Emerging STIs

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STIs and their Consequences

- HIV transmission
- Impaired fertility
- Reproductive tract cancer
- Adverse pregnancy outcomes

19 million estimated annual new cases

$17 billion estimated annual direct costs

Sexually Transmitted Infections

Estimated number of new and existing (total) sexually transmitted infections
- United States, 2008

<table>
<thead>
<tr>
<th>Infection</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syphilis</td>
<td>117,000</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>270,000</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>422,000</td>
</tr>
<tr>
<td>HIV</td>
<td>908,000</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>1,570,000</td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>3,710,000</td>
</tr>
<tr>
<td>HSV-2</td>
<td>24,100,000</td>
</tr>
<tr>
<td>HPV</td>
<td>79,100,000</td>
</tr>
</tbody>
</table>

TOTAL: 110,197,000

Populations at Greatest Risk for STIs

• Youth
  – 50% of STIs estimated to occur in 15-24 yr

• Men who have sex with men (MSM)
  – Account for 66.5% of syphilis cases in 2010
  – High rates of HIV co-infection

• Racial/ethnic minorities
  – STIs among highest racial /ethnic disparity
Prevalence of STIs Among Females, 14 to 19

<table>
<thead>
<tr>
<th>STI</th>
<th>All ♀ Weighted Prevalence (%)</th>
<th>Sexually Experienced ♀ Weighted Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any STI</td>
<td>24.1</td>
<td>37.7</td>
</tr>
<tr>
<td>HPV*</td>
<td>18.3</td>
<td>29.5</td>
</tr>
<tr>
<td>C trachomatis</td>
<td>3.9</td>
<td>7.1</td>
</tr>
<tr>
<td>T vaginalis</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>N gonorrhoeae</td>
<td>1.3</td>
<td>2.5</td>
</tr>
</tbody>
</table>

*HPV 6/11 & any of 23 oncogenic types

Forhan SE, *Pediatrics* 2009
STI in MSM

• STI risk higher in subgroups of MSM
  • Racial disparity
  • Methamphetamine, internet partnering
  • Syphilis, rectal CT/GC, LGV, hepatitis C

• Changing attitudes
  • Unprotected oral sex perceived as low risk
    – 20% syphilis (MMWR 2004); fellatio only 5% CT/GC (Hourihan, 2004)
  • Serosorting
  • Changes in sexual networks and venues for partners
## STI Screening for MSM

<table>
<thead>
<tr>
<th>STD</th>
<th>Site</th>
<th>Type of Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV</td>
<td>blood</td>
<td>oral, anal</td>
</tr>
<tr>
<td>Syphilis</td>
<td>blood</td>
<td>oral, anal</td>
</tr>
<tr>
<td>GC/CT</td>
<td>urethra or urine</td>
<td>oral, anal</td>
</tr>
<tr>
<td>GC/CT</td>
<td>rectum</td>
<td>receptive anal</td>
</tr>
<tr>
<td>GC</td>
<td>pharynx</td>
<td>receptive oral</td>
</tr>
<tr>
<td>HSV-2*</td>
<td>blood</td>
<td></td>
</tr>
</tbody>
</table>

* Consider testing

**FREQUENCY:** At least at the initial visit then annually or more frequently based on risk
STD Screening: Requires asking

“Whoa—way too much information.”

Ask  Screen  Intervene  www.nnptc.org/online_training asi
## Distribution of GC by anatomical site in MSM attending STI clinics

<table>
<thead>
<tr>
<th>Site of Infection</th>
<th>% of Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectal only</td>
<td>21%</td>
</tr>
<tr>
<td>Urethral only</td>
<td>15%</td>
</tr>
<tr>
<td>Pharyngeal only</td>
<td>36%</td>
</tr>
<tr>
<td>Rectal and urethral</td>
<td>6%</td>
</tr>
<tr>
<td>Rectal and pharyngeal</td>
<td>12%</td>
</tr>
<tr>
<td>Urethral and pharyngeal</td>
<td>5%</td>
</tr>
<tr>
<td>All 3 sites</td>
<td>5%</td>
</tr>
</tbody>
</table>

- 90% of urethral infections were symptomatic
- Only 16% of rectal infections were symptomatic

