Overview of Sexually Transmitted Diseases

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Epi 220
CHS 51-279
March 11, 2014
4:00 – 5:50 pm
Disclosures

• Dr. Klausner is a faculty member of the University of California Los Angeles
• Dr. Klausner is a guest researcher with the US CDC Mycotics Diseases Branch
• Dr. Klausner is a member of the WHO STD Guidelines group
• Dr. Klausner is medical director, APLA Health and Wellness Center
• Dr. Klausner is a board member of YTH, Inc, non-profit
• Dr. Klausner is medical advisor for Hulahq.com

• In the past 36 months, Dr. Klausner has received:
  – Travel support for meeting attendance from WHO, London School Hygiene and Tropical Medicine, Council of Scientific Industrial Research, SA and Standard Diagnostics, Inc.
  – Research funding, supplies or unrestricted gifts from the NIH, CDC, Hologic Gen-Probe, Inc., Gilead Sciences, Inc., Cepheid, Standard Diagnostics, Chembio, Inc., MedMira, Inc. APLA, Public Health Foundation Enterprises, American Jewish World Service and HulaHQ.com

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Over 2 dozen sexually transmitted infections

- **Bacteria**
  - *Chlamydia trachomatis*
  - *Neisseria gonorrhoeae*
  - *Treponema pallidum*
  - *Mycoplasma genitalium*
  - *Ureaplasma urealyticum*
  - *Haemophilus ducreyi*
  - *Shigella spp.*
  - *Salmonella spp.*

- **Protozoa**
  - *Trichomonas vaginalis*
  - *Giardia lamblia*
  - *Entamoeba histolytica*

- **Viruses**
  - Human papillomaviruses (> 120 types)
  - Herpes simplex virus 1 and 2
  - Kaposi’s Sarcoma-associated virus (Human herpes virus 8)
  - Human immunodeficiency virus
  - Human T-cell lymphotropic virus 1 and 2
  - Cytomegalovirus
  - Ebstein-Barr virus
  - Hepatitis A, B and C
STIs in the United States

- Over 20 million new cases per year
  - 50% in those < age 25 years
- 110 million prevalent STIs
- $16 billion dollars annually in direct medical costs

CDC’s estimates of sexually transmitted infections:

**Annual new infections**
- United States, 2008
  - 20 million

**Total infections**
- United States, 2008
  - 110 million

**Total medical costs**
- United States (in 2010 dollars)
  - $16 billion

Estimated number of new sexually transmitted infections
- United States, 2008

Hepatitis B: 19,000
HIV*: 41,400
Syphilis: 55,400
HSV-2: 776,000
Gonorrhea: 820,000
Trichomoniasis: 1,090,000
Chlamydia: 2,860,000
HPV: 14,100,000

Total: 19,738,800

*HIV incidence not calculated by age in this analysis

Bars are for illustration only; not to scale, due to wide range in numbers of infections

Young people (15-24) represent 50% of all new STIs
Sexually Transmitted Diseases

- Urethritis
- Cervicitis
- Vaginitis
- Vaginosis
- Balanitis
- Warts
- Genital ulcer disease
- Pelvic inflammatory disease
- Proctitis
- Pharyngitis
- Skin rashes
- Tubo-ovarian abcess
- Hepatitis
- Epididymitis
- Arthritis
- Conjunctivitis
- Meningitis
- Cancer
- Infertility
- AIDS
Today’s talk

• Gonorrhea
• Chlamydia
• Syphilis
• Herpes
• HPV
• Trichomoniasis
• *Not covering HIV, hepatitis B, other*
Case

• 28 year old man with urethral discharge
Differential diagnosis of urethritis

• Infectious
  
  *Neisseria gonorrhoeae*
  *Chlamydia trachomatis*
  *Mycoplasma genitalium*
  *Trichomonas vaginalis*
  *Herpes simplex* virus 1 and 2
  Oral flora---streptococci, anaerobes, haemophilus species

