Sexually Transmitted Infections: Keeping Your Practices Up-to-Date

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Fareeda Haamid, DO
Assistant Professor of Pediatrics

Cynthia Holland-Hall, MD, MPH
Associate Professor of Pediatrics
The presenters, Dr. Fareeda Haamid and Dr. Cynthia Holland-Hall, have no commercial relationships to disclose.
Objectives: At the end of this activity, the participant will be better able to:

1) Screen sexually active adolescents for STIs, using the best tests available, according to nationally published guidelines.
2) Treat STIs appropriately, using regimens consistent with the recommendations in the new CDC 2015 STD Treatment Guidelines.
3) Compare the sensitivity of rapid tests with traditional tests for several reproductive infections, and identify health care settings in which rapid tests may be of particular utility.
Agenda

- Epidemiology
- Screening guidelines
- Management
- *Mycoplasma genitalium*
- *Trichomonas vaginalis*
- Bacterial vaginosis
New content in CDC STD Treatment Guidelines, 2015
stdccn.org

STD Clinical Consultation Network

- STD clinical consultation services within 1-3 business days
- Submit question online
- Links to regional STD Prevention Training Center expert faculty
Sexual Behaviors in Adolescents

- 47% of high school students have had sex
  - 33% of 9th graders
  - 63% of 12th graders
- 15% have had four or more sexual partners
  - 24% of 12th graders
- 41% state they DID NOT use a condom the last time they had sex
- All relatively stable throughout the past decade

www.cdc.gov/yrbs, 2013
Chlamydia: Age- and sex-specific rates, 2013 (CDC STD Surveillance)

<table>
<thead>
<tr>
<th>Age</th>
<th>Rate (per 100,000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-14</td>
<td>108.9</td>
</tr>
<tr>
<td>15-19</td>
<td>715.2</td>
</tr>
<tr>
<td>20-24</td>
<td>1325.6</td>
</tr>
<tr>
<td>25-29</td>
<td>757.9</td>
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<tr>
<td>30-34</td>
<td>390.9</td>
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<td>35-39</td>
<td>207.5</td>
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<td>40-44</td>
<td>116.6</td>
</tr>
<tr>
<td>45-54</td>
<td>55.9</td>
</tr>
<tr>
<td>55-64</td>
<td>17.0</td>
</tr>
<tr>
<td>65+</td>
<td>4.0</td>
</tr>
<tr>
<td>Total</td>
<td>262.6</td>
</tr>
<tr>
<td></td>
<td>623.1</td>
</tr>
</tbody>
</table>

For women:

<table>
<thead>
<tr>
<th>Age</th>
<th>Rate (per 100,000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3621.1</td>
</tr>
<tr>
<td></td>
<td>3043.3</td>
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<tr>
<td></td>
<td>1428.3</td>
</tr>
<tr>
<td></td>
<td>599.2</td>
</tr>
<tr>
<td></td>
<td>273.4</td>
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<tr>
<td></td>
<td>118.3</td>
</tr>
<tr>
<td></td>
<td>41.4</td>
</tr>
<tr>
<td></td>
<td>11.3</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>623.1</td>
</tr>
</tbody>
</table>
Chlamydia: Age- and sex-specific rates, 2013
(CDC STD Surveillance)

That's me!!
## Prevalence of STIs

14–19 year-old U.S. females (n=838)

<table>
<thead>
<tr>
<th>STI</th>
<th>Overall</th>
<th>Sexually Experienced</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPV (HR/6/11)</td>
<td>18.3%</td>
<td>29.5%</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>3.9%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Trichomonas</td>
<td>2.5%</td>
<td>3.6%</td>
</tr>
<tr>
<td>HSV-2</td>
<td>1.9%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>1.3%</td>
<td>2.5%</td>
</tr>
<tr>
<td>&quot;Any STI&quot;</td>
<td>24.1%</td>
<td>37.7%</td>
</tr>
</tbody>
</table>

