Adolescent Chlamydia Infection
Defining the Problem
Provider Role in Chlamydia Control
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Outline
- Epidemiology
- Disease outcomes
- Adolescent susceptibility
- Provider role
  - Screening
  - Treating
  - Prevention

The Problem
- Chlamydia is most common reportable communicable disease
  - 3 million cases per year common
- Highest reported rates among adolescent females
- Usually asymptomatic
- Devastating sequela

Epidemiology
What is the population with the highest chlamydia rates?
- Age
- Gender
- Race
- Location
**Chlamydia Prevalence in Adolescent Females**
- 15%-29% prevalence in inner-city populations
- Highest rates in younger teens
- 5%-10% prevalence in suburban populations
- High reinfection rates within 3-6 months (10%-26%)
- 80% of infections asymptomatic

**Chlamydia Prevalence by Age Females Tested by PCR in Baltimore City Clinics, 1994-1996**

**Reported FEMALE Chlamydia Cases by Age, Erie County, 2006**

**Chlamydia — Rates by state: United States and outlying areas, 2005**

**Chlamydia — Rates by race/ethnicity: United States, 1996–2005**

*Note: The total rate of chlamydia for the United States and outlying areas (Guam, Puerto Rico and Virgin Islands) was 329.5 per 100,000 population.*
**Chlamydia Sequela**

- **Females**
  - Pelvic inflammatory disease
    - Sx and Asx
    - Up to 40% risk
    - Infertility (1 in 5)
    - Ectopic pregnancy (1 in 10)
    - Chronic pelvic pain (1 in 5)
  - HIV transmission
    - 3-5 fold risk

- **Males**
  - Not much
  - Epididymitis
  - Reiter’s Syndrome
  - HIV transmission

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**Female Sequela**

- Pelvic inflammatory disease
  - Sx and Asx
  - Up to 40% risk
  - Infertility (1 in 5)
  - Ectopic pregnancy (1 in 10)
  - Chronic pelvic pain (1 in 5)

- HIV transmission
  - 3-5 fold risk

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**Male Sequela**

- Not much
- Epididymitis
- Reiter’s Syndrome
- HIV transmission

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**Why are STIs an Adolescent Health Problem?**

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**Youth Risk Behavior Surveillance Survey (YRBSS)**

- Nationally representative sample of high school students
- Ask about 6 categories of risk behaviors
- Implemented every 2 years
- Most recent published data from 2005

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**2005 YRBSS Results**

- Sexual Risk Behaviors, New York State (excluding NYC)
  - 39% of all students have had sexual intercourse during their lifetime
  - 3% of all students initiated sexual intercourse before 13 years of age
  - 10% of all students had ≥4 lifetime sex partners
2005 YRBSS Results
Currently Sexually Active Students Behaviors
New York State (excluding NYC)

- 71% reported condom use during their last sexual intercourse
- 17% reported either they or their partner had used birth control pills before last sex
- 20% had used drugs or alcohol at last sexual intercourse

Adolescent Susceptibility to STIs

Physical

- Cervical ectopy
- Smaller introitus - more trauma
- Forced sexual contact - dry/traumatic sex
- No immunity from prior chlamydia infection
- Asymptomatic nature

Behavioral

Cognitive Stage of Development

- Concrete thinkers
  - more likely to have unprotected sex
  - serial monogamous relationships

Early Adolescence
**Personal Fable**
- New skill of "hypothetical thinking" & belief of uniqueness
- Teens believe are invulnerable
- "Those things only happen to others - never to me."
- Believe only "others" can get infected with STIs
- Minimize perceived risk of behaviors

**Access to Care**
- Confidential services
- Lack of "Medical Home"
- Poverty major determinant for lack of insurance and access to healthcare (Newacheck Pediatrics 1999;104:195-202)
- 20% adolescents forgone health care within past year (Ford JAMA 1999;282:2227-2234)

**Adolescent Females with Older Male Partners**
- Predisposes adolescent females to relationship power imbalance
  - Sexual negotiation more difficult for younger females
  - ↑ risk of involuntary intercourse, lack of protective behavior, and exposure to STIs

**Benefits of Early Sexual Activity**
- Gaining peer acceptance and respect
- Establishing autonomy from parents
- Repudiating conventional authority norms and values
- Coping with anxiety, frustration, and anticipation of failure
- Affirming maturity
- Transitioning from childhood to adulthood

**Chlamydia Screening**

**National Guidelines**

**U.S. Chlamydia trachomatis Screening Recommendations**
- Universal annual screening of all sexually active females <25 years old
  - CDC, USPSTF, AAP, AMA, ACOG, AAFP
  - Universal screening sexually active females <25 years old with NAATs is cost effective if prevalence ≥2.3%*
- No clear recommendations for male chlamydia screening

2006 Chlamydia Screening HEDIS Rates

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Commercial (%)</th>
<th>Medicaid (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-20</td>
<td>36</td>
<td>51</td>
</tr>
<tr>
<td>21-26</td>
<td>38</td>
<td>55</td>
</tr>
</tbody>
</table>

The State of Health Care Quality, 2007
National Center for Quality Assurance at:

1999 YRBSS: Health Services Delivery

- >50% of students reported a preventive health care visit in the past 12 months
- <50% reported an STD, HIV, or pregnancy prevention discussion at those visits
  - 43% of ♀ students
  - 26% of ♂ students
  - older, sexually active, hormonal contraception using - females most likely to have reproductive health dialogue


