The “V”

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Celebrity
Vaginas????

Parts

**Vulva**
- Vagina is a specific internal structure, whereas the vulva is the whole external genitalia.
- Gateway to the vagina.
- Helps by flushing out the vaginal fluids and usually maintains normal vaginal health.
- Means: “covering”

**Vestibule**
- Secretions of fluid from the vestibule glands lubricate the vaginal orifice during sexual excitement.
- The space between the labia minora and vagina.

**Vagina**
- The inside part.
- The hallway to the uterus.

**Vestibule**
- Means: "covering".
The Vulva
- Mons Pubis: “mountain of Venus” a pad of fat and hair that cushions during lovemaking. You cannot ‘diet’ to make it as less fat
- Labia Majora: outer, larger lips covered in pubic hair. Derived from same tissue as scrotum. Produce sebum (Earwax) to waterproof from urine, menstrual blood and bacteria.
- Labia Minora: inner lips without hair. Top called “frenulum” the split at the clitoris. The base of the vaginal opening comes back together at the fourchette.
- Intralabial sulcus (folds) Trench between labia majora and minora
- Clitoris: top of the labia minora. Fully formed by 27 week gestation. 8K nerve endings sensitive to touch (2x that of the penis). Covered with a hood “prepuce”. Sole purpose: sexual enjoyment.

The Vestibule
- Area inside the labia minora;
- The hallway to the vagina approached by going through 2 doors
- Upper part: Urethra, lower part: vagina separated at the “Hart Line”
- Bulbs of the vestibule: bundle of blood vessels that line the floor/walls of the hallway. “G spot” Maybe tender to touch
- Bartholin Glands: base of the labia majora. Provides lubrication

The vagina
- women of reproductive age, Lactobacillus is the predominant constituent of normal vaginal flora.
- Colonization by these bacteria keeps vaginal pH in the normal range (3.8 to 4.2).
- High estrogen levels maintain vaginal thickness, bolstering local defenses.
- Menopause: a marked decrease in estrogen causes vaginal thinning, increasing vulnerability to infection and inflammation.
- Some treatments (eg, oophorectomy, pelvic radiation, certain chemotherapy drugs) also result in loss of estrogen.

Vaginal Myths
- Vagina Dentata.
- Period is Punishment
- Hysteria
- You Can’t Get Pregnant If It’s Legitimate Rape
- You Can’t Get Pregnant If You Have Your Period
- Sex With A Virgin Can Cure HIV/AIDS
- You can see someone’s vagina if they go commando
- You can lose something if inserted into the vagina
- You can get STDs from oral sex.
- Douching after sex prevents pregnancy

Hormone Fluctuations During Menstrual Cycle

The Bi Manual Exam
The Pelvic Exam

1. Select appropriate sized speculum, warm speculum and test speculum on the patient’s leg for comfortable temperature.
2. Inform patient prior to speculum insertion.
3. Insert speculum at 45 degree angle then rotate and open when completely inserted.
4. Visualize the cervix by adjusting the speculum anteriorly or posteriorly.
5. Use the appropriate collection vial with the correct attached swab for each culture.
6. For Chlamydia and Gonorrhea cervical cultures, insert the swab into the endocervix for approximately 10 seconds (insert only superficially in pregnancy).
7. For vaginal cultures, obtain a specimen from the posterior fornix.
8. Insert the swab into the vial, break off the excess swab and cap off the collection vial/tube securely and label the specimen.
Vaginitis

**Definition**

- Inflammation of the vagina that often occurs in combination with inflammation of the vulva, a condition known as vulvovaginitis.
- Often the result of an infection with bacteria, yeast or *Trichomonas*, but it may also arise due to physical or chemical irritation of the area.
- In pregnancy, *Trichomonas* infection and bacterial vaginosis are associated with an increased risk of adverse pregnancy outcomes, including preterm labor, PROM, preterm delivery, low birth weight, and postpartum endometritis.

