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Chlamydia Curriculum

Chlamydia

Chlamydia trachomatis

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Chlamydia Curriculum

Learning Objectives

Upon completion of this content, the learner will be able to:

1. Describe the epidemiology of chlamydial infection in the U.S.
2. Describe the pathogenesis of *Chlamydia trachomatis*.
3. Describe the clinical manifestations of chlamydial infection.
4. Identify common methods used in the diagnosis of chlamydial infection.
5. List CDC-recommended treatment regimens for chlamydial infection.
6. Summarize appropriate prevention counseling messages for patients with chlamydial infection.
7. Describe public health measures for the prevention of chlamydial infection.

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Lessons

- I. Epidemiology: Disease in the U.S.
- II. Pathogenesis
- III. Clinical manifestations
- IV. Diagnosis
- V. Patient management
- VI. Prevention

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**Lesson I: Epidemiology:
Disease in the U.S.**

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Epidemiology

Incidence and Cost

- Most frequently reported STI in the U.S.
- Estimated 2.9 million new infections in U.S. annually
- Estimated annual incidence of selected STIs:
 - Human Papillomavirus (HPV) — 14.1 million
 - Trichomoniasis — 1.1 million
 - Gonorrhea — 820,000
 - Herpes Simplex Virus (HSV) — 776,000
 - Syphilis — 55,4000
- Direct and indirect annual costs total approximately \$2.4 billion

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Epidemiology

National Chlamydia Surveillance Systems

- Case Reporting
- National Prevalence Survey
- Prevalence Monitoring (positivity in sentinel clinics)

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Risk Factors

- Adolescence
- New or multiple sex partners
- History of STI
- Presence of another STI
- Oral contraceptive user
- Lack of barrier contraception

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Transmission

- Transmission is **sexual** or **vertical**
- Highly transmissible
 - > 50% of sexual partners acquire infection
 - 60%–70% of infants exposed during passage through birth canal acquire infection
- Incubation period 7–21 days
- Significant asymptomatic reservoir
- Reinfection is common

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Lesson II: Pathogenesis

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Lesson III: Clinical Manifestations

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Chlamydia Curriculum Clinical Manifestations

Clinical Syndromes Caused by *C. trachomatis*

	Local Infection	Complication	Sequelae
Men →	Urethritis Proctitis Conjunctivitis	Epididymitis Reactive arthritis (rare)	Infertility (rare) Chronic arthritis (rare)
Women →	Cervicitis Urethritis Proctitis Conjunctivitis	Endometritis Salpingitis Perihepatitis Reactive arthritis (rare)	Infertility Ectopic pregnancy Chronic pelvic pain Chronic arthritis (rare)
Infants →	Conjunctivitis Pneumonitis Pharyngitis Rhinia	Chronic lung disease?	Rare, if any ²⁰

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Chlamydia Curriculum Clinical Manifestations

C. trachomatis Infection in Men

- Urethritis—One cause of nongonococcal urethritis (NGU)
 - Majority (>50%) asymptomatic
 - Symptoms/signs if present: mucopurulent, mucoid or clear urethral discharge, dysuria
 - Incubation period unknown (probably 7–21 days in symptomatic infection)

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Nongonococcal Urethritis: Mucoïd Discharge



Source: Seattle STD/HIV Prevention Training Center at the University of Washington/UW HSCER Slide Bank 22

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Chlamydia Curriculum Clinical Manifestations

C. trachomatis Complications in Men

- Epididymitis
- Reactive Arthritis

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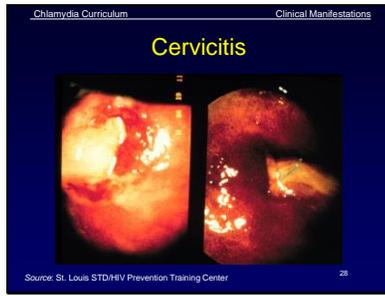
Chlamydia Curriculum Clinical Manifestations

Swollen or Tender Testicles (epididymitis)