Barriers to Primary Care Provider STI Risk Assessment

- Limited well care and primary care, especially in adolescents
- Competing priorities / lack of time
- Lack of reimbursement
- Belief that patient population's STI prevalence is low
- Lack of provider training
- Lack of provider and patient comfort
- No available confidential health care services in commercial health plans

Information Sources for Reported Chlamydia Cases: United States, 2000

Chlamydia — Cases by reporting source and sex: United States, 1996–2005
**Nucleic Acid Amplification Test (NAAT)**
- Amplify nucleic acid sequences specific to organism being detected
- Do not require viable organisms
- Most sensitive chlamydia tests
- Endocervical, urethral, urine, (self collected vaginal swab for Aptima) specimens
- Can detect GC and CT in single specimen
- Expensive

**Chlamydia Test Performance**

<table>
<thead>
<tr>
<th>Test</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAAT</td>
<td>85-95</td>
<td>97-99.5</td>
</tr>
<tr>
<td>Culture</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>Nonamplified</td>
<td>65</td>
<td>98-99</td>
</tr>
</tbody>
</table>

**FDA-Cleared CT/GC NAATs**
- Amplicor
  - Polymerase chain reaction (PCR)
  - Roche Molecular Systems (Branchburg, NJ)
- Aptima
  - Transcription mediated amplification (TMA)
  - Gen-Probe (San Diego, CA)
- BD ProbeTec
  - Strand displacement amplification (SDA)
  - Becton Dickinson (Franklin Lakes, NJ)

**Chlamydia Rx**
- Single-dose Rx: Azithromycin 1 gm x 1
  - Preferred Rx during pregnancy
- **OR**
  - Doxycyclin 100 mg BID x 7 days
- Effectiveness equivocal

**Chlamydia F/U**
- Very high reinfection risk
- No health dept partner notification resources
Provider’s role to prevent repeat infection sequela

- Test of Reinfection:
  - 3-4 months after Rx or whenever pt presents to clinic within next 12 months
- Partner notification
  - Provider Referral
  - Patient Referral
  - Expedited Partner Therapy

Patient-Delivered Partner Therapy

- Providers give patients medication intended for the partners
- Providers prescribe extra doses of medication in the index patients’ names
- Providers write partners prescriptions for medication

EPT effect on repeat CT infections

- Randomized controlled trial evaluating partner management strategies to prevent repeat CT infections
  - sample of 1454 ♀ diagnosed with CT infection
  - compared EPT vs patient referral
- Trend for ↓ CT infection at follow-up among ♀ in EPT arm, but infection rates in both groups were high at follow-up:
  - 12% CT infections among ♀ in EPT arm
  - 15% CT infections among ♀ in patient referral arm
  - Odds Ratio = 0.80 (95% CI = 0.62 – 1.05; P = .102)

Behavior affecting EPT effectiveness

- EPT-specific
  - Patients did not give Rx to any/all partners
- General non-compliance
  - Patients noncompliant with Rx
  - Patients did not contact partner(s)
  - Partners noncompliant with Rx
  - Resumed sex <7 days after case and partner treatment
  - Sex with new partner(s)

Effect of EPT to prevent recurrent or persistent GC or CT infections

<table>
<thead>
<tr>
<th>Index Case Dx</th>
<th>EPT (%)</th>
<th>Referral (%)</th>
<th>RR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gonorrhea</td>
<td>3</td>
<td>11</td>
<td>0.32 (0.13 – 0.77)</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>11</td>
<td>13</td>
<td>0.82 (0.62 – 1.07)</td>
</tr>
<tr>
<td>GC or CT</td>
<td>10</td>
<td>13</td>
<td>0.76 (0.59 – 0.98)</td>
</tr>
</tbody>
</table>

Partner Management Strategies among NYC Providers

- 94% use patient referral frequently
- 49% ever used PDPT
- 27% use PDPT frequently
EPT Legal Status

Permissible in 11 states  Possible in 28 states  Prohibited in 13 states

CDC Recommendations

- Providers consider including EPT as part of their regular STI care
  - EPT is "useful option" to further partner treatment
    - Especially for male partners of chlamydia- or gonorrhea-infected females
  - CDC STD Treatment Guidelines 2006 recommend EPT as option for partner treatment among heterosexual persons with chlamydia or gonorrhea
- Policy makers remove systemic barriers
  - EPT "Dear Colleague" letter available at: www.cdc.gov/std/DearColleagueEPT5-10-05.pdf

Syphilis — Reported cases by stage of infection: United States, 1941–2004


Note: As of January 2000, all 50 states and the District of Columbia had regulations requiring the reporting of chlamydia cases.

Chlamydia Reporting

- Chlamydia became reportable disease in NYS in August of 2000
  - last state to make chlamydia reportable
- Who reports?
- How to report?
Who Reports in NY State?

- Labs via Electronic Clinical Laboratory Reporting System (ECLRS)
  - Positive test data for all NYS reportable disease automatically transferred to health departments
- Providers via DC-103 form or calling ECDOH
  - Physicians are required to report selected communicable diseases to the local health department under NY State Sanitary Code (10NYCRR 2.10).
  - Mandatory laboratory reporting does not negate the physician reporting requirement.

Why Report Communicable Diseases??

- Allows ECDOH to detect outbreaks, prevent 2nd transmission, identify newly emerging infections, and evaluate control measures effectiveness
- Labs only report positive test results to ECDOH
  - suspected/confirmed case report may be the only notification LHD receives.
- ECDOH can assist physicians with accessing appropriate lab tests to confirm suspected cases.

Reported Communicable Diseases, Erie County, 2006

- Gonorrhea 1,791
- Chlamydia 4,199
- All other 49 diseases 1,700

What do we do now?

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