"Any STI"
Prevalence by number of lifetime sexual partners

<table>
<thead>
<tr>
<th># of lifetime partners</th>
<th>n</th>
<th>Prevalence “any STI”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>125</td>
<td>19.7%</td>
</tr>
<tr>
<td>2</td>
<td>62</td>
<td>38.1%</td>
</tr>
<tr>
<td>≥3</td>
<td>159</td>
<td>53.5%</td>
</tr>
</tbody>
</table>

SCREENING
Screening Guidelines

- United States Preventive Services Task Force (USPSTF)
- Centers for Disease Control and Prevention (CDC)
- American Academy of Pediatrics Red Book (AAP)
- Society for Adolescent Health and Medicine (SAHM)
- American Congress of Obstetricians and Gynecologists (ACOG)
- American Academy of Family Physicians (AAFP)
- World Health Organization (WHO)
## Summary of Recommendations and Evidence

<table>
<thead>
<tr>
<th>Population</th>
<th>Recommendation</th>
<th>Grade (What's This?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexually Active Women</td>
<td>The USPSTF recommends screening for chlamydia in sexually active women age 24 years and younger and in older women who are at increased risk for infection.</td>
<td>B</td>
</tr>
<tr>
<td>Sexually Active Women</td>
<td>The USPSTF recommends screening for gonorrhea in sexually active women age 24 years and younger and in older women who are at increased risk for infection.</td>
<td>B</td>
</tr>
<tr>
<td>Sexually Active Men</td>
<td>The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for chlamydia and gonorrhea in men.</td>
<td>I</td>
</tr>
</tbody>
</table>

Go to the [Clinical Considerations](#) section for a description of populations at increased risk for infection and for suggestions for practice regarding the I statement.
<table>
<thead>
<tr>
<th>Grade</th>
<th>Definition</th>
<th>Suggestions for Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>The USPSTF recommends the service. There is high certainty that the net benefit is substantial.</td>
<td>Offer or provide this service.</td>
</tr>
<tr>
<td>B</td>
<td>The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.</td>
<td>Offer or provide this service.</td>
</tr>
<tr>
<td>C</td>
<td>The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.</td>
<td>Offer or provide this service for selected patients depending on individual circumstances.</td>
</tr>
<tr>
<td>D</td>
<td>The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.</td>
<td>Discourage the use of this service.</td>
</tr>
<tr>
<td>I</td>
<td>The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.</td>
<td>Read the clinical considerations section of USPSTF Recommendation Statement. If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.</td>
</tr>
</tbody>
</table>
USPSTF

• Use NAAT
• Urine or vaginal both acceptable
• “In the absence of studies on screening intervals, a reasonable approach would be to screen patients whose sexual history reveals new or persistent risk factors since the last negative test result.”
CDC

- Essentially endorses USPSTF recs for females
- **Vaginal swab with NAAT is preferred screening specimen**
- Consider screening young men in high-prevalence settings
  - Adolescent clinics
  - Correctional facilities
  - STD clinics
Trichomoniasis

- Screening benefits have not been established
- No USPSTF guideline
- CDC
  - Screen HIV-infected females annually
  - Consider screening females at high risk of infection
  - Consider screening incarcerated individuals
- Many adolescent medicine docs screen for TV
Screening for Other STIs

- HPV: Begin screening healthy women at 21 yoa
  - Pap smear
  - No role for HPV testing in adolescents at this time
- Syphilis: Case-by-case basis
  - Geography/Demographics
  - Drug use
Males who have sex with males (MSM)

- Test based on sexual practices, not stated sexual orientation
- Explicit guidelines exist for MSM
  - Available from CDC
  - Most not empirically derived
Screening Guidelines for MSM (CDC)

- HIV, syphilis screening annually
- Gonorrhea and Chlamydia screening
  - Annually
  - Sites for screening based in individual practices (urethral, pharyngeal, rectal)
- More often (Q 3-6 months) in highest risk men
- HBsAg screening/vaccination
- HCV screening with HIV(+) or drug use history
Screening for Nonviral Sexually Transmitted Infections in Adolescents and Young Adults
AAP/SAHM Policy Statement (Pediatrics 2014;134:e302)

- **Chlamydia**
  - All sexually active females <= 25 years annually
  - YMSM at urethra and/or rectum at least annually
  - Exposed partners
  - Consider in males in high-prevalence settings