**Causes**

<table>
<thead>
<tr>
<th>Category</th>
<th>Signs &amp; Symptoms</th>
<th>Criteria for Diagnosis</th>
<th>Microscopic Findings</th>
<th>Differential Dx</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacterial</strong></td>
<td>Thin, grey, fishy-odor discharge, often with pruritus and irritation; no dyspareunia</td>
<td>Thin, grey discharge; clue cells; pH of &gt;4.5; a fishy odor before or after addition of 10% KOH (i.e., the whiff test).</td>
<td>Clue cells, decreased lactobacilli, increased coccobacilli</td>
<td><em>Trichomonas</em> vaginitis</td>
</tr>
<tr>
<td><em>Trichomonas</em></td>
<td>Thin, grey, fishy-odor discharge, often with pruritus and irritation; no dyspareunia</td>
<td>Thin, grey discharge; clue cells; pH of &gt;4.5; a fishy odor before or after addition of 10% KOH (i.e., the whiff test).</td>
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<td><em>Trichomonas</em> vaginitis</td>
</tr>
<tr>
<td><strong>Fungal</strong></td>
<td>Thick, white discharge, irritation, itching, pruritus, no dyspareunia</td>
<td>Thick, white discharge, irritation, itching, pruritus, no dyspareunia</td>
<td>Budding yeast, pseudohyphae, or mycelia; best examined with KOH diluent</td>
<td><em>Candida</em> vaginitis</td>
</tr>
<tr>
<td><strong>Trichomonas</strong></td>
<td>Thin, grey, fishy-odor discharge, often with pruritus and irritation; no dyspareunia</td>
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</tr>
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</table>

**3 Main Culprits**

- **Bacteria**
  - accounts for 40-50% of vaginitis cases
  - The most common bacterial vaginosis in women of childbearing age
  - *Bacterial vaginosis* (BV) (40-45%) accounts for 20-25% of vaginitis cases
- **Fungi**
  - accounts for 20-25% of vaginitis cases
  - *Candida* vaginitis (20-25%) accounts for 20-25% of vaginitis cases
  - *Candida* vaginitis (Yeast) (20-25%) accounts for 20-25% of vaginitis cases
  - *Trichomonas* vaginitis (Tic) (15-20%) accounts for 15-20% of vaginitis cases
  - *Trichomonas* vaginitis (Tric) (15-20%) accounts for 15-20% of vaginitis cases

**Abdominal Pain**

- [Image of abdominal pain diagram]

- Epigastric region
- Periaminal region
- Pelvic region

**Causes**

- **Hypersensitivity**
  - hygiene sprays or perfumes, menstrual pads, tampons, douches, fabric softeners, fabric dyes, synthetic fibers
  - bathwater additives, spermicides, vaginal lubricants/creams, latex condoms, vaginal contraceptive rings, or diaphragms.

- **Physical**
  - Fistulas between the intestine and genital tract, which allow intestinal flora to seed the genital tract, pelvic radiation or tumors

- **Other causes**
  - Contact irritant or allergic vulvitis
  - Chemical irritation
  - Vulvodynia
  - Trichomonal vaginitis
  - Other skin disorders (e.g., psoriasis, tinea)
  - Lichen Sclerosus

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*Vaginitis* definition

- Inflammation of the vulva, a condition known as vulvovaginitis.

- Often the result of an infection with bacteria, yeast or *Trichomonas*, but it may also arise due to physical or chemical irritation of the area.

- In pregnancy, *Trichomonas* infection and bacterial vaginosis are associated with an increased risk of adverse pregnancy outcomes, including preterm labor, PROM, preterm delivery, low birth weight, and postpartum endometritis.
### Bacterial Vaginosis (BV)

**Oral Treatments**
- Tinidazole 2 g orally once daily for 2 days
- Tinidazole 1 g orally once daily for 5 days
- Clindamycin 300 mg orally BID x 7 days
- Metronidazole 500 mg orally BID x 7 days
- Metronidazole (750-mg extended-release) tablets orally once daily x 7 days

**Vaginal Treatments**
- Clindamycin ovules 100 mg intravaginally once at bedtime for 3 days*
- Metronidazole gel 0.75%, one full applicator (5 g) intravaginally, once a day for 5 days
- Clindamycin cream 2%, one full applicator (5 g) intravaginally at bedtime for 7 days