• Non-infectious
  
  Trauma--physical or chemical (drugs), post-catheterization or sex-play related
  Autoimmune--Reiter’s syndrome
Uncomplicated gonococcal infection

**Neisseria gonorrhoeae**

- Urethra
- Cervix
- Pharynx
- Rectum

Gram stain of urethral discharge
1000x

Gram-negative intracellular diplococci
Detection of *N. gonorrhoeae* infection

<table>
<thead>
<tr>
<th>Method</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gram stain</td>
<td>92%</td>
<td>90%</td>
</tr>
<tr>
<td>Culture</td>
<td>95%</td>
<td>100%</td>
</tr>
<tr>
<td>DNA/RNA amplification*</td>
<td>95%</td>
<td>99%</td>
</tr>
</tbody>
</table>

*May be used on self-collected vaginal, rectal, pharyngeal specimens and urine*
Gonorrhea—Rates, United States, 1941–2012

Rate (per 100,000 population)

Year

Gonorrhea—Rates by County, United States, 2012

Rate per 100,000 population

- ≤ 19.0 (n= 1,192)
- 19.1 – 100.0 (n= 1,300)
- >100.0 (n= 650)

(CDC)
## Gonorrhea—Rates by Age and Sex, United States, 2012

<table>
<thead>
<tr>
<th>Age</th>
<th>Rate (per 100,000 population)</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>25.3</td>
<td>521.2</td>
<td>578.5</td>
</tr>
<tr>
<td>15-19</td>
<td>239.0</td>
<td>521.2</td>
<td>578.5</td>
</tr>
<tr>
<td>20-24</td>
<td>184.2</td>
<td>254.1</td>
<td></td>
</tr>
<tr>
<td>25-29</td>
<td>107.5</td>
<td></td>
<td>57.7</td>
</tr>
<tr>
<td>30-34</td>
<td>75.1</td>
<td>121.6</td>
<td></td>
</tr>
<tr>
<td>35-39</td>
<td>44.4</td>
<td>29.2</td>
<td></td>
</tr>
<tr>
<td>40-44</td>
<td>14.4</td>
<td>11.4</td>
<td></td>
</tr>
<tr>
<td>45-54</td>
<td>3.0</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>55-64</td>
<td>0.4</td>
<td>108.7</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Gonorrhea—Rates by Race/Ethnicity, United States, 2008–2012

Rate (per 100,000 population)

American Indians/Alaska Natives

Blacks

NHOP
t

Hispanics

Whites

Multirace

Asians

†NHOPt = Native Hawaiian and Other Pacific Islanders.

In the battle between man and bacteria, we seem to be losing ground. A new World Health Organization statement cautions that around the globe, gonorrhea is becoming more and more resistant to antibiotics. Approximately 106 million people are infected with gonorrhea each year (700,000 of these cases are estimated to occur in the U.S.), and fewer are responding to the treatments that once easily killed it. The organism has indeed become a “superbug,” so what do we do now?
Percentage of *Neisseria gonorrhoeae* Isolates with Ceftriaxone Minimum Inhibitory Concentrations (≥0.125 μg/ml), Gonococcal Isolate Surveillance Project (GISP), 2005 – 2012
Multi-drug treatment for gonorrhea

Ceftriaxone 250 mg IM once **AND**

- azithromycin 1 gm PO once **or**
- doxycycline 100 mg PO twice daily x 7 days

Plus partner treatment

Retesting at 3 months
Penicillin, Tetracycline, and Ciprofloxacin Resistance Among *Neisseria gonorrhoeae* Isolates, 2012

NOTE: PenR = penicillinase producing *Neisseria gonorrhoeae* and chromosomally mediated penicillin-resistant *N. gonorrhoeae*; TetR = chromosomally and plasmid mediated tetracycline-resistant *N. gonorrhoeae*; and QRNG = quinolone-resistant *N. gonorrhoeae*. 
Fluoroquinolone resistance in *Neisseria gonorrhoeae*
Real-time PCR Melting Curves: FRET probe binding to *gyrA* at serine 91 detects the susceptibility of the specimen

