Hot Topics in STIs

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Roadmap

- Selected screening recommendations
  - Women, men, MSM, WSW
- Chlamydia/gonorrhea treatment
- New bugs: *Mycoplasma genitalium*
- Genital herpes
- Recurrent vaginitis
Chlamydia capital of Canada.
Woo hoo.
Get tested. It’s as easy at 1-2-Pee.
Planned Parenthood Regina
THE SEXUAL HEALTH EDUCATION PLACE

WYOMING HAS GONORRHEA. DO YOU?
GET A FREE HIV/STD TEST AT knowya.org
Chlamydia — Rates of Reported Cases by Age and Sex, United States, 2014

<table>
<thead>
<tr>
<th>Men</th>
<th>Rate (per 100,000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4000</td>
</tr>
<tr>
<td>278.4</td>
<td>1368.3</td>
</tr>
<tr>
<td>20.6</td>
<td>4.4</td>
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<table>
<thead>
<tr>
<th>Women</th>
<th>Age</th>
<th>Rate (per 100,000 population)</th>
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<tbody>
<tr>
<td>10-14</td>
<td></td>
<td>99.4</td>
</tr>
<tr>
<td>15-19</td>
<td></td>
<td>2941.0</td>
</tr>
<tr>
<td>20-24</td>
<td></td>
<td>3651.1</td>
</tr>
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<td>25-29</td>
<td></td>
<td>1523.4</td>
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<td>30-34</td>
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<td>633.7</td>
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<td>35-39</td>
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<td>300.9</td>
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<td>40-44</td>
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<td>45-54</td>
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<td>47.0</td>
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<td>55-64</td>
<td></td>
<td>12.8</td>
</tr>
<tr>
<td>65+</td>
<td></td>
<td>2.3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>627.2</td>
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</table>
### Gonorrhea — Rates of Reported Cases by Age and Sex, United States, 2014

<table>
<thead>
<tr>
<th></th>
<th>Rate (per 100,000 population)</th>
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</tr>
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<tbody>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td><strong>Women</strong></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-14</td>
<td>4.2</td>
<td>19.9</td>
</tr>
<tr>
<td>15-19</td>
<td>221.1</td>
<td>430.5</td>
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<tr>
<td>20-24</td>
<td>370.5</td>
<td>533.7</td>
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<td>25-29</td>
<td>228.0</td>
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<td>30-34</td>
<td>144.4</td>
<td>132.2</td>
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<tr>
<td>40-44</td>
<td>57.4</td>
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<tr>
<td>45-54</td>
<td>20.4</td>
<td>13.1</td>
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<tr>
<td>55-64</td>
<td>4.0</td>
<td>3.3</td>
</tr>
<tr>
<td>65+</td>
<td>120.1</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>485.6</td>
<td>101.3</td>
</tr>
</tbody>
</table>
Chlamydia and gonorrhea screening: Women

- All sexually active young women up to age 24
- Selective screening of women over 24 years of age based on risk
What about men?
What is the optimal specimen collection method for chlamydia screening in women?

1. Provider-collected cervical swab
2. Provider-collected liquid-based cytology
3. Patient-collected vaginal swab
4. Patient-collected urine
Vaginal Swab is preferred specimen type for women

NAATs recommended for detection of genital tract infections in men and women – with and without symptoms
- highly sensitive and specific compared to culture
- less dependent on specimen collection and handling

Optimal specimen types are:
First catch urine for men, swabs for rectal/pharyngeal STDs in MSM
Self collected vaginal swabs from women
Self-collected vaginal swabs

Advantages
- As sensitive as endocervical specimen; more sensitive than urine
- No need for pelvic exam
- Acceptable to women
- Easier collection and handling than urine

Future potential screening opportunities
- Alternative venues
- Mail-in specimens

NOTE: Approved for in-clinic patient or provider collection only

STD Screening
Men who have sex with men (MSM)
Among MSM, what percent of GC or CT infections are missed if only urine is screened