Kent C, Chaw J, Wong W et al., *Clinical Inf Dis* 2005; 41:67-74
Proportion of MSM* Attending STD Clinics with Primary and Secondary Syphilis, Gonorrhea or Chlamydia by HIV Status†, STD Surveillance Network (SSuN), 2012

Percentage

<table>
<thead>
<tr>
<th>Condition</th>
<th>HIV-</th>
<th>HIV+</th>
</tr>
</thead>
<tbody>
<tr>
<td>P&amp;S syphilis</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>GC urethral</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>GC pharyngeal</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>GC rectal</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>CT urethral</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>CT rectal</td>
<td>12</td>
<td>20</td>
</tr>
</tbody>
</table>

*MSM=men who have sex with men.
†Excludes all persons for whom there was no laboratory documentation or self-report of HIV status.
‡GC urethral and CT urethral include results from both urethral and urine specimens.
Hepatitis C Virus Infection in MSM

- Increasing incidence of HCV among MSM
- Risks:
  - Unprotected receptive anal intercourse; h/o syphilis
  - Rougher or poorly lubricated unprotected anal penetration, including fisting
- CDC guidelines: screen if HIV+, IDU, and/or born 1945-65
- Acute infection may be HCV antibody negative
  - Check HCV RNA in patients with new, unexplained transaminase elevation

Vandeler, *Clin Infect Dis* 2012
LGV Proctitis

- Rectal exposure in MSM or women
- Rectal ulcers or lesions
- Mucoid anal discharge
- Rectal bleeding
- Tenesmus, constipation
- Rectal scarring/fistulas
STIs are Associated with Increased HIV Acquisition and Transmission

- Mucosal breaks & inflammation
  - Genital ulcers: herpes, syphilis
  - Inflammation: gonorrhea, non-gonococcal urethritis
- Increase amount of HIV shed at genital mucosa
  - Cervix, urethra, rectum
- Increase plasma HIV viral load
- Treatment (gonorrhea, syphilis, and trichomoniasis) can reduce plasma & genital HIV

Paz-Bailey *JID* 2009 & *CID* 2010; Dunne *JAIDS* 2008; Johnson *STD* 2008; Fleming *STI* 1999; Rottingen *STD* 2001
HIV Seroconversion by Number of Prior Rectal Infections

Log-Rank Test p=0.0004
# HIV incidence among MSM with STI

<table>
<thead>
<tr>
<th>Author, pub. year</th>
<th>Setting</th>
<th>Population</th>
<th>HIV incidence</th>
<th>Other key findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathela¹ 2013</td>
<td>Population of NYC</td>
<td>2805 MSM w/ P&amp;S syphilis</td>
<td>Annual incidence = 5.6% (95%CI 5.0-6.1)</td>
<td></td>
</tr>
<tr>
<td>Pathela² 2013</td>
<td>STD clinic (NYC)</td>
<td>276 MSM w/ rectal gonorrhea/chlamydia</td>
<td>Annual incidence = 6.7% (95%CI 4.6-9.4)</td>
<td>Black race associated w/ incident HIV (HR=5, 95%CI 1.8-14.2)</td>
</tr>
<tr>
<td>Ackers³ 2012</td>
<td>47 US cities</td>
<td>450 MSM with hx of STD enrolled in HIV vaccine trial</td>
<td>Incidence 3.8/100 py (95%CI 2.6-4.4)</td>
<td></td>
</tr>
<tr>
<td>Bernstein⁴ 2010</td>
<td>STD clinic (SF)</td>
<td>541 MSM w/ rectal gonorrhea/chlamydia</td>
<td>Annual incidence=2.3% (95%CI 1.5-3.3) Annual incidence = 15% (95%CI 3.2-37.9) among those w/ 2 rectal inf. in prior 2y</td>
<td>Annual incidence = 8.3% (95%CI 1.8-22.5) among those also w/ early syphilis dx in prior 2 y</td>
</tr>
</tbody>
</table>

