# Bartonella

# **1) Essentials at a Glance**

* **Genus**:
  + small, fastidious, aerobic/microaerophilic Gram-negative bacilli;
  + facultative intracellular (endothelium ± erythrocytes).
  + Oxidase-, catalase-, urease-, nitrate- negative;
  + biochemically inert (diagnosis is **serology/PCR**, not phenotypic panels).
* **Key human pathogens & reservoirs/vectors**
  + *B. henselae*
    - cats (reservoir); **cat fleas** vector
    - cat-scratch disease (CSD), osteomyelitis, neuroretinitis/POGS, hepatosplenic disease; bacillary angiomatosis/peliosis in immunocompromise; IE (less common than *B. quintana*).
  + *B. quintana*
    - **human reservoir**; **body lice** vector
    - trench fever (relapsing fever, shin pain), chronic bacteremia in people experiencing homelessness, **blood-culture–negative IE (BCNIE)**.
  + *B. bacilliformis*
    - **sandflies (Lutzomyia)** in Andes
    - Carrion’s disease: **Oroya fever** (acute hemolytic anemia) then **verruga peruana** (angioproliferative lesions).
* **Diagnostic Strategy (pragmatic, exam-style)**
  + BCNIE
  + relapsing fever with lice exposure
  + unilateral tender nodes after cat exposure
  + HIV with angiomatous lesions
  + Peruvian/Andean travel with hemolysis
  + vascular nodules.

# **2) Laboratory Microbiology (bench & reference)**

* **Serology**
* **PCR** on tissue > blood.
* **Culture**: extremely fastidious; slow growth on enriched blood/chocolate (5% CO₂), often **weeks**; isolation from blood is uncommon without enrichment cell culture (e.g., BAPGM/insect-cell media).
* **Stains Histology**: Warthin–Starry or Steiner silver stains highlight bacilli in BA/peliosis; lymph nodes may show stellate microabscesses;
* **Immunohistochemistry m**ore sensitive than silver for *B. henselae* in nodes. [NCBI](https://www.ncbi.nlm.nih.gov/books/NBK586304/bin/oppguide.pdf)[PubMed](https://pubmed.ncbi.nlm.nih.gov/31913159/?utm_source=chatgpt.com)
* **Biochemical profile**: oxidase-, catalase-, urease-, nitrate-negative;
* **Safety**: BSL-2 practices; alert the lab for suspected BCNIE/BA specimens.
* Blood films: in Oroya fever

# **4) Clinical Syndromes (with treatment)**

## **A) Cat-Scratch Disease (CSD) — *B. henselae***

* **Typical**:
  + papule at inoculation
  + **unilateral regional lymphadenitis** (axillary/epitrochlear)
  + low-grade fever
  + often self-limited (2–8 w).
* **Atypical**:
  + hepatosplenic lesions
  + Osteomyelitis
  + Neuroretinitis/POGS
  + encephalopathy.
* **Antibiotics**:
  + not always required; **azithromycin shortens lymph node volume** (5-day course).
  + Dose: 500 mg day 1 then 250 mg daily days 2–5 (adults/children >45.5 kg).
* **Suppuration**: consider **needle aspiration** for pain relief

## **B) Ocular Bartonella (neuroretinitis, Parinaud’s oculoglandular syndrome)**

* **Treatment (common practice)**:
  + **doxycycline 100 mg bd + rifampicin 300 mg bd for 4–6 wks**
  + corticosteroids sometimes adjunctive in severe neuroretinitis (after antibiotics are started).

## **C) Bacillary angiomatosis / peliosis hepatis (usually HIV or profound immunosuppression)**

* **Clinical**:
  + angiomatous skin lesions (may resemble Kaposi)
  + systemic symptoms
  + peliosis
  + hepatic/splenic vascular lesions ± hemorrhage.
* **Treat**:
  + **doxycycline 100 mg q12h OR erythromycin 500 mg q6h for ≥3 months** and until lesions resolve; add
  + **rifampicin** or use CNS-penetrating agents if CNS eye disease.
  + Optimise ART.

## **D) Trench fever / chronic bacteremia — *B. quintana***

* **Features**:
  + association with body lice and homelessness
  + relapsing fever
  + severe bone/shin pain
  + may progress to IE.
* **Treat (typical)**:
  + **doxycycline 100 mg bd for ≥4 wks**;
  + in severe disease or IE suspicion add **gentamicin** for 14 days.

