

Sexually Transmitted Diseases (STDs) / Infections (STIs) – Part II

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Genital Herpes (Herpes Simplex Virus – HSV)

I. Overview

- Causative Agent: Herpes simplex virus (HSV)
 - HSV-1: Usually causes cold sores (oral)
 - HSV-2: Usually causes genital herpes
- Nature of Infection: Viral infection causing painful outbreaks of sores and blisters
- Transmission:
 - Direct vaginal, oral, or anal sexual contact with an infected partner
 - Oral sex from a partner with a history of cold sores
- Treatment: Symptomatic relief with antiviral medications

- Prognosis: No cure, virus remains latent → lifelong infection

2. Pathophysiology & Life Cycle

1. Virus enters through mucous membranes or small skin abrasions
2. Primary infection may cause vesicular lesions
3. Virus travels to sensory ganglia and becomes latent
 - HSV-1: Trigeminal ganglia
 - HSV-2: Lumbar & sacral ganglia
4. Reactivation triggered by: stress, trauma, menstruation, immunosuppression

Text Flowchart – HSV Infection:

Exposure → Viral entry via skin/mucosa → Primary infection → Vesicles & ulcers → Virus travels to ganglia → Latent infection → Reactivation (stress, trauma, menstruation)

3. Incubation Period

- 2–20 days after exposure
- Can be mild or extremely painful
- Recurrent outbreaks called “flare-ups”

4. Clinical Features

General Symptoms

- Tingling or burning sensation at the site before outbreak
- Painful sores/blisters (external or internal)
- Redness & inflammation
- Fever & malaise
- Muscular pain
- Tender lymph nodes
- Highly contagious

Sex-Specific Symptoms

Sex	Symptoms
Female	Blisters in/around vagina, fever, headache
Male	Small sore or cluster of blisters on penile body

Primary Infection in Females:

- Painful vesicular lesions with ulceration
- Virus shedding lasts ~3 weeks
- Highest risk of fetal transmission during pregnancy

S. Laboratory Diagnosis

i. Serology:

- Detects seroconversion or rise in antibody titer
- Most useful in primary infection

ii. NAAT (PCR):

- Amplifies viral genomic DNA → highly sensitive

iii. Viral Isolation:

- Culture in cell lines
- Cytopathic effect (CPE): visible in 1-3 days
- Confirm with fluorescent antibody staining or ELISA for glycoproteins

iv. Tzanck Smear:

- Cells from vesicle base stained with Giemsa
- Multinucleated giant cells → suggestive of HSV

6. Key Exam Points

- HSV is lifelong → latent in ganglia
 - HSV-2 → main cause of genital herpes
 - Primary infection during pregnancy → highest fetal risk
 - Tzanck smear shows multinucleated giant cells
 - Stress, trauma, menstruation → triggers reactivation
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Chlamydia (Chlamydia trachomatis D-K)

I. Overview

- Causative Agent: *Chlamydia trachomatis* (obligate intracellular bacteria)
- Serovars & Diseases:

Serovar	Disease
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A, B, C	Trachoma
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D-K	Urogenital STDs: cervicitis, urethritis, proctitis, PID
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L1, L2, L3	Lymphogranuloma venereum (LGV)
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- Incubation Period: 2-3 weeks
- Other Chlamydia species: *Chlamydophila psittaci*, *Chlamydophila pneumoniae* (non-STD)
- Global Impact: ~4 million new cases/year 🌍

2. Life Cycle of Chlamydia

Text Flowchart – Chlamydia Life Cycle:

Elementary Body (EB) → attaches to epithelial cell → enters cell → Converts to Reticulate Body (RB) → replicates inside inclusion → RB converts back to EB → cell lysis → EB released → infects new cells

- Elementary Body (EB): Infectious form
- Reticulate Body (RB): Replicative form inside host cell

3. Clinical Features 🐍

General Symptoms

- Fever & low-grade fever
- Unexplained weight loss
- Swollen lymph nodes
- Fatigue & malaise
- Diarrhea
- White spots in mouth

Female Symptoms

- Vaginal discharge (white or grey)
- Dysuria (burning with urination)
- Lower abdominal pain
- Intermenstrual bleeding
- Painful intercourse
- Low-grade fever (later symptom)

Male Symptoms

- Urethral discharge (mucopurulent, mucoid, or clear)
- Dysuria & burning/itching at penile opening
- Pain & swelling in testicles (epididymitis)
- Low-grade fever

Infant Symptoms

- Conjunctivitis

- Pneumonitis
- Pharyngitis
- Rhinitis

4. Complications ⚠

Sex	Complications
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Male	Epididymitis, Reiter's syndrome (conjunctivitis, urethritis, arthritis), Reactive arthritis
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Female	Pelvic inflammatory disease (PID): salpingitis, endometritis; Reiter's syndrome; Reactive arthritis
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5. Laboratory Diagnosis 🧪