1. 557 HIV-infected adults in primary care (4 cities)
   - Screened/treated for STI at enrollment and at 6 months
   - 13% with STI at enrollment; 7% incident STI at 6 months
     - Excluding trichomoniasis, 94% of incident STDs were in MSM
     - Most common in men: rectal chlamydia, oropharyngeal gonorrhea
     - Risks: polysubstance use, > 4 partners in 6 months
   - 20% of MSM diagnosed with an STI by 6 mo: most asymptomatic

Mayer et al. *Sex Transm Dis* 2012
Prevention Strategies

• Behavioral counseling
  – Partners, pregnancy, protection, practices, past STIs
• Pre-exposure vaccination (hepatitis A, B, HPV)
• Male latex condoms
  – Mucosal fluids (HIV, GC, CT, trichomonias)
• Avoid agents that disrupt anal/vaginal epithelium
  – N9 spermicide, hyperosmolar lubricants
• Male circumcision reduces risk of HPV, genital herpes (African heterosexuals)
# HPV Vaccine Recommendations

<table>
<thead>
<tr>
<th>Population</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Age</td>
</tr>
<tr>
<td>All Females</td>
<td>9-26</td>
</tr>
<tr>
<td>All Males</td>
<td>9-21</td>
</tr>
<tr>
<td></td>
<td>22-26</td>
</tr>
<tr>
<td>MSM and HIV+ Males</td>
<td>22-26</td>
</tr>
</tbody>
</table>

* Irrespective of history of abnormal Pap, HPV, genital warts

MMWR, May 28 2010; 59(20):626-629, 630-632
MMWR, December 23 2011; 60(50):1705-1708
Proportion of eligible age women* with genital warts, by resident status, Australia, 2004-2010

-25%

-73%

* Eligible age - ≤26 years old in July 2007

Donovan B et al. ISSTDR Quebec City, July 2011
CDC STD Treatment Guidelines

- Authoritative, evidence-based source for STD clinical management
- Available at www.cdc.gov/std
- Wall charts, pocket guides, eBook
- Webinars, podcasts
- STD Treatment Mobile App for Apple devices (iPhone & iPads) and Droid devices (phones & tablets).
- Currently under revision for release in 2014
Urethritis

GC (5-20%)
Chlamydia 15-40%
*M. genitalium* 5-25%
Ureaplasma 0-20%
Trichomoniasis 5-20%
HSV 15-30%, adenovirus
Enterics, *Candida*
Mycoplasma genitalium

- Small bacteria that lacks cell wall (gram stain neg)
- Association with acute or persistent NGU (29 studies)
  - No role in male infertility
- Conflicting evidence in women: cervicitis, PID, infertility, ectopic pregnancy, birth outcomes
- Azithromycin superior to doxycycline for MG urethritis (Mena 2009)
  - Resistance to azithromycin (Jensen 2009)
- Moxifloxacin for persistent NGU
  - 400 mg daily x 7 d
Chlamydia & Gonorrhea

NOTE: Error bars indicate 95% confidence intervals.
Chlamydia—Percentage of Reported Cases by Sex and Selected Reporting Sources, United States, 2012

*HMO=health maintenance organization; HD=health department

NOTE: Of all cases, 11.4% had a missing or unknown reporting source. Among cases with a known reporting source, the categories presented represent 69.8% of cases; 30.2% were reported from sources other than those shown.
Chlamydia

- Primary focus of screening
  - Sexually active women $\leq 25$ (USPSTF, Ann Int Med 2007)
- Selective male screening (adolescent clinics, corrections, national job training program, < 30 yrs, STD, military)
- Retest women/men 3 mo post treatment
  - CT testing in third trimester (reinfection)

2010 CDC STD Treatment Guidelines
**USPSTF Screening Recommendations for Women**

<table>
<thead>
<tr>
<th></th>
<th>Grade</th>
<th>Age/Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USPSTF</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlamydia Screening in non-pregnant women</td>
<td>A</td>
<td>Sexually active women ≤ 24 and at-risk women ≥ 25</td>
</tr>
<tr>
<td>Chlamydia Screening in pregnant women</td>
<td>B</td>
<td>All women ≤ 24 and at-risk women ≥ 25</td>
</tr>
<tr>
<td>Gonorrhea Screening in women</td>
<td>B</td>
<td>All at-risk sexually active women (including pregnant women) - <em>special considerations also include population risk factors</em></td>
</tr>
<tr>
<td>HIV screening in adolescents and adults</td>
<td>A</td>
<td>All adolescents and adults at increased risk</td>
</tr>
<tr>
<td>Syphilis Screening</td>
<td>A</td>
<td>All pregnant women and all persons at risk</td>
</tr>
</tbody>
</table>