Percentage of *Neisseria gonorrhoeae* Isolates that are Ciprofloxacin-Resistant by Sex of Sex Partner, Gonococcal Isolate Surveillance Project, 1995-2012
“eXpert” NG-Cip/Ceph

- Rapid detection of NG
- Simultaneous detection of key antimicrobial resistance profile
- Enable targeted treatment
- Reduce antibiotic selection pressure
- Decrease emergence of resistance

UNDER DEVELOPMENT
Case

19 year old female used SexInfo text message service (Text “SexInfo” to 61827) and comes in for a check-up. She has one regular partner for 6 months and has no symptoms.

What STD screening tests are appropriate?
Recommended STI screening in sexually active female < 25 years

- *Chlamydia trachomatis*, annual
- HIV test
- *Neisseria gonorrhoeae*…
  - if African-American, > 1 partner past year, hx STDs

*Consider*

Herpes simplex virus type 2 antibody

*Avoid*

PAP smear (only if sexually active ≥ 3 years)

USPSTF, 2013
Screening tests for *chlamydia* infection

- Nucleic acid amplification tests
  - DNA amplification (Roche, Bayer, Abbott, BD, Siemens, Cepheid)
  - RNA amplification (Hologic Gen-Probe)
Options for specimen collection

1) Cervical swab
2) Vaginal swab
3) Self-collected vaginal swab
4) Urine
5) Rectal swab
6) Self-collected rectal swab
Test performance by collection method and assay for rectal chlamydia (n=907, 66 True Positive)

<table>
<thead>
<tr>
<th>Rectal swab specimen collector</th>
<th>Test</th>
<th>C. trachomatis (n = 907)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>SDA</td>
<td>Sensitivity (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40.9 (27/66)²</td>
</tr>
<tr>
<td></td>
<td>SDA</td>
<td>43.9 (29/66)²</td>
</tr>
<tr>
<td></td>
<td>AC2</td>
<td>Sensitivity (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>81.8 (54/66)²</td>
</tr>
<tr>
<td></td>
<td>AC2</td>
<td>71.2 (47/66)²</td>
</tr>
<tr>
<td>Clinician</td>
<td>Culture</td>
<td>Sensitivity (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18.2 (12/66)</td>
</tr>
</tbody>
</table>

True positive defined as **culture** or any 2 **positive** NAATs

Most rectal chlamydial infections in gay/bisexual men are asymptomatic, San Francisco

Rectal chlamydia
n=316

14%
Asymptomatic
Symptomatic
86%

Kent et al. Clin Inf Dis, 2005
Rectal Chlamydia Positivity, San Francisco (n=6,861)

Mean positivity 8.4% (n=576+)

- STD Clinic: 9.8%
- MSM Clinic: 7.4%
- Community Screening: 8.3%
- HIV Testing Prg: 5.2%
- HIV Seroconverters: 7.1%
- 2 HIV Clinics: 6.2%
- Sex Wrk Clinic: 8.1%
- Homeless/TG Clinic: 4.7%
- Private MD: 11.3%
Cervicitis

Mucopurulent discharge

Friability


Slide courtesy of M. Leibowitz
Swab Test in Cervicitis

Positive Swab Test

Negative Swab Test


Slide courtesy of M. Leibowitz
Treatment for uncomplicated *chlamydial* infection

1) Azithromycin 1 gm orally once
2) Doxycycline 100 mg orally twice daily for 7 days
3) Amoxicillin 500 mg po tid x 7 days
4) Levofloxacin 500 mg po qd x 7 days

- Partner treatment
  - SB 648, CA Law January 2001

- Re-testing at 3 months
Chlamydia—Rates by Sex, United States, 1992–2012

Rate (per 100,000 population)

Year

Women
Total
Men

NOTE: As of January 2000, all 50 states and the District of Columbia have regulations that require the reporting of chlamydia cases.
Chlamydia—Rates by County, United States, 2012

