Vaginal discharge (vaginitis): Initial evaluation

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INTRODUCTION

Vaginitis is the general term for disorders of the vagina caused by infection, inflammation, or changes in the normal vaginal flora. Symptoms include vaginal discharge, odor, pruritus, and/or discomfort. The initial evaluation typically consists of a history, physical examination, microscopy, and tests for sexually transmitted infections (STIs). Individuals whose initial evaluation confirms a diagnosis then receive targeted treatment. Those who remain without a diagnosis, or whose symptoms recur, then go through a more detailed evaluation process.

This topic will discuss the approach to individuals who present with vaginal discharge from an unknown cause. Detailed reviews of specific causes of vaginitis are presented separately:

- (See "Candida vulvovaginitis: Clinical manifestations and diagnosis".)
- (See "Bacterial vaginosis: Clinical manifestations and diagnosis".)
- (See "Trichomoniasis: Clinical manifestations and diagnosis".)
- (See "Clinical manifestations and diagnosis of Neisseria gonorrhoeae infection in adults and adolescents".)
- (See "Clinical manifestations and diagnosis of Chlamydia trachomatis infections".)

In this topic, when discussing study results, we will use the terms "woman/en" or "patient(s)" as they are used in the studies presented. However, we encourage the reader to consider the specific counseling and treatment needs of transgender and gender diverse individuals.

NORMAL DISCHARGE

Vaginal discharge is a prominent symptom of vaginitis but may be difficult to distinguish from normal vaginal discharge. Characteristics of normal vaginal discharge vary by the hormonal status of the patient.

- **Normal vaginal discharge**
  - **Characteristics** – In reproductive-aged females, normal vaginal discharge consists of 1 to 4 mL of fluid (per 24 hours), which is white or transparent, thick or thin, and mostly odorless. The pH is typically 4.0 to 4.5 as measured with pH paper. This physiologic discharge is formed by mucoid endocervical secretions in combination with sloughing epithelial cells, normal vaginal flora, and vaginal transudate.
  - **Minimal additional symptoms** – Although normal discharge may be yellowish, slightly malodorous, and accompanied by mild irritative symptoms [1], it is not accompanied by pruritus, pain, burning or significant irritation, erythema, local erosions, or cervical or vaginal friability. The absence of these signs and symptoms helps to distinguish normal vaginal discharge from discharge related to a pathological process, such as vaginitis or cervicitis.
- **Role of estrogen**
  - **Estrogenized** – In the presence of estrogen the nonkeratinized stratified squamous epithelium of the vagina is rich in glycogen. Glycogen from sloughed cells is the substrate for lactobacilli, which convert glucose into lactic acid, thereby creating an acidic vaginal environment (typically pH 4.0 to 4.5 as measured with pH paper, although higher levels have been reported) [2-4]. This acidity helps maintain the normal vaginal flora and inhibits growth of pathogenic organisms that are typically present, including *Gardnerella vaginalis*, *Escherichia*

coli, group B streptococci, genital *Mycoplasma* species, and *Candida albicans* [5].

- **Absence of estrogen** – Common hypoestrogenic states include premenarche and postmenopause. The lack of estrogen, and glycogen substrate, results in sparse presence of lactobacilli and an elevated vaginal pH (typically >4.5) [4].
  - **Premenarche**– Prior to estrogenization, physiologic vaginal discharge ranges from absent or scant. If present, fluid can be clear, white, or mucoid. The vaginal pH is alkaline (7). (See "Vulvovaginitis in the prepubertal child: Clinical manifestations, diagnosis, and treatment".)
  - **Postmenopause** – The hypoestrogenic state of menopause leads to a reduction of vaginal discharge and increase in vaginal pH (typically > 4.5) [5]. (See "Genitourinary syndrome of menopause (vulvovaginal atrophy): Clinical manifestations and diagnosis", section on 'Effects of hypoestrogenism'.)

- **Factors impacting normal vaginal discharge** – Vaginal discharge may become more noticeable at times ("physiological leukorrhea"), such as at midmenstrual cycle close to the time of ovulation or during pregnancy or use of estrogen-progestin contraceptives. Diet, sexual activity, medication, and stress can also affect the volume and character of normal vaginal discharge. (See 'Vaginal discharge' below.)

ABNORMAL DISCHARGE

Disruption of the normal ecosystem can lead to conditions favorable for development of vaginitis with vaginal discharge. Some of these potentially disruptive factors include sexually transmitted diseases, antibiotics, foreign body, estrogen level, use of hygienic products, pregnancy, sexual activity, and contraceptive choice.

Prevalence — It is estimated that the majority of females will experience a vaginal infection during their lifetime that is characterized by vaginal discharge, itching, burning, or odor [6].

Common etiologies

- **Infectious** – The most common causes of abnormal vaginal discharge are vulvovaginal candidiasis, bacterial vaginosis (BV), and trichomoniasis [7,8]. These

infections account for over 90 percent of infectious vaginitis [9]. Cervicitis, typically from sexually transmitted infections (STIs), such as gonorrhea, chlamydia, and mycoplasma, can also present as nonspecific vaginal symptoms.

- (See "Bacterial vaginosis: Clinical manifestations and diagnosis".)
- (See "Candida vulvovaginitis: Clinical manifestations and diagnosis".)
- (See "Trichomoniasis: Clinical manifestations and diagnosis".)
- (See "Screening for sexually transmitted infections".)

- **Noninfectious** – Noninfectious etiologies include vaginal atrophy/atrophic vaginitis in postmenopausal individuals; foreign body (eg, retained tampon or condom); irritants and allergens (eg, vaginal washes or douches); dermatoses; and several rarer entities, including some systemic medical disorders (eg, rheumatoid arthritis and systemic lupus). One grouping of noninfectious etiologies is mechanical, chemical, allergic, or other [6].
  - (See "Genitourinary syndrome of menopause (vulvovaginal atrophy): Clinical manifestations and diagnosis".)
  - (See "Vulvar lesions: Differential diagnosis of red lesions" and "Vulvar lesions: Differential diagnosis of red lesions", section on 'Irritant contact dermatitis'.)

Clinical features — Individuals with abnormal vaginal discharge from vaginitis typically present with one or more of the following nonspecific vulvovaginal symptoms [10]:

- Change in the volume, color, or odor of vaginal discharge
- Pruritus
- Burning
- Irritation
- Erythema
- Dyspareunia
- Spotting
- Dysuria

INITIAL DIAGNOSTIC EVALUATION

Summary of approach — The main steps in the initial evaluation of individuals with symptoms of vaginitis are (algorithm 1) [11]:

- **Obtain a history and perform a physical examination** – The history often suggests a particular diagnosis (table 1) which must be confirmed by diagnostic studies. Physical examination includes evaluation of the vulva, clitoris, vestibule, vagina, cervix, and pelvis. (See 'History' below and 'Physical examination' below.)

- **Test for vaginal and cervical infections** – The vaginal discharge is evaluated for evidence of bacterial vaginosis (BV) and candidiasis using either pH testing with microscopy and/or laboratory tests (culture or molecular tests such as rapid antigen and nucleic acid amplification tests) [9,12]. Sexually active individuals are also tested for sexually transmitted cervical infections (eg, gonorrhea, chlamydia, and trichomoniasis) as coinfection can be present.

  - (See 'Test vaginal discharge' below.)

  - (See 'Perform cervical tests for STI' below.)

- **Provide targeted treatment and reassess symptoms**

  - **Identified etiology** – For individuals in whom an etiology is identified and whose symptoms resolve after initial targeted treatment, no further evaluation is needed. (See 'Initial findings' below.)

  - **No identified etiology** – For those in whom an etiology is not identified, we proceed to evaluate for less common and rare causes of vaginitis. Twenty-five to 40 percent of those presenting with genital symptoms will not have a specific cause identified on initial diagnostic evaluation [13]. These individuals tend to have a noninfectious etiology of symptoms as discussed below. (See 'No diagnosis after initial evaluation' below.)

  - **Continued or recurrent symptoms** – For patients who are diagnosed and treated but continue to exhibit symptoms, we repeat testing for vaginal and cervical infections. The causes of recurrent symptoms are complex and depend on pathogen or causal mechanisms. Sexual partners can cause recurrence of cervicitis or vaginitis resulting from sexually transmitted infection (STI) pathogens

(eg, trichomonas or N. gonorrhea). (See 'Special populations' below.)

History — The initial history questions gather details of the patient's symptoms. Each symptom is further evaluated separately as more than one condition may be present [14]. However, none of the findings from the history allows a definitive diagnosis since there is considerable overlap in symptoms among the different etiologies of vaginitis (table 2) [1,15].

Our initial evaluation includes questions about the following:

- **Discharge** – If discharge is present, what is the quantity, color, consistency, and odor? Classic descriptions of the vaginal discharge associated with the three most common vaginal infections are as follows:
  - **Bacterial vaginosis (BV)** – The discharge of BV is typically malodorous, thin, gray (never yellow), and is a prominent complaint. (See "Bacterial vaginosis: Clinical manifestations and diagnosis".)
  - **Vaginal candidiasis** – Vaginal candidiasis typically presents with scant discharge that is thick, white, odorless, and often curd-like. (See "Candida vulvovaginitis: Clinical manifestations and diagnosis".)
  - **Trichomoniasis** – Trichomoniasis is characterized by purulent, malodorous discharge, which may be accompanied by burning, pruritus, dysuria, frequency, and/or dyspareunia. (See "Trichomoniasis: Clinical manifestations and diagnosis".)
- **Burning, irritation, or other discomfort** – *Candida* vulvovaginitis often presents with marked inflammatory symptoms (pruritus and soreness). In contrast, BV is associated with only minimal inflammation and minimal irritative symptoms. Burning and irritation can also be a symptom of noninfectious disorders such as vulvodynia.
  - (See "Candida vulvovaginitis: Clinical manifestations and diagnosis".)
  - (See "Bacterial vaginosis: Clinical manifestations and diagnosis", section on 'Clinical features'.)
  - (See "Vulvar pain of unknown cause (vulvodynia): Clinical manifestations and

diagnosis".)

- **Pruritus** – General pruritus is suggestive of a diffuse process such as infection, allergy, or dermatosis. Persistent or chronic focal pruritus is suggestive of a localized process such as neoplasia or malignancy. (See 'Pruritus' below.)

- **Vaginal bleeding** – Vaginal bleeding is not consistent with infectious vaginitis, with the exception of postcoital spotting, which may indicate cervicitis. If vaginal bleeding is present, the patient should be evaluated for cervicitis, erosive causes of vaginitis (eg, erosive lichen planus), and/or a uterine source.

  - (See "Vulvar lesions: Differential diagnosis of vesicles, bullae, erosions, and ulcers", section on 'Erosions, excoriations, and fissures'.)

  - (See "Abnormal uterine bleeding in nonpregnant reproductive-age patients: Terminology, evaluation, and approach to diagnosis".)

- **Pain** – Patients with predominant pain symptoms are evaluated for inflammatory causes of vaginitis or nonvaginal sources, such as pelvic floor myofascial pain or vulvodynia.

  - (See 'Inflammation or irritation' below.)

  - (See "Clinical manifestations and diagnosis of myofascial pelvic pain syndrome in women".)

  - (See "Vulvar pain of unknown cause (vulvodynia): Clinical manifestations and diagnosis".)

- **Dysuria or dyspareunia** – These symptoms can be suggestive of inflammatory disorders, such as infection or allergy, as well vulvovaginal atrophy.

  - (See 'Inflammation or irritation' below.)

  - (See "Genitourinary syndrome of menopause (vulvovaginal atrophy): Clinical manifestations and diagnosis".)

- **Timing of symptoms** – Symptoms of candidal vulvovaginitis often occur in the premenstrual period, while symptoms of trichomoniasis and BV often occur during

or immediately after the menstrual period. Symptoms that develop soon after sexual intercourse are suggestive of STIs. Symptoms that develop after gynecologic surgery such as hysterectomy can suggest a vaginal fistula.

- **Estrogen status** – Low estrogen levels can cause genitourinary syndrome of menopause (ie, vulvovaginal atrophy) that presents with symptoms of vaginitis, vaginal dryness, and dyspareunia. Menopausal individuals receiving systemic hormone therapy may not have adequate estrogen levels for vaginal health and thus remain prone to atrophic vaginitis unless additional low-dose vaginal estrogen is utilized. (See "Genitourinary syndrome of menopause (vulvovaginal atrophy): Clinical manifestations and diagnosis".)

  Other hypoestrogenic states include being postpartum, lactating, or taking antiestrogenic drugs. Some individuals develop relatively low estrogen levels related to hormonal contraceptive use.

Physical examination — Physical examination includes evaluation of the vulva, clitoris, vestibule, vagina, cervix, and pelvis. Sites of discomfort are identified and mapped. The clinician assesses the degree of vulvovaginal inflammation, characteristics of the vaginal discharge, and presence of lesions or foreign bodies. Other significant findings include cervical inflammation and pelvic or cervical motion tenderness.

- **Vulva** – Findings of the vulvar examination can help guide further evaluation and diagnosis.
  - Normal findings are consistent with BV or leukorrhea. (See "Bacterial vaginosis: Clinical manifestations and diagnosis", section on 'Clinical features'.)
  - Erythema, edema, or fissures suggest candidiasis, trichomoniasis, or dermatitis.
    - (See "Candida vulvovaginitis: Clinical manifestations and diagnosis", section on 'Physical examination'.)
    - (See "Trichomoniasis: Clinical manifestations and diagnosis", section on 'Individuals with a vagina'.)
    - (See "Vulvar dermatitis".)
  - Atrophic changes are caused by hypoestrogenemia and suggest the possibility of

atrophic vaginitis. (See "Genitourinary syndrome of menopause (vulvovaginal atrophy): Clinical manifestations and diagnosis", section on 'Clinical presentation'.)