- **Gonorrhea**
  - All sexually active females <= 25 years annually
  - YMSM at urethra, pharynx, and/or rectum at least annually
  - Exposed partners
  - Consider in males at increased risk
AAP/SAHM Policy Statement (*Pediatrics* 2014;134:e302)

- **Trichomonas**
  - Routine screening not recommended
  - Consider based on individual and population-based risk factors

- **Syphilis**
  - Routine screening not recommended
  - Screen sexually active YMSM at least annually
  - Screen based on demographics, individual risk factors

- **Rescreen adolescents with GC or Ct in three months**
  - Consider for TV as well
HIV Screening

- **CDC** *(MMWR 2006; 55(RR14);1-17)*
  - Patients 13-64 years old should be screened for HIV in all health-care settings

- **USPSTF**
  - Persons 15-65 years old should be screened for HIV
  - Younger adolescents who are at risk should also be screened
  - No evidence-based recommendations for screening intervals
## Summary of Recommendations and Evidence

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<tr>
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<th>Recommendation</th>
<th>Grade (What's This?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adolescents and Adults 15-65 Years Old</td>
<td>The USPSTF recommends that clinicians screen for HIV infection in adolescents and adults aged 15 to 65 years. Younger adolescents and older adults who are at increased risk should also be screened. Go to the Clinical Considerations for more information about screening intervals.</td>
<td>A</td>
</tr>
<tr>
<td>Pregnant Women</td>
<td>The USPSTF recommends that clinicians screen all pregnant women for HIV, including those who present in labor who are untested and whose HIV status is unknown.</td>
<td>A</td>
</tr>
</tbody>
</table>
HIV Screening: AAP

Pediatrics 2011;128(5):1-23-1029

- Routine screening should be offered to all adolescents at least once by 16-18 yoa in settings where the prevalence of HIV is >0.1%.
- For settings with <0.1% prevalence, testing is encouraged for all sexually active adolescents and those with other risk factors for HIV.
How to Test for STIs:
What Specimen?
What Test?
Nucleic Acid Amplification Tests

- APTIMA (GenProbe)
  - Transcription-mediated amplification (TMA)
- BD ProbeTec Qx (Becton, Dickinson)
  - Strand displacement amplification (SDA)
- Abbott Real Time CT/NG
  - Polymerase chain reaction (PCR)
First-Catch Urine

- At least one hour since last void
- NOT a clean-catch specimen
- First 5-10 ml of urine stream (max!) collected in sterile specimen cup
- Remainder of void into toilet
- May be left at room temperature for 24 hours
- Appropriate for screening asymptomatic females
- Appropriate for males +/- symptoms
Vaginal Swabs

CDC states that **vaginal swabs** are the **preferred** specimen for screening asymptomatic females!
Outstanding Performance of Vaginal Swab Specimens

<table>
<thead>
<tr>
<th></th>
<th>Ct(+) N</th>
<th>Sensitivity</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>cervix</td>
<td>vagina</td>
<td>urine</td>
<td></td>
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<tr>
<td>Schachter, 2005</td>
<td>180</td>
<td>96%</td>
<td>97%</td>
<td>92%</td>
<td></td>
</tr>
<tr>
<td>Falk, 2010</td>
<td>171</td>
<td>97%</td>
<td>96%</td>
<td>88%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Organism Load (EB/100 mcl)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Michel, 2007</td>
<td>73</td>
<td>2331</td>
<td>773</td>
<td>47</td>
<td></td>
</tr>
</tbody>
</table>
Oropharyngeal and Rectal Testing

- CDC Recommends use of NAAT…
- …but no NAAT has FDA approval for these sites.
- Labs encouraged to perform internal validation testing; CDC guidance available
- Must remain in compliance with CLIA
- Commensal *Neisseria* species in oropharynx may lead to false-positive results; follow up testing may be indicated
Summary: Gonorrhea and Chlamydia Screening

• Screen sexually active females at least annually
• Consider screening high risk individuals more frequently
• Use the best test you can
  • Vaginal swab if possible
  • First catch urine also acceptable, but may detect up to 10% fewer infections compared to vaginal swab
• Consider screening boys as well
Treatment Update

