Sexually Transmitted Infections Update 2019

Ryan Dare M.D.
Assistant Professor of Medicine
Division of Infectious Diseases
University of Arkansas for Medical Sciences

10/25/2019
• No Conflicts of Interest
Case in my HIV clinic

HPI: 35yo M with well controlled HIV presents for routine visit. No acute complaints. No new medical problems. Tolerating HIV meds well. Stopped smoking. Depression improved on SSRI.

PE: VSS, AAO, RRR, CTAB, no new rash

Assessment: HIV follow up doing well.

Plan:
- Obtain CD4, HIV VL, CBC with diff, BMP, LFTs
- Influenza vaccination
- Refill ART (biktarvy)
- Follow up in clinic in 6 months

Labs:
- CBC: WBC 8K  HCT 43%  Plts 215K
- SCr: 1.0
- **AST 100  ALT 125**  Tbili 1.2 (3m prior AST 24 ALT 29 T bili 1.1)

Plan #2:
- Hold biktarvy and repeat LFTs in 2 weeks

Labs 2 weeks after visit:
- **AST 350  ALT 399**  Tbili 1.1
Follow up visit 4 weeks after initial visit:

• 2 weeks prior to initial visit, reports viral syndrome with new ulcerative anal lesion (now gone) after developing multiple new sex partners.

• Exam: Rash on palms and soles

• Labs:
  – AST 497   ALT 450   Tbili 1.1
  – RPR 1:64 (previously Neg)
  – Hepatitis C Ab positive; HCV viral load 1,800,000 (previously Neg)

Assessment:
• 35yo M with HIV with high risk sexual behavior presenting with secondary syphilis and acute hepatitis C

Plan:
• Restart Biktarvy
• Treat Secondary syphilis with 2.4MU Pen-G 2.4MU IM x1
• Monitor LFTs during and refer to Hepatology if does not clear in 6m
• Ask about sexual behavior in future during clinic visits....
The Five P’s: Partners, Practices, Prevention of Pregnancy, Protection from STDs, and Past History of STDs

1. Partners
   • “Do you have sex with men, women, or both?”
   • “In the past 2 months, how many partners have you had sex with?”
   • “In the past 12 months, how many partners have you had sex with?”
   • “Is it possible that any of your sex partners in the past 12 months had sex with someone else while they were still in a sexual relationship with you?”

2. Practices
   • “To understand your risks for STDs, I need to understand the kind of sex you have had recently.”
   • “Have you had vaginal sex, meaning ‘penis in vagina sex’?” If yes, “Do you use condoms: never, sometimes, or always?”
   • “Have you had anal sex, meaning ‘penis in rectum/anus sex’?” If yes, “Do you use condoms: never, sometimes, or always?”
   • “Have you had oral sex, meaning ‘mouth on penis/vagina’?”
   • For condom answers:
     If “never”: “Why don’t you use condoms?”
     If “sometimes”: “In what situations (or with whom) do you use condoms?”

3. Prevention of pregnancy
   • “What are you doing to prevent pregnancy?”

4. Protection from STDs
   • “What do you do to protect yourself from STDs and HIV?”

5. Past history of STDs
   • “Have you ever had an STD?”
   • “Have any of your partners had an STD?”
   Additional questions to identify HIV and viral hepatitis risk include:
   • “Have you or any of your partners ever injected drugs?”
   • “Have your or any of your partners exchanged money or drugs for sex?”
   • “Is there anything else about your sexual practices that I need to know about?”
Sexually Transmitted Infections (STIs)

- HSV
- HPV
- HIV
- *Chlamydia trachomatis*
- Pediculosis pubis
- *Mycoplasma genitalium*
- Syphilis
- Trichomoniasis
- BV
- Scabies
- Mulloscum contagiosum
- HTLV-1

- *Haemophilus ducreyi*
- *Klebsiella granulomatis*
- HAV
- HBV
- HCV
- Zika virus
- *Neisseria gonorrhoeae*
- Vaginal candidiasis
- LGV
- EBV
- CMV
If we were in Vegas...

The State of STDs in the United States in 2018

STDs surge for the fifth straight year, reaching an all-time high.