- Changes in vulvovaginal architecture (eg, scarring) may be caused by a chronic inflammatory process, such as erosive lichen planus, as well as lichen sclerosus or mucous membrane pemphigoid rather than vaginitis. (See "Vulvar lichen planus".)

- Pain with application of pressure from a cotton swab ("Q-tip test") on the labia or at the vaginal introitus may indicate an inflammatory process (candidiasis, dermatosis) or provoked vulvodynia (ie, vulvar pain of unclear etiology). (See "Vulvar pain of unknown cause (vulvodynia): Clinical manifestations and diagnosis".)

- **Speculum examination** – Speculum examination is performed to evaluate the vagina, any vaginal discharge, and the cervix.

  - **Vagina** – The vagina is examined for the following lesions:

    - A foreign body (eg, retained tampon or condom) is easily detected and is often associated with vaginal discharge, intermittent bleeding or spotting, and/or an unpleasant odor due to inflammation and secondary infection. Removal of the foreign body is generally adequate treatment. Antibiotics are rarely indicated.

    - Vaginal warts are skin-colored or pink and range from smooth flattened papules to a verrucous, papilliform appearance (picture 1). When extensive, they can be associated with vaginal discharge, pruritus, bleeding, burning, tenderness, and pain. (See "Condylomata acuminata (anogenital warts) in adults: Epidemiology, pathogenesis, clinical features, and diagnosis".)

    - Granulation tissue or surgical site infection can cause vaginal discharge or bleeding after hysterectomy or childbirth.

    - Necrotic or inflammatory changes associated with malignancy in the lower or upper genital tract can result in vaginal discharge; spotting is more common

in this setting than in infectious vaginitis.

- The presence of multifocal rounded macular erythematous lesions (like a spotted rash or bruise), purulent discharge, and tenderness suggests erosive vulvovaginitis, which can be caused by trichomoniasis or one of several noninfectious inflammatory etiologies (picture 2) [16].

- **Vaginal discharge** – The characteristics of the vaginal discharge may suggest the type of infection, if present (table 2). Trichomoniasis is classically associated with a greenish-yellow purulent discharge; candidiasis with a thick, white, adherent, "cottage cheese-like" discharge; and BV with a thin, homogeneous, "fishy smelling" gray discharge. Inflammation and/or necrosis related to malignancy of the lower or upper genital tract can result in watery, mucoid, purulent, and/or bloody vaginal discharge. However, the appearance of the discharge is unreliable and should never form the basis for diagnosis [1]. A sample of vaginal discharge is collected with a cotton swab and tested for pH and with microscopy. (See 'Test vaginal discharge' below.)

  Vesicovaginal and rectovaginal fistulas are rare, can be hard to detect, and are a source of chronic vaginal discharge. At-risk patients include those who are postpartum, posthysterectomy, postsurgery for prolapse, or have a history of inflammatory bowel disease or radiation therapy to the pelvis. (See "Rectovaginal and anovaginal fistulas" and "Urogenital tract fistulas in females".)

- **Cervix** – Cervical inflammation with a normal vagina is suggestive of cervicitis rather than vaginitis. The cervix in individuals with cervicitis is usually erythematous and friable, with a mucopurulent discharge (picture 3). (See "Acute cervicitis".)

  Cervical erythema in cervicitis should be distinguished from ectropion, which represents the normal physiologic presence of endocervical glandular tissue on the exocervix. Ectropion is more common in individuals taking estrogen-progestin contraceptives and during pregnancy. Ectropion may increase the volume of normal vaginal discharge. (See "Benign cervical lesions and congenital anomalies of the cervix", section on 'Ectropion'.)

- **Bimanual pelvic examination** – Bimanual examination is performed to assess for

tenderness and/or abnormal anatomy.

- Patients with vaginitis who also have pelvic or cervical motion tenderness are further evaluated for pelvic inflammatory disease (PID). (See "Pelvic inflammatory disease: Clinical manifestations and diagnosis".)
- Adnexal masses could represent a cyst or malignancy. (See "Approach to the patient with an adnexal mass".)
- While bimanual examination can also identify pelvic muscle spasm and tenderness reflecting pelvic muscle dysfunction, these entities are not usually associated with abnormal vaginal discharge. (See "Clinical manifestations and diagnosis of myofascial pelvic pain syndrome in women".)

Test vaginal discharge — The gold standards for diagnosis of common infections include culture for candida species, culture for trichomoniasis, and microscopy with Nugent score, followed by Amsel criteria for indeterminate tests, for BV. However, not all of these are readily available to clinicians. Molecular laboratory tests have become an established test alternative and have improved detection of trichomoniasis (algorithm 1).

Comparison of testing approaches — Two main testing strategies for evaluating vaginal discharge include in-office testing with pH and microscopy or clinical laboratory testing [6]. If pH and microscopy are not diagnostic, then diagnostic laboratory tests should be performed. All sexually active patients are tested for gonorrhea, chlamydia, and trichomoniasis as well. Those at risk for human immunodeficiency virus (HIV) acquisition are offered HIV testing. We do not advise patient self test of vaginal pH. (See 'Patient self tests' below.)

The selection of testing approach is determined by provider training and availability of equipment and tests (algorithm 1).

- **In-office testing with pH and microscopy**
  - **Advantages** – The main advantage of in-office testing is the provision of immediate diagnostic information (table 2) [6,17]. Other advantages include immediate treatment (if results are diagnostic), low cost, and need for minimal equipment.

- **Disadvantages** – Disadvantages include the need for clinician-acquired specimen, clinician microscopy education, availability of a microscope and slide supplies, and need for subsequent laboratory tests for patients with negative test results but a high clinical suspicion for infection. Additionally, pH and microscopy do not evaluate for common causes of cervicitis, including gonorrhea and chlamydia; separate testing for these infections is required.

- **Diagnostic accuracy** – Overall, testing with microscopy has lower sensitivities and negative predictive values for BV, vulvovaginal candidiasis, and trichomoniasis compared with nucleic acid amplification testing (NAAT) [7,18]. The ability of microscopy to detect BV, trichomoniasis, or yeast is approximately 50 percent that of NAAT and culture, respectively, although the range is wide and varies with testing platform [7,8,19]. Vaginal pH guides the differential diagnosis if infection is present but is not diagnostic as it is only a marker of pathology.

- **Laboratory testing**

  - **Advantages** – The main advantage of clinical laboratory tests are improved diagnostic accuracy as compared with pH and microscopy [7,8,18,20]. For this reason, NAAT is preferred for testing of some infections, particularly trichomoniasis [10]. Additional advantages include the ability to use a patient-collected specimen and lack of need for specialized clinician training (versus microscopy).

  - **Disadvantages** – Disadvantages include delayed time for diagnosis and need for specialized and/or costly equipment.

  - **Diagnostic accuracy** – Clinical laboratory tests are associated with improved diagnostic accuracy compared with pH and microscopy for diagnosing BV, trichomoniasis, and candida vaginal infections [7,8,18,20]. For this reason, laboratory tests are preferred when trichomoniasis is suspected [10].

    - In a study of females with and without vulvovaginal symptoms (n = 200 and 100, respectively) presenting to outpatient gynecologic offices and a vulvovaginal referral clinic, NAAT had a greater sensitivity for candida and trichomoniasis compared with microscopy (NAAT sensitivities of 92 and 100 percent and microscopy sensitivities of 89 and 75 percent) [7].

- A cross-sectional study of over 1500 individuals tested with a single-use, point-of-care polymerase chain reaction (PCR) device reported sensitivities and specificities of over 96 percent for the detection of *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and *T. vaginalis* compared with clinician-collected swabs tested with laboratory NAAT kits [21].

- A cross-sectional study of over 1700 women with vaginitis symptoms reported sensitivities and specificities of greater than 90 percent for detection of BV, candidiasis, and trichomoniasis by NAAT compared with traditional culture methods [12].

Office-based testing — The results of vaginal pH testing and microscopy, presented in the table (table 2), are used to identify normal vaginal discharge and diagnose common infectious etiologies (algorithm 1).

pH measurement — Measurement of vaginal pH helps determine which infections may be contributing to the patient's symptoms (table 2).

- **Technique** – A pH test stick (or pH paper if available) is applied for a few seconds to the vaginal sidewall (to avoid contamination by blood, semen, or cervical mucus, which pool in the posterior fornix and distort results). Alternatively, the vaginal sidewall can be swabbed with a dry swab and then the swab rolled onto pH paper (if available). Narrow range pH paper (4.0 to 5.5) is easier to interpret than broad range paper (4.5 to 7.5). The pH of the specimen is stable for approximately two to five minutes at room temperature. The swab should not be premoistened as the moistening liquid can affect pH. The results of the pH test are then combined with findings from microscopy to establish a diagnosis. (See 'Interpretation of results' below.)

- **Factors impacting pH** – As vaginal pH rises in hypoestrogenic individuals, measurement of pH for diagnosis of BV, trichomoniasis, or candidiasis is less useful at the extremes of age. (See 'Normal discharge' above.)

  Vaginal pH may be altered (usually to a higher pH) by contamination with lubricating gels, semen, blood, douches, and intravaginal medications. In pregnant persons, leakage of amniotic fluid raises vaginal pH.

Microscopy — A sample of the patient's vaginal discharge is obtained with a cotton swab, smeared onto a slide, and evaluated under a microscope with both saline and potassium hydroxide (KOH) in the steps below. If microscopy is does not provide a diagnosis, additional laboratory testing is performed to identify candida, BV, and/or trichomoniasis [6,17].

- Saline **wet mount** – Vaginal discharge is generally sampled with a plastic or wood vaginal/cervical scraper or a cotton-tipped swab. The sample of vaginal discharge is mixed with one to two drops of 0.9 percent normal saline solution at room temperature on a glass slide. A cover slip is then placed on the slide, which is examined under a microscope at low and high power. Microscopy should be performed within 10 to 20 minutes of obtaining the sample to reduce the possibility of loss of motility of any trichomonads. (See "Trichomoniasis: Clinical manifestations and diagnosis".)

  - **Normal findings** – Microscopic examination of normal vaginal discharge reveals a predominance of squamous epithelial cells, rare polymorphonuclear leukocytes (PMNs), and *Lactobacillus* species morphotype (table 2 and figure 1). The presence of parabasal epithelial cells suggests vaginal atrophy (picture 4).

  - **Abnormal findings** – The slide is examined for candidal buds (picture 5) or hyphae (picture 6), motile trichomonads (picture 7), epithelial cells studded with adherent coccobacilli (clue cells (picture 8 and picture 9)), and increased numbers of PMNs. Clue cells may be accompanied by *Mobiluncus* species (movie 1). Excess PMNs without evidence of yeast, trichomonads, or clue cells suggest cervicitis or noninfectious or inflammatory vaginitis.

- **Potassium hydroxide wet mount** – The addition of 10 percent potassium hydroxide (KOH) to the wet mount of vaginal discharge destroys cellular elements, thus it is helpful for identifying hyphae and budding yeast for the diagnosis of candidal vaginitis (picture 5 and picture 6). (See "Candida vulvovaginitis: Clinical manifestations and diagnosis".)

- **Amine (whiff) test** – Smelling ("whiffing") the slide immediately after applying KOH is useful for detecting the fishy (amine) odor of BV. (See "Bacterial vaginosis: Clinical manifestations and diagnosis".)

Interpretation of results — The pH of the normal vaginal secretions in reproductive-age females is 4.0 to 4.5 (although higher levels have been reported) [1-3]. In premenarchal and postmenopausal females in whom estrogen levels are low, the pH of the normal vaginal secretions is ≥4.5. Thus, measurement of pH for diagnosis of BV, trichomoniasis, or candidiasis is less useful at the extremes of age. (See 'Normal discharge' above.)

The findings of pH measurement and microscopy are then used to identify normal vaginal discharge and common infectious etiologies (table 2) [10]:

- **Normal vaginal discharge (estrogenized patient)**
  - pH 4.0 to 4.5
  - Microscopy: Lactobacilli present, white cells absent
  - Whiff test negative
- **Vulvovaginal candidiasis**
  - pH 4.0 to 4.5
  - Microscopy: Candida species (budding yeast, pseudohyphae, and/or hyphae visible on potassium hydroxide [KOH] wet mount)
  - Whiff test negative
- **Bacterial vaginosis (BV)**
  - pH >4.5
  - Microscopy: Clue cells (at least 20 percent of epithelial cells)
  - Whiff test positive
- **Trichomoniasis**
  - pH >4.5
  - Microscopy: Motile trichomonads
  - Whiff test often positive but may be negative

Clinical laboratory tests — Clinical laboratory tests use NAAT to diagnose BV, vaginal candidiasis, or trichomonas vaginitis, as well as cervicitis caused by gonorrhea and chlamydia (algorithm 1) [12,21]. Some products test for single infections while others are combined tests. These can be used as the initial diagnostic tool or as a follow-up to negative microscopy in patients with high clinical suspicion for infectious vaginitis. Culture has traditionally been the gold standard for diagnosing vulvovaginal candidiasis and may

be a better choice when antifungal susceptibility testing is indicated.

- **Nucleic acid amplification testing (NAAT)** – NAAT, which utilizes various types of PCR techniques, is commonly available to detect BV, trichomoniasis, candidiasis, gonorrhea, and chlamydia. The tests consist of a vaginal or cervical swab that can be collected by a clinician or the patient. Some tests are performed at the point of care, and provide rapid diagnostic information, while most are processed in a clinical laboratory and require additional time for test results. (See "Tools for genetics and genomics: Polymerase chain reaction", section on 'Detection of infectious organisms'.)

