Chlamydia, Gonorrhea, Trichomonas and PID

Eunmee Chun, MD, MPH
NYC DOHMH Bureau of STD Control
echun1@health.nyc.gov
347.396.7288

Chlamydia

Chlamydia—Rates by Sex, United States, 1990–2010

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 Age and Sex, United States, 2010

<table>
<thead>
<tr>
<th>Age</th>
<th>Rate (per 100,000 population) Men</th>
<th>Rate (per 100,000 population) Women</th>
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</thead>
<tbody>
<tr>
<td>10–14</td>
<td>3,700</td>
<td>2,960</td>
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<tr>
<td>15–19</td>
<td>740</td>
<td>680</td>
</tr>
<tr>
<td>20–24</td>
<td>1,480</td>
<td>2,220</td>
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<tr>
<td>25–29</td>
<td>774.3</td>
<td>1,187.0</td>
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<tr>
<td>30–34</td>
<td>598.0</td>
<td>309.0</td>
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<tr>
<td>35–39</td>
<td>153.2</td>
<td>153.2</td>
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<tr>
<td>40–44</td>
<td>91.3</td>
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<td>45–54</td>
<td>39.3</td>
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<td>55–64</td>
<td>233.7</td>
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<tr>
<td>65+</td>
<td>2.8</td>
<td>2.8</td>
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<tr>
<td>Total</td>
<td>3,378.2</td>
<td>3,407.9</td>
</tr>
</tbody>
</table>

Chlamydia

- **Chlamydia trachomatis**: Gram-negative, obligate intracellular organism

<table>
<thead>
<tr>
<th>Serovar</th>
<th>Clinical Syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, B, Ba, C</td>
<td>Trachoma</td>
</tr>
<tr>
<td>D → K</td>
<td>Urogenital, rectal, conjunctival infections, Neonatal pneumonia</td>
</tr>
<tr>
<td>L1, L2, L3</td>
<td>Lymphogranuloma venereum</td>
</tr>
</tbody>
</table>

Chlamydia

- **Transmission:**
  - Anal, vaginal, oral sex
  - Mother-to-child
  - Efficient: 65-70% of exposed sex partners concurrently infected

- **Risk Factors:**
  - Young age (<25)
  - Female
  - Previous Ct infection
Chlamydia

Clinical manifestations:
- Conjunctivitis
- Urethritis
- Cervicitis
- Proctitis

Complications: Reiter’s Syndrome, PID, epididymitis

**The majority of infections are asymptomatic (~70-80% in females, 50% in males)**

Reiter’s Syndrome

- Aseptic inflammatory arthritis that follows urethritis or infectious dysentery
- Linked to HLA-B27; male predominance (2:1)
- Triad: Urethritis (cervicitis)
  - Asymmetric polyarthritis
  - Conjunctivitis/Uveitis
- Management: antibiotics, anti-inflammatory agents

Chlamydia: Diagnosis

- NAATs
  - Male urethral/urine
  - Female vaginal/endocervical/urine/liquid cytology
  - Rectal and pharyngeal with local validation studies only
- Culture
  - Endocervical, urethral, pharyngeal or rectal specimens
- Non-Amplified Tests
- Serology
Cervical Ectopy

Normal cervix with ectopy.

Courtesy of California NNPTC
Chlamydia Treatment
Adolescents and Adults – non-pregnant

**Recommended regimens**
- Azithromycin 1g PO x 1
  - OR
  - Doxycycline 100mg PO BID x 7d

**Alternative regimens**
- Ofloxacin 300 mg PO BID x 7 d
- Levofloxacin 500 mg PO QD x 7 d
- Erythromycin base 500 mg PO QID x 7 d
- Erythromycin ethylsuccinate 800 mg PO QID x 7 d

Chlamydia Treatment
Pregnancy

**Recommended Regimens**
- Azithromycin 1g PO x 1
  - OR
  - Amoxicillin 500mg PO TID x 7d

- Test of cure 3 weeks after completion of therapy
- Retest in 3 months after treatment
- Retesting during 3rd trimester for women at increased risk (<25, multiple sex partners)