1. 0%
2. 10%
3. 25%
4. > 50%
High Proportion of Extranetal CT/GC Associated with Negative Urine test, STD Surveillance Network (n=21994)

Between 70-90% of infections would be missed by only screening with urine

Patton et al CID 2014
% screened by anatomic site among MSM in STD Clinics

N=21994 MSM in the STD Surveillance Network (SSUN)

- 11% Urogenital GC+
- 8% Pharyngeal GC+
- 10% Rectal GC+
- 8% Urogenital CT+
- 3% Pharyngeal CT+
- 14% Rectal CT+

Patton et al CID 2014
## Chlamydia and gonorrhea screening: MSM (q3-6 months if at increased risk)

<table>
<thead>
<tr>
<th></th>
<th>Chlamydia</th>
<th>Gonorrhea</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Urethra (urine)</td>
<td>✓</td>
<td>✓</td>
<td>If insertive sex</td>
</tr>
<tr>
<td>Rectum</td>
<td>✓</td>
<td>✓</td>
<td>If receptive anal sex</td>
</tr>
<tr>
<td>Pharynx</td>
<td></td>
<td>✓</td>
<td>If receptive oral sex</td>
</tr>
</tbody>
</table>

**NOTE:** NAATS are not FDA cleared for rectal or pharyngeal sampling, but can be used by laboratories that have met all regulatory requirements for an off-label procedure.
Other Screening Guidelines for MSM

At least annually:
- HIV
- Syphilis

Other:
- Hepatitis BsAg
- Hepatitis C
  - MSM born between 1945-1965
  - Other MSM if risk factors are present
  - Annual HCV testing in MSM with HIV infection
STD Screening: Women who have sex with women (WSW)
WSW and STIs

- Presumed low risk
- Studies about the burden of STIs in representative samples of WSW are rare
- STI services targeting WSW are uncommon
- WSW heterogeneous population
  Of women who reported WSW-ever (NHANES)
  - 52.6% self-identified as heterosexual/straight
  - 28.3% as bisexual
  - 9.1% as homosexual/lesbian

CT Infection among WSW attending Family Planning Clinics in Pacific Northwest

- Women age 15-24 seen in Region X IPP clinics, 1997-2005
- Sexual partner data for past 60 days – identified WSW and WSMW
- CT positivity 7.1% for both WSW and WSMW vs. 5.3% for WSM
- Factors assoc. with CT infection no different from those among WSM

Chlamydia and Gonorrhea
Treatment, Partners, Rescreening
# Chlamydia Treatment
## Adolescents and Adults

### Recommended regimens (non-pregnant):
- Azithromycin 1 g orally in a single dose
- Doxycycline 100 mg orally twice daily for 7 days

### Recommended regimens (pregnant*):
- Azithromycin 1 g orally in a single dose
- Amoxicillin 500 mg po TID x 7 days

* Test of cure at 3-4 weeks only in pregnancy

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CDC 2015 STD Treatment Guidelines [www.cdc.gov/std/treatment](http://www.cdc.gov/std/treatment)
Gonorrhea: hard to spell
Neisseria gonorrhoeae causes gonorrhea, a sexually transmitted disease that can result in discharge and inflammation at the urethra, cervix, pharynx, or rectum.

**Resistence of Concern**

*N. gonorrhoeae* is showing resistance to antibiotics usually used to treat it. These drugs include:

- cefixime (an oral cephalosporin)
- ceftiraxone (an injectable cephalosporin)
- azithromycin
- tetracycline

**Public Health Threat**

Gonorrhea is the second most commonly reported notifiable infection in the United States and is easily transmitted. It causes severe reproductive complications and disproportionately affects sexual, racial, and ethnic minorities. Gonorrhea control relies on prompt identification and treatment of infected persons and their sex partners. Because some drugs are less effective in treating gonorrhea, CDC recently updated its treatment guidelines to slow the emergence of drug resistance. CDC now recommends only ceftriaxone plus either azithromycin or doxycycline as first-line treatment for gonorrhea. The emergence of cephalosporin resistance, especially ceftriaxone resistance, would greatly limit treatment options and could cripple gonorrhea control efforts.