[www.ahrq.gov](http://www.ahrq.gov)  
[www.cdc.gov/vaccine/recs/acip](http://www.cdc.gov/vaccine/recs/acip)
Repeat Chlamydial Infection is Common in Women

Chlamydia
Emerging Issues

• Effectiveness of azi<doxy for rectal CT
• Doxy delayed release 200 mg d
  – Noninferior to generic doxy
  – Less gi side effect
• Concerns over amoxicillin use in pregnancy (CT persistence in vitro)
  – Alternative regimen
Gonorrhea—Rates, United States, 1941–2012

Rate (per 100,000 population)
Gonorrhea—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>25.3</td>
</tr>
<tr>
<td>15-19</td>
<td>521.2</td>
</tr>
<tr>
<td>20-24</td>
<td>578.5</td>
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<tr>
<td>25-29</td>
<td>254.1</td>
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<tr>
<td>30-34</td>
<td>121.6</td>
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<tr>
<td>35-39</td>
<td>57.7</td>
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<tr>
<td>40-44</td>
<td>29.2</td>
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<tr>
<td>45-54</td>
<td>11.4</td>
</tr>
<tr>
<td>55-64</td>
<td>3.0</td>
</tr>
<tr>
<td>65+</td>
<td>0.4</td>
</tr>
<tr>
<td>Total</td>
<td>108.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Men</th>
<th>750</th>
<th>600</th>
<th>450</th>
<th>300</th>
<th>150</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-14</td>
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<td>15-19</td>
<td>239.0</td>
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<tr>
<td>20-24</td>
<td>293.9</td>
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<td>25-29</td>
<td>184.2</td>
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<tr>
<td>65+</td>
<td>105.8</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Women</th>
<th>750</th>
<th>600</th>
<th>450</th>
<th>300</th>
<th>150</th>
<th>0</th>
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</thead>
<tbody>
<tr>
<td>10-14</td>
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<td></td>
<td>0.4</td>
</tr>
</tbody>
</table>
Gonorrhea—Percentage of Reported Cases by Sex and Selected Reporting Sources, United States, 2012

*HMO=health maintenance organization; HD=health department

NOTE: Of all cases, 11.7% had a missing or unknown reporting source. Among cases with a known reporting source, the categories presented represent 66.2% of cases; 33.8% were reported from sources other than those shown.
“Whatever freedoms were won during the sexual revolution, bacterial evolution promises soon to constrain.”
Neisseria gonorrhoeae Antibiotic Resistance

- Antibiotic resistance
  - Undermines treatment success
  - Heightens risk of complications
  - Facilitates transmission

- *Neisseria gonorrhoeae* (NG) has demonstrated ability to progressively develop antibiotic resistance

Resistance

- Sulfonamides
- Penicillins
- Tetracyclines
- Fluoroquinolones
The Gonococcal Isolate Surveillance Project (GISP)

• CDC-supported US sentinel surveillance since 1987
• Monitors trends in *N. gonorrhoeae* antibiotic susceptibility in men attending STD clinics

**Methods**
• Urethral isolates obtained from the first 25 men per site each month
• Susceptibility testing conducted by 5 regional laboratories
  • Minimum inhibitory concentrations (MICs) by agar dilution
• Confirmatory testing by CDC
• Limited demographic & clinical data from participating men

http://www.cdc.gov/std/gisp/
*Percentage of Isolates in Which Minimal Inhibitory Concentrations (MICs) of Cefixime Were 0.25 µg per Milliliter or Higher, 2005–2011.

Susceptibility to cefixime was not tested in 2007 or 2008. From the Gonococcal Isolate Surveillance Project.

