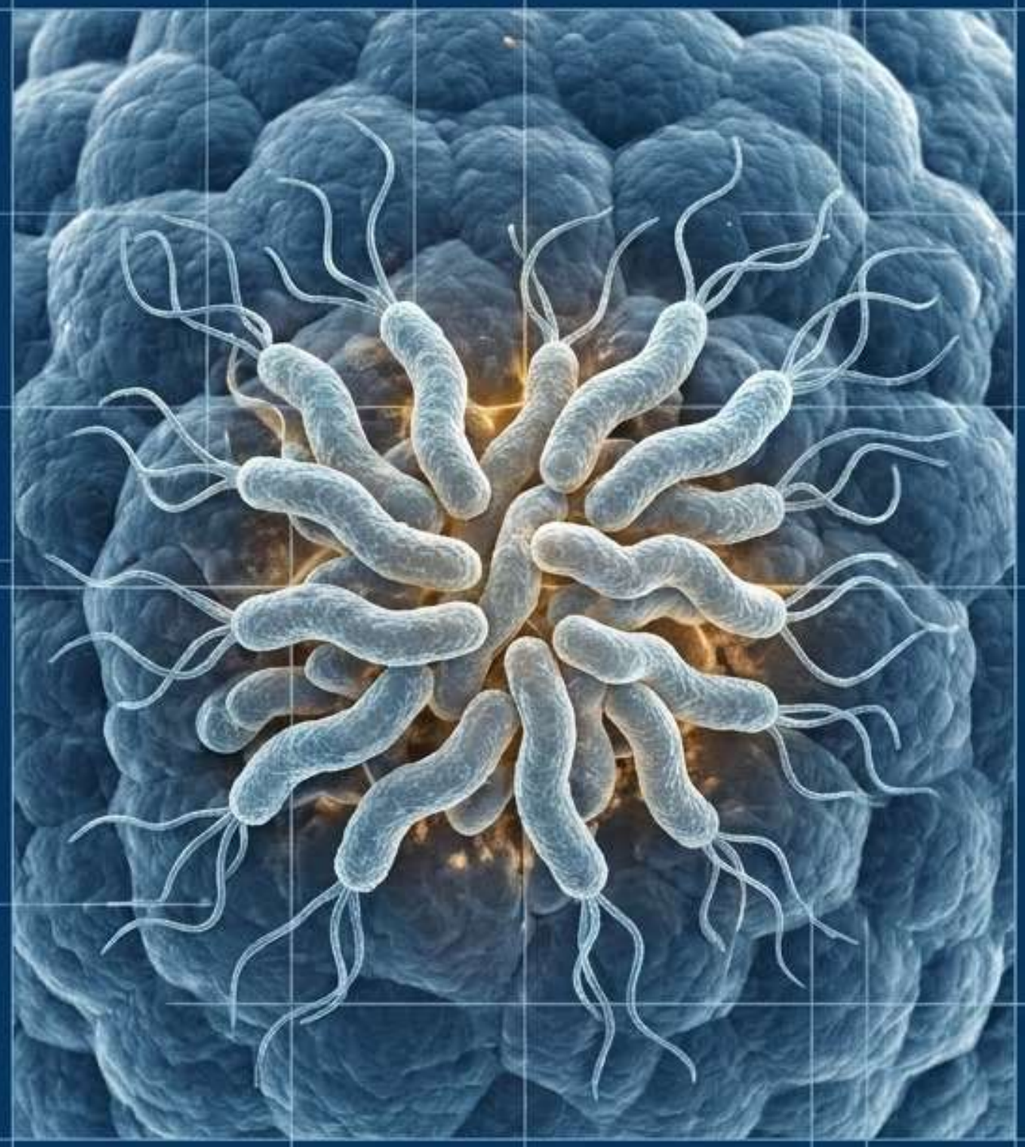
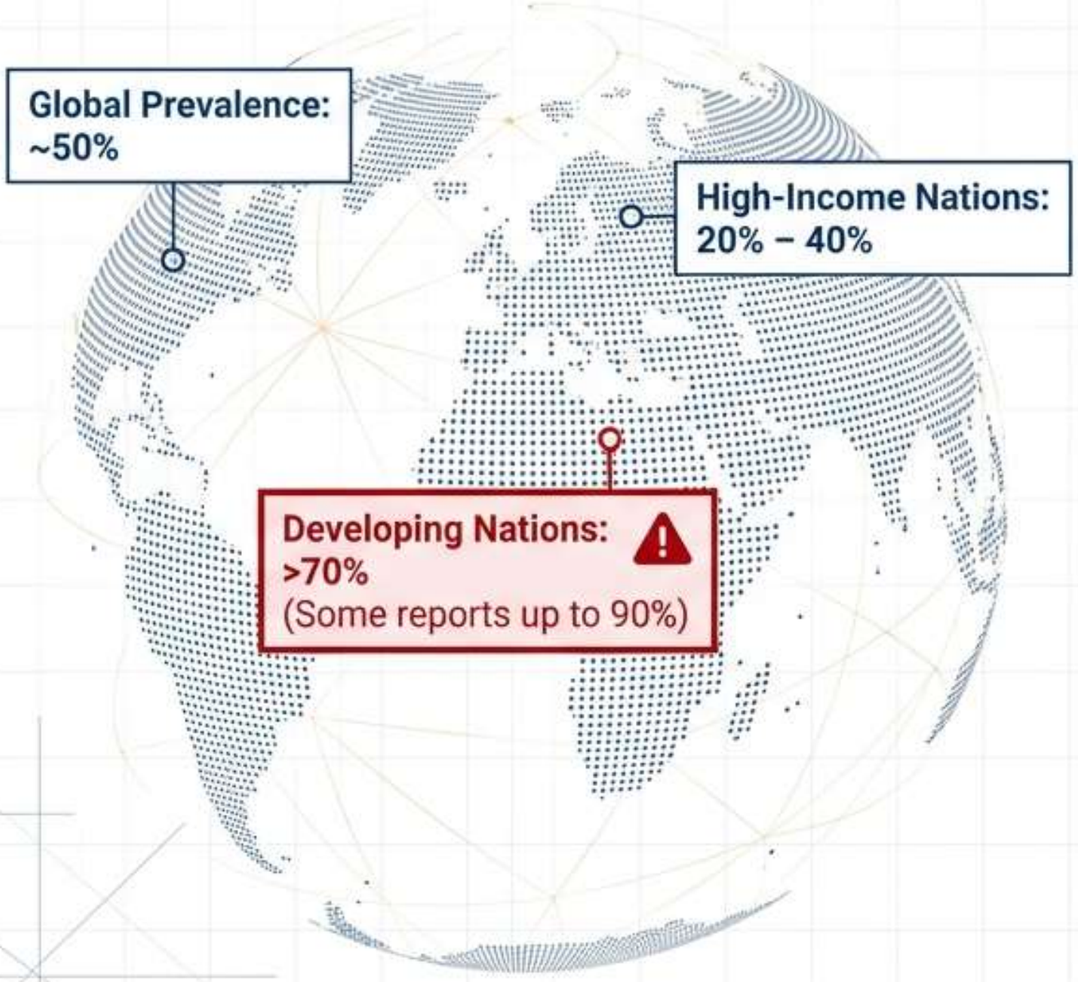