1.8 million cases of chlamydia
19% rate increase since 2014

583,405 cases of gonorrhea
63% rate increase since 2014

115,045 cases of syphilis
71% rate increase of infectious syphilis since 2014

1,306 cases of syphilis among newborns
185% rate increase since 2014

Learn more at: www.cdc.gov/std/
Sexually Transmitted Infections (STIs)

- HSV
- HPV
- HIV
- **Chlamydia trachomatis**
- Pediculosis pubis
- *Mycoplasma genitalium*
- Syphilis
- Trichomoniasis
- BV
- Scabies
- Mulloiscum contagiosum
- HTLV-1

- *Haemophilus ducreyi*
- *Klebsiella granulomatis*
- HAV
- HBV
- HCV
- Zika virus
- *Neiserria gonorrhoeae*
- Vaginal candidiasis
- LGV
- EBV
- CMV
Chlamydia

- Typically asymptomatic

- Cervicitis, Urethritis, PID (if untreated)

- Treatment:
  - Azithromycin 1g x1 or Doxy 100mg PO BID x7d
  - Alt: Erythromycin base 500mg PO QID x7d
  - Alt: Levofloxacin 500mg qd x7d

- Refer partners (60d) for presumptive treatment
Chlamydia

• Most common reported disease in USA

• 1,758,000 cases in 2018 (Rate: 540 per 100K)
  - Arkansas rate 588 (#11)
  - Arkansas female rate 819 (#9)

• Highest incidence and rate ever recorded

• African American and Native Americans with highest rates
Figure 1. Chlamydia — Rates of Reported Cases by Sex, United States, 2000–2018

* Rate*: Per 100,000.

**NOTE**: See sections A1.3 and A1.8 in the Appendix for more information on chlamydia case reporting and interpreting trends in chlamydia case reports.
Figure 3. Chlamydia — Rates of Reported Cases by State and Territory, United States, 2018

* Per 100,000.

NOTE: See Section A1.11 in the Appendix for more information on interpreting reported rates in US territories.
Figure 4. Chlamydia — Rates of Reported Cases by County, United States, 2018

Rate*

- 0–194
- 195–278
- 279–378
- 379–559
- 560–5,216

* Per 100,000.

NOTE: See section A1.5 in the Appendix for more information on county-level rates.

https://www.cdc.gov/std/stats18/default.htm
Figure 5. Chlamydia — Rates of Reported Cases by Age Group and Sex, United States, 2018

Male Rate*

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–14</td>
<td>959.0</td>
</tr>
<tr>
<td>15–19</td>
<td>216.5</td>
</tr>
<tr>
<td>20–24</td>
<td>651.3</td>
</tr>
<tr>
<td>25–29</td>
<td>370.4</td>
</tr>
<tr>
<td>30–34</td>
<td>1,134.7</td>
</tr>
<tr>
<td>35–39</td>
<td>1,784.5</td>
</tr>
<tr>
<td>40–44</td>
<td>13.6</td>
</tr>
<tr>
<td>45–54</td>
<td>380.6</td>
</tr>
<tr>
<td>55–64</td>
<td>Total</td>
</tr>
<tr>
<td>65+</td>
<td>7.4</td>
</tr>
</tbody>
</table>

Female Rate*

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–14</td>
<td>92.9</td>
</tr>
<tr>
<td>15–19</td>
<td>750.2</td>
</tr>
<tr>
<td>20–24</td>
<td>1,726.2</td>
</tr>
<tr>
<td>25–29</td>
<td>363.9</td>
</tr>
<tr>
<td>30–34</td>
<td>176.6</td>
</tr>
<tr>
<td>35–39</td>
<td>66.0</td>
</tr>
<tr>
<td>40–44</td>
<td>18.5</td>
</tr>
<tr>
<td>45–54</td>
<td>2.3</td>
</tr>
<tr>
<td>55–64</td>
<td>692.7</td>
</tr>
<tr>
<td>65+</td>
<td>Total</td>
</tr>
</tbody>
</table>

* Per 100,000.

https://www.cdc.gov/std/stats18/default.htm
Figure 8. Chlamydia — Rates of Reported Cases by Race/Hispanic Ethnicity, United States, 2014–2018

Rate*

1,200

800

400

0

2014

2016

2018

Year

Blacks

AI/AN

NHOPKI

Hispanics

Whites

Multirace

Asians

* Per 100,000.

NOTE: See Section A1.5 in the Appendix for information on reporting STD case data for race/Hispanic ethnicity.

ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPKI = Native Hawaiians/Other Pacific Islanders.
Chlamydia Screening

• Women:
  – <25yo sexually active (annually)
  – >25yo sexually active new/multiple partners (annually)
  – Pregnant: <25yo, increased risk, retest 3rd trimester
  – HIV+ (annually)
  – Test of cure 3m post treatment (3 wks if pregnant)

• Men:
  – Consider if young and sexually active
  – MSM site specific (annually)
  – HIV+ (annually)

www.cdc.gov/std/tg2015/screening-recommendations.htm
Sexually Transmitted Infections (STIs)

- HSV
- HPV
- HIV
- *Chlamydia trachomatis*
- Pediculosis pubis
- *Mycoplasma genitalium*
- Syphilis
- Trichomoniasis
- BV
- Scabies
- Mullocsum contagiosum
- HTLV-1

- *Haemophilus ducreyi*
- *Klebsiella granulomatis*
- HAV
- HBV
- HCV
- Zika virus
- *Neisseria gonorrhoeae*
- Vaginal candidiasis
- LGV
- EBV
- CMV
Gonorrhea:
Gram Stain of Urethral Discharge

Source: CDC/NCHSTP/Division of STD Prevention, STD Clinical Slides
Gonorrhea

• Gram Negative Diplococci

• Urethritis and Cervicitis->PID

• Disseminated gonococcal Infection (DGI)
  – Only about 50% of patients with DGI have positive blood or synovial fluid cultures; in at least 80% of cases culture from a mucosal site is positive.
  
