National Network of STD Clinical Prevention Training Centers

Florida HEALTH

2018 Updates on STD Management: Practical Approaches to the Most Common STD Clinic Patient Concerns

A Monthly Webinar Series

Webinars occur 12-1 pm EST
One Tuesday per month
January – November 2018

Learner Objectives

At the conclusion of this webinar series, participants should be able to:

- Accurately identify patients at risk for STIs and then test, diagnose, and treat according to CDC STD Treatment Guidelines.

Continuing Education Accreditation

This activity has been planned and implemented in accordance with the Essential Areas and the Policies of the Accreditation Council for Continuing Medical Education through the joint providership of the University of Alabama School of Medicine and the Sylvie Ratelle STD/HIV Prevention Training Center.

The University of Alabama School of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for participants.

The University of Alabama designates this webinar for a maximum of 1.0 *AMA PRA Category 1 Credit*™. Participants should claim only the credit commensurate with the extent of their participation in the activity.

These credits are also applicable for registered nurses.

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After Today's Webinar

- You will receive an auto-generated email from the National Network of STD Clinical Training Centers to complete a brief evaluation of today's presentation.

- Within that email, you will find instructions on how to register for and receive CME credits through the University of Alabama School of Medicine.

- Webinars will be archived and available for viewing at www.RatellePTC.org. CME credits will also be available for archived webinars.

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Save The Dates:
2018 STD Webinar Schedule

Date	Title	Speaker(s)	Affiliations
Jan 16	Vaginitis: Bacterial Vaginosis, Yeast Vaginitis, Trichomoniasis	Katherine Hsu, MD, MPH	MDPH/Boston Univ. Med. Ctr.
Feb 20	Cervicitis/PID: Chlamydia, Gonorrhea, *M. genitalium*	Candice McNeil, MD, MPH	Wakeforest Univ.
Mar 20	Motivational Interviewing for STI/HIV Prevention	Thomas Creger, PhD, MPH	Univ. of Alabama at Birmingham
Apr 17	Pregnancy and STIs	Candice McNeil, MD, MPH	Wakeforest Univ.
May 15	Urethritis/Epididymitis/Proctitis: Gonorrhea, *M. genitalium*, and Lymphogranuloma Venereum	Candice McNeil, MD, MPH	Wakeforest Univ.
Jun 19	Clinician-Health Department Partnerships: Partner Management, Disease Reporting, Presumptive Treatment	Marjorie Kirsch, MD	FL DOH Wakulla County

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Save The Dates:
2018 STD Webinar Schedule (cont'd)

Date	Title	Speaker(s)	Affiliations
Jul 17	Genital Lesions: HSV, HPV, Syphilis	Nicholas Van Wagoner, MD, PhD	Univ. of Alabama Sch. of Med.
Aug 21	Management of STI/HIV Coinfection	Katherine Hsu, MD, MPH	MDPH/Boston Univ. Med. Ctr.
Sept 11	Genital Dermatology	Nicholas Van Wagoner, MD, PhD	Univ. of Alabama Sch. of Med.
Oct 16	Approaches with Special Populations: Youth, GLBT	Katherine Hsu, MD, MPH and Nicholas Van Wagoner, MD, PhD	MDPH/Boston Univ. Med. Ctr. and Univ. of Alabama Sch. of Med.
Nov 13	Update on PrEP	Ulyee Choe, DO	FL DOH Pinellas County/Univ. of S. Florida College of Med.

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VAGINITIS!

Katherine Hsu, MD, MPH*
Director, STD/HIV Prevention Training Center of New England
Medical Director, Division of STD Prevention
Massachusetts Department of Public Health

Slides developed by Drs. Ratelle, Dunne, Mitchell, and Hsu*

***No commercial disclosures or conflicts of interest**

Objectives

- Review normal vaginal ecosystem
- Review three main causes of vaginitis, including current diagnostics, treatment, and management of recurrences
  - Bacterial vaginosis
  - Yeast vaginitis
  - Trichomoniasis

Today's Questions

- **What questions on …**
  - **History (symptoms)**
  - **Exam (signs)**
  - **Labs (office point of care tests)**

… can we ask to rule in or rule out specific causes of vaginitis?

Background

- 3 out of 4 women have some type of vaginitis in their lifetime
- 1 of the top 7 reasons women seek health care
  - 10 million office visits annually
  - Procedures are billable!
- Diagnosis limited by:
  - Poor patient recognition
  - Poor provider-patient telephone triage
  - Poor provider office based prediction
    - Under-utilization of pH and microscopy

Allen-Davis J 2002 Ob Gyn
Weisenfeld 1999 Am J ObGyn
Landers 2004 Am J ObGyn

Normal Vaginal Ecosystem

=

Mature vaginal squamous epithelium

+

Mucus

+

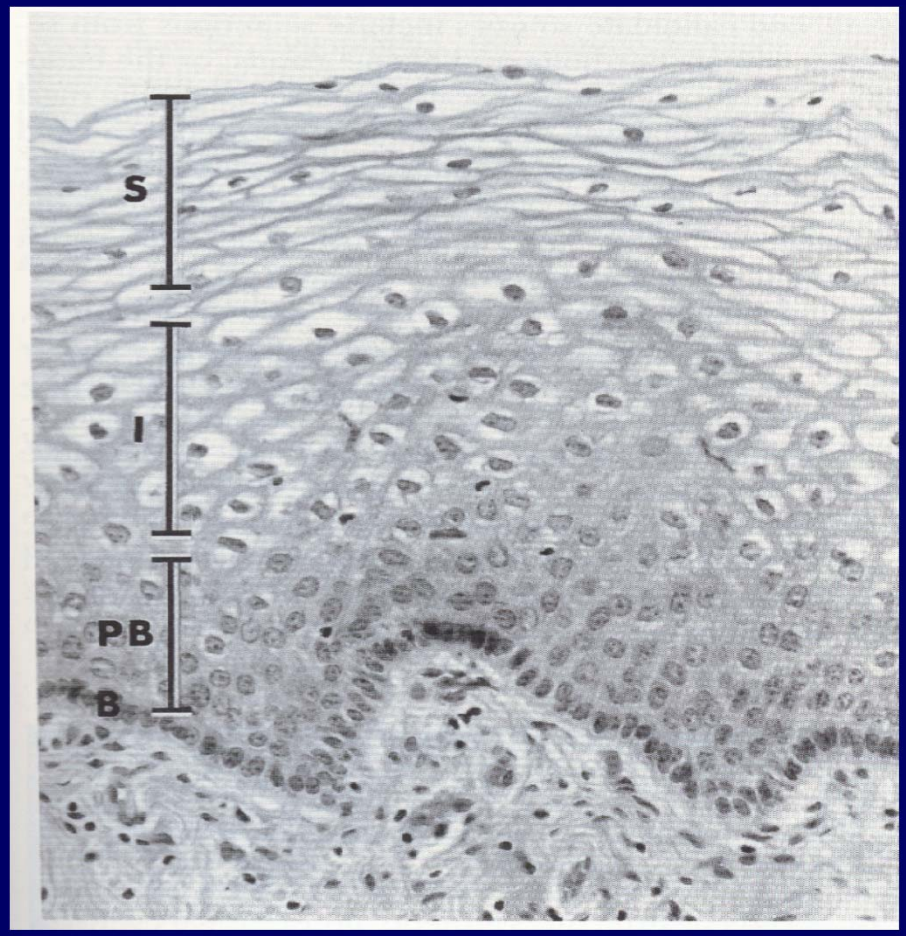
Normal vaginal flora

(~10^9 bacterial colony forming units per gram of fluid)

=

Clear to white, odorless, high viscosity discharge

Mature Vaginal Squamous Epithelium



Source: Sharon Hillier, PhD

The epithelium is composed of:

- multiple layers of superficial cells (S)
- multiple layers of intermediate cells (I)
- several layers of parabasal cells (PB)
- a basal layer (B)

… that accumulate glycogen under the influence of estrogen stimulation

Protective Role of Mucus

- Provides lubrication
- Traps pathogens
- Delivers anti-microbial agents
- Constantly shed

What Is Normal Vaginal Flora?

Predominantly *Lactobacillus* (95%)

The other 5% …

Streptococci sp.
Staphylococcus epidermidis
Diphtheroid sp.
Gardnerella vaginalis
Peptostreptococci sp.
Bacteroides sp.
Anaerobic *Lactobacillus*
Ureaplasma urealyticum
Mycoplasma hominis

Adapted from D. Eschenbach, MD, “Overview and Epidemiology of Vaginal Infections”, Dallas 12/06/98

Functions of Lactobacilli

- Produce hydrogen peroxide
  - viricidal, inhibits growth of many other bacteria such as *G. vaginalis*, anaerobes, *N. gonorrhea*
- Produce lactic acid
- Resultant vaginal pH <4.5
- Produce bacteriocidin
- Interfere with bacterial adhesion to epithelial cells

Adapted from D. Eschenbach, MD, "Overview and Epidemiology of Vaginal Infections", Dallas 12/06/98