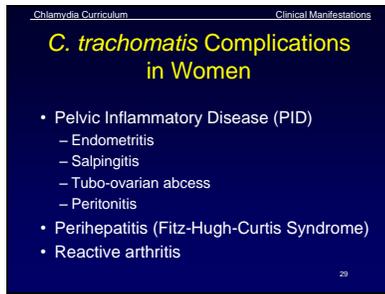


Source: Seattle STD/HIV Prevention Training Center at the University of Washington 24

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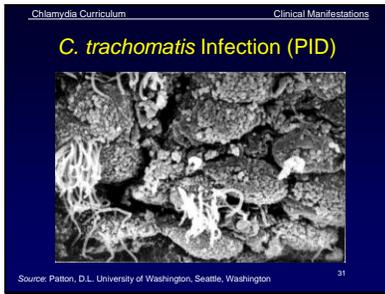
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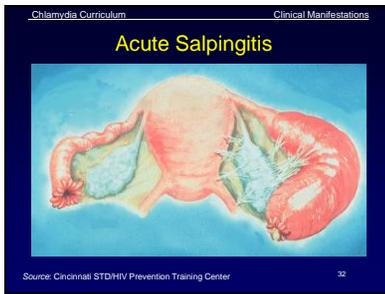
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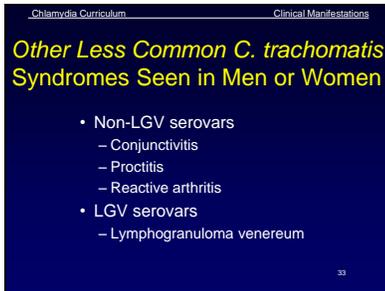
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Chlamydia Curriculum Clinical Manifestations

LGV Lymphadenopathy



Source: CDC Division of STD Prevention Clinical Slides 34

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Chlamydia Curriculum Clinical Manifestations

C. trachomatis Infections in Infants

- Perinatal clinical manifestations:
 - Inclusion conjunctivitis
 - Pneumonia

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Chlamydia Curriculum Clinical Manifestations

C. trachomatis Infections in Children

- Preadolescent males and females
 - Urogenital infections
 - Usually asymptomatic
 - Vertical transmission
 - Sexual abuse

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Lesson IV: Diagnosis

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Chlamydia Diagnostics

- Preferred
 - Nucleic acid amplification tests (NAATs)
- Acceptable in limited circumstances
 - Culture
- Not recommended
 - Non-amplification tests
 - Serology

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NAATs

- NAATs amplify and detect organism-specific genomic or plasmid DNA or rRNA
- A number of NAATs are commercially available. They include
 - Abbott Ldx
 - Artus/Diagen RealArt PCR
 - Becton Dickinson BDProbe Tec®
 - Gen-Probe AmpCT, Aptima®
 - Roche Amplicor®
- Some can detect *C. trachomatis* and *N. gonorrhoeae* in the same specimen.
- Significantly more sensitive than other tests.

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NAATs (continued)

- FDA cleared
 - All NAATs
 - urethral swabs from men
 - cervical swabs for women
 - urine from men and women
 - Certain NAATs
 - vaginal swabs
- Not FDA cleared
 - Rectal
 - Pharyngeal
 - Some laboratories have met regulatory requirements

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Culture

- Historically the "gold standard"
- Variable sensitivity (50% – 80%)
- High specificity
- Use in legal investigations
- Approved for use in all anatomical sites
- Not suitable for widespread screening

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Non-Amplification Tests: Not Recommended

- Less expensive than culture or NAATs, but sensitivity only 50 – 75%
- Direct fluorescent antibody (DFA)
 - Detects intact bacteria with a fluorescent antibody
 - Variety of specimen sites
- Enzyme immunoassay (EIA)
 - Detects bacterial antigens with an enzyme-labeled antibody
- Nucleic acid hybridization (NA probe)
 - Detects specific DNA or RNA sequences of *C. trachomatis* and *N. gonorrhoeae*

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Serology

- Rarely used for uncomplicated infections
- Comparative data between types of serologic test are lacking
- Criteria used in LGV diagnosis
 - Complement fixation titers >1:64 can support diagnosis of LGV in the appropriate clinical context.
 - Serologic test interpretation for LGV is not standardized.