  – Arthritis-Dermatitis: Polyarthralgias, tenosynovitis, Hemorrhagic papules and pustules, fever may be mild or absent, more likely to have positive blood cultures
  
  – Septic Arthritis: Overt septic arthritis in one or 2 joints as dermatitis resolves some patients present without preceding rash. Synovial fluid contains >50,000 WBC/mm³, more likely to have positive synovial fluid cultures
DGI Dermatitis-Arthritis
Disseminated Gonococcal Infection
Gonorrhea Diagnosis: Nucleic Acid Amplification Tests (NAATs)

- Supplanted culture in most clinical settings

- Based on a variety of methods, including transcription-mediated amplification

- Sensitivity is at least as good as culture; sometimes better

- Specificity is >99% with voided urine

- Particularly useful when the assay detects both gonorrhea and Chlamydia
Gonorrhea — Rates of Reported Cases by Year, United States, 1941–2018

Rate* vs. Year

* Per 100,000.

NOTE: See section A1.3 in the Appendix for more information on gonorrhea case reporting.
Gonorrhea Incidence 2018:

- 583,405 US cases (Rate: 179.1 per 100K)
  - Arkansas rate 243 per 100K (#8)

https://www.cdc.gov/std/stats18/default.htm
Gonorrhea — Rates of Reported Cases by County, United States, 2018

* Per 100,000.

NOTE: See section A1.4 in the Appendix for more information on county-level rates.
Gonorrhea — Rates of Reported Cases by Age Group and Sex, United States, 2018

**Male Rate***

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Rate Per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–14</td>
<td>4.8</td>
</tr>
<tr>
<td>15–19</td>
<td>320.5</td>
</tr>
<tr>
<td>20–24</td>
<td>316.1</td>
</tr>
<tr>
<td>25–29</td>
<td>200.5</td>
</tr>
<tr>
<td>30–34</td>
<td>120.0</td>
</tr>
<tr>
<td>35–39</td>
<td>120.0</td>
</tr>
<tr>
<td>40–44</td>
<td>9.0</td>
</tr>
<tr>
<td>45–54</td>
<td>212.8</td>
</tr>
<tr>
<td>55–64</td>
<td>51.3</td>
</tr>
<tr>
<td>65+</td>
<td>9.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>212.8</strong></td>
</tr>
</tbody>
</table>

**Female Rate***

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Rate Per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–14</td>
<td>21.3</td>
</tr>
<tr>
<td>15–19</td>
<td>548.1</td>
</tr>
<tr>
<td>20–24</td>
<td>427.2</td>
</tr>
<tr>
<td>25–29</td>
<td>427.2</td>
</tr>
<tr>
<td>30–34</td>
<td>248.3</td>
</tr>
<tr>
<td>35–39</td>
<td>139.1</td>
</tr>
<tr>
<td>40–44</td>
<td>74.3</td>
</tr>
<tr>
<td>45–54</td>
<td>28.6</td>
</tr>
<tr>
<td>55–64</td>
<td>7.7</td>
</tr>
<tr>
<td>65+</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>145.8</strong></td>
</tr>
</tbody>
</table>

* Per 100,000.
Gonorrhea — Estimated* Rates of Reported Gonorrhea Cases by MSM, MSW, and Women, STD Surveillance Network (SSuN)†, 2010–2018

* Estimates based on interviews among a random sample of reported cases of gonorrhea (n=21,417); cases weighted for analysis. Data not available for 2014; 2013–2015 trend interpolated; trends lines overlap for MSW and women in this figure.

† Sites include Baltimore, Philadelphia, New York City, Washington State, San Francisco, and California (excluding San Francisco).

‡ Per 100,000.


ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only.
Gonorrhea — Rates of Reported Cases by Race/Hispanic Ethnicity, United States, 2014–2018

* Per 100,000.

NOTE: See Section A1.5 in the Appendix for information on reporting STD case data for race/Hispanic ethnicity.

ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPi = Native Hawaiians/Other Pacific Islanders.
Gonorrhea Treatment

• Recently, increase in ceftriaxone resistance has changed recommendation to dual therapy

  – Preferred Regimen:
    • Ceftriaxone 250mg IM x1 + Azithromycin 1g PO x1

  – Alternative:
    • Gemifloxacin 320mg PO x1 + Azithromycin 1g PO x1
Neisseria gonorrhoeae — Prevalence of Tetracycline, Penicillin, or Fluoroquinolone Resistance* or Elevated Cefixime, Ceftriaxone, or Azithromycin Minimum Inhibitory Concentrations (MICs)†, by Year — Gonococcal Isolate Surveillance Project (GISP), 2000–2018

* Resistance = Fluoroquinolone (ciprofloxacin): MIC ≥ 1.0 µg/mL; Penicillin: MIC ≥ 2.0 µg/mL or Beta-lactamase positive; Tetracycline: MIC ≥ 2.0 µg/mL.
† Elevated MICs = Azithromycin: MIC ≥ 1.0 µg/mL (2000–2004), MIC ≥ 2.0 µg/mL (2005–2018); Ceftriaxone: MIC ≥ 0.125 µg/mL; Cefixime: MIC ≥ 0.25 µg/mL.
NOTE: Cefixime susceptibility was not tested in 2007 and 2008.
Neisseria gonorrhoeae — Percentage of Isolates with Elevated Minimum Inhibitory Concentrations (MICs) to Azithromycin, Cefixime, and Ceftriaxone, Gonococcal Isolate Surveillance Project (GISP), 2009–2018

NOTE: Elevated MIC = Azithromycin: ≥ 2.0 μg/mL; Cefixime: ≥ 0.25 μg/mL; Ceftriaxone: ≥ 0.125 μg/mL.
Gonorrhea Screening

• Women:
  – Sexually active <25yo or older if high risk
  – Retest 3 months s/p treatment

• Pregnant:
  – All pregnant women <25yo or older if high risk
  – Retest 3 months s/p treatment

• MSM:
  – Annually if sexually active (site specific)
  – Every 3-6m if high risk

• HIV:
  – First visit then annually if sexually active

www.cdc.gov/std/tg2015/screening-recommendations.htm
Sexually Transmitted Infections (STIs)

- HSV
- HPV
- HIV
- *Chlamydia trachomatis*
- Pediculosis pubis
- *Mycoplasma genitalium*
- **Syphilis**
- Trichomoniasis
- BV
- Scabies
- *Molluscum contagiosum*
- HTLV-1

- *Haemophilus ducreyi*
- *Klebsiella granulomatis*
- HAV
- HBV
- HCV
- Zika virus
- *Neisseria gonorrhoeae*
- Vaginal candidiasis
- LGV
- EBV
- CMV
Who is Getting Syphilis?

Primary and Secondary Syphilis — Rates of Reported Cases by Age Group and Sex, United States, 2018

Male Rate*

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–14</td>
<td>0.1</td>
</tr>
<tr>
<td>15–19</td>
<td>10.9</td>
</tr>
<tr>
<td>20–24</td>
<td>33.7</td>
</tr>
<tr>
<td>25–29</td>
<td>44.6</td>
</tr>
<tr>
<td>30–34</td>
<td>55.7</td>
</tr>
<tr>
<td>35–39</td>
<td>18.7</td>
</tr>
<tr>
<td>40–44</td>
<td>8.8</td>
</tr>
<tr>
<td>45–54</td>
<td>23.9</td>
</tr>
<tr>
<td>55–64</td>
<td>45.8</td>
</tr>
<tr>
<td>65+</td>
<td>10.9</td>
</tr>
<tr>
<td>Total</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Female Rate*

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–14</td>
<td>10.0</td>
</tr>
<tr>
<td>15–19</td>
<td>9.4</td>
</tr>
<tr>
<td>20–24</td>
<td>7.5</td>
</tr>
<tr>
<td>25–29</td>
<td>5.8</td>
</tr>
<tr>
<td>30–34</td>
<td>3.6</td>
</tr>
<tr>
<td>35–39</td>
<td>5.8</td>
</tr>
<tr>
<td>40–44</td>
<td>2.0</td>
</tr>
<tr>
<td>45–54</td>
<td>0.7</td>
</tr>
<tr>
<td>55–64</td>
<td>0.1</td>
</tr>
<tr>
<td>65+</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Centers for Disease Control and Prevention: STD Surveillance 2018
Who is Getting Syphilis?

Primary and Secondary Syphilis — Distribution of Cases by Sex and Sex of Sex Partners, United States, 2018

- Men who have sex with men only (n = 16,905) - 48%
- Men who have sex with women only (n = 5,416) - 15%
- Men who have sex with men and women (n = 1,855) - 5%
- Men without data on sex of sex partners (n = 5,858) - 17%
- Women (n = 4,995) - 14%
- Cases with unknown sex (n = 34) - 0%

CDC
Primary and Secondary Syphilis — Rates of Reported Cases by Region, United States, 2009–2018

Rate*

Year

2009 2012 2015 2018

West
South
Northeast
Midwest

* Per 100,000.
Primary and Secondary Syphilis — Rates of Reported Cases by Race/Hispanic Ethnicity, United States, 2014–2018

NOTE: See Section A1.5 in the Appendix for information on reporting STD case data for race/Hispanic ethnicity.

ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPi = Native Hawaiians/Other Pacific Islanders.
Primary and Secondary Syphilis — Rates of Reported Cases by State and Territory, United States, 2018

NOTE: Section A1.11 in the Appendix for more information on interpreting reported rates in US territories.
In 2018, 1,498 (47.7%) of 3,142 counties in the United States reported no cases of primary and secondary syphilis. See section A1.4 in the Appendix for more information on county-level rates.
Congenital Syphilis — Reported Cases by Year of Birth and Rates of Reported Cases of Primary and Secondary Syphilis Among Females Aged 15–44 Years, United States, 2009–2018

* Per 100,000.

ACRONYMS: CS = Congenital syphilis; P&S = Primary and secondary syphilis.
Natural History of Syphilis

Exposure
- Primary incubation: 10–90 days from exposure

Primary syphilis
- Chancre formation

Secondary incubation
- Secondary incubation: 4–10 weeks after appearance of chancre

CNS invasion
- CNS invasion: 25%–60%

Early neurosyphilis

Asymptomatic

Symptomatic
- Meningitis
- Cranial neuritis
- Ocular involvement
- Meningovascular disease

Infectious via sexual or mother-to-child transmission

Recurrence (24%)

Secondary syphilis

Early latent syphilis
- Asymptomatic
- ≤1 year postinfection

Late latent syphilis
- Asymptomatic
- >1 year postinfection

Noninfectious

Cardiovascular syphilis
- (10%)
- Onset 20–30 years after infection

Gummatous disease
- (15%)
- Onset 1–46 years after infection

Tertiary syphilis

Tertiary syphilis

Late neurosyphilis
- General paresis
- (2%–5%)
- Onset 2–30 years after infection

- Tabes dorsalis
- (2%–8%)
- Onset 3–50 years after infection
Primary Syphilis

- Primary lesion or "chancre" develops at the site of inoculation

- Chancre:
  - Progresses from macule to papule to ulcer
  - Typically painless, indurated, and has a clean base
  - Highly infectious
  - Heals spontaneously within 1 to 6 weeks
  - 25% present with multiple lesions

- Regional lymphadenopathy: classically rubbery, painless, bilateral

- Serologic tests for syphilis may not be positive during early primary syphilis
Primary Syphilis - Penile Chancre

Source: CDC/NCHSTP/ Division of STD Prevention, STD Clinical Slides
Primary Syphilis- Labial Chancres
Primary Syphilis - Tongue

Source: CDC/ NCHSTP/ Division of STD Prevention /STD Clinical Slides
Primary Syphilis
Secondary Syphilis Rash

Courtesy of S. Stroud
Secondary Syphilis – Nickel/Dime Lesions

Source: CDC/ NCHSTP/ Division of STD Prevention, STD Clinical Slides
Secondary Syphilis - Condylomata lata

Source: CDC/ NCHSTP/ Division of STD Prevention, STD Clinical Slides
Secondary Syphilis - Alopecia

Source: CDC/ NCHSTP/ Division of STD Prevention, STD Clinical Slides
Darkfield Microscopy

• What to look for:
  – *T. pallidum* morphology and motility

• Advantage:
  – Definitive immediate diagnosis

• Disadvantages:
  – Requires specialized equipment and an experienced microscopist
  – Possible confusion with other spirochetes (some non-pathogenic)
    • Generally not recommended on oral lesions
  – Must be performed immediately
  – Possibility of false-negatives
Serologic Tests for Syphilis

• Two types
  – Treponemal (qualitative)
  – Non-treponemal (qualitative and quantitative)

• The use of only one type is insufficient for diagnosis

• Conventional testing:
  – non-treponemal followed by treponemal
  – RPR->Syphilis IgG

• Reverse sequence testing:
  – Begin with treponemal test followed by non-treponemal
  – Syphilis IgG->RPR
Treponemal Serologic Tests

- Fluorescent Treponemal Antibody Absorbed (FTA-ABS)
- *T. pallidum* particle agglutination (TP-PA)
- Treponemal enzyme/chemiluminescence immunoassays (EIA/CIA)
  - Periodontal disease (oral spirochetes) -> antibody reactive to Tp47

**Principles**
- Measure antibodies directed against *T. pallidum*
- Qualitative
- Usually reactive for life
  - Not useful for following response to therapy
  - Unable to differentiate current from past infection
Nontreponemal (Lipoidal) Serologic Tests

- Rapid Plasma Reagin (RPR)
- Venereal Disease Research Laboratory (VDRL)

