

Vulvovaginitis

Vulvovaginitis is usually related to infections secondary to *Gardnerella*, *Trichomonas*, or *Candida* (yeast) species. Vaginal discharge, pruritus, burning sensation, foul-smelling odor, superficial dyspareunia, and dysuria may be the presenting complaint. With candidiasis, the patient may describe a thick, white, cottage cheese–like discharge associated with pruritus. [Vulvovaginitis](#) is common, affecting women of all ages. Vulvovaginitis is an inflammation of the vagina and vulva, most often caused by a bacterial, fungal, or parasitic infection. Normally, a woman may have a vaginal discharge, the amount and consistency of which varies during the course of the menstrual cycle; however, vulvovaginitis causes a symptomatic increased vaginal discharge. Other symptoms associated with this condition are pain with intercourse, pain with urination, and odor. Women with vulvovaginitis tend to be embarrassed or are worried about sexually transmitted diseases (STD). Self-treatment is usually the norm and close to 50% ineffective. In this country alone, millions of dollars are wasted on over-the-counter antifungals because of self-treatment for candidiasis. Providers may also be uncomfortable or do not have adequate time to diagnose the true etiology and may treat the wrong condition. Thus, vulvovaginitis is probably underdiagnosed. Bacterial vaginosis typically presents with an unpleasant fishy-smelling discharge that is more noticeable after unprotected intercourse. A thin, gray-white vaginal discharge that is homogeneous may adhere to the vaginal walls and be present at the introitus (vaginal opening). The discharge is usually moderate to profuse. Itching and inflammation are unusual in bacterial vaginosis. The absence of inflammation is the basis for the term vaginosis rather than vaginitis. Bacterial Vaginosis is secondary to bacterial overgrowth and not due to tissue inflammation. The organisms associated with bacterial vaginosis are *Gardnerella vaginalis*, *Mycoplasma hominis*, and *Mobiluncus*, a facultative anaerobe. Summarizing, practically any condition changing the vaginal milieu may result in vulvovaginitis. Bacterial vaginosis is the most important cause of vulvovaginitis. Estimating the number of patients presenting with bacterial vaginosis is difficult because *G vaginalis* can be recovered from the vagina in 30-50% of asymptomatic women.

Trichomonal infection may be asymptomatic or may produce a profuse, frothy, yellow-gray, homogenous discharge. This discharge may adhere to the vaginal walls and may not be present at the vaginal introitus. In contrast to bacterial vaginosis, vulvar and vaginal erythema and edema with *Trichomonas* species often are present. Punctate hemorrhages may be visible on the vagina and cervix (2% of cases). *Trichomonas vaginalis* affects 2-3 million women annually in the United States. The organism also is detected in 30-40% of men who are exposed to women with *T vaginalis*. The prevalence of *T vaginalis* infection at clinics treating

sexually transmitted diseases (STDs) varies from 8-31%. In men, *T vaginalis* may account for as many as 17% of cases of nongonococcal, nonchlamydial urethritis. *T vaginalis* infection appears to be more common in the southern United States.

Candida species infection typically is found as an isolated infection, heralded by pruritus. A thick, odorless, white, cottage cheese-like discharge often is found adhering to the vagina. Erythema (redness), edema, and excoriation may be present. Dysuria and urinary frequency occasionally may be present. *Candida* can occur in women who are not sexually active. Candidal vulvovaginitis is considered slightly less common than bacterial vaginosis, yet, 3 out of every 4 women in the United States will have at least 1 bout of vulvovaginal candidiasis (VVC) during their lifetime. Patients with recurrent or severe vulvovaginal candidiasis warrant a screening test for diabetes.

Pathophysiology

The normal vaginal epithelium cornifies (develops into a thickened layer of epithelial cells) under the influence of estrogen, protecting women against infection. A normal vaginal discharge consists of 1-4 mL of fluid that is white or transparent, thick, and odorless. This physiologic discharge is formed by sloughing epithelial cells, normal bacteria, and vaginal transudate. The discharge may be noticeable during pregnancy, oral contraceptive pill use, or at mid menstrual cycle, close to the time of ovulation.

The normal pH of vaginal secretions is 4.0-4.5. The pH is maintained by lactobacillus, which produces hydrogen peroxide and lactic acid; diphtheroids; and *Staphylococcus epidermidis*. Lactobacillus is found in 62-88% of women. Vaginal pH may increase with age, phase of menstrual cycle, sexual activity, contraception choice, pregnancy, presence of necrotic tissue or foreign bodies, and use of hygienic products or antibiotics.

After menopause, most women experience some vaginal atrophy as estrogen levels fall. Incidence of atrophic vaginitis depends on how it is defined. Vulvovaginitis related to infection is much less common after menopause. Desquamative inflammatory vaginitis, an exception, has an unknown etiology, but a Gram stain of culture often reveals streptococci. This is treated with intravaginal clindamycin cream or a topical or intravaginal estrogen. Postirritation vulvovaginitis may occur in women undergoing pelvic irradiation for cancer.