- **Culture** – Culture has traditionally been the gold standard for diagnosing vulvovaginal candidiasis [6,7]. Bacterial cultures are rarely indicated because a large variety of bacterial species colonize the vagina and are not vaginal pathogens [22]; identification of these bacteria may lead to unnecessary antibacterial therapy. Apart from Group A *Streptococcus*, a clear causal relationship between any bacteria and vaginitis has not been established in adults.

  - (See "Invasive group A streptococcal infection and toxic shock syndrome: Epidemiology, clinical manifestations, and diagnosis".)

  - (See "Pregnancy-related group A streptococcal infection".)

Specific test information is presented separately for each infection type:

- (See "Bacterial vaginosis: Clinical manifestations and diagnosis", section on 'Clinical laboratory tests'.)

- (See "Candida vulvovaginitis: Clinical manifestations and diagnosis", section on 'Other tests'.)

- (See "Trichomoniasis: Clinical manifestations and diagnosis", section on 'Diagnostic evaluation'.)

- (See "Clinical manifestations and diagnosis of Neisseria gonorrhoeae infection in adults and adolescents", section on 'Nucleic acid amplification'.)

- (See "Clinical manifestations and diagnosis of Chlamydia trachomatis infections", section on 'Nucleic acid amplification testing (test of choice)'.)

Patient self tests — While pH self-test kits are available over-the-counter, the author does not advise their use because of lack of specificity for vaginal pH as an isolated test, limited supporting data for self-test kits [23-25], and lack of validation against office-based or laboratory-based testing options. A confounding factor is that vaginal pH can be elevated by several common contaminants, including lubricating gels, semen, blood, douches, intravaginal medications, and leakage of amniotic fluid.

Perform cervical tests for STI — Sexually active individuals with symptoms of vaginitis are tested for the STIs *N. gonorrhoeae*, *C. trachomatis*, and *T. vaginalis* (algorithm 1); individuals with symptomatic vaginitis can have more than one infection. In a study of 581 vaginal specimens evaluated with molecular-based testing, one-quarter of the specimens positive for BV or *Candida* vulvovaginitis also tested positive for an STI (*N. gonorrhoeae*, *C. trachomatis*, or *T. vaginalis)* [14].

The presentation and diagnosis of these infections is discussed in detail elsewhere:

- (See "Clinical manifestations and diagnosis of Neisseria gonorrhoeae infection in adults and adolescents", section on 'Nucleic acid amplification'.)
- (See "Clinical manifestations and diagnosis of Chlamydia trachomatis infections", section on 'Nucleic acid amplification testing (test of choice)'.)
- (See "Trichomoniasis: Clinical manifestations and diagnosis", section on 'Diagnostic evaluation'.)

INITIAL FINDINGS

Alarm findings — Rarely, physical examination reveals an atypical cause of vaginitis that warrants a change in the diagnostic evaluation. Examples include an obvious vulvar, vaginal, or cervical cancer; probable pelvic inflammatory disease (PID); purulent vaginitis; vulvovaginal ulceration; and vaginal fistulae. These patients should be immediately referred for specialty evaluation and care.

- (See "Vulvar cancer: Epidemiology, diagnosis, histopathology, and treatment".)
- (See "Vaginal cancer".)
- (See "Invasive cervical cancer: Epidemiology, risk factors, clinical manifestations, and

diagnosis".)

- (See "Pelvic inflammatory disease: Clinical manifestations and diagnosis".)
- (See "Vulvar lesions: Differential diagnosis of vesicles, bullae, erosions, and ulcers", section on 'Ulcers'.)
- (See "Urogenital tract fistulas in females".)
- (See "Anorectal fistula: Clinical manifestations, diagnosis, and management principles".)

Common diagnoses — Of individuals who present for the evaluation of vaginitis, approximately 70 percent will be diagnosed with one of three vaginal infections: bacterial vaginosis (BV; 40 to 50 percent), *Candida* vulvovaginitis (20 to 25 percent), or trichomoniasis (15 to 20 percent) [1,26]. The cervical infections gonorrhea and chlamydia are also commonly diagnosed causes of vaginitis in sexually active persons. Lastly, in addition to infectious etiologies, hypoestrogenic females can have concomitant vulvovaginal atrophy. Individuals with a specific diagnosis receive treatment targeted to the etiology.

- (See "Bacterial vaginosis: Initial treatment".)
- (See "Candida vulvovaginitis: Treatment".)
- (See "Trichomoniasis: Clinical manifestations and diagnosis".)
- (See "Treatment of uncomplicated Neisseria gonorrhoeae infections".)
- (See "Treatment of Chlamydia trachomatis infection".)
- (See "Genitourinary syndrome of menopause (vulvovaginal atrophy): Treatment".)

Those who remain without a clear diagnosis after the initial evaluation continue with a more detailed evaluation. We avoid empiric therapy, as this can aggravate symptoms without benefit. (See 'No diagnosis after initial evaluation' below.)

When to refer for specialty evaluation — We advise referral to a specialist in vulvovaginal disease for individuals whose symptoms persist in the absence of abnormal diagnostic tests and for those who experience persistent symptoms or frequent symptom

recurrence following diagnostic test-directed therapy (assuming lack of compliance has been excluded).

NO DIAGNOSIS AFTER INITIAL EVALUATION

As discussed above, 25 to 40 percent of patients with genital symptoms do not have a specific cause identified on initial diagnostic evaluation [13].

Avoid empiric therapy — Given the nonspecific nature of vaginitis symptoms (table 2), identifying the etiology is mandatory before initiating therapy [1,27]. Diagnostic testing enables targeted treatment, increases therapeutic compliance, and increases the likelihood of partner notification [6]. Empiric blind therapy can aggravate symptoms, cause misdiagnosis, and result in inappropriate therapy [1,28,29]. In one study of over 300 symptomatic individuals, 47 percent of those with a laboratory-confirmed diagnosis (81 out of 170) received one or more inappropriate prescriptions [30]. Self-diagnosis and treatment can further complicate the diagnostic process as the patient may have a partially treated infection or a reaction to a previous treatment [31].

Secondary approach — Upon completion of the initial diagnostic evaluation above, some patients remain without an identified cause of their symptoms. For those in whom *Candida* vaginitis, bacterial vaginosis (BV), and trichomoniasis have been excluded, and no other source of vaginitis has been identified, we take the following approach:

- **Repeat evaluation when symptoms are present** – If the patient had minimal symptoms at the time of initial evaluation and the evaluation was nondiagnostic, we repeat the steps of the initial evaluation at a future visit when they are symptomatic. Repeating the steps at a time when symptoms are present is particularly important for individuals who have recently been treated with antimicrobials. When symptoms persist without a clear diagnosis, the author advises biopsy of the symptomatic site [11].

- **Repeat vaginal pH** – Repeat the vaginal pH, as it helps guide the differential diagnosis and diagnostic process (table 2):

    - **Increased** – If pH is increased, consider noninfectious causes of vaginal symptoms, such as vaginal atrophy, atrophic vaginitis, erosive lichen planus,

lichen sclerosus, desquamative inflammatory vaginitis, and pemphigoid syndromes. BV and trichomoniasis are commonly associated with increased vaginal pH and should be excluded, preferably with nucleic acid amplification testing (NAAT). (See 'Clinical laboratory tests' above.)

- **Normal** – If pH is normal, the vagina is likely to be normal with normal microbiome, so focus on the most common vulvar and external causes of vulvovaginal symptoms, such as contact or irritant dermatitis, seborrheic or eczematoid dermatitis, psoriasis, or vulvodynia. Candidiasis should be excluded with microscopy, NAAT, or culture. (See 'Clinical laboratory tests' above.)

- **Decreased** – If the pH is decreased, some evaluate for cytolytic vaginosis. (See 'Pruritus' below.)

- **Obtain additional history** – Obtain information on the duration of symptoms (acute versus chronic disease), site of symptoms (vulva versus vagina), and whether there has been a recent change in sexual partner or practices (eg, change in type of lubricant or condom), as this information is also helpful in forming a differential diagnosis.

Detailed secondary history — For individuals who remain without a diagnosis after the initial history and evaluation above, we then perform a more detailed history in attempt to identify the cause of the patient's symptoms.

- **Acuity and timing of symptoms** – Are the symptoms acute, chronic, or recurrent? An acute process is likely to have an infectious etiology; a chronic process is more likely from inflammation unrelated to infection.

- **Associated symptoms** – Does the patient have pelvic pain or systemic symptoms (eg, fever, nausea)? Pelvic pain is suggestive of pelvic inflammatory disease (PID) and suprapubic pain is suggestive of cystitis, although both are rare with vaginitis. The common causes of vaginitis are not associated with systemic symptoms. (See "Pelvic inflammatory disease: Clinical manifestations and diagnosis" and "Acute simple cystitis in women".)

- **Sexual practices** – For individuals with undiagnosed vaginitis, we obtain a detailed sexual history. Females who have sex with females and females who have sex with

both females and males are at increased risk of BV [32]. Those with a new sexual partner have an increased risk of acquiring sexually transmitted infections (STIs) such as *T. vaginalis* or cervicitis related to *N. gonorrhoeae* or *C. trachomatis*. (See "Screening for sexually transmitted infections".)

- **Medication history** – What medications (prescription and nonprescription) are being used? Antibiotics predispose to candidal vulvovaginitis; estrogen-progestin contraceptives can increase physiologic discharge; pruritus and burning unresponsive to antifungal agents may be due to vulvovaginal dermatitis. (See "Vulvar dermatitis".)

- **Hygienic practices** – What are the patient's hygienic practices? Mechanical, chemical, or allergic irritation may cause vulvovaginal symptoms (pruritus, burning) mistakenly attributed to an infectious source. Vaginal symptoms can result from irritants (eg, scented panty liners, spermicides, povidone-iodine, soaps and perfumes, and some topical drugs) and allergens (eg, latex condoms, topical antifungal agents, seminal fluid, chemical preservatives) that produce acute and chronic hypersensitivity reactions, including contact dermatitis. We ask about vaginal practices using over-the-counter and traditional products and/or medicines as these can have adverse effects [33]. Patient symptom/contact diaries may be helpful. (See "Vulvar dermatitis".)

- **Medical history** – Does the patient have a history of an oral mucosal, ocular, cutaneous, or systemic disease that could affect the vulvovaginal area? As examples:

  - Herpes simplex virus and Behçet's syndrome can cause vulvovaginal ulcers.

    - (See "Epidemiology, clinical manifestations, and diagnosis of herpes simplex virus type 1 infection".)

    - (See "Clinical manifestations and diagnosis of Behçet syndrome", section on 'Urogenital lesions'.)

  - Females with diabetes are prone to vulvovaginal candidiasis. (See "Susceptibility to infections in persons with diabetes mellitus".)

  - Individuals with HIV are prone to vaginal infections. (See "HIV and women", section on 'Gynecologic issues'.)

- After transplantation, graft versus host disease can cause vaginal irritation, discharge, ulceration, and stenosis [34,35]. (See "Clinical manifestations and diagnosis of chronic graft-versus-host disease", section on 'Genitalia'.)

- Lichen planus is often diagnosed in the mouth prior to being identified in the vulvovaginal mucosa. (See "Lichen planus".)

- Stevens-Johnson syndrome and toxic epidermal necrolysis have potentially severe vulvovaginal sequelae [36]. (See "Stevens-Johnson syndrome and toxic epidermal necrolysis: Pathogenesis, clinical manifestations, and diagnosis".)

- **Surgical history** – Has the patient had recent transvaginal surgery or repair of perineal lacerations from childbirth? Vaginal symptoms may be related to a foreign body, bacterial infection, granulation tissue, or vaginal fistula.

Continued evaluation by dominant symptom

Inflammation or irritation — Individuals whose vaginitis complaint is associated with significant irritation or inflammation are further evaluated for dermatitis and desquamative inflammatory vaginitis.

- **Vulvar dermatitis** – Vulvar dermatitis, an allergic or chemical-induced irritative dermatitis, is the most common noninfectious etiology of vulvovaginal itching, irritation, or burning associated with inflammatory changes. Vaginal pH is normal in these patients. Allergens/irritants include soaps, creams, microbicides, toilet paper, detergents, and sanitary pads. Diagnosis and management involves identifying and eliminating the offending agent by taking a thorough history and systematically removing potential irritants and allergens from the urogenital environment (table 3). Patient symptom/contact diaries may be helpful. (See "Vulvar dermatitis".)

  Corticosteroid therapy is indicated to control inflammation and relieve symptoms. We use a medium potency fluorinated topical steroid two to three times per day, as needed, until symptoms resolve (table 4). (See "Irritant contact dermatitis in adults" and "Topical corticosteroids: Use and adverse effects".)

- **Desquamative inflammatory vaginitis** – Desquamative inflammatory vaginitis is an uncommon chronic clinical syndrome of unknown etiology that usually occurs in

perimenopausal females. Patients present with purulent vaginal discharge, vulvovaginal burning or irritation, dyspareunia, and vulvar and vaginal erythema. (See "Desquamative inflammatory vaginitis".)

The diagnosis requires all of the following criteria:

- At least one of the following symptoms: vaginal discharge, dyspareunia, pruritus, burning, irritation
- Vaginal inflammation (spotted ecchymotic rash, erythema, focal or linear erosion)
- Vaginal pH >4.5
- Saline microscopy showing increased parabasal and inflammatory cells (ie, leukocyte to epithelial cell ratio greater than 1:1)

Pruritus — Pruritus unrelated to infection can occur anywhere in the lower genital tract: the vagina, vestibule, vulva, perineum, or perianal area. It can be uni- or bilateral and may be difficult for the patient to localize. Infrequent, transient, mild vulvovaginal pruritus is relatively common and may be normal. Evaluation is indicated in individuals with persistent, chronic, or severe pruritus.