*abstinence from alcohol use should continue for 24 hours after completion of Metronidazole or 72 hours after completion of Tinidazole

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### Recurrent BV

- Metronidazole gel twice weekly for 4–6 months
- Metronidazole or Tinidazole 500 mg twice daily for 7 days
  - followed by intravaginal boric acid 600 mg daily for 21 days
  - and then suppressive 0.75% metronidazole gel twice weekly for 4–6 months
- Metronidazole 2g administered with fluconazole 150 mg, monthly
- Treatment of male sex partners has not been beneficial in preventing the recurrence of BV

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### Pregnancy & BV

- BV is associated with adverse pregnancy outcomes, including premature rupture of membranes, preterm labor, preterm birth, intra-amniotic infection, and postpartum endometritis.
- Multiple studies and meta-analyses have not demonstrated an association between metronidazole use during pregnancy and teratogenic or mutagenic effects in newborns.
- Regardless of the antimicrobial agent in pregnant women, oral therapy is preferred because of the possibility of subclinical upper-genital-tract infection.

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### BV: Recommended Regimens for Pregnant Women

- Metronidazole 500 mg orally twice a day for 7 days
- Metronidazole 250 mg orally three times a day for 7 days

Oral therapy has not been shown to be superior to topical therapy, and symptomatic pregnant women can be treated with either of the oral or vaginal regimens recommended for non-pregnant women.
- Clindamycin 300 mg orally twice a day for 7 days
  - cure rate of 85% using Gram-stain criteria
Vulvovaginal Candidiasis (VVC)

Typically caused by *C. albicans*, but occasionally caused by other Candida sp. or yeasts.

Typical symptoms of VVC include pruritus, vaginal soreness, dyspareunia, external dysuria, and abnormal vaginal discharge.

An estimated 75% of women will have at least one episode, and 40%–45% will have two or more episodes within their lifetime.

Classified as either uncomplicated or complicated.

Approximately 10%–20% of women will have complicated VVC that necessitates diagnostic and therapeutic considerations.

**Classification of vulvovaginal candidiasis (VVC)**

**Uncomplicated**
- Sporadic or intermittent vulvovaginal candidiasis
- Mild-to-moderate vulvovaginal candidiasis
- Likely to be *C. albicans*
- Non-immunocompromised women

**Complicated**
- Recurrent vulvovaginal candidiasis
- Severe vulvovaginal candidiasis
- Non-albicans candidiasis
- Women with uncontrolled diabetes, debilitation, or immunosuppression

**Diagnosis**
- Presence of external dysuria and vulvar pruritus, pain, swelling, and redness.
- Signs include vulvar edema, fissures, excoriations, or thick, curdy vaginal discharge.
- Associated with a normal vaginal pH (<4.5), and therefore, pH testing is not a useful diagnostic tool.

**Treatment**
- Short-course topical formulations (i.e., single dose and regimens of 1–3 days).
- The topically applied azole drugs are more effective than nystatin.
- Treatment with azoles results in relief of symptoms and negative cultures in 80%–90% of patients who complete therapy.

**Over-the-counter Intravaginal Agents:**
- Butoconazole: 2% cream 5 g intravaginally for 3 days
- Clotrimazole: 1% cream 5 g intravaginally for 7–14 days
- Miconazole: 2% cream 5 g intravaginally for 3 days
- Miconazole: 4% cream 5 g intravaginally for 3 days
- Miconazole: 100 mg vaginal suppository, QD for 7 days
- Miconazole: 200 mg vaginal suppository, QD for 3 days
- Miconazole: 1200 mg vaginal suppository, one for 1 day
- Tioconazole: 6.5% ointment 5 g intravaginally in a single application

**Prescription (Rx)**
- Butoconazole 2% cream (single dose), 5 g intravaginally for 1 day
- Clotrimazole 100,000-unit vaginal tablet, one tablet for 14 days
- Terconazole 0.4% cream 5 g intravaginally for 7 days
- Terconazole 0.8% cream 5 g intravaginally for 3 days
- Terconazole 50 mg vaginal suppository, one for 3 days
- Oral Agent: Fluconazole 150 mg oral tablet, one tablet in single dose

**Complicated VVC**
- Recurrent Vulvovaginal Candidiasis (RVVC)
- Defined as four or more episodes of symptomatic VVC in 1 year, poorly understood, and most women with RVVC have no apparent predisposing or underlying conditions.
- Vaginal cultures should be obtained to identify unusual species.
- Although *C. glabrata* and other non-albicans Candida species are observed in 10%–20% of patients, *C. glabrata* does not form pseudohyphae or hyphae and is not easily recognized on microscopy.