1. Cytology

- Stains: Giemsa, Iodine, Pap smear
- Detects chlamydial inclusions in epithelial cells

2. Isolation in Cell Culture

- Gold standard but slow & expensive
- Cell lines: McCoy or HeLa cells
- Incubation: 40–72 hours

3. Direct Fluorescent Antibody (DFA)

- Detects elementary bodies using fluorescent staining

4. Nucleic Acid Hybridization (NA Probe)

- Detects *C. trachomatis* & *N. gonorrhoeae* DNA/RNA

5. Amplification Techniques

- PCR, LCR (Ligase Chain Reaction)

6. Serology

- CFT, ELISA (screening, may give false positives)

6. Pap Smear & Significance

- Purpose: Quick, simple, painless screening for pre-cancerous changes

- Detects infections even without symptoms: Yeast, Chlamydia, Genital Herpes, Trichomonas
- Screening Guidelines:
 - First Pap: 3 years after sexual activity onset (age 21-29)
 - Annual thereafter; can extend to every 2-3 years after 3 normal tests

7. Key Exam Points

- Chlamydia = obligate intracellular bacteria, serovars D-K → urogenital STDs
- Incubation: 2-3 weeks
- Life cycle alternates between EB (infectious) and RB (replicative)
- Lab diagnosis: Pap smear, DFA, PCR, culture
- Complications: PID in females, epididymitis & reactive arthritis in males

Lymphogranuloma Venereum (LGV)

Causative Agent: *Chlamydia trachomatis* (L1, L2, L2a, L3)

Other Chlamydiae: *Chlamydophila psittaci*, *C. pneumoniae*

Overview

- LGV primarily affects lymphatics and lymph nodes
- Entry via:
 - Breaks in the skin
 - Crossing epithelial layers of mucous membranes

Clinical Features 🦴

- Genital papules or ulcers
- Swollen inguinal lymph nodes
- Rectal involvement (esp. after anal intercourse): ulcers, bleeding, pain, discharge

Complications ⚠️

- Enlargement & ulceration of external genitalia
- Lymphatic obstruction → elephantiasis of genitalia

Text Flowchart - LGV Pathogenesis:

Skin/mucosal entry → Local infection → Lymphatic invasion → Swollen inguinal/femoral lymph nodes → Possible chronic lymphedema

Chancroid

Causative Agent: *Haemophilus ducreyi*

Also called Soft Chancre

Clinical Features 🦋

- Painful sores or raised bumps on genitalia
- Narrow red border → pus-filled → ruptures → open painful ulcer
- Inguinal lymphadenopathy common

Laboratory Diagnosis 🧪

Method	Findings
Direct microscopy	Gram-negative bacilli in "school of fish" pattern
Culture	Chocolate agar with X factor (hemin), no V factor (NAD)
PCR	Detects bacterial DNA
Direct immunofluorescence	Specific staining
EIA	Absorption & non-absorption; Lipo-oligopolysaccharide detection

Text Flowchart – Chancroid Infection:

Skin/mucosal breach → Local infection → Painful pustule
→ Rupture → Ulcer → Lymphadenopathy

Granuloma Inguinale (Donovanosis)

Causative Agent: *Klebsiella granulomatis* (formerly *Calymmatobacterium granulomatis*)

Clinical Features

- Small painless nodules appear 10–40 days post-exposure
- Nodules burst → fleshy, oozing “beefy-red” lesions
- Usually no inguinal lymphadenopathy

Histology

- Donovan bodies: intracellular inclusions in macrophages
 - Appearance: rod-shaped, oval, “safety-pin” style
 - Detected with Wright-Giemsa stain

Diagnosis


- Based on sexual history & physical exam
- Tissue biopsy → Wright-Giemsa stain → Donovan bodies
- Culture: Egg yolk or Modified Levanthal agar

Text Flowchart – Granuloma Inguinale Pathogenesis:

Skin/mucosal entry → Painless nodule → Ulceration → Beefy-red lesion → Donovan bodies in macrophages

Genital Ulcer Disease Differential Diagnosis

Disease	Organism	Key Feature
Genital Herpes	HSV-1 / HSV-2	Painful sores
Primary Syphilis	<i>Treponema pallidum</i>	Painless chancre
Chancroid	<i>H. ducreyi</i>	Painful ulcer, inguinal lymphadenopathy
LGV	<i>C. trachomatis</i> (L1-L3)	Infection of lymphatics & lymph nodes
Granuloma Inguinale	<i>K. granulomatis</i>	Painless, beefy-red lesion, no lymphadenopathy

Key Exam Points 

- LGV: Lymphatic invasion, may cause elephantiasis
- Chancroid: Painful ulcer, "school of fish" on Gram stain
- Granuloma Inguinale: Painless, beefy-red ulcer, Donovan bodies in macrophages
- GUD differentiation based on pain, lymphadenopathy, and ulcer characteristics