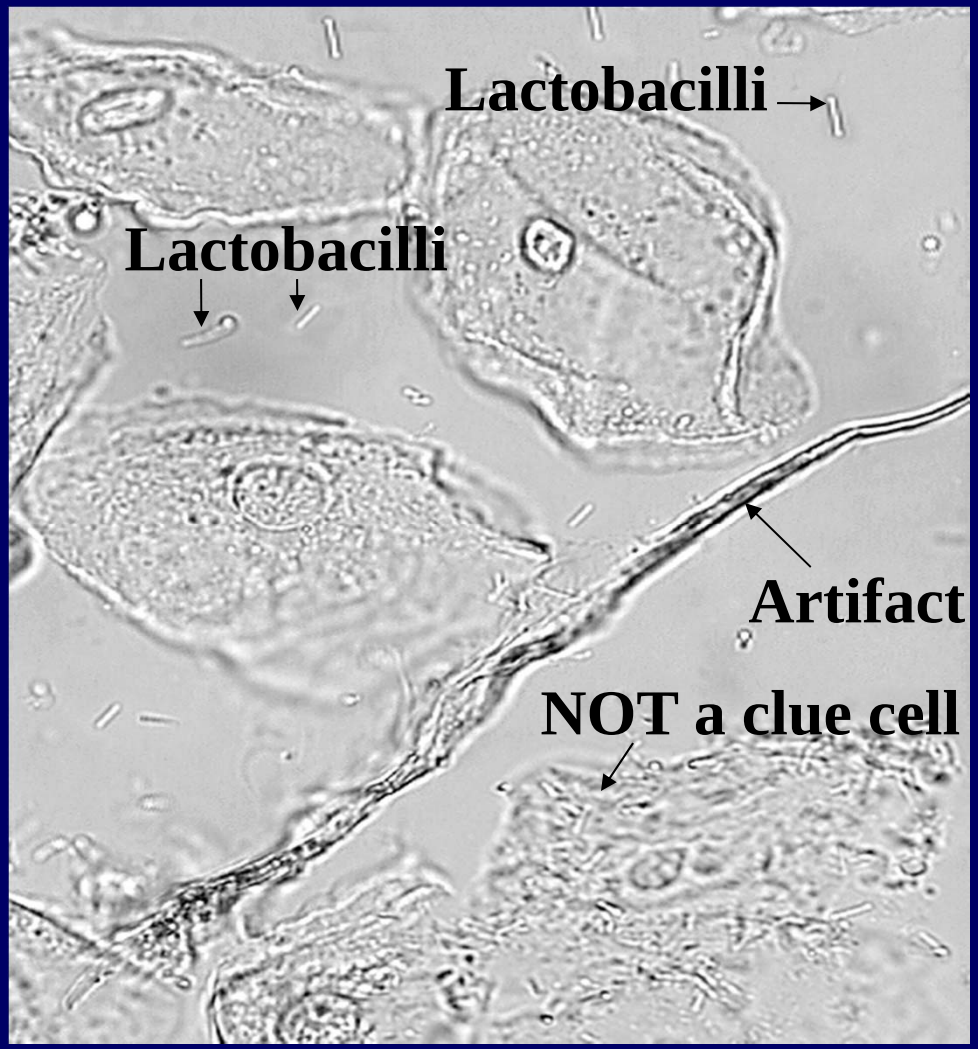
Dairy Food Strains DON'T Colonize and Persist in the Vagina

- Three studies from US, Japan and Italy using DNA homology for identification of lactobacilli show that the most common vaginal species are *L. crispatus* and *L. jensenii* (not *L. acidophilus*)
- When women are followed over several months, H_2O_2-producing strains of *L. crispatus* and *L. jensenii* are the most likely to persist

Vallor et al., JID 2001
Source: Sharon Hillier, PhD

Wet Prep: Lactobacilli and Epithelial Cells

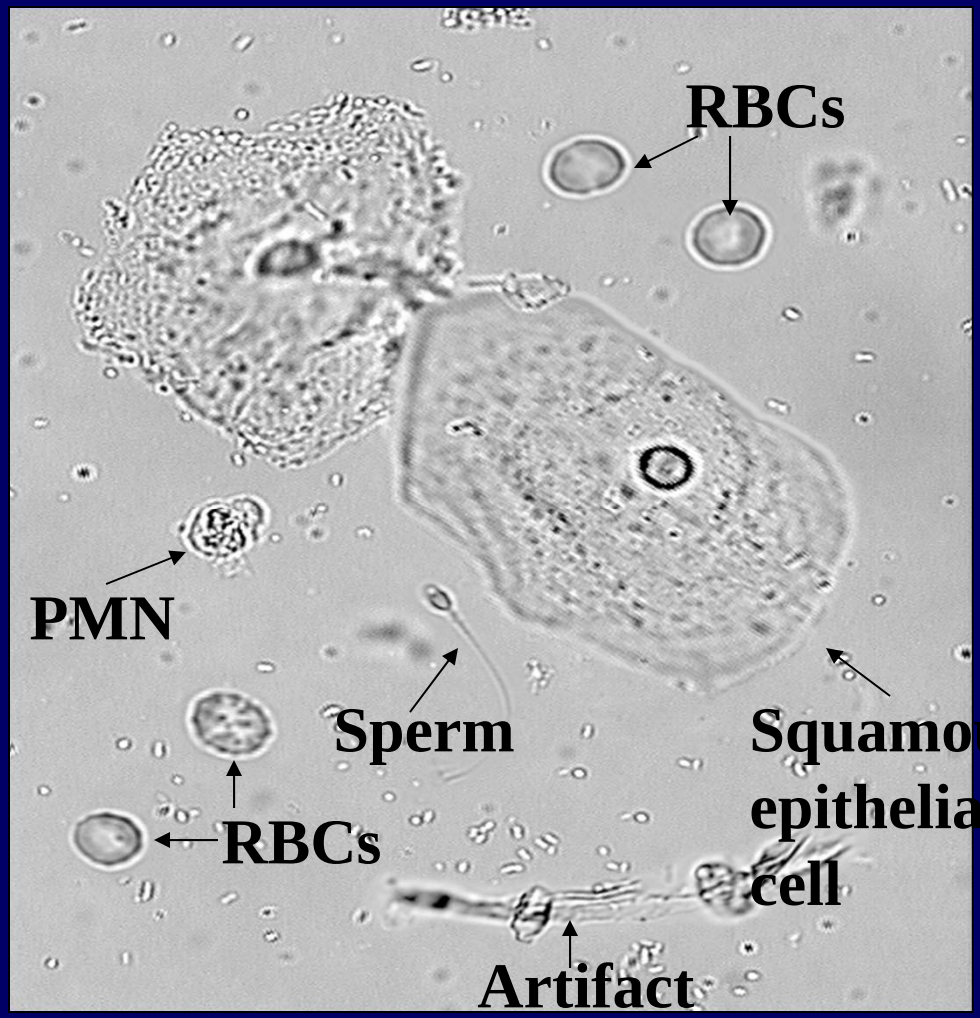
Saline: 40X objective



Source: CDC and Seattle STD/HIV Prevention Training Center at the University of Washington

Wet Prep: RBCs, Sperm, PMNs, and More

Saline: 40X objective



Source: CDC and Seattle STD/HIV Prevention Training Center at the University of Washington

Etiologies of Vaginitis

	National	Anderson et al.
Yeast	20-25%	17-39%
BV	40-50%	22-50%
Trich	15-20%	4-35%
Undiagnosed	30%	7-72%

Anderson, M. R. et al. JAMA 2004;291:1368-1379

Etiologies of Vaginal Discharge

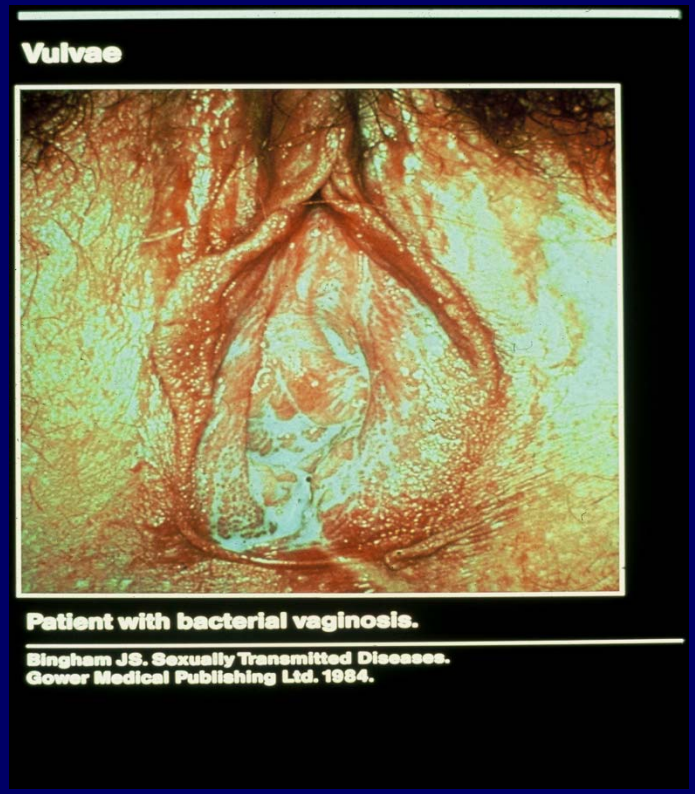
- Infectious 90%
  - Bacterial vaginosis
  - Candida species
  - *T. vaginalis*
  - Cervicitis
    - *N. gonorrhoeae*
    - *C. trachomatis*
  - HSV
  - Staph/Strep (TSS)
  - Group B streptococci
- Non-Infectious 10%
  - Cervical caps
  - Detergent spermicides
  - Retained foreign bodies
  - "Drying" agents
  - Allergies (latex, etc.)
  - Chemical (douching)
  - Fragranced liners/tampons
  - Cytolytic vaginitis

Less Common Causes of Vaginal Complaints

- GC and chlamydia
  - Association with vaginal discharge is UNCONFIRMED!
  - BUT age group <25 years has the peak incidence
- HSV
- Mycoplasma and ureaplasma?
- Chemical irritation
  - Latex
  - Semen
  - Douching
- Mechanical irritation

Bacterial Vaginosis

Homogeneous, white discharge



Bacterial Vaginosis

Bacterial Vaginosis

- Most frequent cause of abnormal vaginal discharge
- Prevalence estimates from 2-30% general population; 40-50% women in STD clinics

Risk Factors for BV

- More common among African American and older women
- Douching
  - Recent douching (OR=2.1), frequent douching, douching for hygiene or symptoms
- IUD: 2-fold more likely to have BV
- Two or more sex partners in previous six months
- New sex partner
- Female sex partners*
- Past history of BV*
- Others??