Gonorrhea
Gonorrhea—Rates, United States, 1941–2010

Gonorrhea—Rates by Age and Sex, United States, 2010

Gonorrhea

- *Neisseria gonorrhoeae:* Gram-negative diplococcus

Transmission

- Vaginal, anal, oral sex
- Mother-to child
- Risk of F to M transmission: 20% with one episode, 60-80% after 4 episodes
Gonorrhea

Clinical Manifestations:
- Conjunctivitis
- Urethritis
- Cervicitis
- Proctitis
- Pharyngitis

Complications: Disseminated Gonococcal Infection (DGI), PID, Epididymitis, Genital abscesses

Disseminated Gonococcal Infection (DGI)

- Septic Arthritis: 1-2 joints
- Dermatitis-Arthritis:
  - Painless skin lesions
  - Asymmetrical polyarthritis, tenosynovitis
- High fevers, chills, rigors
- Initial treatment requires hospitalization and IV antibiotics

DGI – Skin Lesions

Gonorrhea Diagnosis

- Gram Stain (symptomatic male urethral specimens)
  +PMNs with intracellular Gram neg. diplococci
- Culture
  Rectal and pharyngeal specimens
  Urethral and endocervical specimens
  Conjunctival specimens
- NAATs
  Male urethral/urine
  Female vaginal/endocervical/urine
  Rectal and pharyngeal with local validation only
- Non-Amplified Tests
Emergence of cephalosporin resistance among *Neisseria gonorrhoea* isolates

- Cephalosporins are the only drug class left for treating GC
- Isolated reports of clinical treatment failures with injectable cephalosporins: Japan (2001), Norway (2 cases, 2010)
- Decreased susceptibility to cephalosporins has been observed in the U.S.; no known treatment failures have occurred (MMWR 2011; 60:873-877)

Gonorrhea

Emerging Antibiotic Resistance

- **Ceftriaxone 250mg** now recommended:
  - Observed decreased *in vitro* susceptibility to cephalosporins and reported treatment failures
  - Enhanced efficacy against pharyngeal GC infections;
  - Same dosage for treatment at all anatomic sites
- **Routine co-treatment for chlamydia:**
  - Frequency of co-infection with chlamydia
  - Dual therapy may enhance eradication of pharyngeal GC and hinder development of antibiotic-resistant GC
  - Azithromycin 1g preferred over Doxycycline
Gonorrhea Treatment
Uncomplicated Cervical, Urethral, Rectal Infections

Recommended Regimens
- Ceftriaxone 250mg IM x 1
  OR, IF NOT AN OPTION
- Cefixime 400mg PO x 1
  OR
- Single-dose injectable cephalosporin regimens
  PLUS
  Azithromycin 1g PO x 1

Gonorrhea Treatment
Uncomplicated Cervical, Urethral, Rectal Infections

Other single-dose injectable cephalosporins:
- Ceftizoxime 500mg IM
- Cefoxitin 2g IM plus probenecid 1g PO x 1
- Cefotaxime 500mg IM

Alternative Regimens
- Cefpodoxime 400mg PO x 1
- Cefuroxime axetil 1g PO x 1
  Azithromycin 2g PO x 1*
**Gonorrhea Treatment**

**Cephalosporin Allergy**

- Use of cephalosporins should be contraindicated only in those with a history of a severe reaction to PCN (e.g. anaphylaxis, Stevens Johnson syndrome, and TEN)

- Azithromycin 2g PO x 1 is effective, but its use should be limited due to concerns over development of macrolide resistance (*MMWR* 2011; 60:579-581)

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**Gonorrhea**

**For treatment failure or in vitro resistance:**

- Report to CDC via local public health authorities
- Culture and susceptibility studies
- Infectious disease consultation regarding re-treatment
- Ensure partner treatment
- Test of cure in 1 week with culture or NAAT (*MMWR* 2011; 60:873-877)

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**Gonorrhea and Chlamydia Follow-up**