Rate per 100,000 population

- ≤ 300.0 (n=1,721)
- 300.1–400.0 (n=494)
- >400.0 (n=927)
### Chlamydia—Rates by Age and Sex, United States, 2012

<table>
<thead>
<tr>
<th>Age</th>
<th>Rate (per 100,000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-14</td>
<td>125.3</td>
</tr>
<tr>
<td>15-19</td>
<td>3291.5</td>
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<tr>
<td>20-24</td>
<td>3695.5</td>
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<tr>
<td>25-29</td>
<td>1388.4</td>
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<tr>
<td>30-34</td>
<td>582.7</td>
</tr>
<tr>
<td>35-39</td>
<td>257.4</td>
</tr>
<tr>
<td>40-44</td>
<td>115.8</td>
</tr>
<tr>
<td>45-54</td>
<td>39.5</td>
</tr>
<tr>
<td>55-64</td>
<td>11.0</td>
</tr>
<tr>
<td>65+</td>
<td>2.2</td>
</tr>
<tr>
<td>Total</td>
<td>643.3</td>
</tr>
</tbody>
</table>
Chlamydia—Rates by Race/Ethnicity, United States, 2008–2012


Prevalence, %

NOTE: Error bars indicate 95% confidence intervals.
Chlamydia screening and treatment reduces sequelae

Reported cases of *Chlamydia trachomatis*
San Francisco women, 1993–2004

Reported pelvic inflammatory disease cases
San Francisco County, 1993–2004

Ectopic pregnancies
San Francisco General Hospital 1993–2004

44 year old man with new lesion near his anus
### Differential diagnosis of anogenital ulcer

<table>
<thead>
<tr>
<th>Sexually transmitted diseases</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Primary syphilis</td>
<td>• Fixed drug reactions</td>
</tr>
<tr>
<td>• Genital herpes</td>
<td>• Skin flora infections</td>
</tr>
<tr>
<td>• Chancroid</td>
<td>• Autoimmune conditions</td>
</tr>
</tbody>
</table>

- [Differential diagnosis of anogenital ulcer](#)
1000x darkfield microscopy

*Treponema pallidum pallidum*, bacterial spirochete
All those syphilis tests

- Non-treponemal tests (RPR, VDRL)
  - Antibody to cardiolipin-lecithin-phospholipids
  - Rise and fall with infection and treatment over time
  - 4-fold change in titer (1:2 to 1:8 or 1:64 to 1:16) is significant
  - Specificity = 98% (false-positives in IDU, auto-immune, etc)

- Treponemal tests (FTA-Abs, TPPA, TP EIA)
  - Antibody to Treponemal antigen
  - More sensitive and develop earlier
  - Stay positive for “life” (85%)
  - Indicate past or current infection
Primary syphilis – penile chancre
Secondary syphilis: trunk rash
Secondary syphilis: palmar and plantar lesions
Secondary syphilis: split papules, “moth-eaten” alopecia, mucous patches, and *condyloma lata*
Latent syphilis
Syphilis—Reported Cases by Stage of Infection, United States, 1941–2012

Cases (in thousands)

Year

Primary and Secondary Syphilis—Rates by Age and Sex, United States, 2012

<table>
<thead>
<tr>
<th>Age</th>
<th>Rate (per 100,000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
</tr>
<tr>
<td>10-14</td>
<td>0.0</td>
</tr>
<tr>
<td>15-19</td>
<td>0.7</td>
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<td>20-24</td>
<td>3.2</td>
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<td>25-29</td>
<td>3.2</td>
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<td>30-34</td>
<td>1.8</td>
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<td>35-39</td>
<td>0.7</td>
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<tr>
<td>40-44</td>
<td>0.1</td>
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<tr>
<td>45-54</td>
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<tr>
<td>55-64</td>
<td>0.1</td>
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<tr>
<td>65+</td>
<td>0.0</td>
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<tr>
<td>Total</td>
<td>0.9</td>
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</table>
Primary and Secondary Syphilis—Rates by Race/Ethnicity, United States, 2008–2012

Rate (per 100,000 population)

Year

2008  2009  2010  2011  2012

* Al/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiian and Other Pacific Islanders.