**Principles**

- Measure antibody directed against lipoidal antigens released from damaged host cells (e.g. cardiolipin) and possibly from the treponemes themselves
- Not specific for *T. pallidum*
- Titers usually correlate with disease activity. Results are quantitative.
- Usually, but not always, disappear after effective treatment
Nontreponemal Serologic Tests
(continued)

**Advantages:**
- Rapid and inexpensive
- Easy to perform and can be done in clinic or office
- Quantitative
- Used to follow response to therapy
- Can be used to evaluate possible reinfection

**Disadvantages:**
- May be insensitive in certain stages (false negative in early infection)
- Prozone effect may cause a false-negative reaction
- False-positive reactions may occur
- Not automated
Syphilis serologic screening algorithms

**Traditional**
- **Quantitative RPR**
  - **RPR+**
    - TP-PA+ (Syphilis, past or present)
  - **RPR-**
    - TP-PA- (Syphilis unlikely)
  - **Send-out to ARUP labs 2-3 days TAT**

**Reverse sequence**
- **EIA or CIA**
  - **EIA/CIA+**
    - **Quantitative RPR**
      - **RPR+**
        - TP-PA+ (Syphilis, past or present)
      - **RPR-**
        - TP-PA- (Syphilis unlikely)
  - **EIA/CIA-**
    - **Send-out ARUP 2-3 days**

Performed Once per shift In-House
1-2 hr TAT EIA Bioplex IgG
Performed within 8hrs In-house
## Treatment of Adult Syphilis

<table>
<thead>
<tr>
<th>Stage</th>
<th>Recommended Treatment</th>
<th>Alternative in Penicillin Allergy</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>Benzathine Pen G 2.4 MU IM x 1</td>
<td>Doxycycline for 2 weeks&lt;br&gt;Ceftriaxone 1-2 g im/iv qd x 10-14 d ?&lt;br&gt;Azithromycin 2g x1</td>
<td>Penicillin only in pregnancy; desensitize if pen-allergic and pregnant. Do not use azithro in pregnancy, MSM or HIV</td>
</tr>
<tr>
<td>Early Latent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Late Latent</strong></td>
<td>Benzathine Pen G 2.4 MU IM qwk x 3</td>
<td>Doxycycline for 4 weeks&lt;br&gt;Ceftriaxone</td>
<td>Use of non-penicillin rx in HIV should be undertaken with caution.</td>
</tr>
<tr>
<td><strong>Latent of Unknown Duration</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Neuro</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tertiary</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neurosyphilis</td>
<td>Pen-G 18-24 MU IV qd for 10-14 d (q 4h or continuous infusion)&lt;br&gt;Pen G-2.4 MU IM qd plus probenecid po for 10-14 d</td>
<td>Desensitize if pen allergic&lt;br&gt;Ceftriaxone 2 g im/iv qd x 10-14 d (limited data)</td>
<td></td>
</tr>
</tbody>
</table>

CDC. MMWR Recomm Rep 2015;64(No.RR-3):1-138
Indications for Lumbar Puncture

• Any of the following should prompt CSF evaluation:
  – Neurologic signs/symptoms
    • CN deficits
    • chronic or acute meningitis
    • stroke
    • altered mentation
    • loss of vibratory sense
    • auditory abnormalities
    • ophthalmic signs/symptoms
  
  – Evidence of active tertiary syphilis (e.g., aortitis, gumma, and iritis)
  
  – Treatment failure (No 4-fold decrease in non-treponemal titers)

• REMOVED from latest version of CDC STD treatment guidelines: HIV infection with late latent syphilis or latent syphilis of unknown duration
Diagnosis of Neurosyphilis

- **CSF VDRL**: highly specific but insensitive; when reactive in the absence of gross contamination of the CSF with blood, it is considered diagnostic of neurosyphilis.

- **CSF FTA-Abs**: highly sensitive but not specific.

- Diagnosis usually depends on the following factors:
  - Reactive blood test results,
  - Abnormalities of CSF cell count or protein, or
  - A reactive CSF VDRL with or without clinical manifestations.

- **CSF leukocyte count usually is elevated (>5 WBCs/mm$^3$) in patients with neurosyphilis.**
Syphilis Screening

• Pregnant women
  – 1\textsuperscript{st} visit
  – Repeat 3\textsuperscript{rd} Trimester
  – Repeat at delivery (if high risk)

• MSM:
  – Annually if sexually active
  – Q3-6m if at increased risk

• HIV:
  – 1\textsuperscript{st} Visit and annually after

www.cdc.gov/std/tg2015/screening-recommendations.htm
Sexually Transmitted Infections (STIs)

- HSV
- HPV
- **HIV**
- *Chlamydia trachomatis*
- Pediculosis pubis
- *Mycoplasma genitalium*
- Syphilis
- Trichomoniasis
- BV
- Scabies
- Mulluscum contagiosum
- HTLV-1