In 2011, 321,849 cases of gonorrhea were reported to CDC, but CDC estimates that more than 800,000 cases occur annually in the United States.

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
<th>Estimated number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gonorrhea</td>
<td></td>
<td>820,000</td>
</tr>
<tr>
<td>Resistance to any antibiotic</td>
<td>30%</td>
<td>246,000</td>
</tr>
<tr>
<td>Reduced susceptibility to cefixime</td>
<td>&lt;1%</td>
<td>11,480</td>
</tr>
<tr>
<td>Reduced susceptibility to ceftiraxone</td>
<td>&lt;1%</td>
<td>3,280</td>
</tr>
<tr>
<td>Reduced susceptibility to azithromycin</td>
<td>&lt;1%</td>
<td>2,460</td>
</tr>
<tr>
<td>Resistance to tetracycline</td>
<td>23%</td>
<td>188,600</td>
</tr>
</tbody>
</table>


For more information about data methods and references, please see technical appendix.
Gonorrhea Dual Therapy
Uncomplicated Genital, Rectal, or Pharyngeal Infections

Ceftriaxone 250 mg IM in a single dose

PLUS*

- Regardless of CT test result

Azithromycin 1 g orally (preferred) or Doxycycline 100 mg BID x 7 days

CDC 2015 STD Treatment Guidelines
www.cdc.gov/std/treatment
Gonorrhea Treatment Alternatives
Anogenital Infections

**ALTERNATIVE CEPHALOSPORINS:**
- Cefixime 400 mg orally once
  *PLUS*
- Dual treatment with azithromycin 1 g (preferred) or doxycycline 100 mg BID x 7 days, regardless of CT

**IN CASE OF SEVERE ALLERGY:**
- Gentamicin 240 mg IM + azithromycin 2 g PO
  OR
- Gemifloxacin 320 mg orally + azithromycin 2 g PO

*Doxy removed as co-treatment (unless azithro allergy)*

CDC 2015 STD Treatment Guidelines [www.cdc.gov/std/treatment](http://www.cdc.gov/std/treatment)
Any downside to the alternative regimens?

<table>
<thead>
<tr>
<th></th>
<th>Gentamicin Regimen</th>
<th>Gemifloxacin Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route</td>
<td>IM or IV</td>
<td>Oral</td>
</tr>
<tr>
<td>Nausea</td>
<td>27%</td>
<td>37%</td>
</tr>
<tr>
<td>Vomiting (&lt;1 hour)</td>
<td>3%</td>
<td>7%</td>
</tr>
<tr>
<td>Availability</td>
<td>OK</td>
<td>FDA reported shortage in May 2015</td>
</tr>
<tr>
<td>Volume</td>
<td>Need 6 cc (40mg/cc)</td>
<td></td>
</tr>
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</table>
CT/GC Partner Management

- Clinical evaluation is first-line option
- Concurrent patient-partner therapy can be effective for those with one primary partner
- Offer expedited partner treatment (EPT) CT/GC if partner cannot be promptly treated
  - Use of prepackaged medication is recommended
  - Dual therapy (cefixime 400 mg + azithromycin 1 g) is crucial if EPT is used for GC
  - CDC recommends EPT for heterosexuals

CDC 2015 STD Treatment Guidelines: [www.cdc.gov/std/treatment](http://www.cdc.gov/std/treatment)
Testing after an STD diagnosis

- Women who test positive for CT/GC, or trichomonas should be rescreened three months following treatment.

- Men who test positive for chlamydia or gonorrhea should be rescreened at three months after adequate therapy.

- Rescreening can happen opportunistically anytime in the 1-12 months after treatment.

- All patients with a bacterial STDs or trichomonas should be tested for other STDs including CT/GC, syphilis, and HIV.