- **Infectious etiologies** – *Candida* is the most common infectious cause of vulvovaginal pruritus, followed by trichomoniasis and, uncommonly, BV.
- **Non-infectious etiologies** – Noninfectious etiologies of vaginal discharge associated with pruritus include vulvar dermatitis, other vulvar dermatoses, and cytolytic vaginitis. Rarely, vulvar or vaginal malignancy can present with pruritus as the main symptom.
- **Evaluation** – Evaluation of patients with pruritus involves taking a detailed history, which often takes a considerable amount of time, and performing a thorough physical examination, with laboratory tests guided by clinical findings. Tissue biopsy can be necessary to make the diagnosis.
- **Treatment** – Treatment often begins with a local "drug holiday" (ie, removing potential causes of pruritus from daily life). Empiric drug therapy should be avoided. Targeted drug therapy is administered when a specific cause is identified.

Specific causes of pruritus include:

- **Vulvar dermatitis** – Vulvar dermatitis, the most common vulvar dermatosis, can present as vaginitis with complaints of pain and/or itching as well as the finding of inflammation on physical examination. (See 'Inflammation or irritation' above.)

- **Other vulvar dermatoses** – Patients whose chief complaint is vaginitis associated with pruritus, without infection or vulvar dermatitis, are further evaluated for other disorders of the vulvar skin. Biopsy can be required to diagnose other vulvar conditions. (See "Vulvar lesions: Differential diagnosis of vesicles, bullae, erosions, and ulcers" and "Vulvar lesions: Diagnostic evaluation".)

  - Inflammatory vulvar dermatoses include lichen sclerosus, lichen planus, and lichen simplex chronicus. (See "Vulvar lichen sclerosus" and "Vulvar lichen planus".)

  - Other common skin conditions that may present with external pruritus include psoriasis, eczema, and seborrheic dermatitis. (See "Psoriasis: Epidemiology, clinical manifestations, and diagnosis" and "Atopic dermatitis (eczema): Pathogenesis, clinical manifestations, and diagnosis" and "Seborrheic dermatitis in adolescents and adults".)

- **Malignancy** – Although malignancy is uncommon in individuals presenting with vaginitis, vulvar pruritus is the most common complaint among symptomatic patients with vulvar intraepithelial neoplasia (VIN); other presentations include a visible lesion, a palpable abnormality, perineal pain or burning, or dysuria. Malignancy, while rare, is more likely in menopausal individuals. (See 'Special populations' below.)

- **Cytolytic vaginosis** – Cytolytic vaginosis refers to a rare controversial syndrome of vaginal hyperacidity due to overgrowth of lactobacilli, although the existence of this entity is debated. It is characterized by pruritus, dyspareunia, vulvar dysuria, and **cyclical increase in symptoms** during the luteal phase [37,38]. The cyclic symptoms are thought to reflect the higher levels of lactobacilli that occur in the luteal phase.

  Diagnostic criteria include presence of white vaginal discharge, pH between 3.5 and 4.5, Gram stain showing large numbers of lactobacilli, paucity of white blood cells,

evidence of cytolysis (bare nuclei, shreds of cytoplasm), and most importantly exclusion of candidal infection by culture.

Sodium bicarbonate douches have been used for treatment. A solution of one rounded teaspoon of sodium bicarbonate in 600 mL of water is used for irrigating the vagina, once per day for 7 to 14 days. There are no data to support longer courses of therapy.

Pain

- **Acute onset of purulent discharge and pain** – Individuals who present with acute pelvic pain and purulent vaginal or cervical discharge are evaluated for PID and Group A *Streptococcus*.

  - **Pelvic inflammatory disease (PID)** – (See "Pelvic inflammatory disease: Clinical manifestations and diagnosis".)

  - **Group A *Streptococcus* (*Streptococcus pyogenes* [GAS])** – Those whose evaluation is negative for PID may have Group A *Streptococcus* (*Streptococcus pyogenes* [GAS]), although this infection is more common in prepubertal females [39,40]. GAS can colonize and be transmitted from skin (especially in individuals with chronic dermatological conditions), nasopharynx, and the gastrointestinal tract (including the perianal area) [41]. (See "Vulvovaginitis in the prepubertal child: Clinical manifestations, diagnosis, and treatment", section on 'Group A streptococcal infection'.)

    Clinical features include acute onset of frankly purulent discharge accompanied by pruritus, soreness and irritation, erythema, labial edema, and possibly dysuria from burning of the skin with voiding. Vaginal pH can be normal or mildly increased. Microscopy of the discharge reveals a marked increase in polymorphonuclear leukocytes (PMNs) and Gram stain shows chains of gram-positive cocci.

    Penicillin treatment after confirmation of the diagnosis by culture rapidly leads to cure. We use Penicillin VK 500 mg four times daily for 10 to 14 days or clindamycin cream 2% vaginally for 7 to 10 days.

- **Serosanguinous discharge and pelvic pain** – Individuals with serosanguinous

discharge and pelvic symptoms (eg, pain and/or bloating) and a negative initial vaginitis evaluation are assessed for fallopian tube carcinoma. Fallopian tube carcinoma typically presents in the fifth or sixth decades with vague complaints, although the incidence of this cancer is very low. The so-called "classic" symptoms and signs associated with this malignancy include: serosanguinous vaginal discharge (50 to 60 percent), pelvic pain (30 to 50 percent), and a pelvic mass (12 to 61 percent); however, the full triad (Latzko triad) is noted in fewer than 15 percent of patients. Hydrops tubae profluens, which refers to intermittent discharge of clear or blood-tinged fluid spontaneously or on pressure followed by shrinkage of the adnexal mass, has been described as pathognomonic of the disease. (See "Epithelial carcinoma of the ovary, fallopian tube, and peritoneum: Clinical features and diagnosis", section on 'Subacute presentation'.)

- **Chronic introital pain** – Vestibulodynia refers to spontaneous or induced pain on penetration of the introitus and tenderness provoked by focal vestibular pressure. These symptoms should be present for at least three to six months and other causes of vestibular pain, such as infectious vaginitis, should be excluded before making the diagnosis. Vaginal discharge and vaginal inflammation are typical features of vaginitis but are not part of the clinical spectrum of vestibulodynia. Candidal vulvovaginitis may mimic localized, provoked vulvodynia and may also be an initial trigger for this condition. (See "Vulvar pain of unknown cause (vulvodynia): Clinical manifestations and diagnosis".)

- **Postcoital vulvovaginal pruritus and pain** – Seminal plasma allergy or hypersensitivity is a rare disorder characterized by postcoital vulvovaginal itching, burning, edema, and erythema with or without systemic signs and symptoms. Vaginal discharge is not a typical feature. Complaints occur immediately or within one hour after contact with seminal plasma. Most affected persons are under age 40 years and have a family history of atopy.

  The diagnosis is based on absence of symptoms with condom use and on positive skin testing with a pooled sample of seminal fluid. (See "Allergic reactions to seminal plasma".)

Vulvar lesions — While a wide variety of lesions can develop on the vulva, most are not associated with vaginitis in the absence of infection. Vulvar lesions can be grouped by

appearance and then further evaluated with examination and biopsy, as indicated. The differential and diagnosis of vulvar lesions is presented in detail separately.

- (See "Vulvar lesions: Diagnostic evaluation".)
- (See "Vulvar lesions: Differential diagnosis of vesicles, bullae, erosions, and ulcers".)
- (See "Vulvar lesions: Differential diagnosis of red lesions".)
- (See "Vulvar lesions: Differential diagnosis of white lesions".)
- (See "Vulvar lesions: Differential diagnosis of pigmented (black, brown, blue) lesions".)
- (See "Vulvar lesions: Differential diagnosis of yellow, skin-colored, and edematous lesions".)

Persistent genital malodor — The normal odor of vaginal secretions cannot be clearly defined but is probably slightly sour due to lactic acid and volatile sulfur compounds. Persistent genital malodor can seriously impair an individual's quality of life; the cause is difficult to identify after readily diagnosable causes have been excluded.

- **Common etiologies** – The common causes include [42]:
  - Neglected foreign body (including retained tampon)
  - BV
  - Trichomoniasis
  - Infectious ulcer/PID
  - Pelvic fistula (rectovaginal, vesicovaginal, ureterovaginal)
  - Hidradenitis suppurativa
  - Chronic constipation
  - Urinary incontinence
  - Fecal incontinence
  - Poor hygiene
  - Malignant ulcer
  - Excessive genital perspiration and local bacterial colonization related to obesity

  Other potential causes of malodor include metabolic disorders (see "Inborn errors of metabolism: Epidemiology, pathogenesis, and clinical features", section on

'Abnormal odors'), olfactory reference syndrome [43], and olfactory hallucinations. (See "Nonepileptic paroxysmal disorders in adolescents and adults", section on 'Olfactory hallucinations'.)

- **Management** – Management depends on determining a cause, although an etiology is frequently not established. In the absence of poor hygiene, frequent washing and vaginal douching are not helpful and can be harmful. Excessive soaping of the genital area can cause a chemical vulvitis and douching (rinsing of the vagina with vinegar or an antiseptic with the aid of a douche bag) can increase the risk of vaginal and pelvic infection [44,45].

  - **Elevated vaginal pH or lack of lactobacilli** – For individuals with an elevated vaginal pH or lack of lactobacilli on Gram stain of vaginal discharge, a single but not repeated trial of antibiotics for anaerobic infection is reasonable (eg, metronidazole 500 mg orally twice daily for seven days).

  - **No identifiable abnormality** – For those with no identifiable abnormalities, use of a specific medical grade stainless steel douching device (Water Works Douching Device) can be helpful. A randomized trial including 140 women with perceived vaginal odor and no vaginal infection reported significant improvement after douching daily for four weeks with tap water using this device [46]. In the Water Works group, odor intensity scores fell from 7.3 to 1.8 ($p < 0.001$), which was superior to that among women who used a conventional over-the-counter plastic douche bag, 7.2 to 3.4 ($p < 0.003$).

Vaginal discharge — Leukorrhea is the thin, white, non-foul-smelling normal vaginal discharge that typically begins 6 to 12 months before menarche. (See 'Normal discharge' above.)

- **Evaluation** – Patients who present with complaints of excessive leukorrhea undergo the evaluation outlined above.

- **Counseling** – After exclusion of pathological causes of vaginal discharge, females with alterations in their normal vaginal discharge can be reassured that changes in the volume and character of vaginal discharge are normal. Causes can include changes in diet, sexual activity, medication, stress, etc.

- **Interventions** – If pathology has been excluded and the patient remains bothered by the discharge, progestin-only therapy, such as progestin-only contraceptive pills, depot medroxyprogesterone acetate injection every three months, or norethindrone acetate 5 mg orally daily, will decrease estrogen levels and thus may decrease physiological leukorrhea. However, supporting data are lacking and side effects of some progestin-only therapies may not be warranted for this indication alone.

  Currently no dietary modifications are relevant in management of vaginitis with the exception of avoiding excessive refined sugars in some individuals prone to *Candida* vulvovaginitis. Similarly, probiotics available in the United States are not proven to be useful in prevention or control of vaginitis.

Other — The following diagnoses are listed because clinicians sometimes attempt to diagnose and treat patients for these conditions. We do **not** believe they are causes of vaginitis.

- **Group B *Streptococcus* (GBS)** – GBS commonly colonizes the vagina: Approximately 20 percent of women are colonized with GBS [39,47]. Whether GBS is a pathogen in vulvovaginitis is controversial. Some clinicians believe it has a pathogenic role in vulvovaginitis and report an ameliorative effect on vulvovaginal symptoms with antibiotic treatment (oral penicillin or clindamycin cream). We and most experts do not believe this organism has a pathogenic role in symptomatic vulvovaginitis and that positive culture results merely reflect colonization, which is facilitated by disruption of the normal vaginal bacterial environment [47]. Therefore, in individuals with vaginitis, both GBS culture and treatment of positive culture results should be avoided.

- **Nonspecific bacterial vaginitis (BV)** – The concept of nonspecific BV is no longer acceptable. In the past, many with BV were given the diagnosis of nonspecific vaginitis but this should no longer occur since clear diagnostic criteria for BV are now available. (See "Bacterial vaginosis: Clinical manifestations and diagnosis", section on 'Diagnosis'.)

  As discussed above, vaginal bacterial cultures are rarely indicated in patients with vaginal discharge and are frequently misleading, leading to unnecessary antibacterial therapy. Apart from GAS, a clear causal relationship between any bacteria and vaginitis has not been established.

Treatment of infectious causes of vulvovaginitis should be targeted to the causative organism. Sulfanilamide cream (eg, triple sulfa or AVC cream) has no role in the treatment of vulvovaginitis, as it is less effective than other therapies (eg, metronidazole for *T. vaginalis* and BV, fluconazole for *Candida* vulvovaginitis) [48,49].

- ***Mycoplasma hominis, Ureaplasma parvum,* and *Ureaplasma urealyticum*** – Molecular tests for these species are sometimes bundled with tests for more common causes of vaginitis. However, there are limited data to suggest that these organisms cause vaginitis independent of co-occurring bacterial vaginosis [50,51].