- Hard copy
- Online
- pdf
- iBook
- Pocket card
- Wall chart
- Apps

www.cdc.gov/std/treatment
Designed and Developed by CDC

STD Treatment Guidelines

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Fast Access to Conditions

Conditions

Assault - Sexual
Bacterial Vaginosis
Candidiasis - Vulvovaginal
Cervicitis
Chancroid
Chlamydia
Epididymitis
Gonorrhea
Granuloma Inguinale
Hepatitis

View Treatment Regimens

Recommended Regimens

Azithromycin 1 g orally in a single dose
OR
Doxycycline 100 mg orally twice a day for 7 days

Alternative Regimens

Erythromycin base 500 mg orally four times a day for 7 days
OR
Erythromycin ethylsuccinate 800 mg
Chlamydia Treatment

• Uncomplicated cervicitis or urethritis:
  • Azithromycin 1 gm po, single dose
    OR
  • Doxycycline 100 mg po BID x 7 days

• Doxycycline may be marginally superior, but not preferred over azithromycin at this time
Azithromycin vs. Doxycycline

- Probably equally efficacious for treatment of urogenital Chlamydia infections
- Newer studies question this, particularly for rectal infections
- Meta-analysis by Hocking (ISSDDR 2013)
  - 23 RCTs
  - 1065 treated with azithro; 850 with doxy
  - Pooled cure rates: Doxy 97.5%, Azithro 94.4%
  - Favored doxycycline slightly, particularly in men
Neisseria gonorrhoeae
Gonococcal Infections

- Resistance to antimicrobials a hot topic
  - Quinolones no longer recommended
  - Cephalosporin resistance emerging
  - Oral cephalosporins not recommended
- Ceftriaxone is the drug of choice for treatment
- Dual treatment recommended to slow progression of antimicrobial resistance
Gonococcal Isolate Surveillance Project (GISP), United States, 2012

www.cdc.gov/std/gisp/gisp-map.htm
Percentage of *Neisseria gonorrhoeae* Isolates with Elevated Cefixime Minimum Inhibitory Concentrations (MICs) (≥0.25 µg/ml)
Gonococcal Isolate Surveillance Project (GISP), 2005 – 2012
Percentage of *Neisseria gonorrhoeae* Isolates with Elevated Ceftriaxone Minimum Inhibitory Concentrations (MICs) (≥0.125 µg/ml) Gonococcal Isolate Surveillance Project (GISP), 2005 – 2012
Treatment of uncomplicated gonococcal infections of the cervix, urethra, rectum, pharynx

- Ceftriaxone 250 mg IM + azithromycin 1 g PO
- Cefixime 400 mg PO + azithromycin 1 g PO
  - ONLY if unable to use ceftriaxone
  - NOT for pharyngeal infection (low efficacy)
Gonorrhea: New Treatment Alternatives
(Kirkaldy, CID 2014)

- Gentamicin 240 mg IM + Azithromycin 2 g PO
- Gemifloxacin 320 mg PO + Azithromycin 2 g PO

<table>
<thead>
<tr>
<th></th>
<th>Gentamicin / Azithromycin</th>
<th></th>
<th>Gemifloxacin / Azithromycin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>% (L 95% CI)</td>
<td>n/N</td>
</tr>
<tr>
<td>Urethra/Cervix</td>
<td>202/202</td>
<td>100% (98.5%)</td>
<td>198/199</td>
</tr>
<tr>
<td>Pharynx</td>
<td>10/10</td>
<td>100%</td>
<td>15/15</td>
</tr>
<tr>
<td>Rectum</td>
<td>1/1</td>
<td>100%</td>
<td>5/5</td>
</tr>
</tbody>
</table>
Gonorrhea Test of Cure

- TOC not recommended for uncomplicated urogenital/rectal infection if a recommended or alternative regimen is used
- TOC indicated for pharyngeal infections treated with alternative regimen
  - 14 days after treatment
  - If NAAT (+), culture recommended
STI Follow-up Testing

