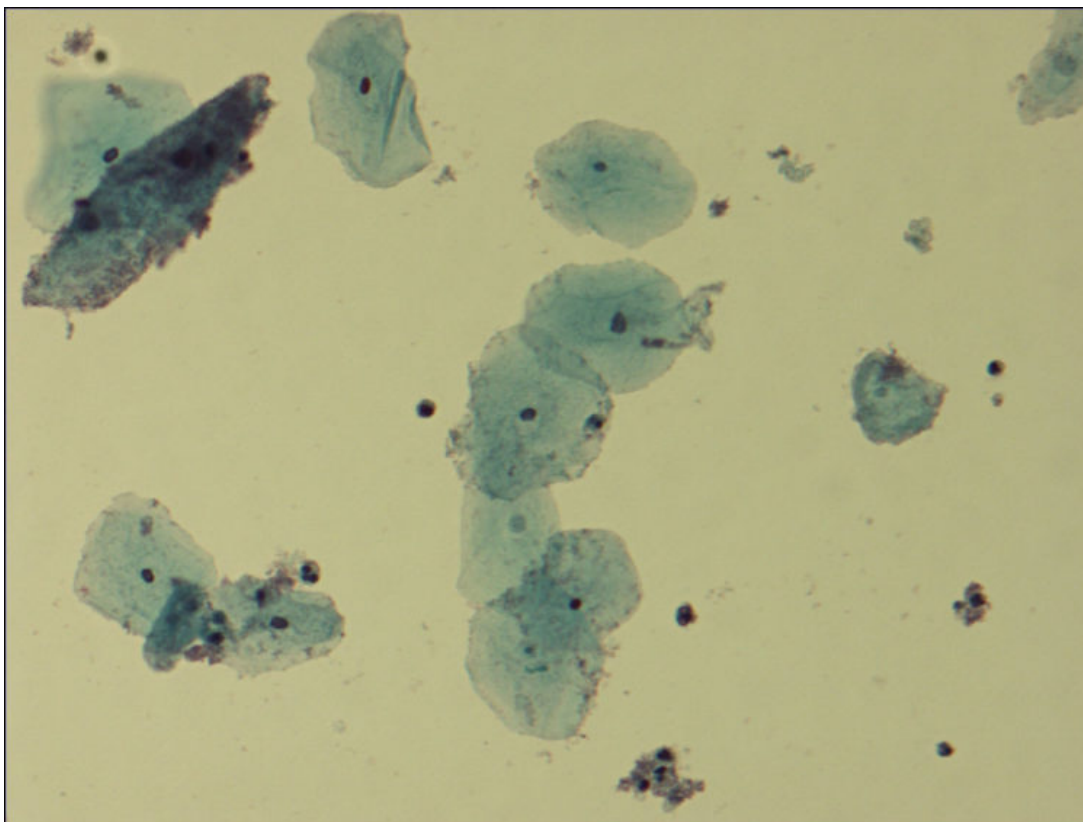


## Gardnerella Vaginalis — Symptoms and Differential Diagnosis

[See online here](#)

In 1955, a cause of nonspecific vaginitis (bacterial vaginosis) was described by two scientists: Gardner and Dukes. The bug was named *Haemophilus vaginalis*, later the name was changed to *Corynebacterium vaginale*, and finally, the bacterium responsible for the condition obtained the name *Gardnerella vaginalis* (1980) after the scientist who discovered it. *Gardnerella vaginalis* is a non-specific infection of the vaginal tract caused by gram-negative bacteria named as *Gardnerella vaginalis*. This condition is not regarded as a sexually transmitted disease, but sexual activity enhances the development of the infection.



### Definition and Background of Gardnerella Vaginalis

*Gardnerella vaginalis* is a pleomorphic, gram-variable (mostly gram-negative), facultative nonmotile anaerobic **rod**. Overgrowth of this bacteria is the most frequent cause of **vaginitis** in women (90% of vulvovaginitis) and causes epidemiological concern in males (**urethritis**).

Advanced microbiology technologies, including the electron microscope, improved

laboratory equipment, and better testing methods (isolation and identification of bacteria), mean that the term '**nonspecific vaginitis**' lost its meaning. The condition's specific cause was detected and can be described in detail.