**Treatment**
- Recommend a longer duration of initial therapy (e.g., 7–14 days of topical therapy)
- 100 mg, 150 mg, or 200 mg oral dose of fluconazole every third day for a total of 3 doses (day 1, 4, and 7) to attempt mycologic remission before initiating a maintenance antifungal regimen.
Maintenance Regimens

- Oral fluconazole (i.e., 100-mg, 150-mg, or 200-mg dose) weekly for 6 months is the first line of treatment.
- If this regimen is not feasible, topical treatments used intermittently as a maintenance regimen can be considered.
- Suppressive maintenance antifungal therapies are effective in reducing RVVC.
- However, 30%-50% of women will have recurrent disease after maintenance therapy is discontinued.
- Routine treatment of sex partners is controversial.
- C. albicansazole resistance is rare in vaginal isolates, and susceptibility testing is usually not warranted for individual treatment guidance.

Severe and Non-albicans VVC

- Extensive vulvar erythema, edema, excoriation, and fissure formation is associated with lower clinical response rates in patients treated with short courses of topical or oral therapy.
- Either 7-14 days of topical azole or 150 mg of fluconazole in two sequential doses (second dose 72 hours after initial dose) is recommended.
- 600 mg of boric acid in a gelatin capsule, administered vaginally once daily for 2 weeks. (Compounded)
- Optimal treatment of non-albicans VVC remains unknown.
- Longer duration of therapy (7-14 days) with a non-fluconazole azole drug (oral or topical) as first-line therapy.

Trichomonosis

- Sexually transmitted
- About 70% of people who are infected do not show any symptoms
- Most infected persons (70%-85%) have minimal or no symptoms, and untreated infections might last for months to years
- Associated with two- to threefold increased risk for HIV acquisition

Trichomonosis: Symptoms

- Symptoms usually appear 5 to 28 days after exposure and can include:
  - Yellow-green (sometimes frothy)vaginal discharge with a foul odor
  - Discomfort during sex and when passing urine
  - Irritation and itching in the genital area
  - Lower abdominal pain in rare cases

Frothy, Malodorous Discharge

Strawberry Cervix
Treatment

- **Metronidazole** 2 g orally in a single dose
- **Tinidazole** 2 g orally in a single dose

Alternate
- **Metronidazole** 500 mg orally twice a day for 7 days

- Pregnant women: Metronidazole 2 g orally in a single dose.
- Male partners should be evaluated and treated with either Tinidazole in a single dose of 2 g orally or Metronidazole twice a day at 500 mg orally for 7 days.
- Metronidazole gel is considerably less efficacious for the treatment of Trichomoniasis.
- Women with HIV infection should be treated with metronidazole 500 mg orally twice daily for 7 days.

Test of Cure

- High rate of reinfection (17% within 3 months in one study)
- Retesting is recommended for all sexually active women within 3 months, regardless of whether they believe their sex partners were treated.
- Testing by nucleic acid amplification can be conducted as soon as 2 weeks after treatment.

Persistent or Recurrent Trichomoniasis

- Metronidazole resistance occurs in 4%–10% of cases and Tinidazole resistance in 1%.
- Single-dose therapy should be avoided for treatment that is not likely a result of reinfection.
- If above fails, both should start Metronidazole or Tinidazole at 2 g orally for 7 days.
- Not recommended: intravaginal betadine (povidone-iodine), Clotrimazole, acetic acid, furazolidone, gentian violet, nonoxynol-9, and potassium permanganate.