SPECIAL POPULATIONS

- **Prepubertal children** – The evaluation of vaginitis in prepubertal children is presented separately:
  - (See "Vulvovaginitis in the prepubertal child: Clinical manifestations, diagnosis, and treatment".)
  - (See "Gynecologic examination of the newborn and child".)
- **Menopausal females** – Menopausal persons undergo the initial evaluation discussed above. In addition to performing the initial evaluation, the clinician should assess for vulvovaginal atrophy (ie, genitourinary syndrome of menopause) and genital neoplasia and/or malignancy.
  - **Vulvovaginal atrophy** – Vulvovaginal atrophy is common in menopausal individuals and may be present in addition to other causes of vaginitis.
    - **Clinical presentation** – Nonspecific signs and symptoms include a watery, white or yellow, malodorous discharge; vaginal burning or irritation; itching; dyspareunia; and urinary symptoms such as urgency, frequency, and/or leakage. Physical findings include thinning of the vaginal epithelium, loss of elasticity, loss of rugae, pH ≥5, vaginal erosions, and cervicovaginal friability. (See "Genitourinary syndrome of menopause (vulvovaginal atrophy): Clinical manifestations and diagnosis".)
    - **Microscopy findings** – The wet mount is nonspecific, as similar findings

occur in other inflammatory vaginal conditions. It shows parabasal cells, many polymorphonuclear leukocytes (PMNs), and no lactobacilli, with or without background bacteria. Parabasal cells are immature squamous epithelial cells that are rounded and have a large nucleus-to-cytoplasm ratio; in contrast, mature squamous epithelial cells are larger, cuboidal, with a smaller nucleus-to-cytoplasm ratio, and sometimes folded. The presence of epithelial cells rather than parabasal cells and premenopausal status helps to distinguish bacterial vaginosis (BV) from atrophic vaginitis.

- **Treatment** – Symptomatic response to topical estrogen therapy, which restores the vaginal epithelium, supports the diagnosis. Antibiotics are not needed. (See "Genitourinary syndrome of menopause (vulvovaginal atrophy): Treatment", section on 'Vaginal estrogen therapy'.)

- **Intraepithelial neoplasia and malignancy** – Neoplasia and malignancy are unusual causes of vaginal discharge but are more common in menopausal individuals. Tissue biopsy, with or without colposcopy, is generally required for diagnosis.

  - **Vaginal intraepithelial neoplasia (VaIN)** – VaIN can present with vaginal discharge and/or postcoital spotting, although patients are usually asymptomatic. (See "Vaginal intraepithelial neoplasia".)

  - **Vulvar intraepithelial neoplasia (VIN)** – VIN may cause vulvar pruritus or burning. (See "Vulvar squamous intraepithelial lesions (vulvar intraepithelial neoplasia)".)

  - **Fallopian tube cancer** – Fallopian tube cancer may present with a serosanguineous vaginal discharge and pelvic pain. (See 'Pain' above.)

- Tamoxifen **users** – Females taking tamoxifen are at increased risk of C*andida* vulvovaginitis. Individuals with recurrent candidal infections can be offered maintenance fluconazole therapy. (See "Candida vulvovaginitis: Treatment", section on 'Recurrent treatment'.)

- **Persons with recurrent or chronic symptoms** – Individuals with continued vaginal symptoms are separated into those with recurrent symptoms (ie, symptoms improve

at intervals) and those with chronic, ongoing symptoms.

- **Recurrent symptoms after intervals of improvement** – For those with recurrent vaginitis, we look at chart results of past testing. Frequently the wrong diagnosis is provided by false-positive tests for organisms (eg, *Gardnerella vaginalis*). We also inquire as to the type of therapy the patient received and the response to this therapy. We then perform microscopy and repeat testing, as indicated, for BV, candida, trichomonas, sexually transmitted infections (STIs), including herpes simplex virus, and, less commonly, group A streptococcus.

- **Chronic or persistent symptoms** – Patients who continue to exhibit symptoms and/or have positive tests for STIs after treatment are most likely to have been reinfected by their sexual partner(s) [52]. Thus, we advise repeating the approach outlined in the initial evaluation above, including repeat testing for STIs. While gonorrhoea and chlamydia are cervical pathogens, infection can result in vaginal discharge. However, neither infection is typically the cause of recurrent vulvovaginal symptoms in the absence of cervicitis. (See 'Initial diagnostic evaluation' above.)

POSTDIAGNOSTIC MANAGEMENT

Individuals with a confirmed diagnosis are treated as indicated. If the patient's symptoms resolve, no further evaluation or treatment is warranted. However, those diagnosed with sexually transmitted infections (STIs) presumably have an infected partner and are at increased risk of reinfection or acquiring other sexually transmitted diseases. Thus, sexual partners of individuals diagnosed with an STI should be referred for specific testing and treatment. Partner-delivered patient medication (PDPM), also known as expedited partner therapy (EPT), is an alternative if evaluation of the sexual partner is not possible or unlikely. (See "Screening for sexually transmitted infections" and "Treatment of Chlamydia trachomatis infection", section on 'Management of sex partners'.)

RESOURCES FOR PATIENTS AND CLINICIANS

- The International Society for the Study of Vulvovaginal Disease provides open access to patient handouts in multiple languages.

- The American College of Obstetricians and Gynecologists provides open access to Vaginitis: Frequently Asked Questions.

SOCIETY GUIDELINE LINKS

Links to society and government-sponsored guidelines from selected countries and regions around the world are provided separately. (See "Society guideline links: Bacterial vaginosis" and "Society guideline links: Gynecologic infectious diseases (non-sexually transmitted)".)

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topics (see "Patient education: Vaginal discharge (The Basics)" and "Patient education: Vulvar itching (The Basics)")

- Beyond the Basics topics (see "Patient education: Vaginal discharge in adult women (Beyond the Basics)" and "Patient education: Vaginal yeast infection (Beyond the Basics)" and "Patient education: Bacterial vaginosis (Beyond the Basics)" and "Patient education: Gonorrhea (Beyond the Basics)" and "Patient education: Chlamydia (Beyond the Basics)")

SUMMARY AND RECOMMENDATIONS

- **Normal vaginal discharge** – In reproductive-aged females, normal vaginal discharge consists of 1 to 4 mL of fluid (per 24 hours), which is white or transparent, thick or thin, and mostly odorless. Estrogenized vaginal epithelium contains glycogen that is converted by lactobacilli into lactic acid, thereby resulting in an acidic vaginal environment (typically pH 4.0 to 4.5 as measured with pH paper). This acidity helps maintain the normal vaginal flora and inhibits growth of pathogenic organisms that are typically present. (See 'Normal discharge' above.)

- **Common etiologies** – Vaginitis can result from infectious and noninfectious causes. Infectious vaginitis is much more common and typically results from bacterial vaginosis (BV), *Candida* vulvovaginitis, and/or trichomoniasis. Noninfectious etiologies include vaginal atrophy/atrophic vaginitis in postmenopausal individuals, foreign body (eg, retained tampon or condom), irritants and allergens (eg, vaginal washes or douches (table 3)), dermatoses, and several rarer entities including some systemic medical disorders (eg, rheumatoid arthritis and systemic lupus). (See 'Abnormal discharge' above.)

- **Presenting symptoms** – Individuals with vaginitis typically present with one or more of the following: change in vaginal discharge, pruritus, burning, irritation, erythema, dyspareunia, spotting, and dysuria. (See 'Clinical features' above.)

- **Initial diagnostic evaluation** – Determining the etiology of vaginitis is mandatory before initiating therapy. The initial evaluation consists of a history, physical examination, tests for vaginal and cervical infections, and reassessment after targeted treatment (algorithm 1). (See 'Summary of approach' above.)

  - **Comparison of test approaches** – Two main testing strategies include office-based testing of vaginal pH and microscopy or clinical laboratory testing, typically with nucleic acid amplification testing (NAAT). In-office testing provide immediate results if trained providers and equipment are available and is less costly but, for most infections, less accurate. Laboratory testing has higher sensitivity but takes more time and incurs higher cost. (See 'Comparison of testing approaches' above.)

    - **Vaginal pH and microscopy** – To measure vaginal pH, a pH test stick (or pH paper if available) is applied for a few seconds to the vaginal sidewall. A

sample of the patient's vaginal discharge is obtained with a cotton swab, smeared onto a slide, and evaluated under a microscope with both saline and potassium hydroxide. If pH and microscopy do not identify an infectious cause but the clinical suspicion is high, further diagnostic testing is performed with culture or NAATs, as indicated. (See 'Office-based testing' above.)

- **Clinical laboratory tests** – Diagnostic laboratory tests (eg, rapid antigen and NAAT) can be used for primary diagnosis of BV, vaginal candidiasis, or trichomonas vaginitis or performed if pH testing and microscopy are not diagnostic. (See 'Clinical laboratory tests' above.)

- **Testing for sexually transmitted infections (STIs)** – The STIs *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and *Trichomonas vaginalis* must always be considered in sexually active individuals with vaginitis since those with STIs may go on to develop pelvic inflammatory disease (PID) and its potential complications. Individuals at risk for HIV acquisition are offered HIV testing as well. (See 'Perform cervical tests for STI' above.)

- **Alarm findings** – Findings that warrant a change in the diagnostic evaluation include an obvious vulvar, vaginal, or cervical cancer; probable PID; vulvovaginal ulceration; and vaginal fistulae. These patients should be immediately referred for specialty evaluation and care. (See 'Alarm findings' above.)

- **Lack of diagnosis after initial evaluation** – Approximately 25 to 40 percent of patients with vaginitis symptoms do not have a specific cause identified on initial diagnostic evaluation. These patients undergo secondary evaluation, preferably at a time when symptoms are present. (See 'No diagnosis after initial evaluation' above.)

- **Special populations** – Special populations that require different evaluation or treatment include prepubertal children, menopausal individuals, those receiving tamoxifen therapy, and persons with recurrent symptoms. (See 'Special populations' above.)

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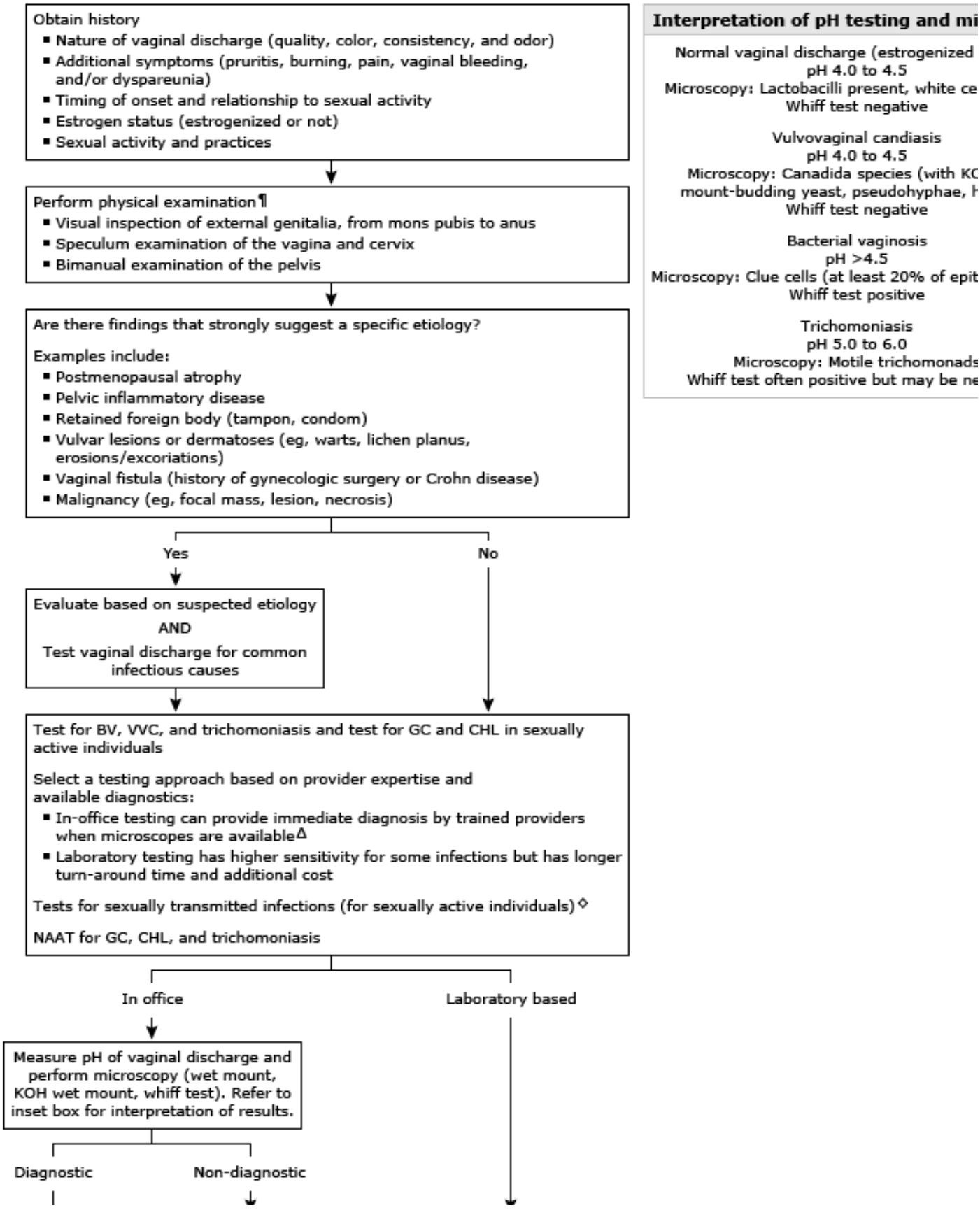
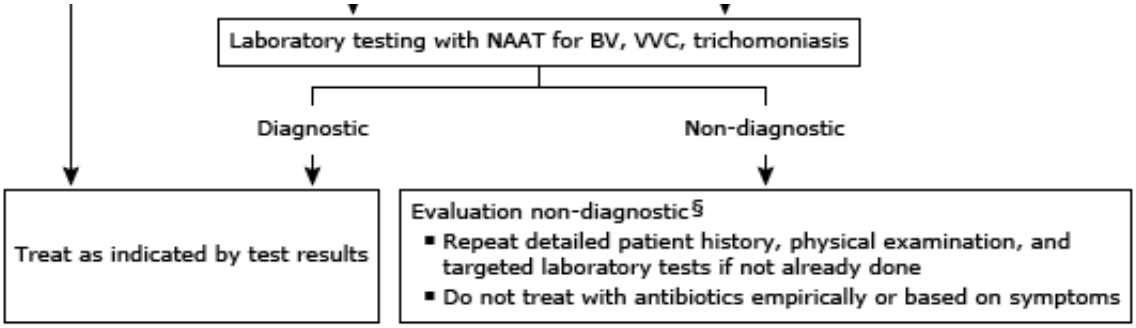
Topic 5477 Version 64.0

GRAPHICS

Initial approach to evaluation of vaginal discharge in adults*





BV, VVC, and trichomoniasis are among the most common causes of abnormal vaginal discharge and for approximately 70% of cases. While certain clinical findings may suggest one of these infections ov another, these findings are ultimately nonspecific. Therefore we evaluate all patients in-clinic to obtai samples for testing and exclude alternate causes. Empiric treatment can result in misdiagnosis and w of symptoms.

