



## Microorganisms

### Chlamydia trachomatis (CT)

Caractéristiques	Practical implications
<ul style="list-style-type: none"> <li>Obligate intracellular bacterium</li> <li>Lacks a cell wall</li> </ul>	<ul style="list-style-type: none"> <li>Cannot be cultured on standard laboratory media</li> <li>Detected by NAAT*</li> <li>Does not Gram stain</li> <li>Naturally resistant to antibiotics targeting the cell wall, including <math>\beta</math>-lactams</li> </ul>

\* NAAT: Nucleic Acid Amplification Test (e.g., PCR, TMA)

### Neisseria gonorrhoeae (NG)

Characteristics	Practical implications
<ul style="list-style-type: none"> <li>Gram-negative diplococcus, cultivable</li> <li>Fragile organism</li> </ul>	<ul style="list-style-type: none"> <li>Although primarily detected by NAAT, culture remains useful for antibiotic susceptibility testing</li> <li>Requires transport media and rapid processing for culture</li> </ul>

## Associated Diseases and Complications

- In women: CT and NG infections are frequently asymptomatic or mildly symptomatic.
- In men: NG urethritis is typically symptomatic; CT urethritis is often asymptomatic or mildly symptomatic. Extragenital sites (pharynx, rectum) are frequently asymptomatic.
- Site of infection depends on exposure and sexual practices.

<b>Women</b>	<ul style="list-style-type: none"> <li>Urogenital infection: cervicitis, endometritis, salpingitis</li> <li>Anorectal infection: proctitis</li> <li>Lymphogranuloma venereum (LGV)</li> <li>Oropharyngeal infection: pharyngitis</li> <li>Complications: infertility, ectopic pregnancy, reactive arthritis, pelvic inflammatory disease (PID)</li> </ul>
<b>Men</b>	<ul style="list-style-type: none"> <li>Urogenital infection: urethritis, epididymo-orchitis</li> <li>Anorectal infection: proctitis</li> <li>LGV</li> <li>Oropharyngeal infection: pharyngitis</li> <li>Complications: urethral stricture</li> </ul>
<b>Newborn</b>	<ul style="list-style-type: none"> <li>Perinatal transmission during vaginal delivery may lead to: <ul style="list-style-type: none"> <li>CT: conjunctivitis or pneumonia</li> <li>NG: bilateral conjunctivitis</li> </ul> </li> </ul>



## Diagnostic

Sampling and testing methods depend on gender and site of infection

Localisation	Genre	Prélèvement	Méthode
Genital	♀	Vaginal* or cervical swab	<ul style="list-style-type: none"> <li>• NAAT for CT/NG</li> <li>• If symptomatic: culture for NG</li> </ul>
	♂	First-catch urine or urethral swab	<ul style="list-style-type: none"> <li>• NAAT for CT/NG</li> <li>• If symptomatic: culture for NG</li> </ul>
Anorectal	♀ & ♂	Rectal swab*	<ul style="list-style-type: none"> <li>• NAAT for CT/NG</li> <li>• If NAAT positive for CT: test for LGV</li> <li>• If NAAT positive for NG: culture to test resistance<sup>#</sup></li> </ul>
Oropharyngeal	♀ & ♂	Throat swab*	<ul style="list-style-type: none"> <li>• NAAT</li> <li>• If NAAT positive for NG: culture to test resistance<sup>#</sup></li> </ul>

\* Self-collection is possible

<sup>#</sup> Consider risk of infection with ceftriaxone-resistant strains if acquired in Asia-Pacific or after contact with individuals who traveled there, or if failure to respond to recommended treatment.

→ A full bacterial and viral STI screening is routinely recommended: HIV, hepatitis B, syphilis...

## Antibiotic susceptibility

Microorganism	Active Antibiotics	Acquired resistance (2023)
<i>Chlamydia trachomatis</i>	<ul style="list-style-type: none"> <li>• Tetracyclines</li> <li>• Macrolides</li> <li>• Fluoroquinolones</li> <li>• Rifampin</li> </ul>	<ul style="list-style-type: none"> <li>• No acquired resistance reported</li> </ul>
<i>Neisseria gonorrhoeae</i>	<ul style="list-style-type: none"> <li>• β-lactams</li> <li>• Macrolides</li> <li>• Fluoroquinolones</li> <li>• Tetracyclines</li> <li>• Aminoglycosides</li> </ul>	<ul style="list-style-type: none"> <li>• Ceftriaxone ≈ 0.2%*</li> <li>• Azithromycin &lt; 10%</li> <li>• Fluoroquinolones ≈ 70%</li> <li>• Tetracyclines &gt; 90%</li> <li>• Spectinomycin : 0%</li> </ul>

\* Rare strains resistant to 3<sup>rd</sup>-generation cephalosporins must be sent to the National Reference Center

## Treatment and Follow-up: Chlamydia trachomatis

### Treatment

- Drug and dosage

Indication	Treatment
1 <sup>st</sup> line and pregnant women in 1 <sup>st</sup> trimester	Doxycycline <sup>a</sup> 100 mg orally twice daily
2nd line and pregnant women in 2nd and 3rd trimesters	Azithromycin 1 g orally once daily
3rd line (only for lower and upper genital infections)	Ofloxacin 200 mg orally twice daily or Levofloxacin 500 mg once daily
Pregnant women with lower genital infection contraindicated for doxycycline and azithromycin	Erythromycin 500 mg orally four times daily for 7 days