CDC 2015 STD Treatment Guidelines  [www.cdc.gov/std/treatment](http://www.cdc.gov/std/treatment)
New bugs: Man with a “Drip”

- A 23 yo male presents for evaluation of a urethral discharge without dysuria
- He has been seen in STD clinic 15 times between 5/22/12 and 9/2/14
  - Sometimes visible discharge on exam, sometimes not
  - On 9 occasions a urethral Gram stain performed
    - 5 times <5PMN/hpf
    - 4 times >5PMN/hpf
  - GC documented 5/23/13, otherwise, tested for GC and CT at each of the 15 visits and always negative
- Most recently treated with 1gm Azithromycin orally once; partner received treatment; GC and CT neg
Today he presents with thick, white discharge...now what?

Source: Diepgen TL, Yihune G et al. Dermatology Online Atlas
What is your next step?

1) Give up
2) Give him longer course of azithromycin
3) Get a urine culture
4) Try a different antibiotic
5) Get a consult from ID
6) More than 1 of the above
New STI on the block
*Mycoplasma genitalium*
**M. genitalium**
More common than you think

Young adults 18-24 yrs

<table>
<thead>
<tr>
<th>STD Clinic/ED Attendees</th>
<th>MG</th>
<th>CT</th>
<th>GC</th>
<th>TV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seattle</td>
<td>13.4%</td>
<td>7.0%</td>
<td>15.2%</td>
<td>19.2%</td>
</tr>
<tr>
<td>New Orleans</td>
<td>12.1%</td>
<td>12.1%</td>
<td>19.2%</td>
<td>19.2%</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>22.4%</td>
<td>15.2%</td>
<td>19.2%</td>
<td>19.2%</td>
</tr>
<tr>
<td>Baltimore</td>
<td>19.2%</td>
<td>19.2%</td>
<td>19.2%</td>
<td>19.2%</td>
</tr>
</tbody>
</table>


L. Manhart, with permission
M. genitalium & Reproductive Tract Disease

- Definitely associated with NGU in men
- Study of association with:
  - Cervicitis
  - PID
  - Infertility
  - Preterm delivery
- Increased odds of adverse outcomes = ~2.0 fold higher for all conditions
  - Statistically significant for all but infertility

Lis et al., 2015 Clin Infect Dis
Detecting MG infections?

No FDA-approved diagnostic test

- **Nucleic Acid Amplification Test (Hologic GenProbe)**
  - Currently research use only
  - FDA approval being sought

- **Commercial Laboratories (in house PCR tests)**
  - Limited test-performance information

L. Manhart, with permission
MG cure rates with doxycycline and azithromycin

Randomized Trials
Doxycycline (100mg bid x 7d) vs. Azithromycin (1g)

CONCLUSION: AZM (1g) is superior to DOX (100mg bid x 7d). However, efficacy of AZM is not consistently high and may be declining

L. Manhart, with permission
MG Treatment

Moxifloxacin 400mg po x 7-14d

- Highly effective for treatment failures
  - 100% cure rates in most places

- Public health 340b pricing available
  - Usual price for 7 day course ~ $100+
  - Negotiated price to $1.21/pill

- **Caveat:** Moxifloxacin treatment failures emerging
  (Japan, Seattle, Australia)

L. Manhart, with permission
Persistent NGU Treatment

If azithromycin NOT given for 1st episode:

- Azithromycin 1 g orally in a single dose
  PLUS
- Metronidazole 2 g orally in a single dose OR
- Tinidazole 2 g orally in a single dose

If azithromycin given for 1st episode:

- Moxifloxacin 400 mg orally qd x 7d
  PLUS
- Metronidazole 2 g orally in a single dose OR
- Tinidazole 2 g orally in a single dose (if having sex with females)
Epilogue

• Patient takes moxifloxacin 400 mg po x 7 days.
• Symptoms finally resolve.

• Take home point: Think about *M. genitalium* in cases of cervicitis and urethritis treatment failure.
Contrary to popular belief...