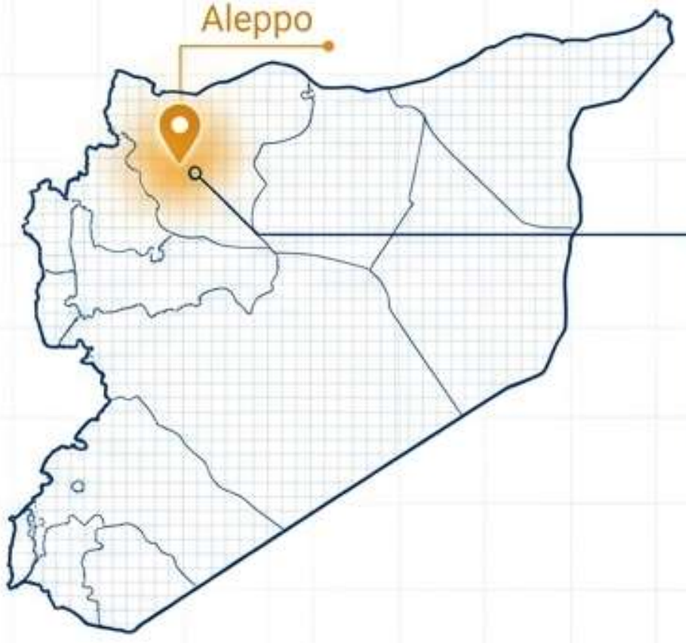
Helicobacter pylori Infection: Clinical Manifestations, Complications, and Updated Treatment Recommendations

Dr. Khaled Alswied
Gastroenterologist

GLOBAL CONTEXT



SYRIAN CONTEXT



- No nationwide epidemiological study exists.
- Aleppo University Hospital data shows localized prevalence of 72.5% to 99%.
- Diagnosis consistently based on histology.

