment for chancroid should be re-examined within 7 days of treatment initiation to assess clinical improvement.</td>
<td>III</td>
<td>CDC, 1993</td>
<td>Prevention of complications of untreated syphilis.** Prevent transmission of chancroid, syphilis, and herpes.</td>
<td>Most patients will have improved by 7 days.</td>
</tr>
<tr>
<td>24. Patients with primary or secondary syphilis should be re-examined clinically and serologically within 6 months after treatment.</td>
<td>III</td>
<td>CDC, 1993</td>
<td>Prevention of complications of untreated syphilis.**</td>
<td>If a treatment failure has occurred, the patient requires re-treatment.</td>
</tr>
</tbody>
</table>

*HIV causes fatigue, diarrhea, neuropathic symptoms, fevers, and opportunistic infections (OIs). OIs cause a wide variety of symptoms, including cough, shortness of breath, and vomiting. Average life expectancy after HIV infection is less than 10 years. Other STDs include gonorrhea, syphilis, and chlamydia. They cause a wide variety of symptoms, including dysuria, genital ulcers, infertility, rashes, neurologic and cardiac problems and rarely contribute to mortality. Preventing HIV and STDs has the added benefit of interrupting the spread of disease and preventing morbidity and mortality in those who thus avoid infection.

**Untreated syphilis infection can lead to tertiary syphilis (neurosyphilis and cardiovascular syphilis) and congenital syphilis among babies born to infected mothers.

**Quality of Evidence Codes:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>I:</td>
<td>RCT</td>
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<tr>
<td>II-1:</td>
<td>Nonrandomized controlled trials</td>
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<tr>
<td>II-2:</td>
<td>Cohort or case analysis</td>
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<tr>
<td>II-3:</td>
<td>Multiple time series</td>
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<tr>
<td>III:</td>
<td>Opinions or descriptive studies</td>
</tr>
</tbody>
</table>
REFERENCES - VAGINITIS AND SEXUALLY TRANSMITTED DISEASES