- Women who test (+) for gonorrhea, chlamydia, or trichomoniasis should be rescreened for all three infections 3 months after treatment.
- Men (+) for gonorrhea or chlamydia should be rescreened 3 months after treatment.
Emerging Issues

*Mycoplasma Genitalium*
Mycoplasma genitalium (M. genitalium)

- Recognized as an etiology of male urethritis
- 15-20% of nongonococcal urethritis (NGU)
- 20-25% non-chlamydial NGU
- 30% persistent/recurrent urethritis
- Singular pathogen or co-infection possible
M. genitalium

Clinical syndromes in males

- Urethritis
- Role in infertility and anogenital tract disease is not fully elucidated
- Does not appear to cause proctitis
**M. genitalium**

Clinical syndromes in females

- Pathogenic potential is less definitive as compared to males
- Isolated from vagina, cervix, & endometrium
- Often asymptomatic
- Can be found in 10-30% of clinical cervicitis
M. genitalium
Pelvic Inflammatory Disease (PID)

- More commonly found in the cervix and endometrium of women with PID versus women without PID
- 2-22% of PID cases (median 10%)
- Data are lacking regarding the rate of M. genitalium-infected females who have PID
M. genitalium
Clinical syndromes in females

- May cause tubal factor infertility
- Not thought to be common amongst women with adverse pregnancy outcomes
- Ectopic pregnancy data is insufficient
M. genitalium

✧ In the case of recurrent or persistent symptoms:
  • Urethritis- “should suspect”
  • Cervicitis or PID- “may consider”
M. genitalium
Diagnosis

- No distinct clinical syndrome
- Culture is not an option
  - Slow-growing (may take up to 6 months)
  - A minority of labs worldwide can capture isolates
M. genitalium
Diagnosis

- NAAT diagnostic modality of choice
- USA: Quite a few large reference labs have internally validated NAAT assays
- Europe/Australia: testing exists
M. genitalium

Treatment

✧ No cell wall
  • Beta-lactams ineffective
✧ Treat in the context of the clinical syndrome
✧ Identical regimen for those with HIV infection
**M. genitalium**
Urethritis and Cervicitis Treatment

- Azithromycin 1 g orally x 1
- Doxycycline: **not** preferred

**Azithromycin**
- 500 mg orally Day 1
- 250 mg orally Day 2-5
- May decrease macrolide resistance

**Moxifloxacin**
- 400 mg orally once daily x 7, 10 or 14 days for treatment failures
Persistent and Recurrent NGU

- Current data implicate *M. genitalium* as the most common cause
- If poor treatment adherence or reexposure then retreat with initial regimen
Persistent and Recurrent NGU

If already treated with Doxycycline then give **Azithromycin** 1 g orally x 1

If they fail Azithromycin then give **Moxifloxacin** 400 mg orally x 7 days

If *Trichomonas vaginalis* (*T. vaginalis*) prevalent area, or men who have sex with women with persistent or recurrent urethritis then **Metronidazole** 2 g orally x 1 or **Tinidazole** 2 g orally x 1

If symptoms persist following both *M. genitalium* and *T. vaginalis* treatment then refer to urology
**M. genitalium**

**PID**

- Current PID regimens are not effective
- Consider *M. genitalium* with treatment failures
- Moxifloxacin 400 mg orally once daily x 14 days
**M. genitalium**

- Routine test-of-cure not recommended in asymptomatic individuals
- Sex partners: should receive treatment as per NGU, cervicitis, and PID recommendations
Diagnostic updates
Trichomoniasis
Wet Mount Microscopy

- Sensitivity 51-65%, Specificity high
- Very commonly used
  - Convenience, lower cost
- Dependent on examiner’s skill and availability of materials for microscopy
- Timely evaluation is crucial
Trichomoniasis

- Highly sensitive and specific tests encouraged
- NAATs may detect a prevalence 3-5x higher than wet mount microscopy
- NAAT = **gold standard**
- Still no FDA-approved NAAT in males
  - Urine NAAT validated in males for clinical use by many large reference labs (Quest and LabCorp)
Trichomononiasis
NAAT