- *Haemophilus ducreyi*
- *Klebsiella granulomatis*
- HAV
- HBV
- HCV
- Zika virus
- *Neisseria gonorrhoeae*
- Vaginal candidiasis
- LGV
- EBV
- CMV
People Living With HIV/AIDS in the United States in 2015

~1,122,900

162,500 (15%)
Unaware of their infection

US Population: 327 million (2018).... So 1 in 300 Americans have HIV
HIV Patients in Care

• 63% received *some* care
• 49% retained in continuous care
• 51% achieved viral suppression

• 76% of newly diagnosed patients (2016) were linked to HIV care within 1 month

https://www.cdc.gov/hiv/basics/statistics.html
HIV STATISTICS

• **USA:**
  – Prevalence:
    • 1.1 million
  – New Diagnosis:
    • 39,513 (2015)
    • 38,739 (2017)
  – Deaths:
    • 15,807 (2016)

• **Arkansas:**
  – Prevalence:
    • 6,087 (2017)
  – New Diagnosis:
    • 406 (2017)

https://www.cdc.gov/hiv/statistics/overview/ataglance.html
2012-2016:
• USA Incidence in HIV stable
  – Northeast: 17%
  – Midwest: 6%
  – South: Stable

2017 HIV INCIDENCE (USA)

New HIV Diagnoses in the US and Dependent Areas for the Most-Affected Subpopulations, 2017

- Black, Male-to-Male Sexual Contact: 9,807
- Hispanic/Latino, Male-to-Male Sexual Contact: 7,436
- White, Male-to-Male Sexual Contact: 6,982
- Black Women, Heterosexual Contact: 4,008
- Black Men, Heterosexual Contact: 1,717
- Hispanic/Latina Women, Heterosexual Contact: 1,058
- White Women, Heterosexual Contact: 999

https://www.cdc.gov/hiv/statistics/overview/ataglance.html
### MSM HIV INCIDENCE (USA) 2005-2014

<table>
<thead>
<tr>
<th>Race</th>
<th>Trend</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>Increase</td>
<td>24%</td>
</tr>
<tr>
<td>Young AA (13-24y)</td>
<td>Increase</td>
<td>87%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>Increase</td>
<td>22%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>Decrease</td>
<td>18%</td>
</tr>
</tbody>
</table>

### MSM HIV INCIDENCE (USA) 2012-2016

<table>
<thead>
<tr>
<th>Race</th>
<th>Trend</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>Stable</td>
<td>-</td>
</tr>
<tr>
<td>Hispanic</td>
<td>Increase</td>
<td>12%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>Decrease</td>
<td>14%</td>
</tr>
</tbody>
</table>
HIV Epidemic in Arkansas

https://aidsvu.org/state/arkansas/
HIV Prevention Toolbox

- HIV Testing
- Safer-sex counseling: understanding risk
- Condoms and lubricant
- Sterile syringes and avoid sharing “works”
- STI testing and treatment
- Biomedical Prevention (Treatment as Prevention)
  - PrEP (pre-exposure prophylaxis)
  - PEP (post-exposure prophylaxis)
What is PrEP

• **Pre-Exposure Prophylaxis (PrEP):**
  – HIV uninfected person takes medication BEFORE exposure to prevent infection

  – USPSTF Grade A Recommendation 2019 for at risk patients

  – Options:
    • Tenofovir (tdf)/emtricitabine [Truvada]
    • Tenofovir (taf)/emtricitabine [Descovy] ** Excluding females
Who to offer PrEP to?

Is PrEP Right For You?

PrEP may benefit you if you are HIV-negative and **ANY** of the following apply to you.

**You are a gay/bisexual man and**
- have an HIV-positive partner.
- have multiple partners, a partner with multiple partners, or a partner whose HIV status is unknown—and you also
  - have anal sex without a condom, or
  - recently had a sexually transmitted disease (STD).

**You are a heterosexual and**
- have an HIV-positive partner.
- have multiple partners, a partner with multiple partners, or a partner whose HIV status is unknown—and you also
  - don’t always use a condom for sex with people who inject drugs, or
  - don’t always use a condom for sex with bisexual men.