Sobel JD et al. Obstet Gynecol 2006; 194;1283-9
Bradshaw CS et al. JID 2006;193:1478-86

BV Pathogenesis

- Flora in healthy vaginas
  - Lactobacilli (95%)
  - Other (5%)
    - Streptococci sp.
    - *Staphylococcus epidermidis*
    - Diphtheroid sp.
    - *Gardnerella vaginalis*
    - Peptostreptococci sp.
    - Bacteroides sp.
    - Anaerobic *Lactobacillus*
    - *Ureaplasma urealyticum*
    - *Mycoplasma hominis*

- Flora in BV
  - Gardnerella- up 17x
  - Bacteroides- up 15x
  - Peptostreptococci- up 10x
  - Mycoplasma/Ureaplasma- up 15x
  - **Lactobacilli- < 5%**

Pathogenesis

- Lack/paucity of lactobacilli (<5%)
- Ratio of anaerobes: aerobes greatly increases
  - Overgrowth of *Gardnerella vaginalis*, genital mycoplasmas, anaerobic GNRs, and *Mobiluncus* species
- Gardnerella probably necessary but not sufficient (experimental data)
  - Synergistic process with anaerobes probably responsible
- BV pts have a higher number of sialidase-producing bacteria
  - 84% of women with BV have elevated levels of sialidase activity in their vaginal fluid (Briselden et al 1992)
  - Mainly produced by *Prevotella* and *Bacteroides* spp.

Clinical Manifestations

- 50% report malodorous vaginal discharge
  - more common after unprotected vaginal intercourse and after menses
- 50% are asymptomatic:
  - may have increased discharge
  - pruritus may or may not be present

Clinical Signs

- Elevated pH ≥4.7
  - surrogate for reduced numbers of lactobacilli
- Clue cells
  - an indication of increased numbers of bacteria and binding of the bacteria to the epithelial cells
- Amine odor
  - an indication that high levels of anaerobic gram negative rods are present
- Homogenous discharge
  - caused by degradation of mucins by anaerobic gram negative rods

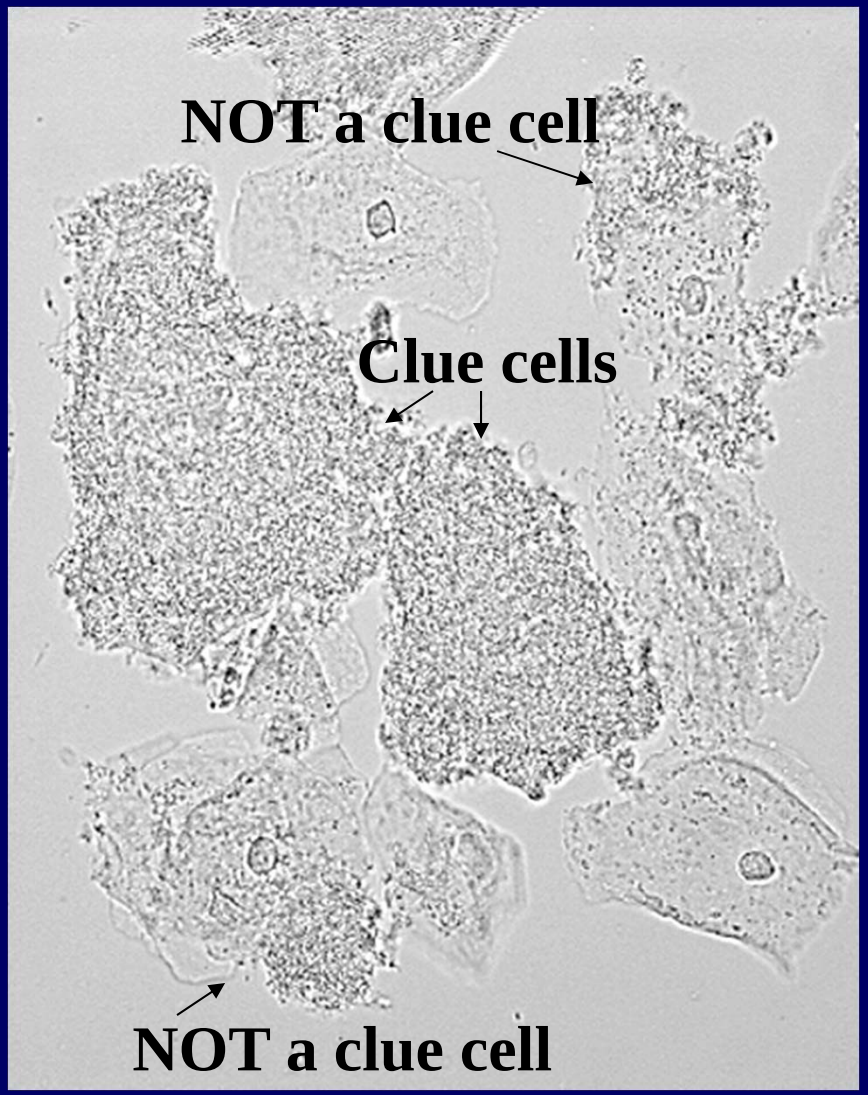
Sensitivity & Specificity of Clinical Criteria

	Sensitivity	Specificity
1. Thin homogenous discharge	79%	54%
2. pH ≥ 4.5	89%	74%
3. Positive amine test	67%	93%
4. Clue cells (>20%)	74%	86%
pH ≥ 4.5 and discharge	69%	86%
pH ≥ 4.5 and amine odor	64%	95%
pH ≥ 4.5 and clue cells	69%	92%
Clue cells and amine odor	63%	95%
Clue cells and discharge	61%	91%
Amine odor and discharge	58%	94%
Amsel criteria (≥ 3 of 4)	69%	93%

Gutman et al. *Obstet Gynecol* 2005;105:551-6.

Wet Prep: Bacterial Vaginosis

Saline: 40X objective



Source: Seattle STD/HIV Prevention Training Center at the University of Washington

Bacterial Vaginosis Diagnosis: Amsel Criteria

Amsel Criteria:

Must have at least <u>three</u> of the following findings:

- **Vaginal pH >4.5**
- **Presence of >20% per HPF of "clue cells" on wet mount examination**
- **Positive amine or "whiff" test**
- **Homogeneous, non-viscous, milky-white discharge adherent to the vaginal walls**

Lab Tests for Diagnosis of Bacterial Vaginosis

- Affirm VP III system (Becton-Dickinson)

  Non-amplified nucleic acid for detection of $>10^7$ CFU/g of *G. vaginalis (T. vaginalis* and *Candida* species).

Clinical Criteria	**Clue Cells**
97% sensitive	90% sensitive
71% specific	97% specific

Could be surrogate for wet mount examination of clue cells
Use in conjunction with vaginal pH and presence of amine odor
(Briselden et al 1994. JCM;2:148-52)

Lab Tests for Diagnosis of Bacterial Vaginosis

- FemExam pH/amine test card (Quidel)
  - Colorimetric pH and amine test on a card
- BVBlue Test (OSOM – Genzyme – CLIA Moderate)
  - 10 minute colorimetric test requiring incubation based on detection of sialidase activity

Gram Stain Score:

91.7% sensitive

97.8% specific

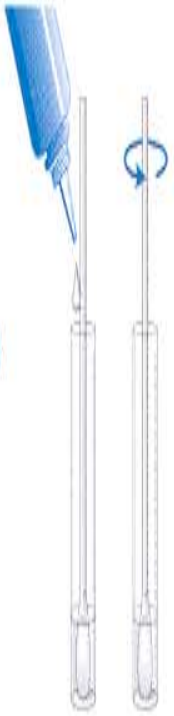
Myziuk et al. 2003;41:1925-8.

TEST PROCEDURE / RESULTS

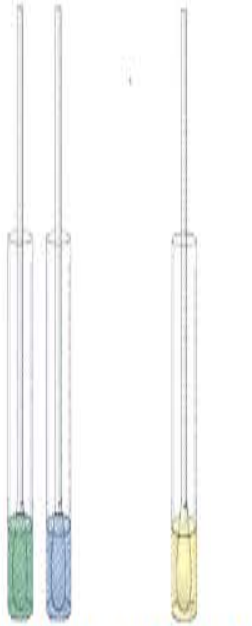
Immerse the head of the cotton swab into the solution. Gently swirl the mixture.

Place the testing vessel containing the cotton swab into an incubator, temperature controlled at 37° C (98.6° F) for 10 minutes.

Add one drop of the Developer Solution to the testing vessel containing the cotton swab. Gently swirl the mixture.



Interpret the results immediately (within 3 minutes) after adding the Developer Solution.



FOR MORE INFORMATION ON OUR RAPID TEST PRODUCTS, VISIT US AT **genzymediagnostics.com**

Treatment Benefits: Non-Pregnant Patients

- Relieve symptoms
- Reduce post-infection rates following hysterectomy and abortion
- May reduce STD/HIV acquisition

THEREFORE:

- Treat all non-pregnant women with symptoms
- Consider screening and treatment of asymptomatic women
  - prior to abortion, hysterectomy, or other invasive upper genital tract procedure

Treatment Benefits:
Pregnant Patients

- Relieve symptoms
- Reduce postpartum endometritis, post C-section wound infection
- Reduce preterm labor in high-risk women?
  - 7 studies done as of 1/2012
    - 4 showed benefit, 2 no change, 1 harm- conflicting results

THEREFORE:

•Treat all women with symptoms

To screen or not to screen?