BV: bacterial vaginosis; VVC: vulvovaginal candidiasis; GC: neisseria gonorrhoeae coccus; CHL: chlamy trachomatis; NAAT: nucleic acid amplification test; KOH: potassium hydroxide.

* Vulvovaginal symptoms, including vaginal discharge, may result from multiple etiologies. Infection i common working diagnosis but is not the only cause that must be considered.

¶ Physical examination of the patient is needed before any treatment is started. Treatment based on symptoms or patient self-diagnosis is not adequate.

Δ Microscopy and laboratory findings, and resultant diagnoses, may be altered by active menstruatio vaginal intercourse, and/or over-the-counter treatment.

◇ Those with risk factors for HIV acquisition are offered HIV testing.

§ Additional discussion of the differential diagnosis and evaluation of vaginal discharge based on pers symptoms is presented in related UpToDate content.

Dr. Jack Sobel.

Graphic 138432 Version 1.0

Likelihood of common vaginal infections

Infection	Sign/symptom	Likelihood ratio*
Candidiasis	Pruritus absent	0.18 to 0.79
	Pruritus as chief complaint	3.3
	Inflammatory signs present	1.4 to 8.4
	Curdlike discharge with pruritus	150
	Yeast not seen on KOH wet prep	0.51 to 0.66
Bacterial vaginosis	No complaint of odor	0.07
	Complaint of malodorous discharge	1.6 to 3.2
Trichomoniasis	Inflammatory signs present	6.4
	Trichomonads on saline wet mount	51 to 310
	Trichomonads absent on saline wet mount	0.34 to 0.51

KOH: potassium hydroxide.
* Confidence intervals are wide but significant.

Adapted from Anderson MR, Klink K, Cohrssen A. JAMA 2004; 291:1368.

Graphic 81449 Version 2.0

Common clinical findings of vaginitis

Parameter	Normal findings	Vulvovaginal candidiasis	Bacterial vaginosis	Trichomoniasis
Symptoms	None or mild, transient	Pruritus, soreness, dyspareunia	Malodorous discharge, no dyspareunia	Malodorous discharge, burning, postcoital bleeding, dyspareunia, dysuria
Signs	Normal vaginal discharge consists of 1 to 4 mL fluid (per 24 hours), which is white or transparent, thin or thick, and mostly odorless	Vulvar erythema and/or edema Discharge may be white and clumpy and may or may not adhere to vagina	Off-white/gray thin discharge that coats the vagina	Thin green-yellow discharge, vulvovaginal erythema
Vaginal pH	4.0 to 4.5	4.0 to 4.5	>4.5	5.0 to 6.0*
Amine test	Negative	Negative	Positive (in 70 to 80% of patients)	Often positive
Saline microscopy	PMN:EC ratio <1; rods dominate; squames +++	PMN:EC ratio <1; rods dominate; squames +++; pseudohyphae (present in approximately 40% of patients); budding yeast for nonalbicans *Candida*	PMN:EC <1; loss of rods; increased coccobacilli; clue cells comprise at least 20% of epithelial cells (present in >90% of patients)	PMN ++++; mixed flora; motile trichomonads (present in approximately 60% of patients)
10% potassium	Negative	Pseudohyphae (in approximately 70%	Negative	Negative

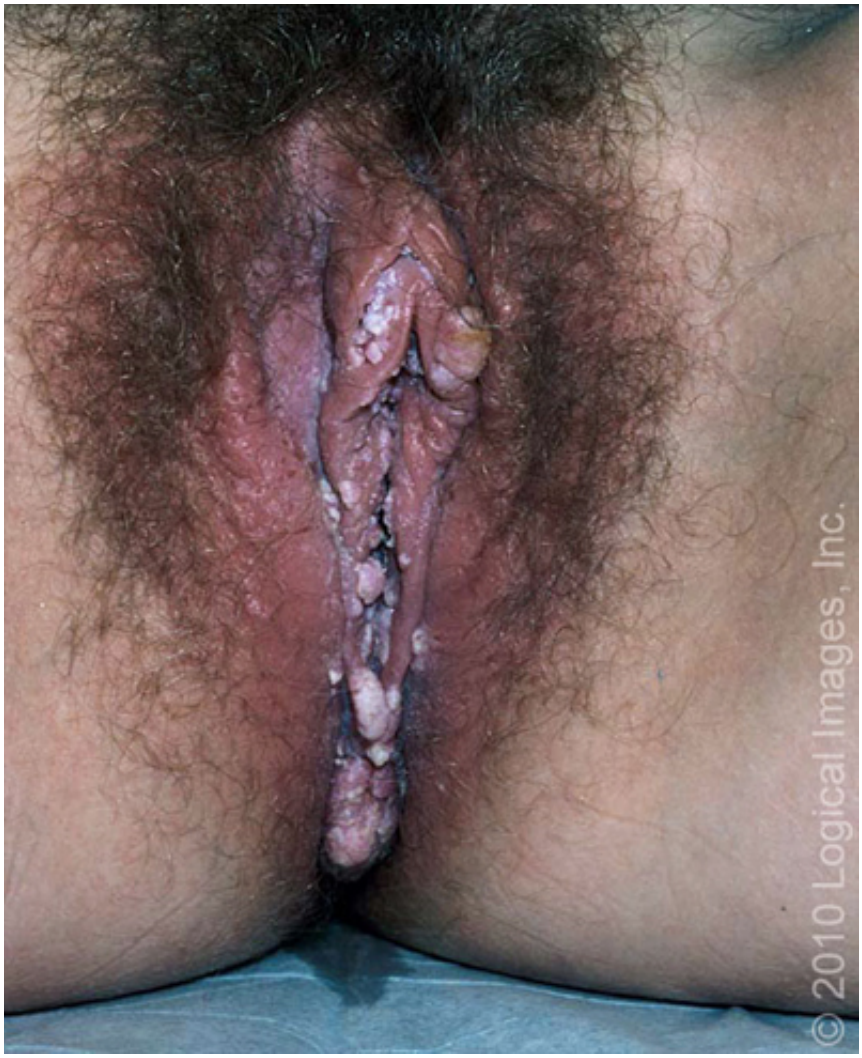
hydroxide microscopy		of patients)		
Other tests	–	If microscopy nondiagnostic: ▪ Culture ▪ Nucleic acid amplification test ▪ DNA hybridization probe	Quantitative microscopy (eg, Nugent criteria, Hay/Ison criteria) Nucleic acid amplification test DNA hybridization probe Culture of **no** value	If microscopy nondiagnostic: ▪ Culture ▪ Rapid antigen test ▪ Nucleic acid amplification test ▪ DNA hybridization probe
Differential diagnosis	Physiologic leukorrhea	Contact irritant or allergic vulvar dermatitis, chemical irritation, focal vulvitis (vulvodynia)	Elevated pH in trichomoniasis, atrophic vaginitis, and desquamative inflammatory vaginitis	Purulent vaginitis, desquamative inflammatory vaginitis, atrophic vaginitis, erosive lichen planus

PMN: polymorphonuclear leukocytes; EC: vaginal epithelial cells.

* In some cases vaginal pH can be normal.

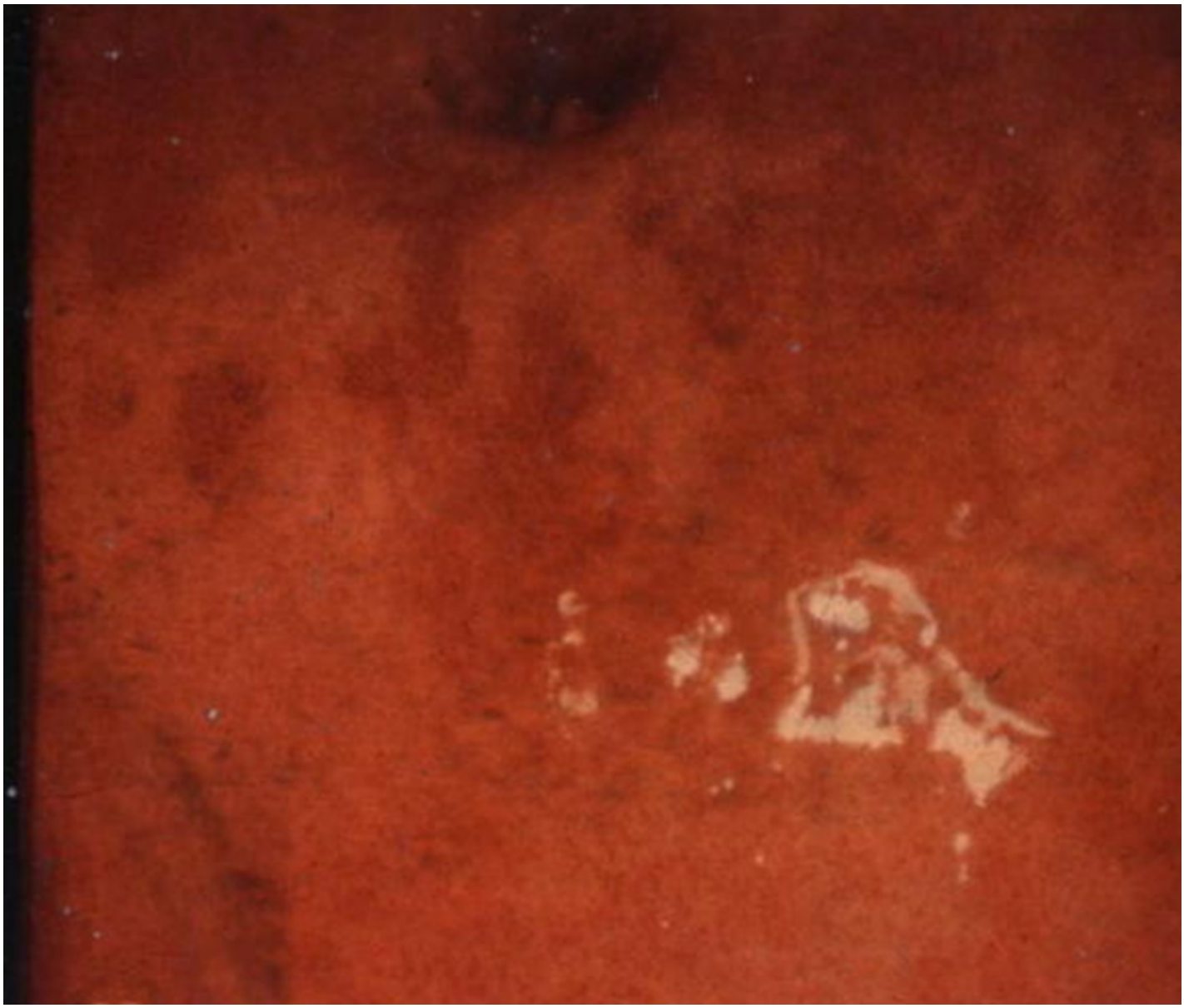
Graphic 68759 Version 17.0

Condyloma acuminatum involving the vulva, vagina, and perianal region



Graphic 51759 Version 9.0

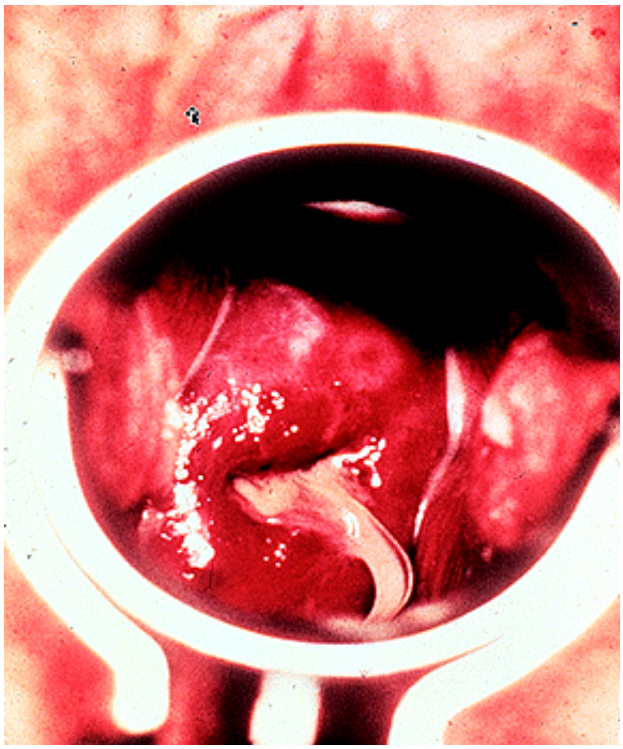
Hemorrhages on cervix in trichomoniasis infection



Punctate hemorrhages on cervix.