Chlamydia & Gonorrhea

**Chlamydia**

- **Azithromycin** 1 g PO in a single dose
- **Doxycycline** 100 mg BID x 7 days
- **Doxycycline** delayed-release 200 mg daily x 7 days
- **Erythromycin base** 500 mg orally QID x 7 days
- **Erythromycin ethylsuccinate** 800 mg orally QID x 7 days
- **Levofoxacin** 300 mg orally once daily x 7 days
- **Oflaxacin** 300 mg orally BID x 7 days

**Gonorrhea**

- **Azithromycin** 1 g orally in a single dose
- **Doxycycline** 100 mg BID x 7 days
- **Doxycycline** delayed-release 200 mg daily x 7 days
- **Levofoxacin** 300 mg orally once daily x 7 days
- **Oflaxacin** 300 mg orally BID x 7 days

Chlamydia: Pregnancy

- **Azithromycin** 1 g orally in a single dose

Alternative Regimens

- **Amoxicillin** 500 mg orally TID x 7 days
- **Erlofoxacin** base 500 mg orally QID x 7 days
- **Erlofoxacin** base 250 mg orally QID x 14 days
- **Erlofoxacin** ethylsuccinate 800 mg orally QID x 7 days
- **Erlofoxacin** ethylsuccinate 400 mg orally QID x 14 days
Pregnancy: Test of Cure

- Test-of-cure (preferably by NAAAT) 3–4 weeks after treatment is recommended because severe sequelae can occur in mothers and neonates.
- All pregnant women who have chlamydial infection diagnosed should be retested 3 months after treatment.
- Women aged <25 years and those at increased risk for chlamydia should be rescreened during the third trimester.

Chlamydia: Treatment Management

- Persons who receive a diagnosis of chlamydia should be tested for HIV, GC, and syphilis.
- Abstain from sexual activity x 7 days after single dose or until completion of a 7-day course of antibiotics.
- Retested approximately 3 months after treatment.
- Doxycycline is contraindicated in the 2nd and 3rd trimesters of pregnancy.

Gonorrhea

- Ceftriaxone 250 mg in a single intramuscular dose.
- [If ceftriaxone is not available: Cefixime 400 mg in a single oral dose]
- Azithromycin 1 g orally in a single dose

*Azithromycin 2 g in a single oral dose for severe cephalosporin allergy
- Retested 3 months after treatment regardless of whether they believe their sex partners were treated.
- Instructed to abstain from unprotected sex x 7 days after they and their sexual partner(s) have completed treatment and after resolution of symptoms.

Wet Mount

- Vaginal secretions are obtained with a swab and placed in a plastic tube with a few drops of 0.9% NaCl.
- pH paper is used to measure pH in 0.2 intervals from 4.0 to 6.0.
- Secretions are placed on slide with swab; diluted with 0.9% NaCl on one side (saline wet mount) and with 10% KOH on the other (KOH wet mount).
- KOH side is checked for a fishy odor (whiff test).
- Apply slide cover to each side.
- Examine saline side as soon as possible to detect trichomonads, clue cells.
- The KOH dissolves most cellular material except for yeast hyphae, making identification easier.

CDC 2015 Sexually Transmitted Disease Guidelines, June 2015

10% KOH “the Whiff Test”
Pelvic Inflammatory Disease

- one of the most common gynecological problems in women worldwide.
- many women have no or mild symptoms, that can be mistaken for another condition.
- develops after infection with STI, especially gonorrhea and chlamydia.
- risk is also increased when healthy bacteria in the vagina become outnumbered by other organisms (BV).
- Young women ages 15 to 24 have the highest rate of PID in the general population.
- About 8% of women who have had PID once become infertile (compared with 1% who have never had PID).
- After having PID, about 20% of women develop (chronic) pelvic pain.
- also increases a woman’s risk of (ectopic) pregnancy.

Diagnosis

- If one or more of the following minimum criteria are present on pelvic examination:
  - cervical motion tenderness
  - uterine tenderness
  - adnexal tenderness.
- Additionally, the presence of lower genital tract inflammation (predominance of leukocytes in vaginal secretions, cervical exudates, or cervical friability)

One or more may enhance the specificity of the minimum criteria and support a diagnosis

- oral temperature >101°F (>38.3°C);
- abnormal cervical or vaginal mucopurulent discharge;
- presence of abundant numbers of WBC on saline microscopy of vaginal fluid;
- elevated erythrocyte sedimentation rate;
- elevated C-reactive protein;
- laboratory documentation of cervical infection with N. gonorrhoeae or C. trachomatis.