- Patients treated for uncomplicated infections do not need a test of cure
- Sex partners during the 60 days preceding onset of symptoms or diagnosis should be evaluated, tested and treated
- **Retest 3-6 months after treatment,** or when the patient next seeks care within the following 12 months
- Abstinence for 7 days after single-dose treatment or until after completion of a 7-day regimen
Trichomoniasis

- The most common treatable STD
- Estimated prevalence:
  - 2%-3% in the general female population
  - 50%-60% in female prison inmates and commercial sex workers
  - 18%-50% in females with vaginal complaints

*Trichomonas vaginalis:*
- Flagellated anaerobic protozoa
- The only protozoan that infects the genital tract
- Causes *vaginitis* in women and *urethritis* in men
- May persist for *months to years* in epithelial crypts and periglandular areas
**Trichomoniasis**

**Transmission:**
- Vaginal sex
- Not found to infect oral sites, and rectal prevalence low among MSM
- Transmission between female sex partners has been documented
- Fomite transmission rare

**Risk Factors:**
- Change in sexual partners; multiple partners
- Infection with another STD
- Drug use

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**Trichomoniasis Clinical Manifestations**

**Females:**
- 50% with symptomatic vaginitis
- 50% are asymptomatic
  - 30% will become symptomatic within 6 months

**Males:**
- Majority are asymptomatic
- May cause urethral discharge and dysuria, prostatitis and epididymitis

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**Trichomoniasis Vaginal Discharge:**
- Frothy, yellow-green, malodorous
- pH >5.0
- Amine Whiff Test may be positive

**Strawberry Cervix**
Punctate hemorrhages on cervix are pathognomonic but not common
Trichomoniasis
Diagnosis

Wet Prep:
- Sensitivity: 60-70% among symptomatic females
  - Decreases to 20% if microscopy is delayed 10 min
  - Low sensitivity for males
- If trichomonas is suspected and microscopy is negative, confirm with culture or PCR

Pap Smear:
- If low risk and pap suggests trichomonas, confirm with culture (unless liquid cytology was used)

Trichomoniasis

Wet Prep
Saline 40X objective
T. Vaginalis must be motile for positive identification

Trichomoniasis

Diagnosis

<table>
<thead>
<tr>
<th>Test type</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCR</td>
<td>74-98%</td>
</tr>
<tr>
<td>Vaginal microscopy</td>
<td>60 - 70%</td>
</tr>
<tr>
<td>Culture*</td>
<td>&gt;90%</td>
</tr>
<tr>
<td>- Diamond’s modified media</td>
<td></td>
</tr>
<tr>
<td>- InPouchTV</td>
<td></td>
</tr>
<tr>
<td>Point of Care Tests</td>
<td></td>
</tr>
<tr>
<td>- Osom ready in 10 minutes</td>
<td>&gt;83%</td>
</tr>
<tr>
<td>- Affirm VP III ready in 45 minutes</td>
<td>&gt;83%</td>
</tr>
</tbody>
</table>

*May use for testing males: urethral swab, urine, semen
Trichomonas Treatment

**Recommended regimens**
- Metronidazole 2g PO x 1
- Tinidazole 2g PO x 1

**Alternative Regimen**
- Metronidazole 500mg PO BID x 7 d

*7-day treatment recommended for HIV positive women

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Trichomonas

**Follow-up:**
- Sex partners need to be treated!
- Advise to avoid sex with partners until completion of treatment and resolution of symptoms
- Consider repeat screening in 3 months

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Pelvic Inflammatory Disease
Sequelae of Untreated GC & Chlamydia in Women

- **Infertility**
  - Untreated Chlamydia: 20-40%
  - Untreated Gonorrhea: 10-40%

- **Ectopic Pregnancy**
  - Untreated Chlamydia: 6%
  - Untreated Gonorrhea: 23%

- **Recurrent PID**
  - Untreated Chlamydia: 36%

**CDC Update:** Some Facts About Chlamydia, March 1997

Pelvic Inflammatory Disease (PID)

- Infection and inflammation of the female upper genital tract
- Caused by microorganisms ascending from the lower genital tract
- Polymicrobial etiology