- CDC- not enough evidence
- USPSTF- not enough evidence
- Cochrane Review- evidence to support screening high risk women, then treating them with systemic therapy only

CDC 2010 STD Treatment Guidelines
USPSTF 2010 Ann Int Med
McDonald 2005 Cochrane Database

Recurrent BV

- Recurrent disease remains common
  - Rates up to 70% within 3 months
- Reasons for recurrence unclear
  - Re-infection
  - Failure of lactobacilli to re-colonize
  - Inadequate length of therapy
  - Persistence of unidentified host factor
- Despite comparable early cure rates, higher recurrence rates associated with shorter treatment
  - Single-dose 2 g metronidazole
  - 3-day clindamycin course

Recurrent BV: Management

- More antibiotic is better: higher cumulative doses (longer therapy, 10-14 days) with subsequent suppression is most effective
  - Metronidazole gel, twice weekly (Sobel 2006)
  - Emerging data support ⇑response of initial BV with higher vaginal doses of MTZ (Sanchez 2004)
- Prevent sexual transmission (condoms, no shared toys): Alkaline pH of sperm (7.5) vs. reinfection? (Trabert 2007; Sanchez 2004)
- Boric acid: 7 d MTZ PO, 21 d vaginal BA (600 mg qHS) followed by MTZ vaginal gel biweekly for 16 weeks was encouraging: cure post-BA 88%-92% (Reichman 2009)

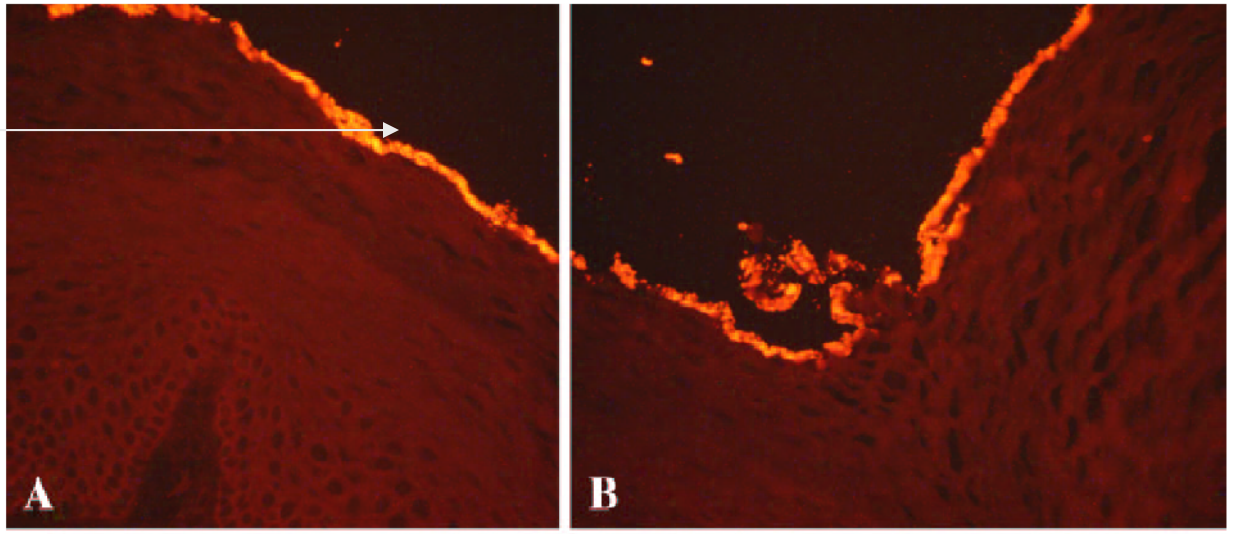
Boric Acid Addition to Suppressive Antimicrobial Therapy for Recurrent Bacterial Vaginosis

Orna Reichman, MD, Robert Akins, PHD,† and Jack D. Sobel, MD**

Slide courtesy of Marrazzo, IDSA 2011

Adherent Biofilms in Bacterial Vaginosis

G. vaginalis



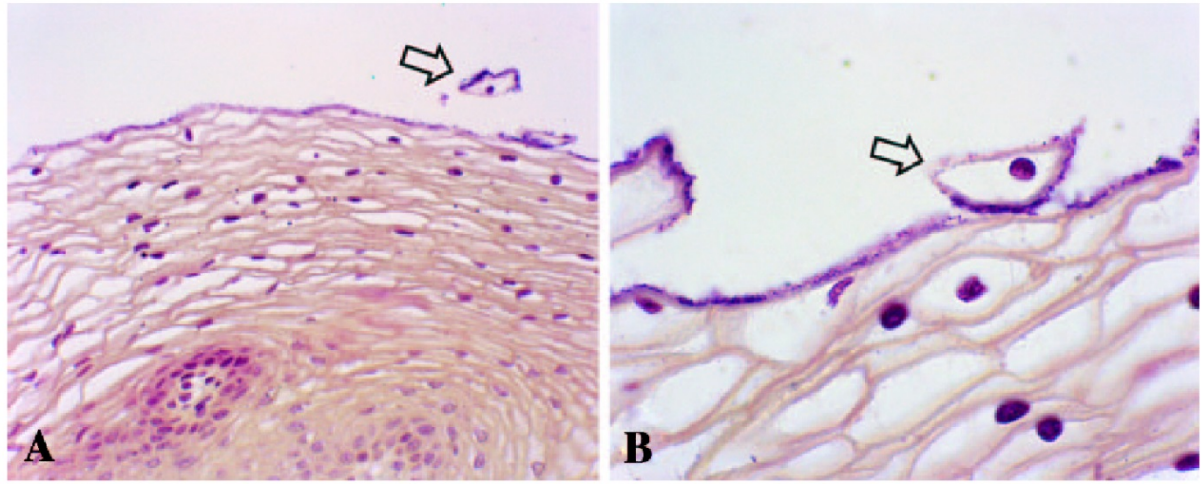


Fig. 4. A continuous biofilm can be detected histologically on the vaginal epithelial surface in patients with bacterial vaginosis (Brown-Hopps modification of the Gram stain). Original magnifications: left panel, x100 **(A)**; right panel, x250 **(B)**. Note the desquamation of surface epithelial cells containing the biofilm that can be detected as ''clue cells'' in the vaginal smear *(arrows)*.

Swidsinski. Biofilms in Bacterial Vaginosis. Obstet Gynecol 2005.

Swidsinski, Obstet. Gynecol 2005

Slide courtesy of Marrazzo, IDSA 2011

Treatment

- Recommended
  - Metronidazole 500 mg PO bid x 7 days OR
  - Metrogel 0.75% 5 g intravaginally qhs x 5 days OR
  - Clindamycin cream 2% 5 g intravaginally qhs x 7 days
    - Oil-based, might weaken latex condoms and diaphragms for 5 days after use
- Alternative
  - Tinidazole 2 g PO qd x 2 days
  - Tinidazole 1 g PO qd x 5 days
  - Clindamycin 300 mg PO bid x 7 days OR
  - Clindamycin ovules 100 mg intravaginally qhs x 3 days
    - Oil-based, might weaken latex condoms and diaphragms for 5 days after use
- Pregnant
  - Same as recommended regimens for non-pregnant women
- Suppressive treatment:
  - Metrogel 0.75% twice weekly for 4-6 months
  - Oral nitroimidazole course, followed by boric acid 600 mg intravaginally for 21 days and suppressive metronidazole gel for 4-6 months (limited data)

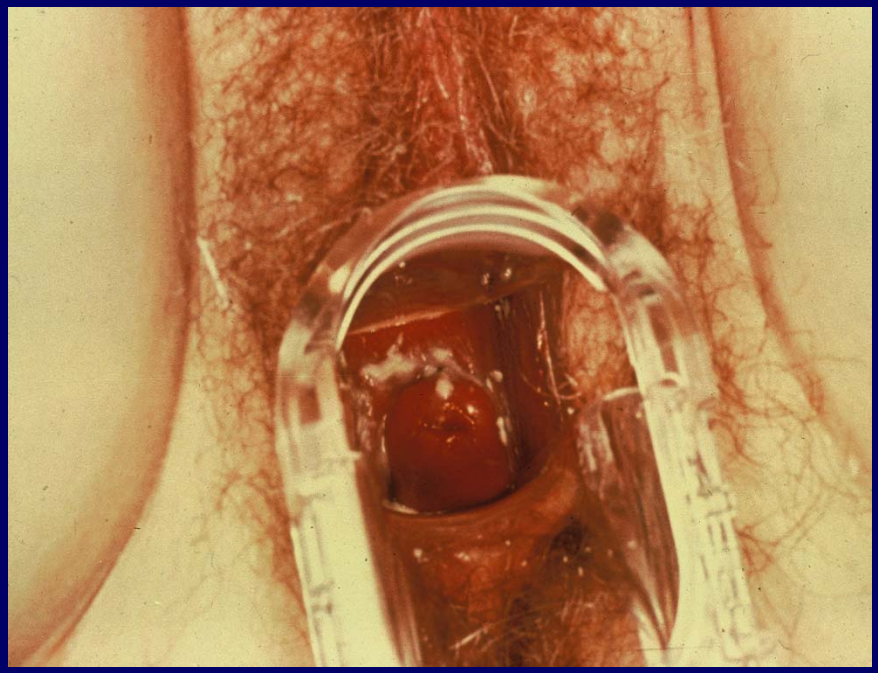
2015 CDC STD Treatment Guidelines

Partner Management

- Routine treatment of male sexual partners of women with BV is not recommended
- Data from clinical trials indicate that a woman's response to therapy and the likelihood of relapse or recurrence are not affected by treatment of her sex partner(s)