**You inject drugs and**
- share needles, syringes, or other equipment to inject drugs.
- are at risk for getting HIV from sex.
HIV Screening

• Women:
  – All 13-64yo
  – Anytime seeking evaluation for STI

• Pregnancy:
  – 1\textsuperscript{st} visit
  – Retest 3\textsuperscript{rd} trimester

• Men:
  – All 13-64yo

• MSM
  – Annually if sexually active
Sexually Transmitted Infections (STIs)

- HSV
- HPV
- HIV
- *Chlamydia trachomatis*
- Pediculosis pubis
- *Mycoplasma genitalium*
- Syphilis
- **Trichomoniasis**
- BV
- Scabies
- Mullosscum contagiosum
- HTLV-1

- **Haemophilus ducreyi**
- *Klebsiella granulomatis*
- HAV
- HBV
- HCV
- Zika virus
- Neisseria gonorrhoea
- Vaginal candidiasis
- LGV
- EBV
- CMV
Chancroid

- *Haemophilus ducreyi*
Trichomoniasis

- *Trichomonas vaginalis*
  - 222,000 visits per year
  - Prevalence 2,300,000 (85% asymptomatic)
  - Overall prevalence 3.1% (13.3% black females)
Herpes Simplex

- One of most common STIs
- 90% of HSV-2 seropositive patients report never being told by provider they had HSV
- ~20% of people (14-49yo) are HSV-2 seropositive
- ~70% of Black Females (40-49yo) are HSV-2 seropositive
- Screen: Serology considered if presenting for STI evaluation. PCR of lesion
- Treatment:
  - Valacyclovir 1g BID x7d (1°)
  - Valacyclovir 500mg BID x3d (recurrence)

https://www.cdc.gov/std/stats16/other.htm
Primary HSV-2
Genital Herpes - Recurrent
HSV-2 in Immunosuppressed
## HSV-2 Treatment

<table>
<thead>
<tr>
<th></th>
<th>1st Clinical Episode</th>
<th>Episodic</th>
<th>Daily Suppression</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acyclovir (mg)</strong></td>
<td>400 tid</td>
<td>400 tid</td>
<td>400 bid</td>
</tr>
<tr>
<td><strong>Famciclovir (mg)</strong></td>
<td>250 tid</td>
<td>125 bid</td>
<td>250 bid</td>
</tr>
<tr>
<td><strong>Valacyclovir (mg)</strong></td>
<td>1000 bid</td>
<td>500 bid</td>
<td>500-1000 qd</td>
</tr>
<tr>
<td><strong>Duration (days)</strong></td>
<td>7-10</td>
<td>5</td>
<td>NA</td>
</tr>
</tbody>
</table>
Human Immunodeficiency Virus (HIV) Screening

Effective April 13, 2015, procedure code G0475 may be billed for HIV screening. Refer to “Screening for the Human Immunodeficiency Virus (HIV) Infection” for more information.

HCPCS/CPT Codes

80081 – Obstetric panel (includes HIV testing)
G0432 – Infectious agent antibody detection by enzyme immunoassay (EIA) technique
G0433 – Infectious agent antibody detection by enzyme-linked immunosorbent assay (ELISA) technique
G0435 – Infectious agent antibody detection by rapid antibody test
G0475 – HIV antigen/antibody, combination assay, screening

ICD-10 Codes

Increased risk factors not reported – Z11.4
Increased risk factors reported – Z11.4 and Z72.89, Z72.51, Z72.52, or Z72.53
Pregnant Medicare beneficiaries – Z11.4 and Z34.00, Z34.01, Z34.02, Z34.03, Z34.80, Z34.81, Z34.82, Z34.83, Z34.90, Z34.91, Z34.92, Z34.93, O09.90, O09.91, O09.92, or O09.93

Screening for Sexually Transmitted Infections (STIs) and High Intensity Behavioral Counseling (HIBC) to Prevent STIs

HCPCS/CPT Codes

88631, 86632, 87110, 87270, 87320, 87490, 87491, 87810 – Chlamydia
87590, 87591, 87650 – Neisseria gonorrhoeae
87800 – Infectious agent detection by nucleic acid (DNA or RNA), multiple organisms; direct probe(s) technique
88552 – Syphilis test, non-treponemal antibody, qualitative (e.g., VDRL, RPR, ART)
88593 – Syphilis test, non-treponemal, quantitative
86780 – Treponema pallidum
87340, 87341 – Hepatitis B (hepatitis B surface antigen)
G0445 – Semiannual high intensity behavioral counseling to prevent STIs, individual, face-to-face, includes education skills training & guidance on how to change sexual behavior, 30 minutes

ICD-10 Codes

Z11.3, Z72.89, Z72.51, Z72.52, Z72.53, Z34.00, Z34.01, Z34.02, Z34.03, Z34.80, Z34.81, Z34.82, Z34.83, Z34.90, Z34.91, Z34.92, Z34.93, O09.90, O09.91, O09.92, and O09.93
Conclusions

• Rates of sexually transmitted infections are increasing every year. Arkansas ranks top 10 in most STI surveillance.

• Sexually active women <25 and high risk older women should be screened for chlamydia and gonorrhea annually. NAAT is best testing modality

• Syphilis rates quadrupled in last decade. Syphilis screening should be performed using reverse algorithm testing

• All patients 13-64 should have HIV screen