What happens in Vegas doesn't stay in Vegas.

You have herpes.

Comic by Matt Melvin @ mattmelvin.com
Herpes: 2nd Most Prevalent STD in the US

HPV
79 million

Chlamydia
3 million

Hepatitis B
1.25 million

HIV
1.2 million

Genital Herpes
50 million

Women are disproportionately affected by genital herpes

1 in 5 women

1 in 9 men

CDC MMWR April 23, 2010 / 59(15);456-459
What percent of people who are infected with HSV-2 know they have it?

1. Less than 5%
2. Only 10% ✔
3. About half
4. Over 80%
5. Not sure
Symptomatic Herpes: Tip of the Iceberg

Seroprevalence of Herpes Simplex Virus Type 2 Among Persons Aged 14–49 Years — United States, 2005–2008

- General U.S. seroprevalence 16.2%; MSM ~50%
  - 50 million in U.S. infected; ~90% unrecognized

MMWR April 23, 21010; Xu, JAMA 2006; Photo: J. Hofmann
So I have genital HSV-1.

How is that different than HSV-2?
HSV Types 1 & 2

**HSV-1**
- Mostly orolabial (cold sores, fever blisters)
- 20-30% of genital herpes

**HSV-2**
- Almost entirely genital; oral infection rare
- >95% of recurrent genital herpes
HSV-1 vs 2

Shedding more frequent with HSV-2 than HSV-1

Recurrences more likely with HSV-2 than HSV-1

The majority (>90%) of people with genital HSV-2 shed virus asymptomatically

HSV-1 antibodies may offer some protection against future genital HSV-2 (or milder initial outbreak)
Genital HSV-1

• HSV-1 still increasing as a cause of genital herpes
• Depending on population, proportion of genital herpes caused by HSV-1 ranges from 24-76%
• Increasing proportion of genital herpes is HSV-1 among young women and MSM
Changing epidemiology: New HSV among Women Aged 18-30 (Herpevac vaccine trial)

All subjects n=3438

No disease suspected N=3196
- Not infected n=3075
  - HSV-1 n=92
  - HSV-2 n=29

Suspected Disease n=242
- Not infected n=180
  - HSV-1 n=35
  - HSV-2 n=27

Genital HSV-1 infection rate > 2x the HSV-2 infection rate (2.5 vs 1.1 per 100 person-years)

Bernstein, Clin Infect Dis 2013:56
HSV-2 shedding declines over time

Phipps and Wald, *JID*, 2011

Diagnosis

HSV NAAT (PCR) or viral culture are preferred for diagnosis of genital ulcers

Serology

- Useful for partners of HSV+ patients
- Help diagnose disease if genital lesions are dry (likely to yield negative culture/NAAT)
- Help diagnose HSV for patient with recurrent genital irritation/symptoms with no other diagnosis
- Confirm prior clinical diagnosis

CDC 2015 STD Treatment Guidelines
Diagnosis

- HerpeSelect HSV-2 ELISA might be falsely positive at low index values (1.1-3.5); should be confirmed with western blot or Biokit
- IgM testing not useful
  
  *Can be detected during recurrences (in 1/3 of patients)*
  *May give false positive results (cannot distinguish between HSV-1 vs HSV-2)*
Should I tell my partners? What can I do to avoid transmission?
Disclosure and Prevention

- Tell current and future partners about the diagnosis
- Learn to recognize prodrome and don’t have sex during prodrome or when lesions present
- Consider suppressive therapy
- Condoms reduce risk of transmission
- When disclosing, encourage partner to be tested for HSV-2 antibody (may already be infected)

2015 CDC STD Tx Guidelines
How can I stop shedding?…
How effective is suppressive therapy at reducing HSV-2 transmission?

