# Helicobacter

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## Helicobacter pylori – Overview

### ✅ Diseases

- Causes:
  - Chronic gastritis
  - Peptic ulcers (gastric and duodenal)
- Strong risk factor for gastric adenocarcinoma
- Associated with:
  - MALT lymphoma (Mucosa-Associated Lymphoid Tissue)

### ✅ Important Properties

- Curved, gram-negative rods
- Morphology similar to *Campylobacter* spp.
- Key differences from *Campylobacter*:
  - Strongly urease-positive (*Campylobacter* = urease-negative)

- Biochemical & flagellar differences → separate genus

✅ Pathogenesis

- Adheres to mucus-secreting epithelial cells of gastric mucosa

- Urease enzyme:

  - Converts urea → ammonia + $CO_2$
  - Ammonia:
    - Neutralizes gastric acid → enables survival
    - Toxic to mucosa → contributes to damage

- Chronic inflammation:

  - Disrupts mucus barrier
  - Leads to gastritis & ulceration

- MALT lymphoma mechanism:

  - Chronic inflammation → B-cell proliferation
  - Possible transformation into B-cell lymphoma
  - *Tumor regresses with H. pylori eradication*

✅ Epidemiology

- Reservoir: Human stomach

- Mode of transmission: Likely person-to-person
- Not isolated from:
    - Stool
    - Food
    - Water
    - Animals
- Familial clustering common
- Prevalence:
    - Very high in developing countries
    - Correlates with higher gastric cancer rates

✅ Clinical Findings

- Upper abdominal pain (recurrent)
- Possible GI bleeding
- No bacteremia or systemic dissemination

✅ Laboratory Diagnosis

- Microscopy:

- Curved gram-negative rods in gastric biopsy

- Culture:
  - On *Campylobacter* media

- Urease-positive:
  - Distinguishing feature from *C. jejuni*

- Urea Breath Test (non-invasive):
  - Patient ingests radiolabeled urea
  - If H. pylori present → urease cleaves it → radiolabeled $CO_2$ in breath

- Stool antigen test:
  - For diagnosis & post-treatment confirmation

- Serology:
  - IgG antibodies indicate infection (not for cure confirmation)

☑ Treatment

- Aim: Eradicate bacteria + reduce acidity

- Triple therapy (commonly):
    - Amoxicillin + Metronidazole *(or Tetracycline instead of Amoxicillin)*
    - Bismuth salts (e.g., Pepto-Bismol)
    - Proton pump inhibitor (PPI) (often used in practice)
- Resistance issues:
    - Especially with Metronidazole
- Eradication greatly reduces recurrence

✅ Prevention

- No vaccine
- No specific preventive measures