Primary & Secondary
and Latent < 1 year syphilis treatment

HIV (-)/(+)  2.4 million units of benzathine penicillin G-LA
Pregnant        2.4 million units of benzathine penicillin G-LA
PCN-allergic:
HIV(-)/(+)  doxycycline 100 mg po bid x 14 d
Pregnant        desensitize, then benzathine penicillin G-LA

• **Prophylactic treatment:** All contacts to syphilis within past 90 days should be treated regardless of serologic test result with benzathine penicillin G 2.4 MU IM once

CDC STD Treatment Guidelines, 2010
Syphilis and HIV infection

- Multiple chancres
- May present with overlapping primary and secondary manifestations
- Rarely abnormal serology but slower decline
- Increased risk neurosyphilis

Syphilis increases HIV viral load and decreases CD4 cell counts in HIV-infected patients with new syphilis infections

Kate Buchacz\textsuperscript{a,b}, Pragna Patel\textsuperscript{a,b}, Melanie Taylor\textsuperscript{c,d}, Peter R. Kerndt\textsuperscript{d}, Robert H. Byers\textsuperscript{b}, Scott D. Holmberg\textsuperscript{b}, Jeffrey D. Klausner\textsuperscript{e,f}

Fig. 1. Changes in HIV viral load associated with syphilis infection and syphilis treatment, according to the stage of syphilis. B–D, ‘Before-to-during’; D–A, ‘during-to-after’; S1, primary syphilis; S2, secondary syphilis. Boxplots show medians and upper and lower quartiles, whiskers encompass the extent of the data. Means are represented by filled circles.
GET TESTED FOR SYPHILIS

www.healthypenis.org 415.487.5580

San Francisco, early 2000s

San Francisco, 2009

Texas

You can have syphilis and not know it. I suggest testing every 3-6 months.

GOT A RASH ON YOUR HAND?
TAKE ONE OF THESE.

Syphilis is a sexually transmitted disease that may not appear if it is passed on your genitals, then a rash on your hands, but sometimes there are no symptoms at all. The only way to be sure is to have a test at a health center and get help if you have it.
Increasing cases of azithromycin treatment failure

Associated with clinical and experimental treatment failure

**Single point mutation in 23S rRNA**

**Figure 1. Sequence Analysis of the 23S rRNA Gene in Selected Strains of Treponema pallidum.**

Only the portion of the sequence of the 23S rRNA gene containing the mutation is shown; the A→G mutation (indicated in bold type) is located at the position cognate to A2058 in the 23S rRNA gene in Escherichia coli. CA denotes San Francisco, Dub Dublin, and UW Seattle.

<table>
<thead>
<tr>
<th>T. pallidum Strain</th>
<th>23S rRNA Gene</th>
<th>Mutation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nichols</td>
<td>TAGACGGAAAGACCCC</td>
<td>Wild type</td>
</tr>
<tr>
<td>Street 14</td>
<td>TAGACGGAAAGACCCC</td>
<td>A→G</td>
</tr>
<tr>
<td>CA 42</td>
<td>TAGACGGAAAGACCCC</td>
<td>A→G</td>
</tr>
<tr>
<td>CA 61</td>
<td>TAGACGGAAAGACCCC</td>
<td>A→G</td>
</tr>
<tr>
<td>Dub 21</td>
<td>TAGACGGAAAGACCCC</td>
<td>A→G</td>
</tr>
<tr>
<td>Dub 25</td>
<td>TAGACGGAAAGACCCC</td>
<td>A→G</td>
</tr>
<tr>
<td>Dub 58</td>
<td>TAGACGGAAAGACCCC</td>
<td>A→G</td>
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<tr>
<td>Dub 49</td>
<td>TAGACGGAAAGACCCC</td>
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<tr>
<td>UW 133</td>
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<td>A→G</td>
</tr>
<tr>
<td>UW 157</td>
<td>TAGACGGAAAGACCCC</td>
<td>A→G</td>
</tr>
</tbody>
</table>
Nichols (WT) and Street 14 (AzR-mutant) RT PCR melting curves
Azithromycin-resistant syphilis
San Francisco, 2000-2004