- APTIMA *Trichomonas vaginalis* assay (Hologic Gen-Probe, San Diego, CA)
- RNA, FDA-approved
- Females: Vaginal, endocervical or urine
  - Asymptomatic or symptomatic
  - Sensitivity 95-100%, specificity 95-100%
- Males: urine or urethral meatus
Trichomoniasis
NAAT

- BD Probe Tec TV QX Amplified DNA Assay (Becton Dickinson, Franklin Lakes, NJ)
- DNA, FDA-approved
- Females: Vaginal, endocervical or urine
  • Asymptomatic or symptomatic
- Males: urine
- Sensitivity and specificity acceptable
OSOM Trichomonas Rapid Test
Trichomoniasis
Point of care test

✧ OSOM Trichomonas Rapid Test (Sekisui Diagnostics, Framingham, MA)
✧ FDA-approved, CLIA-waived
✧ Antigen-detection test
✧ Colorimetric results in 10 minutes
✧ Sensitivity 82-95%, specificity 97-100%
Trichomoniasis
Point of care test

- Affirm VP III (Becton Dickinson, Sparks, MD)
- FDA-approved, CLIA-waived
- DNA probe-hybridization test
  - *T. vaginalis*, *Gardnerella vaginalis*, & *Candida* species (“mixed infections”)
- Colorimetric results in 45 minutes
- Sensitivity 63%, specificity 99.9% compared w/ culture and transcription mediated amplification
Trichomoniasis Culture

- **Culture:** no longer the gold standard
- Sensitivity 75-96%, specificity up to 100%
- Vaginal specimens preferred over urine
- Urethral, urine and/or semen
Trichomoniasis
Pap tests

- Incidental finding
- Not diagnostic in liquid-based or conventional tests due to false positives and negatives
Bacterial Vaginosis
Amsel criteria

3 of 4 criteria must be met:
1. thin, homogenous vaginal discharge
2. vaginal with pH > 4.5
3. clue cells >20% of epithelial cells on
4. positive amine “whiff” test before or after adding 10% potassium hydroxide to vaginal secretions
Bacterial Vaginosis
Amsel criteria

- Commonly used
- Requires microscopy and skilled provider
- Sensitivity 60-67%, specificity 90-95%
OSOM BVBlue Test

TEST PROCEDURE / RESULTS

Insert swab into pre-filled vial and mix.

Let stand for 10 minutes at room temperature.

Add 1 drop of Developer Solution to vial and mix.

Read results.

POSITIVE NEGATIVE
Bacterial Vaginosis
Point of care test

- OSOM BVBlue Test (Sekisui Diagnostics, Framingham, MA)
- FDA-approved, CLIA-waived
- Measures sialidase activity in vaginal fluid
  • Produced by *G. vaginalis, Bacteroides, Prevotella*
- Sensitivity 88-93%, specificity 90-98%
- Rapid colorimetric results in 10 min
Bacterial Vaginosis
Point of care test

- Affirm VP III (Becton Dickinson, Sparks, MD)
- FDA-approved, CLIA-waived
- DNA probe-hybridization test
- Detects *G. vaginalis*, *T. vaginalis*, and *Candida* sp
- Sensitivity 98%, specificity 100%
- Colorimetric results in 45 minutes
Bacterial Vaginosis
Tests that are not recommended

- Card test: detects elevated pH and amines
  - Low sensitivity and specificity
- *G. vaginalis* culture
  - Low specificity
- Pap tests
  - Low sensitivity and specificity
Online Resources

- AAP Red Book Online
- CDC STD Treatment Guidelines, 2015
  - [www.cdc.gov/std/treatment/](http://www.cdc.gov/std/treatment/)
  - [http://www.cdc.gov/std/training/webinars.htm#tg-overview](http://www.cdc.gov/std/training/webinars.htm#tg-overview)
- Evidence papers for the CDC sexually transmitted diseases treatment guidelines, 2015:
- CDC male Chlamydia screening guidance: [www.cdc.gov/std/chlamydia/ChlamydiaScreening-males.pdf](http://www.cdc.gov/std/chlamydia/ChlamydiaScreening-males.pdf)