Oral Treatment Regime for PID

- Ceftriaxone 250 mg IM in a single dose
  PLUS
  Doxycycline 100 mg orally BID x 14 days
  WITH or WITHOUT
  Metronidazole 500 mg orally BID x 14 days

- Cefoxitin 2 g IM in a single dose
  AND
  Probenecid 1 g orally concurrently in a single dose
  PLUS
  Doxycycline 100 mg orally BID x 14 days
  WITH or WITHOUT
  Metronidazole 500 mg orally BID x 14 days

- Other parenteral third-generation cephalosporin (e.g., cefixime or ceftriaxone)
  PLUS
  Doxycycline 100 mg orally BID x 14 days
  WITH or WITHOUT
  Metronidazole 500 mg orally BID x 14 days
Follow up for PID

- Should demonstrate substantial clinical improvement within 3 days after initiation of therapy.
- If no clinical improvement has occurred within 72 hours after outpatient oral or parenteral therapy, further assessment should be performed.
- Women with documented chlamydial or gonococcal infections have a high rate of re-infection within 6 months of treatment.
- Repeat testing of all women who have been diagnosed with chlamydia or gonorrhea is recommended 3-6 months, regardless of whether their sex partners were treated.
- All women diagnosed with acute PID should be offered HIV testing.

Sexual health

- Sexual issues generally increase with aging; distressing sexual complaints peak during midlife (ages 45-64) and are lowest from age 65 onward.
- Decreased estrogen causes a decline in vaginal lubrication and elasticity.
- Decreased testosterone may contribute to a decline in sexual desire and sensation.
- An active sex life, lubricants and moisturizers, and local vaginal estrogen help maintain vaginal health.

Vaginal symptoms

- Symptoms such as vaginal dryness, vulvovaginal irritation/itching, and dyspareunia are experienced by an estimated 10% to 40% of postmenopausal women.
- Vasomotor symptoms, abate over time, vaginal atrophy is typically progressive and unlikely to resolve on its own.
- Treatments include: regular sexual activity, lubricants and moisturizers, and local vaginal estrogen.

Vaginal Atrophy

<table>
<thead>
<tr>
<th>Vaginal Atrophy</th>
<th>Well-Testosterone Premenopausal State</th>
<th>Low-Testosterone Postmenopausal State</th>
</tr>
</thead>
</table>

Table 3. Estrogen therapy products approved for postmenopausal use in US (cont’d)

<table>
<thead>
<tr>
<th>Product</th>
<th>Dose Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>17β-estradiol</td>
<td>Initially 2-4 g/d for 1-2 wk, followed by maintenance dose of 1 g/d (0.1 mg active ingredient/g)</td>
</tr>
<tr>
<td>Conjugated estrogens</td>
<td>For vaginal atrophy: 0.5-2 g/d for 21 d then off 7 d For dyspareunia: 0.5 g/d for 21 d then off 7 d, or twice weekly (0.625 mg active ingredient/g)</td>
</tr>
<tr>
<td>17β-estradiol vaginal ring</td>
<td>7.5 µg/d for 90 days (for vulvovaginal atrophy)</td>
</tr>
<tr>
<td>Estradiol acetate vaginal ring</td>
<td>Device containing 2 mg releases 7.5 µg/d for 90 days (both doses release systemic levels for treatment of vulvovaginal atrophy and vasomotor symptoms)</td>
</tr>
<tr>
<td>Estradiol hemihydrate vaginal tablet</td>
<td>Initially 1 tablet/d for 2 wk, followed by 1 tablet twice weekly (tablet 10 µg of estradiol hemihydrate, equivalent to 10 µg of estradiol; 0 mg estrogenic activity)</td>
</tr>
</tbody>
</table>

* N.B. Higher doses of vaginal estrogen are systemic, meant to relieve hot flashes as well as vaginal atrophy; the lower doses are intended for vaginal symptoms only even though a small amount does get absorbed.