NEJM Policy Debate, 2005-2006


CDC recommends against the use of azithromycin in syphilis in STD treatment guidelines, 2006 and in 2010
Case

35 y transwoman presents with sores on her “thing”

She noticed them about 2 days ago. They are painful. She is HIV-infected on ART and is followed regularly
Genital herpes

*Human herpes simplex virus type-1 and -2*

Mostly asymptomatic, “unrecognized”

Penis, Cervix, Urethra, Anus, Rectum, Vagina

Prevalence of HSV-2 type-specific antibody in U.S., 2005-2008

16.1% HSV-2

Includes all races, both genders, aged 12 years and older

NHANES, 2005-2008, CDC STD Division
Progression of Herpes Lesions

- Early Redness/Swelling
- Thin-Walled Fluid-Filled Vesicles and Pustules
- Early Healing of Vesicles, Erosions, or Ulcers
- Crusting
- Scabbing
- Healed Skin
## Detection of herpes infection

<table>
<thead>
<tr>
<th>Method</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture</td>
<td>70%</td>
<td>100%</td>
</tr>
<tr>
<td>PCR</td>
<td>90%</td>
<td>100%</td>
</tr>
<tr>
<td>EIA</td>
<td>95%</td>
<td>95%</td>
</tr>
<tr>
<td>Western blot</td>
<td>95%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Typical and atypical herpes manifestations in men

Grouped vesicles
Typical and atypical herpes manifestations in female
Key counseling messages in genital herpes

1. Herpes is common: 1 in 6
2. Infection is often asymptomatic
3. Transmission is sexual and often when partners are asymptomatic
4. Spread can be reduced with symptom recognition, avoidance of sex when symptomatic, condom use and suppressive therapy
5. Tell partners: most will cope
Treatment of Genital Herpes

Famciclovir [Famvir®]
- 500 mg
- 250 mg
- 125 mg

Valacyclovir [Valtrex®]
- 1 g
- 500 mg

Acyclovir [Zovirax®]
- 800 mg
- 600 mg
- 200 mg

Valtrex® and Zovirax® are registered trademarks of GlaxoSmithKline.
Condoms Reduce HSV Transmission

• 528 monogamous couples discordant for HSV-2 infection were followed for 18 months.
  – Condom use during more than 25% of sex acts was associated with 92% reduction in HSV-2 acquisition for women

• 1862 persons in HSV-2 vaccine study followed for 18 months.
  – Condom use during more than 65% of sex acts was associated with a 34% reduction in HSV-2 acquisition in women, 41% reduction in men, and 58% in gay men.

Suppressive Therapy Reduces Transmission

- 743 source partners received valacyclovir
- 741 received placebo
- Daily valacyclovir reduced incidence of symptomatic genital HSV-2 infection in partner by 77%
  - acquisition of any HSV-2 infection by 50%

Case

- 32 y female seen w/ new vaginal discharge
- Reports no new sex partners, monogamous for > 5 years
Differential diagnosis of vaginal discharge

• **Infectious**
  Vaginitis
  *Trichomonas vaginalis*
  Bacterial vaginosis
  *Candida albicans* and other
  Cervicitis
  *Neisseria gonorrhoeae*
  *Chlamydia trachomatis*
  *Herpes simplex* virus 1 and 2

• **Non-infectious**
  Mechanical, chemical or allergic irritation
Trichomoniasis