## **E) Infective endocarditis (BCNIE) — *B. quintana* > *B. henselae***

* **Clues**: BCNIE, homelessness/lice or cat exposure; **ANCA-positive pauci-immune GN** can mimic vasculitis — avoid steroids until IE excluded. [CDC Travelers' Health](https://wwwnc.cdc.gov/eid/article/31/4/24-1812_article/?utm_source=chatgpt.com)
* **Regimens (evidence-based options)**
  + **Option 1**: **Doxycycline 100 mg q12h + rifampicin 300 mg q12h for 6 wks**, then **continue doxycycline for ≥3 mo**. [NCBI](https://www.ncbi.nlm.nih.gov/books/NBK586304/bin/oppguide.pdf)
  + **Option 2**: **Doxycycline 100 mg q12h + gentamicin 1 mg/kg q8h for 2 wks**, then **continue doxycycline** to complete at least **6 wks**. [NCBI](https://www.ncbi.nlm.nih.gov/books/NBK586304/bin/oppguide.pdf)
  + ESC 2023 emphasises systematic Bartonella serology in BCNIE work-ups; 2023 **Duke-ISCVID** recognises **Bartonella IgG ≥1:800** (or Bartonella PCR) as **Major**. Surgical management per standard IE indications. [sochicar.cl](https://sochicar.cl/wp-content/uploads/2023/09/ehad193.pdf)[iscvid.org](https://www.iscvid.org/wp-content/uploads/2023/07/2023-The-2023-Duke-ISCVID-Criteria-for-Infective-Endocarditis-Fowler-CID-May-4-2023-Final.pdf?utm_source=chatgpt.com)

## **F) Carrion’s disease — *B. bacilliformis* (travel history to Andes)**

* **Oroya fever (acute hemolytic phase)**:
  + Hospitalise
  + **ciprofloxacin** or **ceftriaxone** commonly used;
  + supportive transfusion as needed
* **Verruga peruana** 
  + **chronic angioproliferative phase**:
  + **azithromycin 7–14 days**, or **rifampicin 21–28 days**; fluoroquinolones are alternatives;

# **5) Antimicrobial Notes (what to know for viva)**

* **Intracellular location** → **tetracyclines/macrolides** preferred; **aminoglycosides** (gentamicin) provide **early bactericidal** activity in IE. **Cephalosporins alone are not reliable** for Bartonella disease (exception: ceftriaxone used in Oroya fever as alternative).
* **Susceptibility testing** is not standardised; results correlate poorly with outcomes. Use **syndrome-based regimens** and duration.

# **6) Epidemiology & Prevention (high-yield points)**

* **Avoid fleas, body lice and sandflies .**

# **7) Pitfalls & Exam Pearls**

* **BCNIE work-up**: Always send **Bartonella and Coxiella serology** early; if surgery occurs, **send valve for PCR** (highest diagnostic yield).
* **Serology titres**: For IE, **IgG ≥1:800** is now **Major** (Duke-ISCVID 2023). Lower titres do **not** exclude Bartonella IE; rely on combined criteria.
* **ANCA positivity**: Bartonella IE can be **PR3-ANCA positive** with **pauci-immune GN** → can be mislabelled as AAV; treat the infection first.
* **CSD therapy**: Azithromycin helps nodes shrink faster but **most cases resolve without antibiotics**; use antibiotics for severe/atypical disease or immunocompromise.
* **HIV BA/peliosis**: treat for **≥3 months** and until lesions resolve; relapse if shorter; optimise ART.
* **CSD (uncomplicated)**: **Azithromycin** 500 mg day 1, then 250 mg daily × 4 days. [CDC](https://www.cdc.gov/bartonella/hcp/bartonella-henselae/index.html?utm_source=chatgpt.com)
* **Ocular (neuroretinitis/POGS)**: **Doxy 100 mg bd + Rifampicin 300 mg bd × 4–6 wks** (± steroids in severe neuroretinitis once antibiotics started). [PMC](https://pmc.ncbi.nlm.nih.gov/articles/PMC6742623/?utm_source=chatgpt.com)
* **BA/peliosis**: **Doxy 100 mg q12h** **or** **Erythro 500 mg q6h** for **≥3 mo**; consider **Rifampicin** add-on for severe/CNS/ocular. [NCBI](https://www.ncbi.nlm.nih.gov/books/NBK586304/bin/oppguide.pdf)
* **Trench fever (no IE)**: **Doxy 100 mg bd ≥4 wks**; add **Gentamicin** 1 mg/kg q8h × 14 days if severe. [Medscape](https://emedicine.medscape.com/article/213169-treatment?utm_source=chatgpt.com)
* **Endocarditis**:
  + **Doxy 100 mg q12h + Rifampicin 300 mg q12h × 6 wks**, then **continue Doxy** ≥3 mo; **or**
  + **Doxy 100 mg q12h + Gentamicin 1 mg/kg q8h × 14 days**, then **continue Doxy** to complete ≥6 wks. (Adjust for renal function; prosthetic valves often need surgery.) [NCBI](https://www.ncbi.nlm.nih.gov/books/NBK586304/bin/oppguide.pdf)
* **Carrion’s disease**:
  + **Oroya fever**: **Ciprofloxacin** (e.g., 500 mg bd) **or** **Ceftriaxone**; **Chloramphenicol** acceptable alternative.
  + **Verruga peruana**: **Azithro 7–14 days** **or** **Rifampicin 21–28 days** (alt: fluoroquinolone).