Typically, *G. vaginalis* is transmitted through **sexual infection**. Some clinical researchers suggest that the rectum may be inhabited with *G. vaginalis*, so the bacteria can travel from the rectum to the genitals, resulting in **self-infection**.

The healthy female vagina contains a high concentration of lactobacilli that maintain the vagina's acidic pH. *G. vaginalis* infection reduces the lactobacilli population, thereby increasing the vaginal pH.

Advanced stages of the infection may lead to severe consequences in the form of **pelvic inflammatory disease**.

## Etiology of Gardnerella Vaginalis

- Bacterial vaginitis (BV, vulvovaginitis) develops from infection with different anaerobic bacteria, including *B. vaginalis*, and is a result of their interaction: *Lactobacillus*, *Prevotella*; anaerobes: *Mobiluncus*, *Bacteroides*, *Peptostreptococcus*, *Fusobacterium*, *Veillonella Eubacterium*, *Mycoplasma hominis*, *Ureaplasma urealyticum*, *Streptococcus viridans*, and *Atopobium vaginae*
- An impaired immune response may trigger BV development
- Lower estrogen production of the host
- High frequency of intercourse
- Multiple sex partners
- Use of IUD
- Pregnancy
- Long-term **antibiotic therapy**
- Douching
- Promiscuity in sexual contacts

## Epidemiology of *G. Vaginalis*

BV is a very common condition. In the US, 29.8% of the female population was diagnosed with BV with a Gram stain in vaginal fluid. Susceptibility increases amidst those ones who are non-white, practice douching, have numerous sexual partners, and have sex with women. Smoking and obesity are also risk factors. It occurs mainly in women of reproductive age. Patients with **HIV** are infected with *G. vaginalis* and develop BV twice as frequently.

## Internationally

*G. vaginalis* is very common worldwide, especially in countries with a **humid and hot climate**; thus, over 50% of women infected with *G. vaginalis* are in sub-Saharan Africa; they also have a higher of contracting HIV.

## Presentation of *G. Vaginalis*

## History

- **Foul vaginal odor** ('fishy odor'), especially after sexual intercourse (one of the most distinguishing features of BV)
- An increased amount of **grayish vaginal discharge**, which is non-painful and non-inflammatory.
- **Grayish vaginal discharges**
- **Dysuria**
- **Vulvar irritation** (itchiness)

## Physical examination

The labia, introitus, cervix, and cervical discharge appear normal; however, there may be signs of **cervicitis**. Vaginal walls produce enhanced light reflex without pronounced inflammation. The vaginal mucosa is covered with gray, watery, homogenous discharges.

## Differential Diagnosis of *G. Vaginalis*

### Candidiasis

This is a **vaginal yeast infection** caused by *candida albicans*. Patients present with vaginal redness, itching, and curd-like discharges. The cervix usually appears normal, with no inflammation.

### Cervicitis

This describes the condition when there are visible purulent or mucopurulent endocervical discharges in the cervical canal, and the cervix bleeds easily on touch.

### Chlamydial genitourinary infections

These are caused by the bacterium called *Chlamydia* and is the leading cause of [infertility](#) in US women. *Chlamydia* affects the urethra, salpinges, uterus, nasopharynx, and epididymis, causing unpleasant vaginal discharges, vaginal bleeding between periods, lower abdominal pain, sometimes fever if pelvic organs are involved in inflammation, dyspareunia, and rectal discharges after anal intercourse.

### Gonorrhea

The so-called 'clap' is caused by the bacterium *neisseria gonorrhoeae* and presents with thin or thick, purulent, and mildly odorous vaginal discharges, sometimes minimal or no discharges, dyspareunia, mild lower abdominal pain, and bleeding between periods.

### Herpes simplex

Herpes simplex is caused by the virus of the herpes family, and the signs are ulceration of the penis or vagina followed by insignificant discharges and itchiness of affected zones. There might be enlarged local lymphatic nodes as well as fever and malaise.

## Trichomoniasis

This condition causes gray, yellow, or green foul-smelling discharge from the vagina urethra, painful urination, and intercourse, dysuria, vaginal bleeding after intercourse or unrelated to menses, genital itchiness, and a burning sensation.