- Female partners of women with BV could be examined and treated if BV is present, but this approach has not been validated
  - Increase awareness of signs &symptoms of BV in women
  - Encourage healthy sex practices: avoid shared sex toys, clean sex toys, use barriers

Vulvovaginal Candidiasis



Yeast Vulvitis

Source: http://www.brooksidepress.org/Products/OBGYN_101

Yeast Vaginitis

Source:http://www.brooksidepress.org/Products/OBGYN_101/

Epidemiology and Causes

- Infection is common
  - 75% at least once
  - 40% to 45% two or more
  - < 5% recurrent VVC
- Not sexually transmitted
  - may be associated with frequency of intercourse, but not # of partners
- Most infections caused by
  - *Candida albicans* (85%)
  - *C. glabrata* (5% - 15%)
  - Misc. species (1% - 5%)

Pathogenesis

- Candida species are normal flora of the skin and vagina
- Symptomatic clinical infection is caused by overgrowth of *C. albicans* or other non-albicans species
- Yeast grows as oval budding yeast cells or as a chain of cells (pseudohyphae)
- Disruption of normal vaginal ecology or host immunity can predispose to vaginal yeast infections

Clinical Manifestations

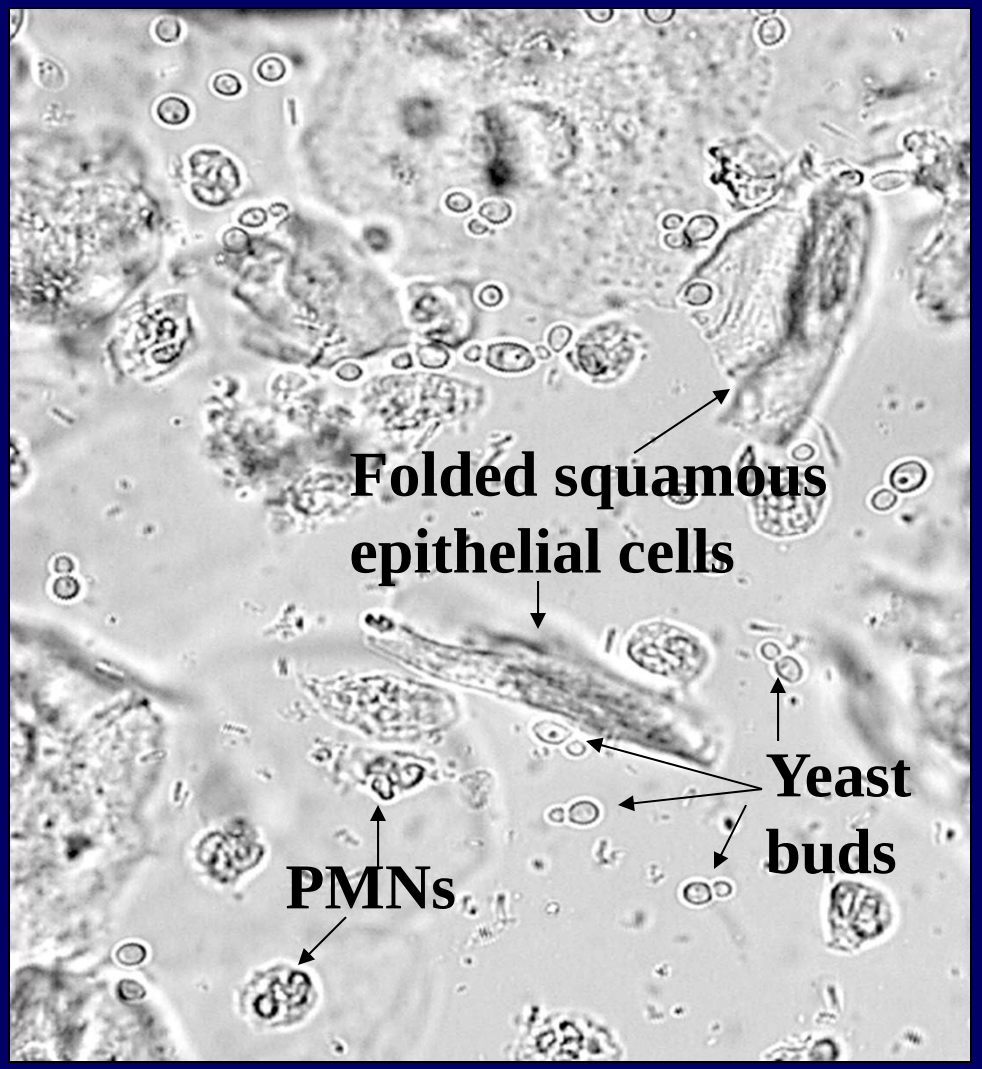
- Intense itching and irritation of vulva
  - Not specific
- Thick, non-odorous discharge
  - Not sensitive
- External dysuria
- Exam
  - Thick, clumpy, adherent, white discharge
  - Erythema and edema of vulva, vagina
  - Sometimes see satellite lesions or shallow linear fissures or excoriations around posterior introitus

Diagnosis

- Based upon clinical presentation, signs, and office tests
  - pH < 4.5; negative amine test
  - Wet mount shows pseudohyphae and/or mycelial elements
    - 10% KOH prep improves visualization by disrupting cells that might be obscuring yeast
- When to use culture?
  - Symptoms present, pH normal, but yeast not seen on wet mount
  - Recurrent VVC (to confirm diagnosis)
  - To identify unusual species
    - *C. glabrata* buds, but doesn't form pseudohyphae or hyphae, so it's harder to see on wet mount
  - No improvement with therapy
  - Relapse within 2 months

Wet Prep: PMNs and Yeast Buds

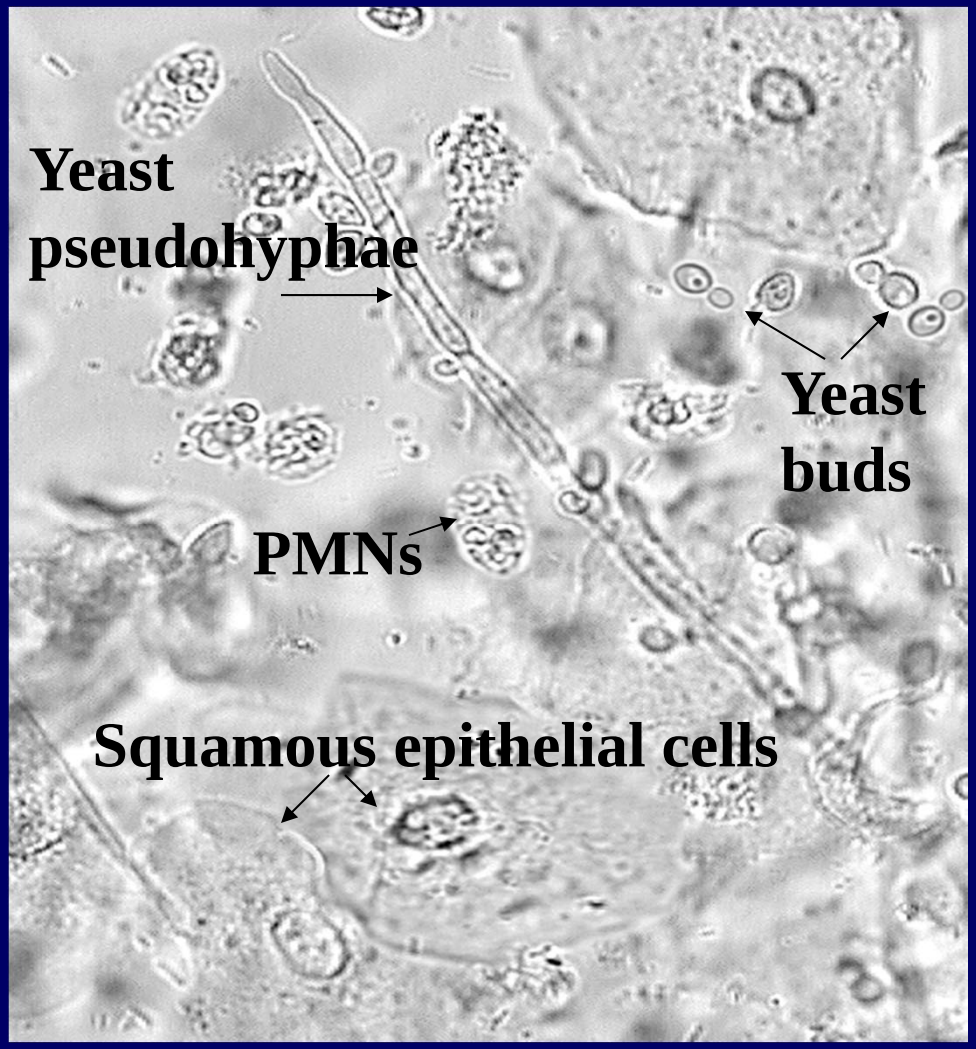
Saline: 40X objective



Source: CDC and Seattle STD/HIV Prevention Training Center at the University of Washington

Wet Prep: PMNs and Pseudohyphae

Saline: 40X objective



Source: CDC and Seattle STD/HIV Prevention Training Center at the University of Washington

Classification

- **Uncomplicated VVC**
  - Sporadic or infrequent
  - Mild to moderate symptoms
  - Likely to be *C. albicans*
  - Normal host
- **Complicated VVC**
  - Recurrent
  - Severe symptoms
  - Non- *C. albicans*
  - Immunosuppressed host
    - Uncontrolled diabetes
    - Pregnancy
    - HIV
    - Immunosuppressive therapy
  - *Not* associated with
    - nylons, type of underwear
    - colored toilet paper, tampons
    - wiping back to front