CLINICAL BOTTOM LINE

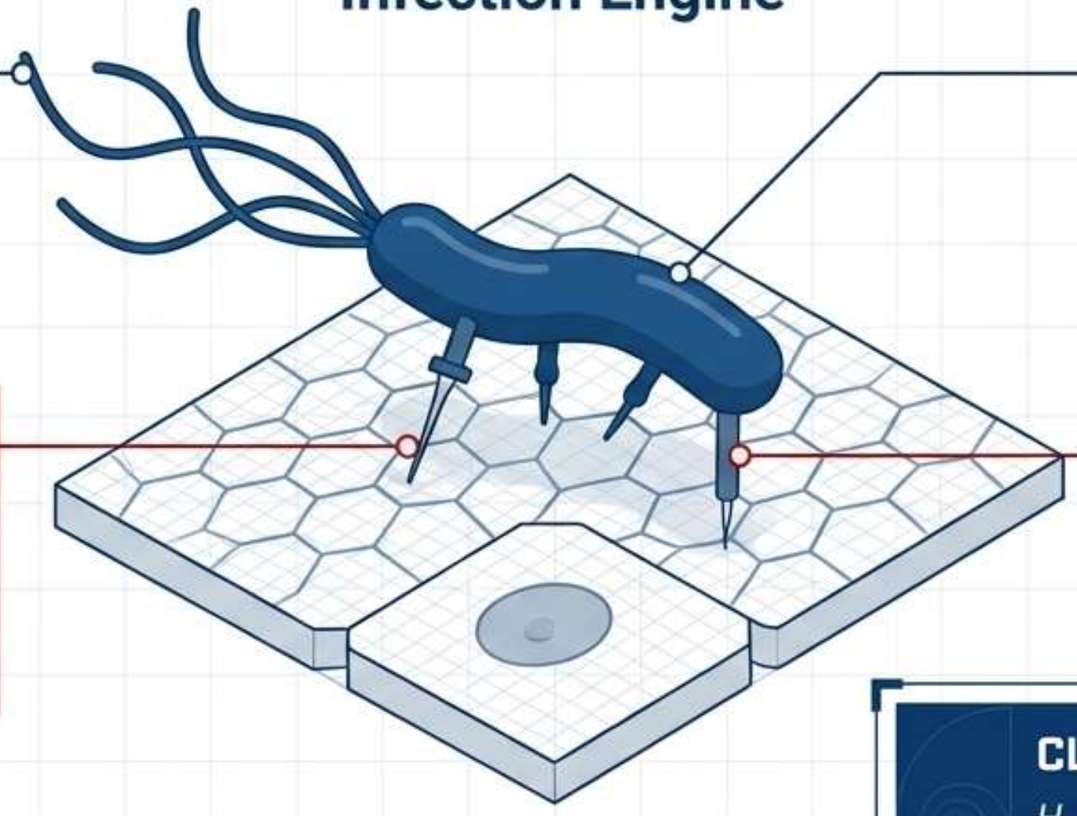
Infection rates in developing regions exceed 70%, demanding aggressive, locally optimized eradication strategies.

The Invader: Morphology & Biological Weaponry

Infection Engine

Mobility: Flagella
(allows strong motility through mucus).

The Shield: Urease secretion
(neutralizes acid, primary pathogenic mechanism).



Weapon 1: CagA (Cytotoxin-associated gene A)

Present in 60-70%. Induces pro-inflammatory cytokines, activates programmed cell death, acts as a potential oncogene.