**Table: Differential Diagnosis of Vaginitis**

Clinical Elements	Bacterial vaginosis	Trichomoniasis	Vaginal candidiasis
Symptoms	Vaginal odor	+	+/-
Vaginal discharge	Thin, gray, homogenous	Green-yellow	White, curd-like
Vulvar irritation	+/-	+	+
Dyspareunia	-	+	-
Signs	Vulvar erythema	-	+/-
Bubbles in vaginal fluid	+	+/-	-
Strawberry cervix	-	+/-	-
Microscopy	Saline wet mount		
Clue cells	+	-	-
Motile protozoa	-	+	-
Pseudohyphae	-	-	+
Whiff test	+	+/-	-
pH	>4.5	>4.5	< 4.5

## Diagnosis of *G. Vaginalis*

### Laboratory studies

**Microscopic examination** of the vaginal discharge will have these characteristics:

- **clue cells** - vaginal epithelial cells with attached bacteria on their surfaces, edges of the cells are stubbed, and 'peppered' with coccobacilli
- pH is greater than 4,5
- Vaginal discharge is gray, watery, and homogenous
- Minimal polymorphonuclear leukocytes (PMNs)-1 per one vaginal epithelial cell
- Catalase-negative, oxidase-negative, and facultative anaerobe

**The whiff test** is positive in 90% of cases. This test can be conducted by mixing the vaginal fluid with a drop of KOH on a microscope slide to detect the presence of amine, which is produced by anaerobic bacterial metabolism.

**Microscopic evaluation** of the bacteria flora is informative when looking for evidence of changes in the overall bacterial predominance. Thus, lactobacilli (large gram-positive rods) are predominant normally. In BV, coccobacilli dominate over any other microflora (anaerobes), and there is a reduced lactobacilli population.

**Vaginal cultures** can exclude other pathogenic growth apart from *G. vaginalis*, namely *trichomonas* species, *C. trachomatis*, and *N. gonorrhoea*. *G. vaginalis* is detected in 100% of BV and 70% of asymptomatic BV.

### Procedures

**Colposcopy** reflects clean, translucent mucus in external cervical os and opaque vaginal contents in the rear vaginal vault. 'Spotted' images, visible after a **Schiller test**, are pathognomic colposcopic features of *G. vaginalis* infection.

# Treatment of Gardnerella Vaginalis

The treatment of *G. vaginalis* has to be prescribed appropriately based on the results of the clinical examination and cytological testing. **Antibacterial therapy** is a first-line pharmacological treatment. For *G. vaginalis*, doctors recommend metronidazole, metronidazole gel, or clindamycin cream.

## Pharmacotherapy

Medication	Duration
Metronidazole 500 mg, orally twice per day	7 days
Metronidazole gel 0,75%, one full applicator intravaginally (5g), once a day	5 days
Clindamycin cream 2% one full applicator intravaginally (5g) at bedtime	5 days

Patients taking treatment with **metronidazole** have to refrain from drinking alcohol during the entire course and 24 hours afterward; **clindamycin cream** softens the latex of condoms and diaphragms for 5 days after use.

Restricting sexual activity may be recommended depending on the severity and nature of the illness.

**Surgical intervention** is not required for *G. vaginalis* infections.

## Patients frequently ask

### Is *G. vaginalis* in men possible?

*G. vaginalis* is rare in men. The risk factors for males include being immunocompromised, having anatomical genitourinary abnormalities, or being alcoholics. It is not considered a sexually transmitted infection, but it may be transmitted during intercourse. If *Gardnerella* is diagnosed, men should also take a standardized treatment as a precaution to avoid retransmission to the partner.

### Is *G. vaginalis* a sexually transmitted disease?

*G. vaginalis* is not considered a sexually transmitted disease, but sexual contact may induce this condition in some patients. An increased number of sexual partners in a month or having an increased number of lifetime sexual partners may predispose the condition.

## References

[Gardnerella vaginalis infection – another sexually transmitted disease](#) via nih.gov

[Gardnerella vaginalis has a gram-positive cell-wall ultrastructure and lacks classical cell-wall lipopolysaccharide](#) via microbiologyresearch.org

[Gardnerella vaginalis: characteristics, clinical considerations, and controversies](#) via nih.gov

[Medscape.com](#)

[Trichomoniasis](#) via webmd.com

[Colposcopy images of cervix in women with Gardnerella vaginalis infection](#) via nih.gov

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