Factors that may contribute to vaginitis:

- Diabetes mellitus, Oral contraceptive use, Antibiotic use, and Immunodeficiency
- Wiping the anus from posterior to anterior, wearing tight-fitting synthetic undergarments, and using vaginal irritants such as bubble baths
- Recent upper respiratory infection or pharyngitis can lead to group A beta-hemolytic streptococci (GABHS) vaginitis
- Vaginal pruritus, especially at night, suggests pinworm infection
- Itching, soreness, bleeding, and vaginal discharge; bloody and foul-smelling discharge may suggest a vaginal foreign body
- Asymptomatic vaginal discharge often occurs in the months prior to menarche and represents a physiologic response to increasing estrogen levels
- Skin conditions (ie, eczema, psoriasis, seborrhea) occasionally involve the vagina

- Number of sexual partners, method of birth control
- A new sexual partner increases the risk of STD and pregnancy.
- Recent antibiotics use
- High estrogen oral contraceptive pills
- Hygienic practices (daily use of panty liners and feminine products)
- Irritants such as soaps, baths, spermicides, perfumes, douches, and creams can cause vulvovaginitis
- Tight-fitting, synthetic undergarments can increase moisture, exacerbating vaginitis
- Social stressors including homelessness, threats to personal safety, and insufficient resources, which appear to increase the risk.
- Increased in postmenopausal women with vaginal bleeding or spotting, pain with urination, itching, watery discharge, or pain with intercourse and decreased sexual activity.

References

- B Angotti L, C Lambert L, E Soper D. Vaginitis: making sense of over-the-counter treatment options. *Infect Dis Obstet Gynecol*. 2007;2007:97424. [[Medline](#)].
- Nyirjesy P. Vulvovaginal candidiasis and bacterial vaginosis. *Infect Dis Clin North Am*. Dec 2008;22(4):637-52, vi. [[Medline](#)].
- Katz. Vaginitis. In: Mosby. *Katz:Comprehensive Gynecology*. 5th ed. Elsevier; 2007:588-596.
- Szumigala JA, Alveredo R. Vulvovaginitis. In: Mosby. *Ferri: Ferri's Clinical Advisor* 2009. ed. Elsevier; 2009:155,1008-1012.
- [Guideline] Workowski KA, Berman SM. Centers for Disease Control and Prevention. Sexually Transmitted Diseases Treatment Guidelines 2006. 2009;[[Full Text](#)].
- Eckert LO. Clinical practice. Acute vulvovaginitis. *N Engl J Med*. Sep 21 2006;355(12):1244-52. [[Medline](#)].
- Margesson LJ. Vulvar disease pearls. *Dermatol Clin*. Apr 2006;24(2):145-55, v. [[Medline](#)].
- Braverman Paula k. Urethritis, Vulvovaginitis, and Cervicitis. In: Churchill Livingstone. *Principals and Practice of Pediatric Infectious Diseases*. 3rd ed. Elsevier; 2008:55.
- Farage MA, Miller KW, Ledger WJ. Determining the cause of vulvovaginal symptoms. *Obstet Gynecol Surv*. Jul 2008;63(7):445-64. [[Medline](#)].
- Biggs WS, Williams RM. Common gynecologic infections. *Prim Care*. Mar 2009;36(1):33-51, viii. [[Medline](#)].
- Hampton T. High prevalence of lesser-known STDs. *JAMA*. Jun 7 2006;295(21):2467. [[Medline](#)].
- Helms DJ, Mosure DJ, Metcalf CA, Douglas JM Jr, Malotte CK, Paul SM, et al. Risk factors for prevalent and incident *Trichomonas vaginalis* among women attending three sexually transmitted disease clinics. *Sex Transm Dis*. May 2008;35(5):484-8. [[Medline](#)].
- Jasper J. Vulvovaginitis in the prepubertal child. *Clin Pediatr Emerg Med*. Mar 2009;10.
- Freeto JP, Jay MS. "What's really going on down there?" A practical approach to the adolescent who has gynecologic complaints. *Pediatr Clin North Am*. Jun 2006;53(3):529-

45, viii. [\[Medline\]](#).