Weapon 2: VacA (Vacuolating cytotoxin A)

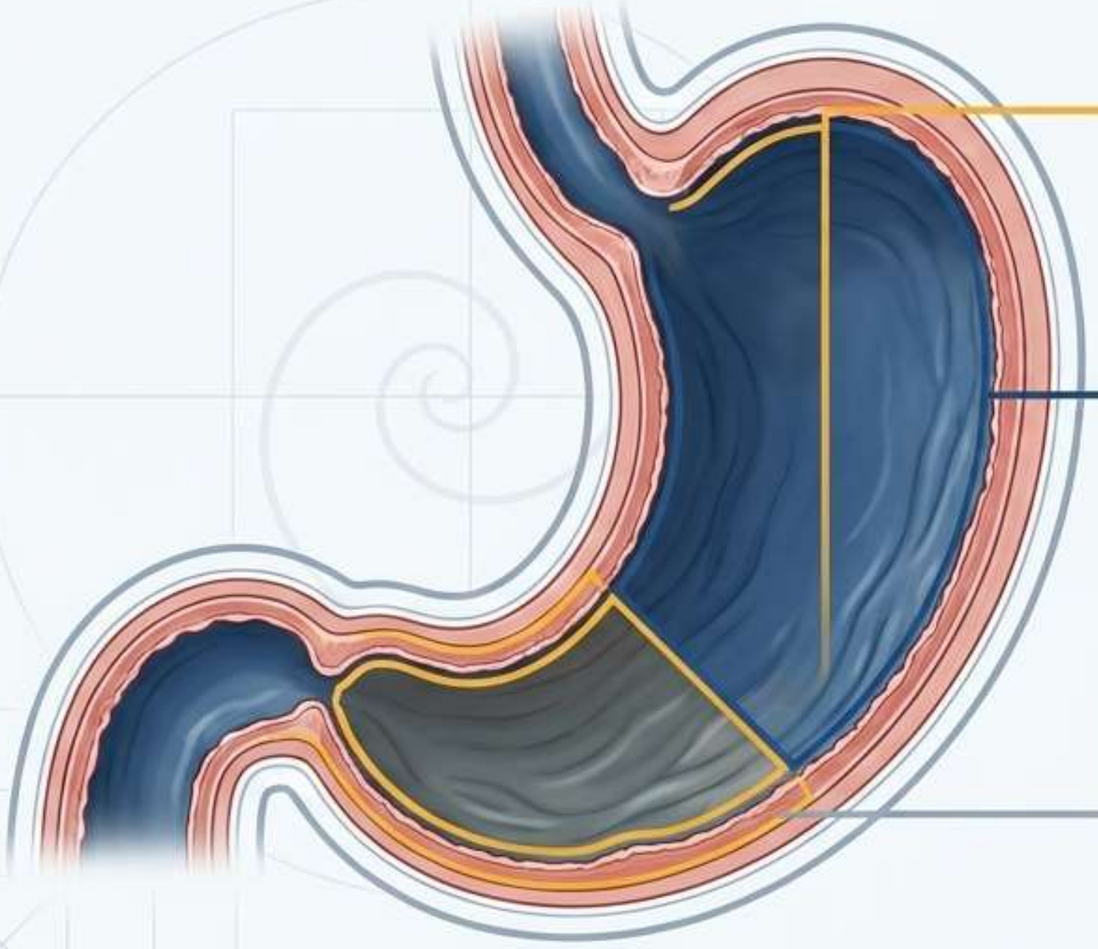
Present in ~50%. Penetrates mitochondrial membranes, causes swelling and cell death.

⚠ **Tissue Damage:**
Phospholipase & Catalase.

CLINICAL BOTTOM LINE

H. pylori does not invade host cells; it anchors to them and injects toxins (CagA/VacA) directly into the epithelium.

Gastric Localization & Disease Trajectories



⚠ Zone 1: Antrum-Predominant

- High acid secretion.
- Strongest correlation with Peptic Ulcer Disease (>90% of duodenal ulcers, >60% of gastric ulcers).

Zone 2: Corpus-Predominant

- Absence of hydrochloric acid.
- Leads to multiple foci of gastric mucosal atrophy.

Zone 3: Pan-Gastritis

- Involves entire stomach.
- Linked to mild mucosal changes.

CLINICAL BOTTOM LINE

Gastric localization dictates the clinical outcome: Antral infections drive ulcers, while corpus infections drive atrophy.

The Gastrointestinal Toll: Ulcers & Lymphoma

Peptic Ulcer Disease

Diagnosed in ~90% of PUD patients, yet <15% of infected individuals ever develop an ulcer.