2006 CDC STD Treatment Guidelines

Principles of Treatment: Uncomplicated Infections

- Treat only symptomatic women
- No need to treat sex partners unless sx
- Topical azole drugs (clotrimazole, miconazole, butonconazole, etc.) more effective than nystatin
- Treatment with azole results in cure rates of 80-90% in women who comply with regimen

Treatment

- **Uncomplicated VVC**
  - Multiple topical azoles for 1-14 days* OR
  - Single-dose fluconazole 150 mg PO**
- **Recurrent VVC**
  - Induction:
    - Multiple topical azoles for 7-14 days* OR
    - Fluconazole 100-200 mg PO every 72 hrs x 3**
  - Maintenance to decrease recurrence
    - First-line: Fluconazole 100-200 mg orally weekly** OR
    - Other topical treatments used intermittently
    - Discontinue and re-assess after 6 months

*All oil-based and may weaken condoms
**Not to be used in pregnancy

2015 CDC STD Treatment Guidelines

Treatment:
Severe and Non- *C. albicans* VVC

Severe VVC

- Lower response rates to shorter courses of treatment
- 7 to 14 days of non-fluconazole topical therapy, OR
- Fluconazole 150 mg x 2 doses (second dose 3 days after first dose)

Non- *C. albicans* VVC

- Optimal treatment unknown
- Confirm with culture
- 7 to 14 days of non-fluconazole topical therapy
- For recurrences: boric acid 600 mg intravaginally daily x 14 days
  (70% clinical and mycologic cure rates)

2015 CDC STD Treatment Guidelines

List of Topical Azoles

- Butoconazole 2% cream 5g intravag x 3 days * *or*
- Butoconazole 2% cream 5g (sustained release), intravag once *or*

- Clotrimazole 1% cream 5g intravag x 7-14 days* *or*
- Clotrimazole 2% cream 5g intravag x 3 days* *or*
- ~~Clotrimazole 100 mg vaginal tablet x 7 days *or*~~
- ~~Clotrimazole 100 mg vaginal tabs, 2 tabs x 3 days~~

- Miconazole 2% cream 5 g intravag x 7 days* *or*
- Miconazole 4% cream 5 g intravag x 3 days* *or*
- Miconazole 100 mg vaginal suppository, one x 7 days* *or*
- Miconazole 200 mg vaginal suppository, one x 3 days*
- Miconazole 1,200 mg vaginal suppository x 1 dose*

- Tioconazole 6.5% ointment 5 g intravag once* *or*

- Terconazole 0.4% cream 5 g intravag x 7 days *or*
- Terconazole 0.8% cream 5 g intravag x 3 days *or*
- Terconazole 80 mg vaginal suppository, one x 3 days

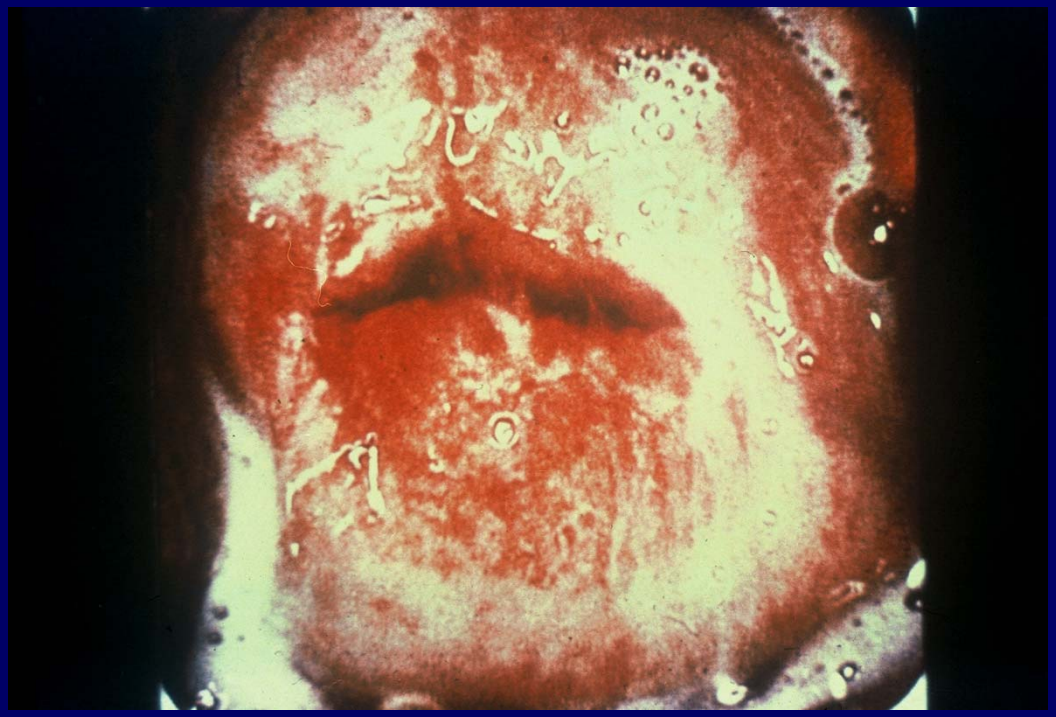
* Available Over-The-Counter

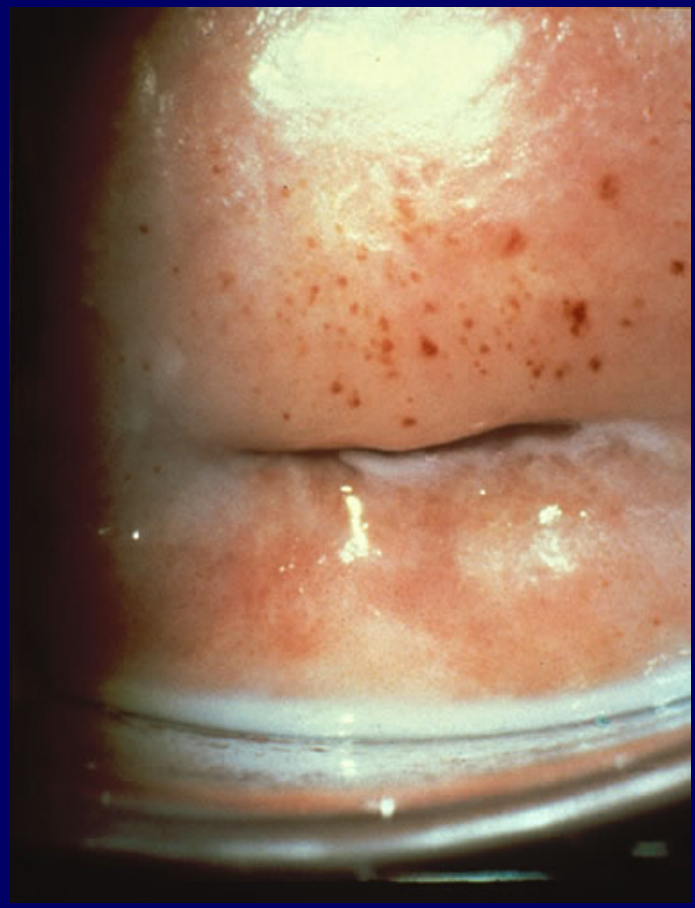
Partner Management

- VVC is not usually acquired through sexual intercourse
- Treatment of sex partners is not recommended but may be considered in women who have recurrent infection
- A minority of male sex partners may have balanitis and may benefit from treatment with topical antifungal agents to relieve symptoms