- Johnson E, Berwald N. Evidence-based emergency medicine/rational clinical examination abstract. Diagnostic utility of physical examination, history, and laboratory evaluation in emergency department patients with vaginal complaints. *Ann Emerg Med*. Sep 2008;52(3):294-7. [\[Medline\]](#).
- Ferris DG, Francis SL, Dickman ED, Miler-Miles K, Waller JL, McClendon N. Variability of vaginal pH determination by patients and clinicians. *J Am Board Fam Med*. Jul-Aug 2006;19(4):368-73. [\[Medline\]](#).
- Kulp JL, Chaudhry S, Wiita B, Bachmann G. The accuracy of women performing vaginal pH self-testing. *J Womens Health (Larchmt)*. May 2008;17(4):523-6. [\[Medline\]](#).
- Chatwani AJ, Mehta R, Hassan S, Rahimi S, Jeronis S, Dandolu V. Rapid testing for vaginal yeast detection: a prospective study. *Am J Obstet Gynecol*. Apr 2007;196(4):309.e1-4. [\[Medline\]](#).
- Hollier LM, Workowski K. Treatment of sexually transmitted infections in women. *Infect Dis Clin North Am*. Dec 2008;22(4):665-91, vi. [\[Medline\]](#).
- Pillay A, Radebe F, Fehler G, Htun Y, Ballard RC. Comparison of a TaqMan-based real-time polymerase chain reaction with conventional tests for the detection of *Trichomonas vaginalis*. *Sex Transm Infect*. Apr 2007;83(2):126-9. [\[Medline\]](#).
- Schwiertz A, Taras D, Rusch K, Rusch V. Throwing the dice for the diagnosis of vaginal complaints?. *Ann Clin Microbiol Antimicrob*. Feb 17 2006;5:4. [\[Medline\]](#).
- Heller DS, Maslyak S, Skurnick J. Is the presence of *Trichomonas* on a Pap smear associated with an increased incidence of bacterial vaginosis?. *J Low Genit Tract Dis*. Jul 2006;10(3):137-9. [\[Medline\]](#).
- [Guideline] Huntzinger A. Practice Guideline Briefs. *American Family Physician*. Nov 2006;74.
- Mania-Pramanik J, Kerkar SC, Mehta PB, Potdar S, Salvi VS. Use of vaginal pH in diagnosis of infections and its association with reproductive manifestations. *J Clin Lab Anal*. 2008;22(5):375-9. [\[Medline\]](#).
- Schwebke JR, Desmond R. A randomized trial of metronidazole in asymptomatic bacterial vaginosis to prevent the acquisition of sexually transmitted diseases. *Am J Obstet Gynecol*. Jun 2007;196(6):517.e1-6. [\[Medline\]](#).
- Schwebke JR, Desmond RA. A randomized trial of the duration of therapy with metronidazole plus or minus azithromycin for treatment of symptomatic bacterial vaginosis. *Clin Infect Dis*. Jan 15 2007;44(2):213-9. [\[Medline\]](#).
- Swadpanich U, Lumbiganon P, Prasertcharoensook W, Laopaiboon M. Antenatal lower genital tract infection screening and treatment programs for preventing preterm delivery. *Cochrane Database Syst Rev*. Apr 16 2008;CD006178. [\[Medline\]](#).
- Carey JC, Klebanoff MA, Hauth JC, et al. Metronidazole to prevent preterm delivery in pregnant women with asymptomatic bacterial vaginosis. National Institute of Child Health and Human Development Network of Maternal-Fetal Medicine Units. *N Engl J Med*. Feb 24 2000;342(8):534-40. [\[Medline\]](#).
- Nailor MD, Sobel JD. Tinidazole for the treatment of vaginal infections. *Expert Opin Investig Drugs*. May 2007;16(5):743-51. [\[Medline\]](#).
- Marrazzo J. Vulvovaginal candidiasis. *BMJ*. Sep 14 2002;325(7363):586. [\[Medline\]](#).

- Mann JR, McDermott S, Zhou L, Barnes TL, Hardin J. Treatment of trichomoniasis in pregnancy and preterm birth: an observational study. *J Womens Health (Larchmt)*. Apr 2009;18(4):493-7. [Medline].
- [Best Evidence] Buckling J. Local oestrogen for vaginal atrophy in postmenopausal women. *Cochrane Database Syst. Rev.* 2006;4:[Medline].
- Donders G, Bellen G, Byttebier G, Verguts L, Hinoul P, Walckiers R, et al. Individualized decreasing-dose maintenance fluconazole regimen for recurrent vulvovaginal candidiasis (ReCiDiF trial). *Am J Obstet Gynecol*. Dec 2008;199(6):613.e1-9. [Medline].
- Van Der Pol B, Kwok C, Pierre-Louis B, Rinaldi A, Salata RA, Chen PL, et al. Trichomonas vaginalis infection and human immunodeficiency virus acquisition in African women. *J Infect Dis*. Feb 15 2008;197(4):548-54. [Medline].
- Gabbe SG. Vaginal infections. In: *Obstetrics - Normal and Problem Pregnancies*. 4th ed. 2002.
- Johns Hopkins. Diagnostic features and management of vaginal infections. In: *The Harriet Lane Handbook: A Manual for Pediatric House Officers*. 17th ed. 2005.
- Owen MK, Clenney TL. Management of vaginitis. *Am Fam Physician*. Dec 1 2004;70(11):2125-32. [Medline].

Sobel JD. Vaginitis, vulvitis, cervicitis and cutaneous vulval lesions. In: *Infectious Diseases*. 2nd ed. Cohen & Powderly; 2004.