*Trichomonas vaginalis*

Vagina
Cervix
Urethra
Detection of *T. vaginalis* infection

<table>
<thead>
<tr>
<th>Method</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet mount</td>
<td>40-80%</td>
<td>90%</td>
</tr>
<tr>
<td>Culture</td>
<td>95%</td>
<td>99%</td>
</tr>
<tr>
<td>EIA</td>
<td>90-95%</td>
<td>93-100%</td>
</tr>
<tr>
<td>PCR</td>
<td>95%</td>
<td>99%</td>
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</tbody>
</table>
Treatment of trichomoniasis

<table>
<thead>
<tr>
<th>Metronidazole</th>
<th>Cure rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 gm po x 1</td>
<td>95%</td>
</tr>
<tr>
<td>500 mg po bid x 5-7</td>
<td>95%</td>
</tr>
</tbody>
</table>

Partner management—Treat partners

Prevalence of Trichomonas vaginalis among non-Hispanic black women, compared with the prevalence among women from all other racial/ethnic groups, by age, 2001–2004

Case

22 year old sexually active women c/o new bumps on her vagina. She reports a new partner over the past 3 months with rare condom use.

On physical exam you see multiple warty lesions
Exophytic lesions

condylomata lata
syphilis

condylomata acuminata
HPV warts
External genital warts

- *Human papilloma virus, types 6, 11*
- Vagina, cervix, penis, urethra, anus/rectum
- Diagnosis by visual inspection—80% accurate
- Up to 70% sexually active adults exposed to HPV
Provider-applied treatment for external genital warts

<table>
<thead>
<tr>
<th>Medication</th>
<th>Cure rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cryotherapy liquid nitrogen</td>
<td>50%</td>
</tr>
<tr>
<td>TCA/BCA 80-90%</td>
<td>50%</td>
</tr>
<tr>
<td>Surgical excision</td>
<td>50%</td>
</tr>
<tr>
<td>Patient applied podofilox</td>
<td>70%</td>
</tr>
<tr>
<td>Patient applied imiquimod</td>
<td>70%</td>
</tr>
</tbody>
</table>
HPV and immunization

- 2392 women allocated to HPV-16 vaccine or placebo
  - 0% HPV incidence vs. 3.8 per 100 person-years
    Koutsky L et al. NEJM, November 2002

- Gardasil (HPV 6,11,16,18) FDA-approved
- Cervarix (HPV 16, 18) FDA-approved

- HPV immunization recommended in 11 & 12 year old boys and girls, and approved for ages 9-26 years.
HPV and anal cancer

- Anal cancer rates in gay men about 35-50/100,000 per year
  - Increased in HIV-infected, 50-100/100,000 per year
- Anal PAP smear screening may detect early disease
- No evidence routine anal PAP screening reduces disease incidence
- Current screening recommendations vary, no national recommendations
Study Adds to Evidence That HPV Vaccine Helps Guard Against Cervical Cancer

By Mary Brophy Marcus, HealthDay News

Large population of Australian women were protected to some degree after vaccination, researchers report.

Tuesday, March 04, 2014

A new study offers more evidence that the human papillomavirus (HPV) vaccine is a powerful weapon in the fight against cervical cancer.

In a study that examined the vaccine’s effectiveness in a large population of Australian women, the University of Queensland researchers claim their finding suggests HPV vaccination is effective when given to a broad swath of individuals.
Hot & Healthy Investigation

Chances are, Prigo picked up HPV pretty soon after she started having sex. As is common, the vast majority of the population will contract it during their teens. Most of the cases are asymptomatic, quietly remaining in the body without causing any harm. But a few of them will work their way into normal tissues, eventually growing into harmful cells that can lead to cancer. Prigo tested positive for a high-risk strain.

Whether this is the way doctors turned off part of their service—she reads, "smokers and the ever so slight smell of burning (huh?)"—Prigo is determined to explain. She didn't have the HP vaccine earlier and why so many women and girls need it, and how to avoid it. She's aware that it's a hard pill to swallow because of the widespread belief that it's not enough.

The vaccine protects against 16 types of HPV, which can lead to cervical cancer and other diseases. The vaccine is recommended for all girls and boys aged 11 to 12 years old, and it's also recommended for those aged 13 to 26 years old who haven't been vaccinated earlier. The vaccine can be administered in two doses, with the second dose given 6 to 12 months after the first.