Pelvic Inflammatory Disease (PID) - Normal and PID conditions

**Etiology:**

- Gonorrhea (30-80%) and Chlamydia (20-40%)
- Organisms of the vaginal flora:
  - **G. vaginalis** - Anaerobes
  - **H. influenzae** - Enteric gram neg. rods
  - **Strep. Agalactiae**
- Other sexually transmitted organisms:
  - **Mycoplasma spp.**
  - **Ureaplasma urealyticum**
  - **CMV**
Pelvic Inflammatory Disease (PID)

Risk Factors

• Adolescence
• Multiple sexual partners
• History of prior PID; history of GC or Ct
• Male partner with GC or Ct
• Recent (within 3 weeks) upper genital tract procedure e.g. IUD placement
• Bacterial Vaginosis
• Current douching

Pelvic Inflammatory Disease (PID)

Clinical Manifestations:

- Lower abdominal pain/cramping
- Vaginal Discharge
- Dysuria
- Fever/Chills
- Nausea/Vomiting
- RUQ Pain (Perihepatitis)
- Post-coital/irregular bleeding
- “Silent” PID

Pelvic Inflammatory Disease (PID)

Diagnosis

Minimum Criteria:

• Cervical motion tenderness OR uterine tenderness OR adnexal tenderness
• No single historical, physical or lab finding is both sensitive and specific for diagnosis of acute PID

Additional Criteria:

• Temp > 38.3 C (101 F)
• Abnormal discharge; abundant WBCs on wet mount
• Elevated ESR/C-reactive protein
• + GC/Ct laboratory test
Differential Diagnosis of PID

- Acute Appendicitis
- Ectopic Pregnancy
- Ruptured, Bleeding, Torsion of Ovarian Cyst
- Pelvic Endometriosis
- Inflammatory Bowel Disease
- Urinary Tract Infection
- Renal/Ureteral Stones

Pelvic Inflammatory Disease (PID) Outpatient Treatment

Recommended regimens

<table>
<thead>
<tr>
<th>Ceftriaxone 250mg IM x 1</th>
<th>PLUS</th>
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<tbody>
<tr>
<td>OR</td>
<td>Doxycycline 100mg BID x 14d</td>
</tr>
<tr>
<td>Cefoxitin 2g IM x 1 +</td>
<td>WITH or WITHOUT</td>
</tr>
<tr>
<td>Probenecid 1g PO x 1</td>
<td>Metronidazole 500mg BID x 14d</td>
</tr>
<tr>
<td>Other parenteral 3rd gen</td>
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</tr>
<tr>
<td>Cephalosporin (e.g.</td>
<td></td>
</tr>
<tr>
<td>cefotaxime or cefotaxime)</td>
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</table>

Alternative regimens

Use quinolones only if cephalosporin therapy is not feasible and prevalence/risk of GC is low

Levofloxacin 500 mg PO QD x 14d OR
Ofloxacin 400 mg PO BID X 14d
+/- Metronidazole 500 mg PO BID x 14d**

Other regimens

Ceftriaxone 250mg IM X 1 PLUS
Azithromycin 1g PO qweek x 2
+/- Metronidazole 500mg BID x 14d
Pelvic Inflammatory Disease (PID)
Criteria for Hospitalization

- Unable to rule out surgical emergency
- Pregnancy
- Inability to tolerate or poor clinical response to outpatient treatment regimen
- Severe symptoms—nausea/vomiting, high fever
- Evidence of tubo-ovarian abscess

Pelvic Inflammatory Disease (PID)
Follow-up

- Stress importance of adherence to oral regimen
- Re-examine within 72 hours; hospitalization usually required if no clinical improvement
- Treat sex partners: Male sex partners 60 days preceding onset of symptoms
- For + GC/Ct: repeat testing in 3-6 months
- HIV testing

Pelvic Inflammatory Disease (PID)
Special Considerations

- Pregnant women with suspected PID should be hospitalized and treated with IV antibiotics
- Women with HIV may be more likely to develop tubo-ovarian abscess; but no evidence for more aggressive management
- IUD: Increased risk of PID is confined to first 3 weeks after insertion; evidence insufficient to recommend removal of an IUD in women diagnosed with acute PID, but close follow-up is mandatory
Thank you!