1. Nearly 100%
2. 75-80%
3. About 50% ✔
4. Only 25%
5. Not sure
Transmission of HSV-2 to Susceptible Partners is Reduced with Once-Daily Suppression

- 1484 heterosexual couples randomized to 500 mg of valacyclovir vs placebo once daily for 8 months
- Monthly serum samples collected from susceptible partners
- Valacyclovir group showed
  - decreased transmission
  - lower frequency of shedding
  - fewer copies of HSV-2 DNA when shedding occurred

# Genital Herpes Treatment

<table>
<thead>
<tr>
<th></th>
<th>1st Clinical Episode: (mg for 7-10 days)</th>
<th>Recurrent Genital Herpes: Episodic (mg x days)</th>
<th>Suppressive (mg, daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acyclovir</strong></td>
<td>400 TID</td>
<td>400 TID x 5 d</td>
<td>400 BID</td>
</tr>
<tr>
<td></td>
<td>250 5x/day</td>
<td>800 BID x 5 d</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>800 TID x 2 d</td>
<td></td>
</tr>
<tr>
<td><strong>Famciclovir</strong></td>
<td>250 TID</td>
<td>125 BID x 5 d</td>
<td>250 BID*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1000 BID x 1 d</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>500 mg PO x 1, then 250mg BID x 2 days</td>
<td></td>
</tr>
<tr>
<td><strong>Valacyclovir</strong></td>
<td>1000 BID</td>
<td>500 BID x 3 d</td>
<td>500 QD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1000 QD x 5 d</td>
<td>1000 QD</td>
</tr>
</tbody>
</table>

* Somewhat less effective for suppression of shedding

CDC 2015 STD Treatment Guidelines
[www.cdc.gov/std/treatment](http://www.cdc.gov/std/treatment)
What if I took higher doses?
Would that decrease my chance of shedding?
How much drug is enough to completely suppress shedding

Acyclovir 400 mg twice a day or Valacyclovir 500 mg once a day

Acyclovir 800mg three times a day

Valcyclovir 1000 mg three times a day
None of them completely suppress shedding

- N=90 HSV+, HIV-negative participants,
  Swabs of genitals for PCR 4 times a day to look for shedding

  Regimens compared:
  - No meds vs Acyclovir 400mg BID
  - Valacyclovir 500 mg Daily vs Acyclovir 800mg TID
  - Valacyclovir 500 mg Daily vs Valacyclovir 1 gm TID

**Bottom line:** More drug is better

Shedding happens even with highest dose therapy.
Condoms protect against HSV transmission

- 911 African HSV-2/HIV-1 serodiscordant couples followed for ~18 months.
- Vaginal sex acts with & w/out male condoms reported monthly, quarterly sera samples drawn
- Highest rate of transmission from men to women
- Efficacy of condom use:
  - 96% (P<.001) effective in preventing male to female transmission
  - 65% (P=.060) effective in preventing female to male transmission

Giving you the clap
Recurrent BV and Yeast and Trich, oh my!
Challenges in vaginitis management

- Gaps in knowledge of vaginal ecosystem and local immunity
- Recurrence is common for BV; may be difficult to manage for yeast

Challenges in vaginitis management

Patient factors:
- Self-treatment may preclude diagnosis
- 66% women self-treating with OTC antifungal in one study had incorrect diagnosis
- Clients seek help from multiple providers

Provider factors:
- Insensitive clinic-based tests
- Dependent on provider skills
- Underutilization of available tests
  - One study revealed treatment w/o adequate evaluation in 54% of cases
  - Amine and pH rarely performed (3%)

Background: Normal vaginal ecosystem

- Menarche
- Estrogen levels
- Vaginal epithelium converts glycogen to glucose
- Low pH and antimicrobial activity
- $\text{H}_2\text{O}_2$ and lactic acid
- Lactobacilli

Local immunity is also key factor
BV pathology: Disturbance in vaginal ecosystem

- Enzymes degrade the protective effects of cervical mucus, IgA, and bacterial adhesion
- The trigger event and sequence are unknown
- Sexually-associated condition—no single pathogen

Decrease in H$_2$O$_2$-producing lactobacilli

Polymicrobial overgrowth (anaerobes)

- Decrease in H$_2$O$_2$-producing lactobacilli leads to polymicrobial overgrowth (anaerobes)
Pyrosequencing: Hierarchical Clustering of Vaginal Communities

A = Amsel criteria
N = Nugent score
Red = BV+; Green = BV-

Scale bar = KR distance; colored bars = most abundant taxa in each sample

Women with BV have diverse heterogeneous communities.