What about warts?

If the vaccine is effective in preventing cervical cancer, it darn well better be effective at preventing warts. The vaccine is recommended for all girls and boys aged 11 to 12 years old, and it's also recommended for those aged 13 to 26 years old who haven't been vaccinated earlier. The vaccine can be administered in two doses, with the second dose given 6 to 12 months after the first.

Are fever blisters on the mouth HPVs?

No. Fever blisters are caused by the herpes simplex virus and have no relation to HPV.

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Hot & Healthy Investigation

mental retardation. (That last overstatement by Representative Linda Birdout, describing an encounter with a random man who was never found, was a controversial show a few months ago. The Georgia senator interviewed a man who believed his daughter died because of the Gardasil shot, as well as Diane Harper, MD, an HPV researcher at the University of Louisville who claims the proportion is up to 30 years.)

It’s hard to read about the HPV vaccine without coming across with posts about Dr. Harper, who, while a researcher at the University of Louisville, was involved in the key clinical trials of both Gardasil and Cervarix. Does the developer, a particularly hard-line chiropractor, claim in his blog post about that this was going to wipe out a disease?” she adds. Her enthusiasm seems dampened as she begins to question whether the vaccine would offer protection that would last long enough to prevent an infection in the future. But, in the future, and when it becomes clear that the vaccine is effective, the shot becomes less risky. A Facebook-ready anecdote is born.

What are my odds of getting cervical cancer?

They’re really low if you have HPV. Thanks to regular Pap tests, cervical cancer has gone down more than 50 percent in 30 years. The vast majority of precancerous lesions can be caught and treated before they turn into invasive cancer.” says Christine Chu, MD, et al. Penn.

The largest study so far—published in October in the British Medical Journal—found absolutely no risk of serious side effects.

Will HPV make it harder to get pregnant?

No. But procedures that remove infected tissue from your cervix, like LEEP and cone biopsies, may increase your risk for prematurity. That’s why you should discuss the risks with your doctor before these procedures.

Can the blemished vaccine be removed?

Public health officials are trying primarily by washing out doctors through health department, physician associations, and word of mouth. Pediatrician Todd Parker, MD, of Myrtle Beach, South Carolina, is urging his colleagues to take discussions seriously. “If you’re giving vaccine to prevent disease, we have vaccines for why not use one? We’re about prevention. That’s cancer.” He says. In other words: “It’s not that there are no efforts to ensure that patients get the first shot; it’s just that there are no specific efforts to ensure that patients get the first shot. “It’s just not that there are no efforts,” Parker says. “It’s just that there are no specific efforts.”

Can a virgine have HPV?

Yes. As Dr. Chu, the University of California, San Francisco, who is a co-investigator of the landmark Gardasil study, says: “If you’re diabetic, you’re going to have a higher risk of developing cancer.”

De condoms protect me?

Condoms are not designed to provide 100 percent protection, but they do dramatically lower your risk.

Will having only anal sex help me avoid HPV?

No. (Mostly if you can be treated for some of the other, non-sex, non-anal sex infections that lead to HPV—such as herpes, gonorrhea, and HIV—then the vaccine can prevent HPV.

Can I make oral safer?

Being in love-as and avoiding oral sex is not always the best way to prevent the risk of getting HPV from oral sex, a study in Cancer Prevention Research shows.

Do you have to tell my gay? Your risk. If you don’t tell your gay, you don’t risk your health. The vaccine can prevent HPV, but it’s not 100 percent effective.
Summary

- STDs are common
- Similar epidemiology—young, minority (racial/ethnic and sexual)
- Solutions through:
  - Medical science—vaccines, treatments
  - Laboratory science—diagnostics
  - Social science—complicated
Sources for more STD information

• Me
  – JDKlausner@mednet.ucla.edu

• CDC
  – www.cdc.gov/std

• Current STD Management Textbook
Thank you