Bolan G, NEJM 2012

Robert D. Kirkaldy, MD, MPH; Akbar Zaidi, PhD; Edward W. Hook III, MD; King H. Holmes, MD, PhD; Olusegun Soge, PhD; Carlos del Rio, MD; Geraldine Hall, PhD; John Papp, PhD; Gail Bolan, MD; and Hillard S. Weinstock, MD, MPH

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>MSM (n=8,117)</th>
<th>MSW (n=26,483)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceftriaxone*</td>
<td>0.4</td>
<td>0.1</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Cefixime**</td>
<td>1.7</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Azithromycin†</td>
<td>0.9</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Tetracycline†</td>
<td>37.5</td>
<td>13.3</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Ciprofloxacin‡</td>
<td>29.9</td>
<td>6.9</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

* ≥ 0.125 µg/ml
** ≥ 0.25 µg/ml
† ≥ 2.0 µg/ml
‡ ≥ 1.0 µg/ml

Kirkaldy, Ann Int Med 2012
Percentage of *Neisseria gonorrhoeae* Isolates with Elevated Ceftriaxone Minimum Inhibitory Concentrations (MICs) ($\geq 0.125 \mu g/ml$), Gonococcal Isolate Surveillance Project (GISP), 2005 – 2012
Uncomplicated Gonococcal Infections of Cervix, Urethra & Rectum

Ceftriaxone 250 mg as a single intramuscular dose

PLUS

Azithromycin 1 g orally (preferred) or Doxycycline 100 mg twice daily for 7 days
New Treatment Options

- NIH sponsored multicenter randomized open-label non-comparative trial (Kirkaldy, ISSTDR 2013)
  - Gentamicin 240 mg IM + azithromycin 2 g PO, OR
  - Gemifloxacin 320 mg PO + azithromycin 2 g PO

- Rationale
  - Additive effect, gentamicin and azithromycin *in vitro*
  - Gemifloxacin more active against GC with known cipro resistance or mutations in GyrA and ParC regions (*in vitro*); possibly stronger inhibition by gemifloxacin of GyrA and ParC

- Primary endpt- culture at 10–17 days

<table>
<thead>
<tr>
<th></th>
<th>Gentamicin / Azithromycin</th>
<th>Gemifloxacin / Azithromycin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>% (L 95% CI)</td>
</tr>
<tr>
<td>Urethra/Cervix</td>
<td>202/202</td>
<td>100% (98.5%)</td>
</tr>
<tr>
<td>Pharynx</td>
<td>10/10</td>
<td>100%</td>
</tr>
<tr>
<td>Rectum</td>
<td>1/1</td>
<td>100%</td>
</tr>
</tbody>
</table>
New Agents, New Targets

• Solithromycin single dose promising in phase 2, dose ranging study (Hook ISSTDR 2013); 100% clearance by culture at 7 days

• Novel agents
  – MUT056399: inhibitor of fatty acid biosynthesis enzyme
  – Pleuromutilins, bicyclolide, ketolides
  – Non-quinolone topoisomerase inhibitors
  – Host defense peptides (LL-37): direct and indirects antibacterial activity (Bucki, Arch Immunol 2010)

• New targets
  – Gonococcal lipid A: LpxC inhibitors (critical for synthesis)
  – Efflux pumps
Formidable Challenges

• Surveillance for antimicrobial resistance
  – GISP limitations and selectivity
    • Need to include non-urethral isolates?
  – No consensus on lab criteria for resistance
  – Declining culture & susceptibility capacity
    • Need to define molecular determinants of resistance; however, may not identify emerging mutations in real-time

• Combination of epidemiologic data & molecular typing likely required
Primary and Secondary Syphilis—Rates by Sex and Male-to-Female Rate Ratios, United States, 1990–2012

Rate (per 100,000 population)

Rate Ratio (log scale)

Year
Primary and Secondary Syphilis—Reported Cases* by Stage, Sex, and Sexual Behavior, 2012

* Of the reported male cases of primary and secondary syphilis, 17.4% were missing sex of sex partner information.
† MSW=men who have sex with women only; MSM=men who have sex with men.
Primary and Secondary Syphilis—Percentage of Reported Cases* by Sex, Sexual Behavior, and Selected Reporting Sources, 2012

Percentage, %

- Correctional Facility
- HIV Counseling and Testing Site
- Private Physician/HMO†
- STD Clinic

* Of the reported male cases of primary and secondary syphilis, 17.4% were missing sex of sex partner information, and 6.2% of reported male cases with sex of sex partner data were missing source of information data.