Women who don’t have BV are dominated with either *L. iners* or *L. crispatus*.

Srinivasan 2012
BV creates a biofilm

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).


Diagnosis of BV

**Amsel’s criteria**
- Wet prep
- BV+ if 3 of 4 findings present:
  - Homogenous, thin, watery, adherent d/c
  - Vaginal pH >4.5
  - >20% clue cells on saline wet mount
  - Positive “whiff” test
    - Amines: putrescine, cadaverine

**Nugent criteria**
- Gold standard
- Gram stain
- Score of 0-10 based on bacterial morphotypes
  - 0-3 = Normal
  - 4-6 = intermed/inconcl
  - 7-10 = BV+

NOTE: pH and whiff: sens 64%, spec 95%
Gutman 2005

ACOG *Practice Bulletin* 2006; 72:1195-1206
BV: Recurrence

• Recurrence rates are high
  ▪ As high as 30% at 3 m and 80% at 9 m

• Etiology unclear:
  ▪ Resistance
  ▪ Re-infection
  ▪ Unrecognized trigger
  ▪ Failure to re-colonize

Sobel et al. *Am J. OB GYN* 2006; 194: 1283-1289
What is an acceptable option for treating recurrent BV?

A. Treat with same recommended regimen
B. Treat with different recommended medication
C. Treat with recommended regimen and start maintenance dosing with metronidazole gel
D. Pull your hair out
E. Lock the clinic door and hide
F. A, B, and C
Recurrent BV Treatment Strategies (after multiple documented recurrences)

- Twice weekly suppressive MTZ gel (RCT) for 4-6 m (recurrence common)
- Metronidazole 500 mg po bid x 7 d; followed by boric acid 600 mg 1 capsule intravaginally at h.s. x 21 days; followed by suppressive metrogel**
- Monthly oral metronidazole 2g administered with fluconazole 150 mg has also been evaluated as suppressive therapy; this regimen reduced the incidence of BV and promoted colonization with normal vaginal flora**

**based on a single study
Recurrent BV Treatment Strategies

• Advise condoms for WSM (shown to be protective)
• No data on suppressive tinidazole, oral clindamycin/vaginal cream
• No support of any available probiotic as adjunctive or replacement therapy to antibiotics in BV
• Awaiting more data on Vitamin D, *L. crispatus* vaginal capsule (LACTIN-V) for prevention
Candida albicans: Commensal or pathogen

• Asymptomatic carriage is common
  ▪ up to 30% of women (point-prevalence)
  ▪ up to 70% of women if followed over 1 year

• Fungal organisms on Pap only need treatment if symptomatic

• Transition from asymptomatic colonization to symptomatic candidiasis due to:
  ▪ Change in local defense mechanisms
  ▪ Factors effecting fungal virulence

Cassone, De Bernardis & Santoni Infect and Immun 2007; 4675-4686
Nyirjesy ID Clin N Am 2008; 33:637-652
Recurrent Vulvovaginal Candidiasis (RVVC)

- 5% of women will develop RVVC
  - Confirm diagnosis!
  - Culture
- Non-albicans more common
  - 10-20% of cases
- Pathogenesis is unclear
  - Deficient host response?
  - Overactive host response?
  - Relapse/re-infection?