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Lesson V: Patient Management

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Chlamydia Curriculum Management

Treatment of Uncomplicated Genital Chlamydial Infections

CDC-recommended regimens

- Azithromycin 1 g orally in a single dose, or
- Doxycycline 100 mg orally twice daily for 7 days

Alternative regimens

- Erythromycin base 500 mg orally 4 times a day for 7 days, or
- Erythromycin ethylsuccinate 800 mg orally 4 times a day for 7 days, or
- Ofloxacin 300 mg orally twice a day for 7 days, or
- Levofloxacin 500 mg orally once a day for 7 days

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Treatment of Lymphogranuloma Venereum (LGV)

CDC-recommended regimen

- Doxycycline 100 mg orally twice a day for 21 days

Alternative regimen

- Erythromycin base 500 mg orally 4 times a day for 21 days

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Repeat Testing after Treatment

- **Pregnant women**
 - Test of cure, by NAAT, 3 weeks after completion of therapy
 - Repeat testing for reinfection 3 months after completion of therapy
- **Nonpregnant women and men**
 - Repeat testing 3 months after treatment is recommended to detect re-infection with *C. trachomatis*
 - If not possible, then repeat testing should be performed at next presentation for care within 12 months
 - Test of cure (3 weeks after therapy) is not recommended, but can be considered when
 - compliance is in question,
 - symptoms persist,
 - re-infection is suspected, or
 - erythromycin is used.

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Lesson VI: Prevention

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Why Screen for Chlamydia?

- Most infections are asymptomatic
- Screening may reduce the incidence of PID by more than 50% and may decrease the prevalence of infection in the population

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Screening Recommendations: Non-pregnant Women

- Sexually-active women < age 25 years should be screened annually
- Women ≥25 years old should be screened if risk factors are present.
- Repeat testing of all women 3 months after treatment for *C. trachomatis* infection.
 - If not possible, then repeat testing should be performed at next presentation for care within 12 months.

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Screening Recommendations: Pregnant Women

- Screen all pregnant women at the first prenatal visit.
- Pregnant women aged <25 years and those at increased risk for chlamydia should be screened again in the third trimester.

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Screening Recommendations: Men

- Screening of sexually-active young men should be considered in clinical settings with a high prevalence of chlamydia and when resources permit.
- Repeat testing is recommended for all men 3 months after treatment for *C. trachomatis* infection
 - If not possible, then repeat testing should be performed at next presentation for care within 12 months.

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Partner Management

- Sex partners should be evaluated, tested, and treated if they had sexual contact with the patient during the 60 days preceding the onset of symptoms or diagnosis of chlamydia.
- Most recent sex partner should be evaluated and treated, even if the time of the last sexual contact was >60 days before symptom onset or diagnosis.
- Expedited partner therapy (EPT) - Delivery of therapy to sex partners by heterosexual male or female patients ("patient-delivered partner therapy") is an option in some jurisdictions

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Reporting

- Chlamydia is a reportable STD in all states.
- All clinicians and laboratories must report cases to the local or state STD program.

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Prevention Counseling

- Nature of the infection
 - Chlamydia is commonly asymptomatic in men and women
 - In women, there is an increased risk of upper reproductive tract damage with reinfection.
- Transmission issues
 - Effective treatment of chlamydia may reduce HIV transmission and acquisition.
 - Abstain from sexual intercourse until partners are treated and for 7 days after a single dose of azithromycin or until completion of a 7-day doxycycline or alternative regimen.

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Prevention Counseling (continued)

- Risk reduction

The clinician should

 - Assess the patient's behavior-change potential.
 - Discuss prevention strategies (abstinence, monogamy, condoms, limit number of sex partners, etc.). Latex condoms, when used consistently and correctly, can reduce the risk of transmission of chlamydia.
 - Develop individualized risk-reduction plans.

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Case Study

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Chlamydia Curriculum Case Study

Follow-Up

Suzy returned for a follow-up visit at 3 months

- Her repeat chlamydia test returned positive
- Suzy stated that her partner, Michael, went to get tested, but the test result was negative so he was not treated

9. What is the appropriate treatment at the 3-month follow-up visit?

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