† HMO=health maintenance organization; MSM=men who have sex with men; MSW=men who have sex with women only.
Syphilis
Emerging Issues

• Clarification of neurosyphilis definition
  – VDRL + signs/symptoms
• Pharmacologic interval between benzpcn doses (7-9 days)
• Serological response to tx
  – Stage and titer (Sena 2011)
• Reverse screening algorithm
Syphilis serologic screening algorithms

Traditional

- Quantitative RPR
  - RPR+
    - TP-PA or other trep. test
      - TP-PA+ Syphilis (past or present)
      - TP-PA- Syphilis unlikely
  - RPR-

Reverse sequence

- EIA or CIA
  - EIA/CIA+
    - Quantitative RPR
      - RPR+ Syphilis (past or present)
      - RPR- Syphilis unlikely
  - EIA/CIA-
    - TP-PA
      - TP-PA+ Syphilis (past or present)
      - TP-PA- Syphilis unlikely
Discordant Results from Reverse Sequence Syphilis Screening — Five Laboratories, United States, 2006–2010

<table>
<thead>
<tr>
<th>Population</th>
<th>Test</th>
<th>Total</th>
<th>Reactive EIA/CIA</th>
<th>Nonreactive RPR</th>
<th>Nonreactive confirmatory treponemal test*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>n</td>
<td>% total</td>
<td>n</td>
<td>% EIA/CIA+</td>
</tr>
<tr>
<td>Overall</td>
<td>Various</td>
<td>140,176</td>
<td>4,834</td>
<td>2,743</td>
<td>56.7</td>
</tr>
<tr>
<td>Low prevalence (Kaiser x 3)</td>
<td>Trep-Chek, LIAISON, Trep-Sure</td>
<td>127,402</td>
<td>2,984</td>
<td>1,807</td>
<td>60.6</td>
</tr>
<tr>
<td>High prevalence (New York, Chicago)</td>
<td>Trep-Chek Trep-Sure</td>
<td>12,774</td>
<td>1,850</td>
<td>936</td>
<td>50.6</td>
</tr>
</tbody>
</table>

*Nonreactive confirmatory treponemal test*
Trichomoniasis: disparities by age

NAAT prevalence of TV, CT, and GC infections among 7593 U.S. women age 18–89, by age group (Ginocchio, 2012)

Changes to 2010 guidance: while feasible to test specimens collected for GC/CT screening, TV should not be overlooked in older adults
Epidemiology: disparities by race/ethnicity

Prevalence of TV infection among women age 14–49 years, by self-reported race — NHANES, 2001–2004 (Sutton, 2007)
Trichomoniasis

- Screening in high risk women
  - HIV+, incarcerated, STD clinic
- Rescreening at 3 mo
- Prevalence increases with age
- FDA cleared NAATs
  - Aptima
  - BD Probe Tec TV Qx
U.S. STD Clinics: A Surveillance System & Safety Net at Risk?

Jersey City’s Free STD Clinic Closures Are Postponed for Now

STD programs not sexy enough to avoid funding cuts

By Kim Krisberg

Public health director Kerran Vigroux sounds almost matter-of-fact when she talks about having to shut down her department’s screening services for sexually transmitted diseases. As she talks about the prevention and education opportunities that packed up and left along with the testing services, there’s that familiar, barely audible public health tone to her voice — the one that says “this makes no sense at all.”
Integration of Primary Care and Public Health: STD as a case study

- Clinical preventative services through population health approach
- High impact services that protect the community (STD, TB, immunization)
- Screening/timely treatment core prevention strategy (asx)
- Most reported cases (CT, GC, syphilis) from private sector
- Workforce capacity
  - Primary care
  - Public health
Prevention Guidance

• Education/counseling to reduce risk of STI acquisition
• Detection of asymptomatic infection
• Effective diagnosis and treatment
• Evaluation, treatment, counseling of sexual partners
• Pre-exposure vaccination-hepatitis A, B, HPV