Source: CDC

Trichomoniasis



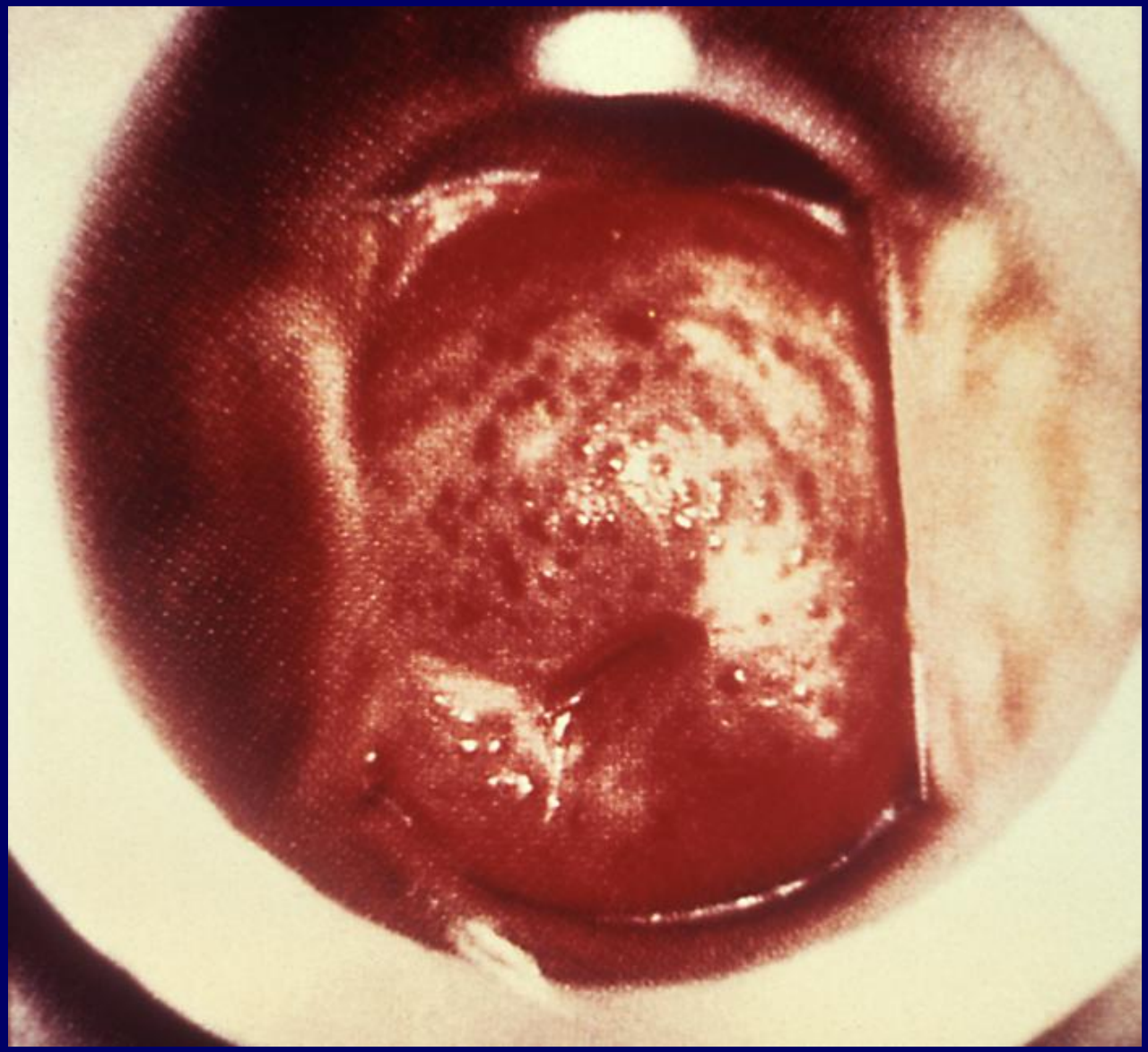


- Frothy vaginal discharge
- "Strawberry cervix" or *colpitis macularis*

Trichomonas Vaginitis

Source: http://www.brooksidepress.org/Products/OBGYN_101

Strawberry Cervix due to Trichomoniasis



Source: PHIL, CDC

Trichomonas vaginalis

- Pear-shaped, flagellated, anaerobic protozoa
- Four anterior flagella
- Undulated membrane
- Posterior axostile
- Wet mount: jerky, swaying motion; increased PMNs
- Other *Trichomonas* species (body site specific):
  - *T. tenax* (oral commensal)
  - *T. hominis* (rare, GI tract)

CDC, National Center for Infectious Diseases, Division of Parasitic Diseases

Epidemiology

- **Most common curable STD**
- Estimated 7.4 million cases/yr ($375 million) in the U.S.
- Estimated prevalence:
  - 50%-60% in female prison inmates and commercial sex workers
  - 18%-50% in females with vaginal complaints
  - **3% in U.S. women 14-49 years of age (NHANES data)***
    - **Factors associated with increased likelihood of infection in multivariable analysis**
      - Black, non-Hispanic race/ethnicity
      - Birth in United States
      - Greater number of lifetime sex partners
      - Increasing age
      - Lower educational level
      - Poverty
      - Douching
      - NOT symptoms

*Sutton et al. *CID* 2007; 45:1319-26

Route of Infection

Inoculation:

- Sexual contact
- Incubation 4-28 days
- Long duration of infection (months to years!)
  - 4 months in men
  - 5 years in women (Bowden, 2000)
- Seen in heterosexual and WSW couples

Transmission:

- Highly transmissible!
- Male to female: 85%
- Female to male: 20-60% (Krieger, 1995)
  70% (Sena, 2003)

Clinical Manifestations

- Women – symptomatic 20-50% of the time
  - profuse, malodorous discharge; genital irritation
  - Erythema of mucosa, profuse frothy discharge
  - Cervical petechiae (“Strawberry cervix”)
  - May also infect Skene's glands and urethra (rare), organism may not be susceptible to topical therapy
- Men – most asymptomatic
  - Non-gonococcal urethritis (etiology in up to 20% of cases)

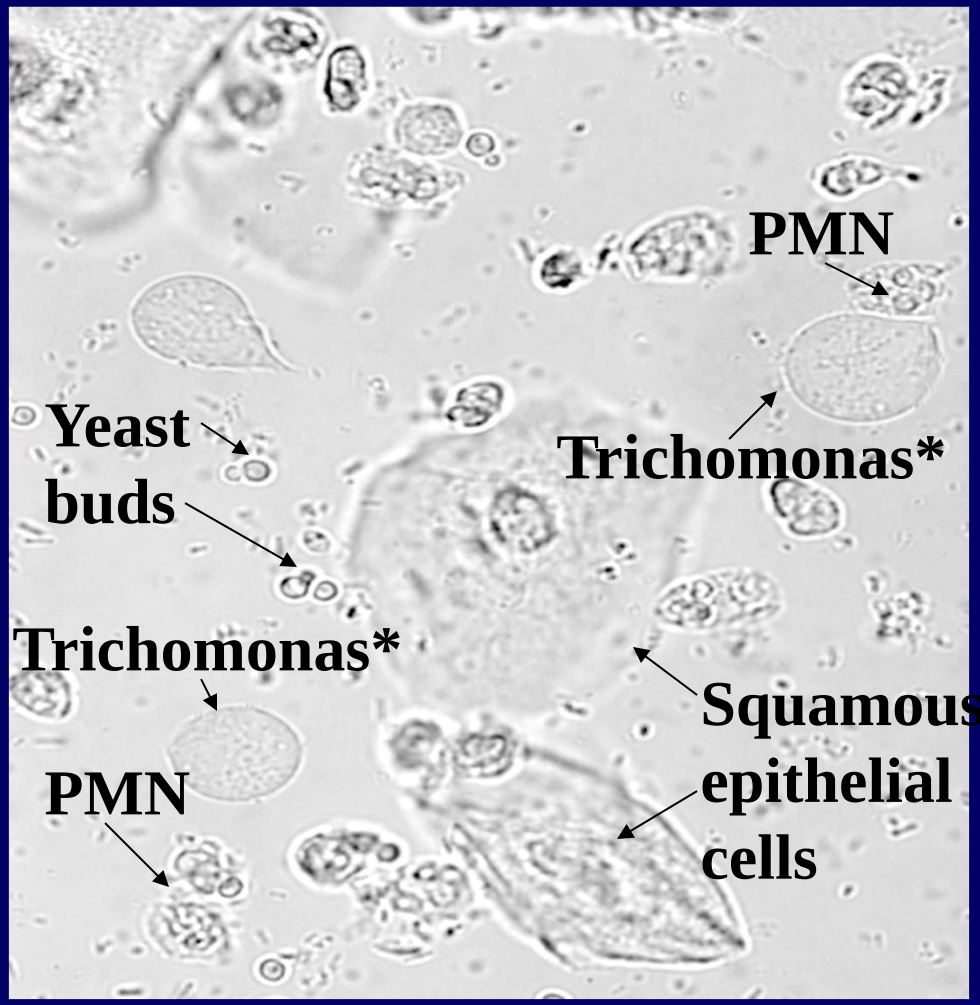
Joyner JL, et al. 2000 Apr;27(4):236-40
Schwebke JR, Hook EW 3rd., 2003

Diagnosis

- Wet mount (saline prep)
  - Sensitivity 60-70% (highest with symptoms)
  - Motile pear-shaped trichomonad
  - Best read within 5 minutes on warm slide
  - Also see many PMNs
- pH >4.5 (90% sensitive, not specific)
- KOH may have positive whiff (50%)

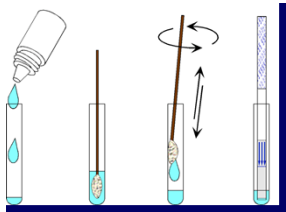
Wet Prep: Trichomoniasis

Saline: 40X objective



*Trichomonas shown for size reference only: must be motile for identification

Source: Seattle STD/HIV Prevention Training Center at the University of Washington



Newer Testing Options for Trich

- Microscopy is inferior to new options, including
  - Rapid antigen testing (OSOM)
  - Nucleic acid amplification testing
    - APTIMA TMA *Trichomonas vaginalis* assay
    - BD ProbeTec TV Q^x Amplified DNA assay
    - May use same specimen types as used with gc/chl NAATs (i.e. vaginal swab, endocervical swab, urine)

Huppert CID 2007

Test	Sens	Spec
APTIMA TMA	98%	98%
OSOM	90%	100%
Culture	83%	100%
Wet prep	56%	100%

Slide courtesy of Marrazzo, IDSA 2011

Table 3. Differences in test sensitivity stratified by the presence or absence of vaginal symptoms.

Test method	Sensitivity, % (95% CI)		
	All patients (n = 330)	Vaginal symptoms present (n = 210)	Vaginal symptoms absent (n = 120)
Wet mount	50.8 (37.7–63.9)	57.5 (40.8–72.9)	38.1 (18.1–61.5)
Culture	75.4 (62.7–85.5)	77.5 (61.5–89.1)	71.4 (47.8–88.7)
Rapid test	82.0 (70.0–90.6)	92.5 (79.6–98.4)	61.9 (38.4–81.9)
TMA	98.4 (91.2–99.9)	97.5 (86.9–99.9)	100 (83.8–100)

NOTE. The comparator was any test result positive for *Trichomonas vaginalis* infection. TMA, transcription-mediated amplification.