Richardson & Rautemas *Front in Biosci* 2009; 14: 4363-4378
Nyirjesy *ID Clin N Am* 2008; 33:637-652
Initial Treatment

- Longer regimen of topical therapy (7-10 days)
- Fluconazole (100 mg, 150 mg, or 200 mg) p.o. every 3rd d x 3 (Day 1, 4, 7)

Before starting maintenance:

- Fluconazole (100 mg, 150 mg, 200 mg) qw x 6 m

OR if not feasible

- Topical antifungals used intermittently
Non-albicans VVC

Optimal treatment unknown

• First line:
  Longer duration of therapy (7–14 days) with a
  non-fluconazole azole regimen

• If recurrence occurs,
  600 mg of boric acid in a gelatin capsule is per vagina at
  h.s. x 14 days
  order from a compounding pharmacy; approx. $30
RVVC: Treatment (cont.)

<table>
<thead>
<tr>
<th>Number of months post 6m maintenance therapy</th>
<th>Oral fluconazole (% of women disease free)</th>
<th>Placebo (% of women disease free)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>90.8%</td>
<td>35.9%</td>
</tr>
<tr>
<td>7</td>
<td>73.2%</td>
<td>27.8%</td>
</tr>
<tr>
<td>12</td>
<td>42.9%</td>
<td>21.9%</td>
</tr>
</tbody>
</table>

NOTE: Relapse is common after maintenance therapy

## Diagnostics for *Trichomonas vaginalis*

<table>
<thead>
<tr>
<th>Category</th>
<th>Test</th>
<th>Sens(%)</th>
<th>Spec(%)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct microscopy</td>
<td>Wet prep</td>
<td>44-68</td>
<td>100</td>
<td>Same day, inexpensive</td>
</tr>
<tr>
<td></td>
<td>Conventional pap</td>
<td>44-79</td>
<td>83-99</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Liquid pap</td>
<td>60-96</td>
<td>98-100</td>
<td></td>
</tr>
<tr>
<td>Culture</td>
<td>InPouch</td>
<td>44-75</td>
<td>100</td>
<td>Several days for results</td>
</tr>
<tr>
<td>Non-amplified molecular</td>
<td>OSOM rapid antigen test</td>
<td>77-98</td>
<td>99-100</td>
<td>CLIA-waived, same day, not for use in asymptomatic women or men</td>
</tr>
<tr>
<td></td>
<td>Affirm VP III DNA probe</td>
<td>64</td>
<td>100</td>
<td>Moderate complexity</td>
</tr>
<tr>
<td>NAATs</td>
<td>Aptima TV</td>
<td>88-100</td>
<td>98-100</td>
<td>Not reliant on viable organism, several days for results</td>
</tr>
</tbody>
</table>

Adapted from Hobbs & Sena. *STI.* 2013;89:434–438
Trich: Recurrence

- Up to 10% of trichomonas may have low level metronidazole resistance
- High level resistance rare
- Assess drug adherence, re-exposure

Bachmann et al. CID 2011; 53(S3): S160-172
Trich: Recurrence (cont.)

- Metronidazole 500 mg p.o. bid x 7 days
- Tinidazole 2g single dose
- Suspected resistance: longer treatment for partner

If repeated failure:
- Metronidazole or tinidazole 2 g p.o. x 5 days
- Consultation and *T. vaginalis* susceptibility testing is available from CDC T: 770-488-4115
Take-home: Management strategies for recurrent vaginitis

Avoid treatment without evaluation

• Recurrent BV
  ▪ Condoms
  ▪ No douching
  ▪ Consider maintenance MTZ gel
  ▪ Stay tuned!
RVVC
• Culture
• Consider other etiologies
• Longer treatment; consider maintenance regimen

Trichomoniasis
• Suspect re-exposure or non-adherence
• Longer treatment
Need a clinical consult? Contact us!

STD Clinical Consultation Network

www.stdccn.org

In: CA, NV, AZ, HI, NM

1 (855) STD-A to Z

1 (855) 783-2869
Want to know more about STDs?
There’s an app for that.

CDC Treatment Guidelines App for Apple and Android devices

FREE!
(Search “CDC STD TX”)
PARTING WORDS…

THANK YOU!

Questions?