Graphic 102398 Version 2.0

Chlamydia cervicitis

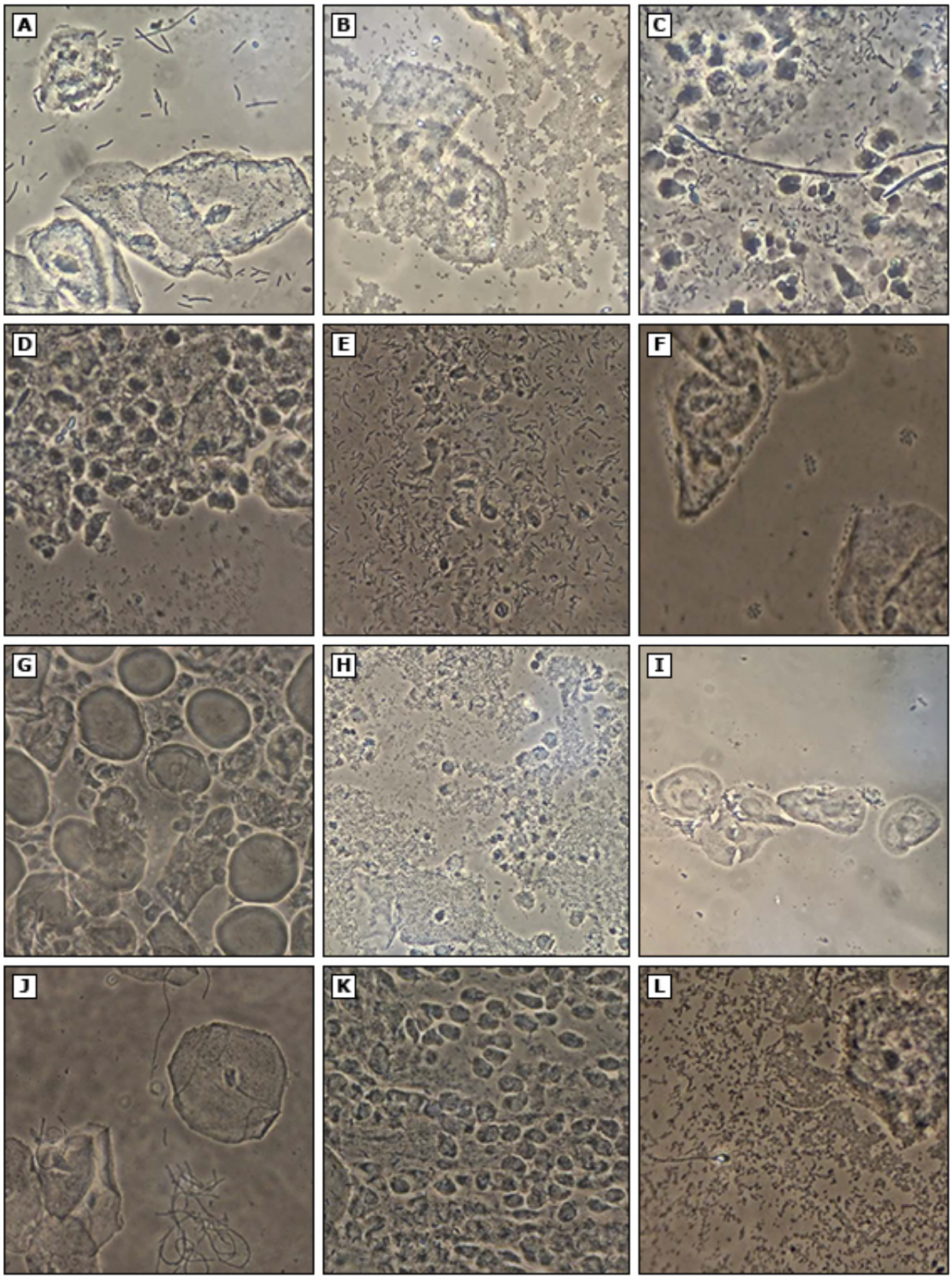


Mucopurulent discharge is visible coming from the os in a patient with Chlamydia cervicitis. The cervix is erythematous and friable.

Reproduced from the Centers for Disease Control and Prevention.

Graphic 67848 Version 2.0

Examples of common findings on wet mount microscopy of vaginal discharge



(A) Normal (presence of pleomorphic lactobacilli and superficial cells).

(B) Bacterial vaginosis (clue cells, absent lactobacilli, presence of granular flora).

(C) Candida (mycelium and blastospores, moderate inflammation, lactobacilli grade IIa; the dimorphism is suggestive of *C. albicans*).

(D) Candida and bacterial vaginosis (lactobacilli absent, granular flora, severe inflammation, blastospores).

(E) Cytolytic vaginosis (abundant lactobacilli, bare nuclei, and cytoplasmatic debris).

(F) Desquamative inflammatory vaginitis (also referred to as aerobic vaginitis).

(G) Desquamative inflammatory vaginitis (severe AV; lactobacilli grade III, cocci, atrophy, and moderate inflammation).

(H) Trichominiasis and bacterial vaginosis (clue cells, granular flora, lactobacilli absent, inflammation, *T. vaginilis*).

(I) Vaginal atrophy (lactobacilli absent, cellular scarcity, parabasal cells).

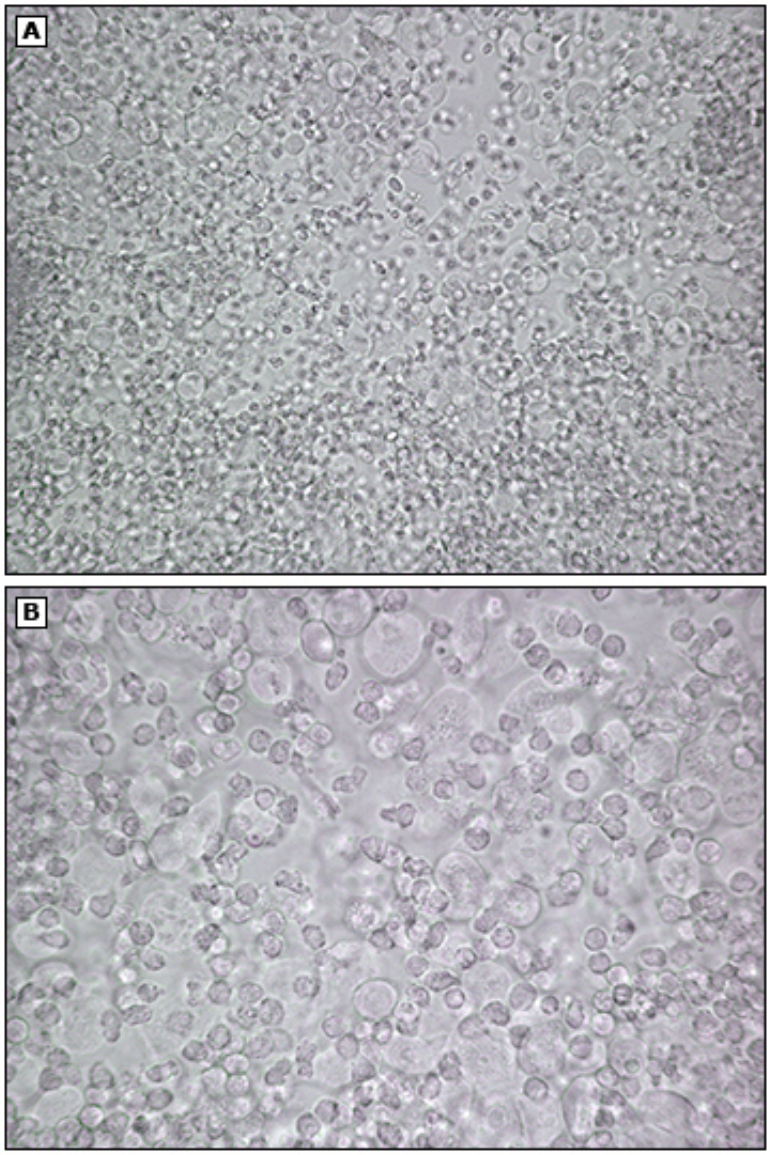
(J) Leptothrix.

(K) Cervical mucus.

(L) Bacterial vaginosis and sperm (sperm can be confused with blastospores, especially after the loss of the tail).

Graphic 131170 Version 2.0

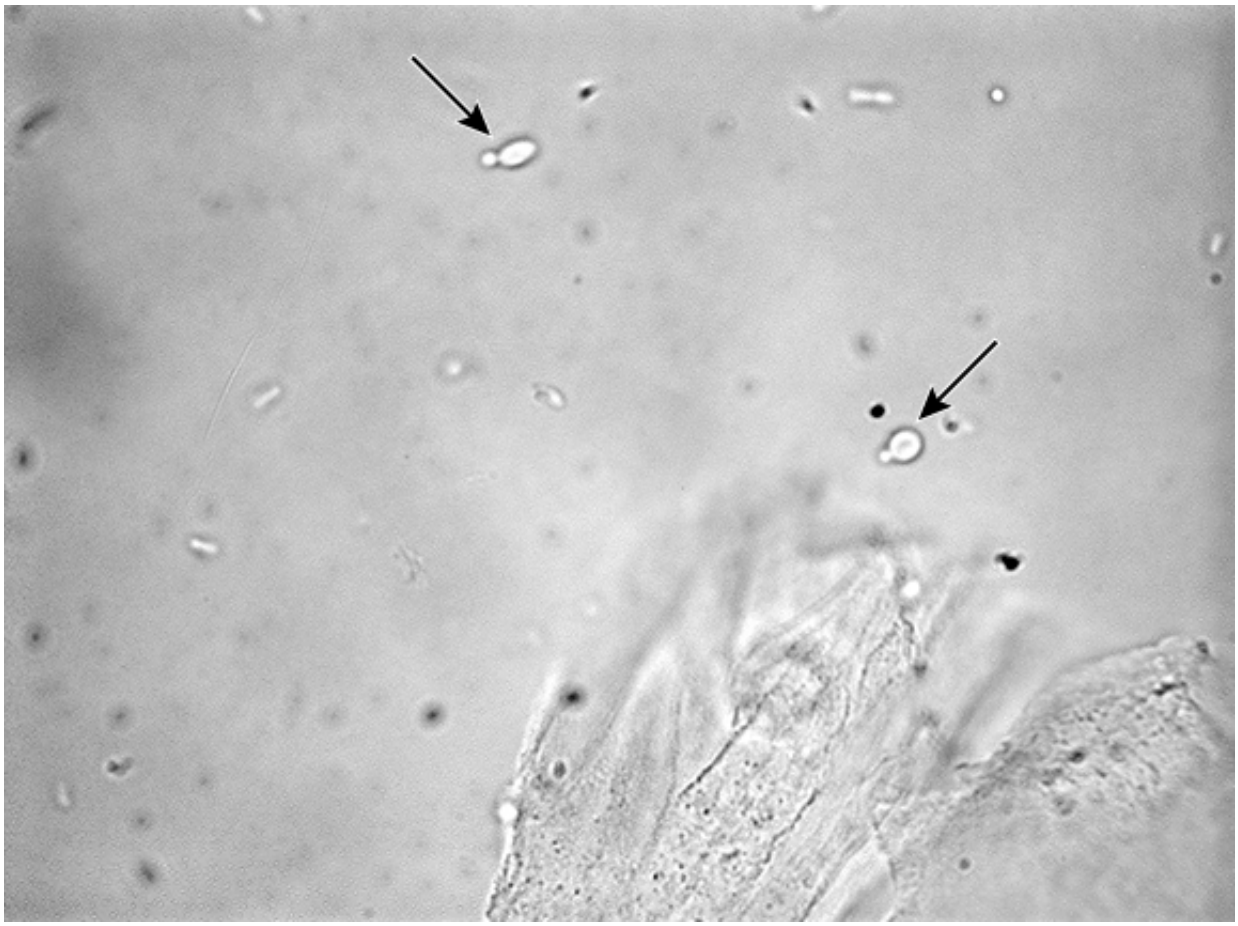
Parabasal cells



Low (A) and high (B) power microscopy of vaginal discharge reveals parabasal cells and a marked increase in inflammatory cells (primarily polymorphonuclear leukocytes).

Graphic 77244 Version 1.0

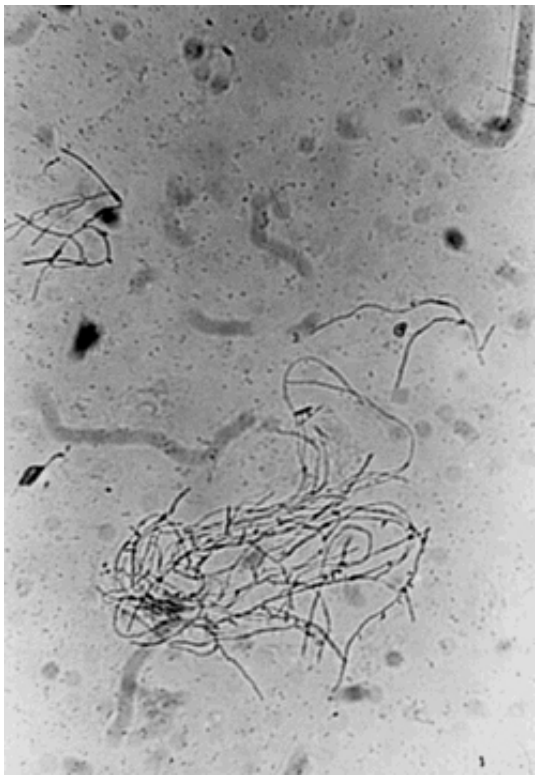
Budding yeast



Budding yeast representing *Candida glabrata*.

Graphic 61326 Version 3.0

Candida albicans vaginitis



Low-power micrograph of hyphal elements seen on 10% potassium hydroxide examination of a patient with *C. albicans* vaginitis.

Courtesy of Jack D Sobel, MD.