Trichomoniasis: Diagnosis

Nucleic Acid Amplification Tests (Vaginal swab)

- BD Probe Tec Q^x
- Hologic APTIMA

Both FDA approved

Sens/Spec :**96-98%,** 98-100%

Saline Wet Mount

- Motile trichomonads
- pH > 4.5
- Whiff test may be positive

Sens/Spec: **35-82**%, 99-100%

Point-of-care tests

- OSOM trichomonas rapid test (Genzyme)
- Affirm VP III (BD)

OSOM **Sens/**Spec: **82-95%,** 99-100%
Affirm VP **Sens**/Spec: **83-90 %,** ~100%

Culture (InPouch TV, BioMed Diagnostics)

Sensitivity: 75-87%
Specificity: 100%

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Miller and Nyirjesy, Curr Infect Dis Rep 2011 13:595-603;
Schwebke JCM Dec 2011; p4106-4111

Trich Testing in Men

- No approved point of care tests
  - Wet prep not sensitive
- Culture available- urethral swab, semen or urine
  - No conclusive studies on sensitivity/specificity
- Urine and urethral swab NAAT offered through certain labs using analyte-specific reagents (check before sending)

**MSM- *T. vaginalis* does not infect oral sites, rectal prevalence low. Do not test these sites.

Treatment Benefits

- In women
  - Infection is associated with ⇧HIV acquisition and transmission
  - Treatment of trich reduces HIV in vaginal secretions
    - Viral RNA decreased from 4677 to 1122 (Wang, 2001)
  - Infection is predictive of *N. gonorrhea* infection

Study	**Population**	**% with GC**		
		TV +		**TV -**
Fouts, 1980	400 sx women	**37**	**vs**	**22**
Wolner-Hanssen, 1989	779 women	**31**	**vs**	**11**
Huppert, 2004	92 sx teens	**61**	**vs**	**17**

Treatment

- Recommended regimens
  - Metronidazole 2 g PO x 1 dose OR
  - Tinidazole 2 g PO x 1 dose
- Alternative regimen
  - Metronidazole 500 mg PO bid x 7 days
- Pregnancy:
  - Metronidazole 2 g orally in a single dose
    - No evidence of teratogenicity (pregnancy category B)
    - Tinidazole pregnancy category C, not recommended
- HIV-infected
  - Metronidazole 500 mg PO bid x 7 days
    - More effective than single-dose therapy
- **Note: Topical vaginal therapy is ineffective**

Safe at all stages of pregnancy
Avoid EtOH x 24 hrs after tx
If breastfeeding, consult guidelines

Pregnancy Category C, do NOT use!
Avoid EtOH x 72 hrs after tx
If breastfeeding, consult guidelines

2015 CDC STD Treatment Guidelines

Partner Management

- Sex partners should be treated

- Patients should be instructed to avoid sex until they and their sex partners are cured (when therapy has been completed and patient and partner(s) are asymptomatic)

SUMMARY: Differential Diagnosis of Vaginitis

Diagnostic Criteria	Syndrome			
	Normal	Bacterial Vaginosis	*Candida* Vulvovaginitis	*Trichomonas* Vaginitis
Vaginal pH	3.8 - 4.2	> 4.5	≤ 4.5 (usually)	> 4.5
Discharge	White, clear, flocculent	Thin, homogeneous, white, gray, adherent, often increased	White, curdy, "cottage cheese" like, sometimes increased	Yellow, green, frothy, adherent, increased
Amine odor (KOH "whiff" test)	Absent	Present (fishy)	Absent	Present (fishy), (not always)
Microscopic	Lactobacilli	Clue cells, coccoid bacteria, no WBC's	Mycelia, budding yeast, pseudo-hyphae w/KOH prep	Trichomonads, WBC's > 10hpf
Common patient complaints	None	Discharge, bad odor, itching may be present	Itching/burning, discharge	Frothy discharge, bad odor, vulvar pruritus, dysuria

SUMMARY:
Utility of Hx and Exam for Vaginitis

- No single symptom has enough predictive power to confidently diagnose any of 3 main causes of vaginitis
- Symptoms & signs can *suggest* a dx
  - Yeast: assoc w/ itching, cheesy d/c, redness and self-dx; watery d/c or odiferous d/c makes it less likely
  - BV: assoc w/ sensation of increased d/c and c/o of odor; absent d/c makes it less likely
  - Inflammation relatively specific for yeast, but not always there, and sometimes assoc w/ trich

Anderson, M. R. et al. JAMA 2004;291:1368-1379

SUMMARY: Office Lab Tests for Vaginitis

- **Wet mount often remains best way to make dx**
  - **No yeast or trich on microscopy does not mean no yeast or trich as cause**
  - **Presence of clue cells makes yeast unlikely**
  - **Lack of lactobacilli and presence of bacilli with corkscrew motility highly assoc with BV**
- **Use pH testing**
  - **Yeast: normal pH!!!**

Anderson, M. R. et al. JAMA 2004;291:1368-1379

Obtaining Vaginal Samples

- How to obtain pH
  - Swab lateral wall of vagina 1/3-1/2 way in
  - Roll swab on narrow range pH paper (3.8-5.5)
  - Compare color to reference
  - Note - pH may be affected by cervical mucus, blood, sperm

Obtaining and Preparing Vaginal Samples (1)

- Wet mount method #1
  - Swab lateral vaginal wall and place in 0.5 cc room-temperature saline
  - Agitate swab in saline to mix; place drop on slide, add coverslip and read under microscope
- Wet mount method #2
  - Place drop of saline on slide
  - Collect sample from vagina, mix into saline
- KEY POINT: keep sample warm and wet on the way to the microscope!

Obtaining and Preparing Vaginal Samples (2)

- KOH preparations
  - swab lateral wall of vagina
  - roll swab onto slide
  - add 10% KOH and mix with swab
  - whiff immediately- fishy odor is “positive”
  - add coverslip and wait 2-5 minutes for KOH to digest cells

Unknown #1

MASSACHUSETTS GENERAL HOSPITAL
VINCENT OBSTETRICS & GYNECOLOGY

- Why is recurrent BV so common?
  - Is it due to inappropriate treatment of the biofilm?
  - Is it recurrence or re-infection?
  - Is it due to a pathogen phenotype or a host phenotype?

Mitchell, 2017

Unknown #2

MASSACHUSETTS GENERAL HOSPITAL
VINCENT OBSTETRICS & GYNECOLOGY

- If vaginal colonization with *Candida albicans* is present in up to 30% of women, why don't they all have symptoms? What prompts development of the inflammatory response?
  - Is it different strains of yeast?
  - Differences in host immune response?
  - Differences in environmental triggers?

Mitchell, 2017

Unknown #3

MASSACHUSETTS GENERAL HOSPITAL
VINCENT OBSTETRICS & GYNECOLOGY

- Is the optimal microbiota the same for everyone?
- How do we promote an optimal vaginal microbiota?

Mitchell, 2017

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2018 Updates on STD Management: Practical Approaches to the Most Common STD Clinic Patient Concerns

A Monthly Webinar Series

Webinars occur 12-1 pm EST
One Tuesday per month
January – November 2018

Learner Objectives

At the conclusion of this webinar series, participants should be able to:

- Accurately identify patients at risk for STIs and then test, diagnose, and treat according to CDC STD Treatment Guidelines.

Continuing Education Accreditation

This activity has been planned and implemented in accordance with the Essential Areas and the Policies of the Accreditation Council for Continuing Medical Education through the joint providership of the University of Alabama School of Medicine and the Sylvie Ratelle STD/HIV Prevention Training Center.

The University of Alabama School of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for participants.

The University of Alabama designates this webinar for a maximum of 1.0 *AMA PRA Category 1 Credit*™. Participants should claim only the credit commensurate with the extent of their participation in the activity.

These credits are also applicable for registered nurses.

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After Today's Webinar

- You will receive an auto-generated email from the National Network of STD Clinical Training Centers to complete a brief evaluation of today's presentation.

- Within that email, you will find instructions on how to register for and receive CME credits through the University of Alabama School of Medicine.

- Webinars will be archived and available for viewing at www.RatellePTC.org. CME credits will also be available for archived webinars.

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Save The Dates:
2018 STD Webinar Schedule

Date	Title	Speaker(s)	Affiliations
Jan 16	Vaginitis: Bacterial Vaginosis, Yeast Vaginitis, Trichomoniasis	Katherine Hsu, MD, MPH	MDPH/Boston Univ. Med. Ctr.
Feb 20	Cervicitis/PID: Chlamydia, Gonorrhea, *M. genitalium*	Candice McNeil, MD, MPH	Wakeforest Univ.
Mar 20	Motivational Interviewing for STI/HIV Prevention	Thomas Creger, PhD, MPH	Univ. of Alabama at Birmingham
Apr 17	Pregnancy and STIs	Candice McNeil, MD, MPH	Wakeforest Univ.
May 15	Urethritis/Epididymitis/Proctitis: Gonorrhea, *M. genitalium*, and Lymphogranuloma Venereum	Candice McNeil, MD, MPH	Wakeforest Univ.
Jun 19	Clinician-Health Department Partnerships: Partner Management, Disease Reporting, Presumptive Treatment	Marjorie Kirsch, MD	FL DOH Wakulla County

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Save The Dates:
2018 STD Webinar Schedule (cont'd)

Date	Title	Speaker(s)	Affiliations
Jul 17	Genital Lesions: HSV, HPV, Syphilis	Nicholas Van Wagoner, MD, PhD	Univ. of Alabama Sch. of Med.
Aug 21	Management of STI/HIV Coinfection	Katherine Hsu, MD, MPH	MDPH/Boston Univ. Med. Ctr.
Sept 11	Genital Dermatology	Nicholas Van Wagoner, MD, PhD	Univ. of Alabama Sch. of Med.
Oct 16	Approaches with Special Populations: Youth, GLBT	Katherine Hsu, MD, MPH and Nicholas Van Wagoner, MD, PhD	MDPH/Boston Univ. Med. Ctr. and Univ. of Alabama Sch. of Med.
Nov 13	Update on PrEP	Ulyee Choe, DO	FL DOH Pinellas County/Univ. of S. Florida College of Med.

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