

Gr-X

Spirochetes (spiral shaped bacteria)

Visualized with dark-field microscopy

Corkscrew-shape

Treponema pallidum

Syphilis

- Primary syphilis** — Localized disease presenting with **painless chancre**. Use fluorescent or dark-field microscopy to visualize treponemes in fluid from chancre. VDRL + in ~80%
- Secondary syphilis** — Disseminated disease with constitutional symptoms, maculopapular rash, **condyloma lata**, lymphadenopathy, patchy hair loss; also confirmable dark-field microscopy, Serology testing: VDRL/RPR (nonspecific), confirm diagnosis with specific test
- Tertiary syphilis** — **Gummas(chronic granulomas)**, aortitis (vasa vasorum destruction), and arthritis
- Neurosyphilis** — Neurosyphilis can occur any stages; Neurosyphilis presents as **tabes dorsalis** (obliteration of dorsal columns, with loss of vibration/proprioception + a positive Romberg sign, where patient falls over when standing with eye closed), **Argyll-Robertson pupil**, and stroke without hypertension
- Congenital syphilis** — **Rhagades** (linear scars at angle of mouth), **snuffles** (nasal discharge), **saddle nose**, **notched (hutchinson) teeth**, **mulberry molars**, and **short maxilla, saber shins, CN-& deafness**

Diagnosing syphilis

- Serology testing**
 - Nontreponemal (nonspecific)** — RPR, VDRL
 - Treponemal (specific)** — FTA-ABS, TPPA
- Direct testing**
 - Darkfield microscopy
 - PCR

Tx: Penicillin G

Borrelia

Borellia burgodferi

Lyme disease; spread by Ixodes tick (same as Ehrlichia, Babesia, and Anaplasma)

Clinical stages

- Early localized: erythema migrans (typical "bull's-eye" configuration is pathognomic but not always present), flulike symptoms
- Early disseminated: secondary lesions, carditis, AV block, facial nerve (Bell) palsy, migratory myalgias/transient arthritis
- Late disseminated: encephalopathy, chronic arthritis, peripheral neuropathy

Tx: Doxycycline (1st line); amoxicillin (pregnant patients, children to 8 years old); ceftriaxone if IV therapy required

Borella recurrentis

Relapsing fever — Spread by body lice, not Ixodes tick the way Lyme disease

Question mark-shape

Leptospira interrogans

Spirochete with hook-shaped ends found in water contaminated with animal urine

Leptospirosis

Flulike symptoms, myalgia (classically of calves), jaundice, photophobia with conjunctival suffusion (erythema without exudate)

Weil disease (interohemorrhagic leptospirosis)

Severe form with jaundice and azotemia from liver dysfunction, fever, hemorrhage, and anemia

Mycobacteria

Mycobacterium Tuberculosis

Cord factor creates "serpentine cord" appearance in virulent M tuberculosis strains; activates macrophages (promoting granuloma formation) and induce release TNF- α .

Sulfatides (surface glycolipids) inhibit phagolysosomal fusion

TB symptoms include fever, night sweats, weight loss, cough, hemoptysis

PPD+ if current infection or past exposure. PPD- if no infection and in immunocompromised patients (especially with low CD4+ cell count, IGRA has fewer false positive from BCG vaccination, caseating granuloma with central necrosis and Langhans giant cell are characteristic of 2 tuberculosis

TB reactivation risk highest in immunocompromised individuals (HIV, organ transplant recipients, TNF- α inhibitor use (Infliximab, adalimumab, certolizumab, golimumab)

Tx: Rifampine, isoniazid, pyrazinamide, ethambutol, streptomycin

Mycobacterium avium-intracellulare

Causes disseminated, non-TB disease in AIDS; often resistant to multiple drugs

Therefore, if CD4 cells are less than 50cells/mm3, the antibiotic azithromycin is given

Mycobacterium scrofulaceum

Cervical lymphadenitis in children

Mycobacterium marinum

Hand infection in aquarium handlers

Mycobacterium Leprae

Acid-fast bacillus that likes cool temperatures — Infects skin superficial nerves—"glove and stocking" loss of sensation and cannot be grown in vitro

Leprosy (Hansen disease)

Lepromatous

Presents diffusely over the skin, with **Leonine** (lionlike facies, and is communicable (high bacterial load). Characterized by low cell-mediated immunity with a largely Th2 response. Lepromatous form can be lethal.

Tuberculoid

Limited to few hypoesthetic, hairless skin plaque; characterized by high cell-mediated immunity with a largely Th1-type response and low bacterial load.

Tx: Dapsone and rifampine for tuberculoid form; clofazimine is added for lepromatous form