Graphic 59030 Version 4.0

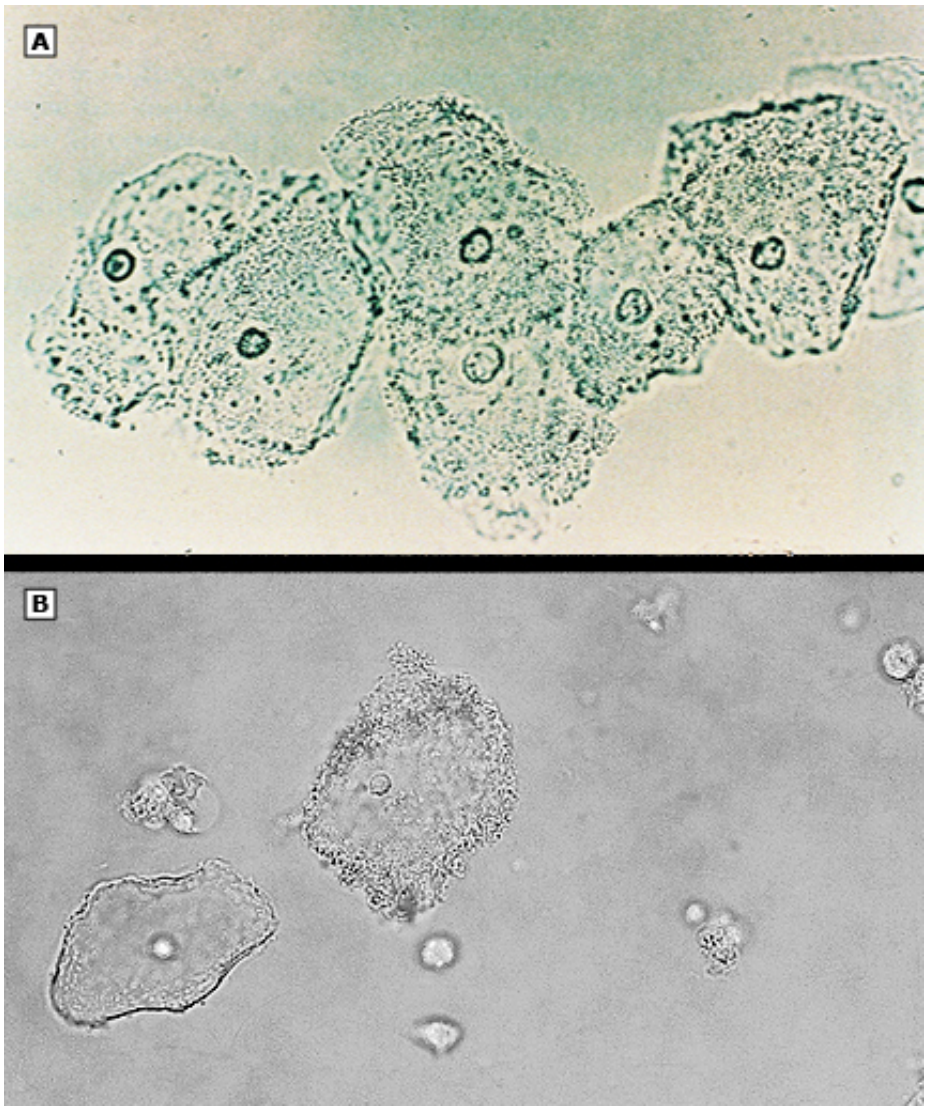
Trichomonas vaginalis

High-power microscopy revealing *Trichomonas vaginalis* with easily identified flagella.

Courtesy of Jack D. Sobel, MD and William E. Secor.

Graphic 71667 Version 2.0

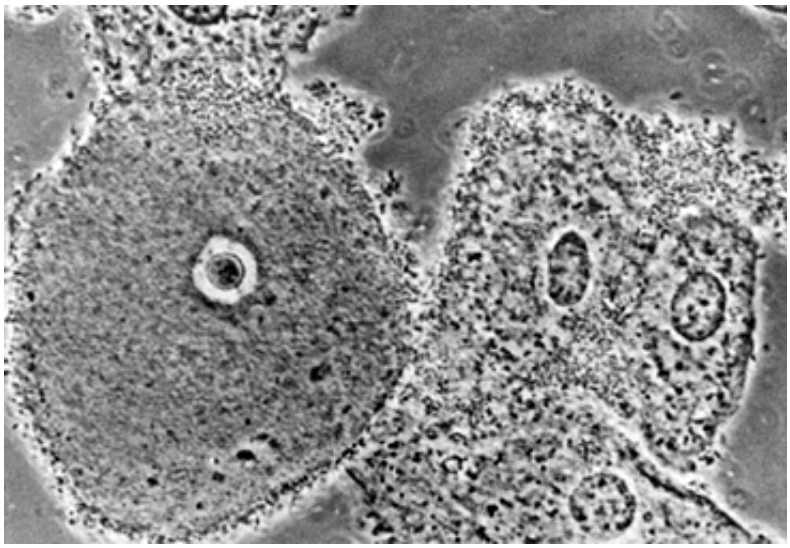
Clue cells



(A) Wet mount showing characteristic clue cells. Note that the epithelial cells are so heavily covered by bacteria as to obscure the margins.
(B) A clue cell. The vaginal epithelial cell on the right has shaggy borders obscured by coccobacilli (1003 magnification). The more normal appearing epithelial cell on the left has sharper borders.

Graphic 52425 Version 3.0

Clue cells



High-power view of clue cells observed in a patient with bacterial vaginosis. Note the obliteration of each epithelial cell margin by adherent *Gardnerella vaginalis*.

Courtesy of Jack D Sobel, MD.

Graphic 73248 Version 2.0

Causes of vulvar contact dermatitis

Irritants	Allergens
Soaps, bubble bath, shampoo	Fragrances/balsam of Peru (*Myroxylon pereirae*) (eg, in soaps, feminine products)
Sanitary or incontinence pads, tampons	Preservatives – quaternium 15, paraben mix, ethylenediamine (eg, hydroxyzine), bronopol, propylene glycol, methylchloroisothiazolinone/methylisothiazolinone, methylisothiazolinone (eg, in moist flushable wipes)
Nylon underwear	Medicaments – corticosteroids (hydrocortisone butyrate, clobetasol propionate, budesonide, tixocortol pivalate), anesthetics (benzocaine, dibucaine), antibiotics (neomycin, bacitracin, framycetin), antifungals (terconazole, clotrimazole)
Sweat, urine	Botanicals/tea tree oil
Talcum powder	Lanolin
Vaginal or vulvar medications	Rubber additives (natural rubber latex and synthetic rubber [nitrile]) (eg, condoms, diaphragms)
Douches	Nickel
Vaginal hygiene products	Chlorhexidine and disinfectants (eg, in lubricants, antiseptic washes)
Vaginal contraceptive products	Dyes
Methylated spirits	Semen
Tea tree oil	
Pinetarsol	
Alcohol	
Fragrances	
Deodorants	
Hair conditioner	
Chemically treated clothing, toilet paper, or water	

Graphic 71478 Version 7.0

Comparison of representative topical corticosteroid preparations (classified according to the United States system)

Potency group*	Corticosteroid	Vehicle type/form	Brand names (United States)	Available strength(s), percent (except as noted)
Super-high potency (group 1)	Betamethasone dipropionate, augmented	Ointment (optimized)	Diprolene	0.05
		Gel, lotion	[Generic only]	0.05
	Clobetasol propionate	Cream, ointment	Temovate	0.05
		Gel, solution (scalp)	[Generic only]	0.05
		Cream	Tasoprol	0.05
		Cream (emollient base)	Temovate E¶	0.05
		Lotion, shampoo, spray aerosol	Clobex	0.05
		Foam aerosol	Olux, Olux-E, Tovet	0.05
		Lotion	Impeklo	0.05
		Ointment	Clobetavix	0.05
		Shampoo	Clodan	0.05
		Solution (scalp)	Cormax¶	0.05
	Diflucortolone valerate (not available in United States)	Ointment, oily cream	Nerisone Forte (United Kingdom, others)	0.3
	Fluocinonide	Cream	Vanos	0.1
	Flurandrenolide	Tape (roll)	Cordran	4 mcg/cm^2
	Halobetasol	Lotion	Ultravate	0.05

	propionate	Cream, ointment	[Generic only]	0.05
		Foam	Lexette	0.05
High potency (group 2)	Amcinonide	Ointment	Cyclocort¶, Amcort¶	0.1
	Betamethasone dipropionate	Ointment	Diprosone¶	0.05
		Cream, augmented formulation (AF)	Diprolene AF	0.05
	Clobetasol propionate	Cream	Impoyz	0.025
	Desoximetasone	Cream, ointment, spray	Topicort	0.25
		Gel	Topicort	0.05
	Diflorasone diacetate	Ointment	ApexiCon¶, Florone¶	0.05
		Cream (emollient)	ApexiCon E	0.05
	Fluocinonide	Cream, gel, ointment, solution	Lidex¶	0.05
	Halcinonide	Cream, ointment, solution	Halog	0.1
	Halobetasol propionate	Lotion	Bryhali	0.01
High potency (group 3)	Amcinonide	Cream	Cyclocort¶, Amcort¶	0.1
		Lotion	Amcort¶	0.1
	Betamethasone dipropionate	Cream (hydrophilic emollient)	Diprosone¶	0.05
	Betamethasone valerate	Ointment	Valisone¶	0.1
		Foam	Luxiq	0.12
	Desoximetasone	Cream,	Topicort,	0.05

		ointment	Topicort LP¶	
	Diflorasone diacetate	Cream	Florone¶, Psorcon	0.05
	Diflucortolone valerate (not available in United States)	Cream, oily cream, ointment	Nerisone (United Kingdom, others)	0.1
	Fluocinonide	Cream (aqueous emollient)	Lidex-E¶	0.05
	Fluticasone propionate	Ointment	Cutivate¶	0.005
	Mometasone furoate	Ointment	Elocon¶	0.1
	Triamcinolone acetonide	Cream, ointment	Aristocort HP¶, Kenalog¶, Triderm	0.5
Medium potency (group 4)	Betamethasone dipropionate	Spray	Sernivo	0.05
	Clocortolone pivalate	Cream	Cloderm	0.1
	Fluocinolone acetonide	Ointment	Synalar	0.025
	Flurandrenolide	Ointment	Cordran	0.05
	Fluticasone propionate	Cream	Cutivate¶	0.05
	Hydrocortisone valerate	Ointment	Westcort¶	0.2
	Mometasone furoate	Cream, lotion, solution	Elocon¶	0.1
	Triamcinolone acetonide	Cream	Kenalog¶, Triderm	0.1
		Ointment	Kenalog¶	0.1
		Ointment	Trianex, Tritocin	0.05
		Aerosol spray	Kenalog	0.2 mg per 2 second spray

		Dental paste	Oralone	0.1
Lower-mid potency (group 5)	Betamethasone dipropionate	Lotion	Diprosone¶	0.05
	Betamethasone valerate	Cream	Beta-Val¶, Valisone¶	0.1
	Desonide	Ointment	DesOwen¶, Tridesilon¶	0.05
		Gel	Desonate, DesRx	0.05
	Fluocinolone acetonide	Cream	Synalar	0.025
	Flurandrenolide	Cream, lotion	Cordran, Nolix	0.05
	Fluticasone propionate	Lotion	Beser, Cutivate	0.05
	Hydrocortisone butyrate	Cream, lotion	Locoid, Locoid Lipocream	0.1
		Ointment, solution	[Generic only]	0.1
	Hydrocortisone probutate	Cream	Pandel	0.1
	Hydrocortisone valerate	Cream	Westcort¶	0.2
	Prednicarbate	Cream (emollient), ointment	Dermatop¶	0.1
	Triamcinolone acetonide	Lotion	Kenalog¶	0.1
		Ointment	Kenalog¶	0.025
Low potency (group 6)	Alclometasone dipropionate	Cream, ointment	Aclovate¶	0.05
	Betamethasone valerate	Lotion	Beta-Val¶, Valisone¶	0.1
	Desonide	Cream	DesOwen, Tridesilon	0.05
		Lotion	DesOwen¶, LoKara¶	0.05

		Foam	Verdeso	0.05
	Fluocinolone acetonide	Cream, solution	Synalar	0.01
		Shampoo	Capex	0.01
		Oil[Δ]	Derma-Smoothe/FS Body, Derma-Smoothe/FS Scalp	0.01
	Triamcinolone acetonide	Cream, lotion	Kenalog[¶], Aristocort[¶]	0.025
Least potent (group 7)	Hydrocortisone (base, ≥2%)	Cream	Ala-Cort, Hytone[¶], Nutracort[¶]	2.5
		Ointment	Hytone[¶]	2.5
		Lotion	Hytone[¶], Ala Scalp, Scalacort DK	2
		Solution	Texacort	2.5
	Hydrocortisone (base, <2%)	Ointment	Cortaid[¶], Cortizone 10, Hytone[¶], Nutracort[¶]	1
		Cream	Ala-Cort, Cortaid[¶], Cortizone 10, Hytone[¶], KeriCort, Synacort[¶]	1
		Gel	Cortizone 10	1
		Lotion	Aquanil HC, Cortizone 10, Sarnol-HC	1
		Spray	Cortaid[¶]	1
		Solution	Cortaid[¶], Noble[¶], Scalp Relief, Scalpicin	1

		Cream, ointment	Cortaid¶	0.5
		Cream	Instacort	0.5
	Hydrocortisone acetate	Cream	MiCort-HC¶	2.5
		Cream	Vanicream HC	1
		Lotion	Nucort	2

* Listed by potency according to the United States classification system: group 1 is the most potent, group 7 is the least potent. Other countries use a different classification system with only 4 or 5 groups.
¶ Inactive United States brand name for specific product; brand may be available outside United States. This product may be available generically in the United States.
Δ 48% refined peanut oil.

Data from:

1. *Lexicomp Online. Copyright © 1978-2022 Lexicomp, Inc. All Rights Reserved.*
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Contributor Disclosures

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