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- Duration of treatment depends on infection type:

	Doxycycline <sup>a</sup>	Azithromycin	Fluoroquinolones
<b>Urethritis and cervicitis</b>	7 days	1 g single dose	7 days
<b>Anorectal infections</b>	7 days	1 g single dose	Not recommended
<b>Oropharyngeal infections</b>	7 days	1 g single dose	Not recommended
<b>Upper genital tract infections <sup>b</sup></b>	10–14 days	1 g at day 0 and 7	10 days
<b>Orchepididymitis and prostatitis</b>	10 days	1 g at day 0 and 7	7 days
<b>Lymphogranuloma venereum (LGV)</b>	21 days	1 g at day 0, 7, 14	Not recommended

<sup>a</sup> Doxycycline is preferred to limit resistance emergence, particularly for Mycoplasma genitalium. Azithromycin remains an option if tetracyclines are contraindicated or adherence is uncertain.

<sup>b</sup> As upper genital infections are often polymicrobial, if treated with fluoroquinolones or clindamycin (active against C. trachomatis), doxycycline addition is unnecessary.

## Follow-up

- Cure is assessed based on symptom improvement.
- Microbiological test of cure is not routinely recommended except in the following cases, at least 4 weeks after treatment completion:
  - Pregnancy
  - Anorectal infection treated with azithromycin
  - LGV or suspected LGV treated with an antibiotic other than doxycycline
  - Persistent symptoms

## Additional measures

- Abstinence or protected sexual intercourse until:
  - End of treatment if doxycycline is used
  - 7 days after the last dose if azithromycin is used
- For high-risk sexual activity, screening at 3 to 6 months is advised.

## Doxycycline

- Main contraindications: pregnancy from 2nd trimester onward, tetracycline allergy, concurrent retinoid or vitamin A treatment.
- Drug interactions: take doxycycline at least 2 hours apart from other medications; avoid lying down within 30 minutes of ingestion.
- Common side effects: rash, candidiasis, esophageal ulcer.

## Treatment and Follow-up: gonococque

### Treatment

- Drug and Dosage

Indication	Treatment
1st line and pregnant women	Ceftriaxone
2 <sup>nd</sup> line	Gentamicin
3rd line and coagulation disorders	Ciprofloxacin or cefixime



- Duration of treatment depends on infection type:

Infection type	Ceftriaxone	Gentamicin	Ciprofloxacin <sup>a</sup>	Cefixime
Urethritis and cervicitis	1 g IM single dose <sup>b</sup>	240 mg IM single dose	500 mg single dose	400 mg single dose
Anorectal infection	1 g IM single dose	240 mg IM single dose	500 mg single dose	400 mg single dose
Ulcerated abscessed anorectal infection	1 g duration per specialist advice	5 mg/kg/day IV single dose (max 3 days)	NR	NR
Pharyngeal infection	1 g IM single dose	240 mg IM single dose	500 mg single dose	NR
Upper genital tract infection	1 g IM or IV single dose <sup>c,d</sup>	5 mg/kg/day IV single dose for 3 days	Ofloxacin or levofloxacin for 10 days	NR
Orchepididymitis	1 g IM or IV single dose <sup>c,f</sup>	5 mg/kg/day IV single dose for 3 days	500 500 mg single dose	NR

<sup>a</sup> Use only if susceptibility testing is available and strain is sensitive.

<sup>b</sup> IM = intramuscular, IV = intravenous, single dose (SD).

<sup>c</sup> IV if severe pain or hospitalization, single dose if uncomplicated, 10–14 days if complicated.

<sup>d</sup> Combined with doxycycline and metronidazole.

<sup>e</sup> Not recommended.

<sup>f</sup> IV if severe pain or hospitalization, single dose if uncomplicated, 7 days if complicated.

## Follow-up

- Cure is assessed based on symptom improvement.
- Microbiological test of cure is not routinely recommended except in the following cases, at least 2 weeks after treatment completion if NAAT used:
  - Treatment with an antibiotic other than ceftriaxone first line
  - Strain with MIC > 0.125 mg/L to ceftriaxone (resistant strain)
  - Infection acquired in high ceftriaxone resistance prevalence areas (Asia-Pacific)
  - Persistent symptoms 72 hours after treatment initiation without untreated co-infection (repeat culture and susceptibility testing plus infectious disease consult recommended)
- Report treatment failures to the National Reference Center for Gonococci.

## Additional measures

- Abstinence or protected sexual intercourse until:
  - 7 days after ceftriaxone treatment completion
  - After negative control NAAT result if indicated
- For high-risk sexual activity, screening at 3 to 6 months is advised



## Screening

### Target populations

Systematic screening	<ul style="list-style-type: none"> <li>All sexually active women aged 15–25, including pregnant women</li> </ul>	Risk factors	<ul style="list-style-type: none"> <li>Multiple partners (<math>\geq 2</math> partners/year)</li> <li>Recent partner change</li> <li>Partner diagnosed with an STI</li> <li>History of STI</li> <li>Men who have sex with men (MSM) who are sexually active</li> <li>Sex workers</li> <li>History of sexual assault</li> </ul>
Targeted screening	<ul style="list-style-type: none"> <li>All sexually active individuals presenting with at least one risk factor</li> <li>Women consulting for induced abortion (termination of pregnancy)</li> </ul>		

### Screening Modalities