Non-ulcer Dyspepsia

High prevalence, but eradication yields clinical benefit in only ~10% of cases (due to multi-factorial causes).

MALT Lymphoma

Accounts for 8% of non-Hodgkin lymphomas.

Active *H. pylori* is present in 95% of cases.

Eradication = Long-term remission.

CLINICAL BOTTOM LINE

For MALT Lymphoma, successful *H. pylori* eradication is not just preventive—it often leads to long-term remission.

The Escalating Threat: Accelerated Gastric Cancer

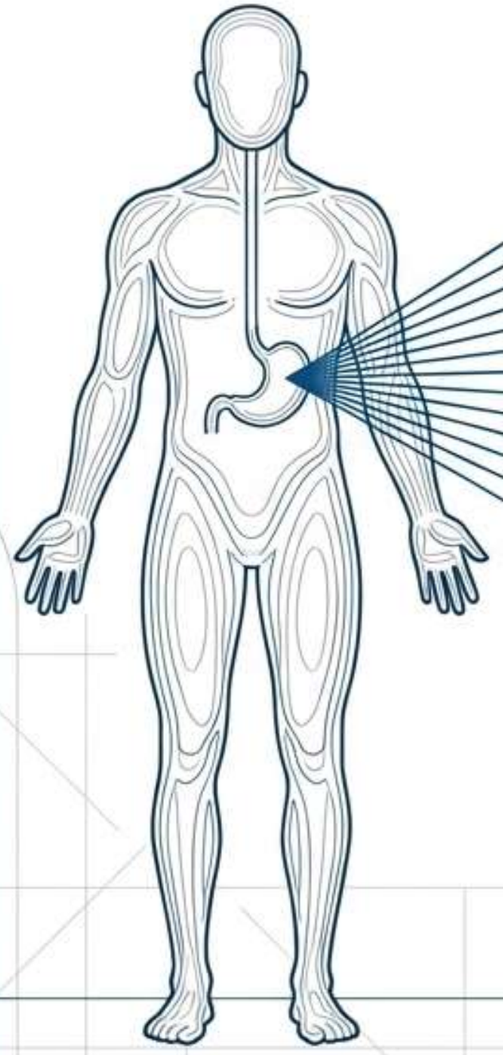
The Threat:
H. pylori accounts for up to 90% of all gastric carcinoma cases.

CAP 2025 Insight:
Infection actively shifts the development of gastric cancer to earlier in life compared to non-linked cancers.

The Failure:
Lack of routine screening leads to young populations developing highly preventable carcinomas.

CLINICAL BOTTOM LINE:
Eradication is primary cancer prevention. Unchecked infection accelerates the oncogenic timeline.

Beyond the Gut: Systemic Manifestations



Strong Evidence

- **Hematologic** (Iron Deficiency Anemia, Immune Thrombocytopenic Purpura, Vitamin B12 Deficiency).

Moderate Evidence

- **Dermatologic** (Chronic urticaria, Rosacea).
- **Neurologic** (Migraine).

Weak/Possible Evidence

- **Cardiovascular** (Atherosclerosis).
- **Metabolic** (Insulin resistance).
- **Hepatobiliary**, Osteoporosis.

CLINICAL BOTTOM LINE:
H. pylori acts as a systemic inflammatory engine, with definitively proven links to extra-gastrointestinal hematologic disorders.

The Diagnostic Arsenal

> ⚠ **Warning:** UBT & SAT are preferred for diagnosis and Test-of-Cure, but are heavily affected by concurrent PPI or antibiotic use.

	Non-Invasive		
1	Urea Breath Test (UBT)	Sens/Spec 95-98%	Gold Standard
2	Stool Antigen Test (SAT)	Sens/Spec 90-95%	Preferred alternative
3	Serology (IgG)	Sens 85-95%, Spec 75-85%	Deprioritized
	Invasive (Endoscopy-Based)		
4	Rapid Urease Test	Sens 85-95%, Spec 95-100%	Fast/Cheap
5	Histology	Sens 90-95%, Spec 95-98%	Assesses mucosa
6	Culture	Sens 70-85%, Spec 100%	Antibiotic sensitivity
7	PCR	Sens/Spec 90-95%	Detects resistance

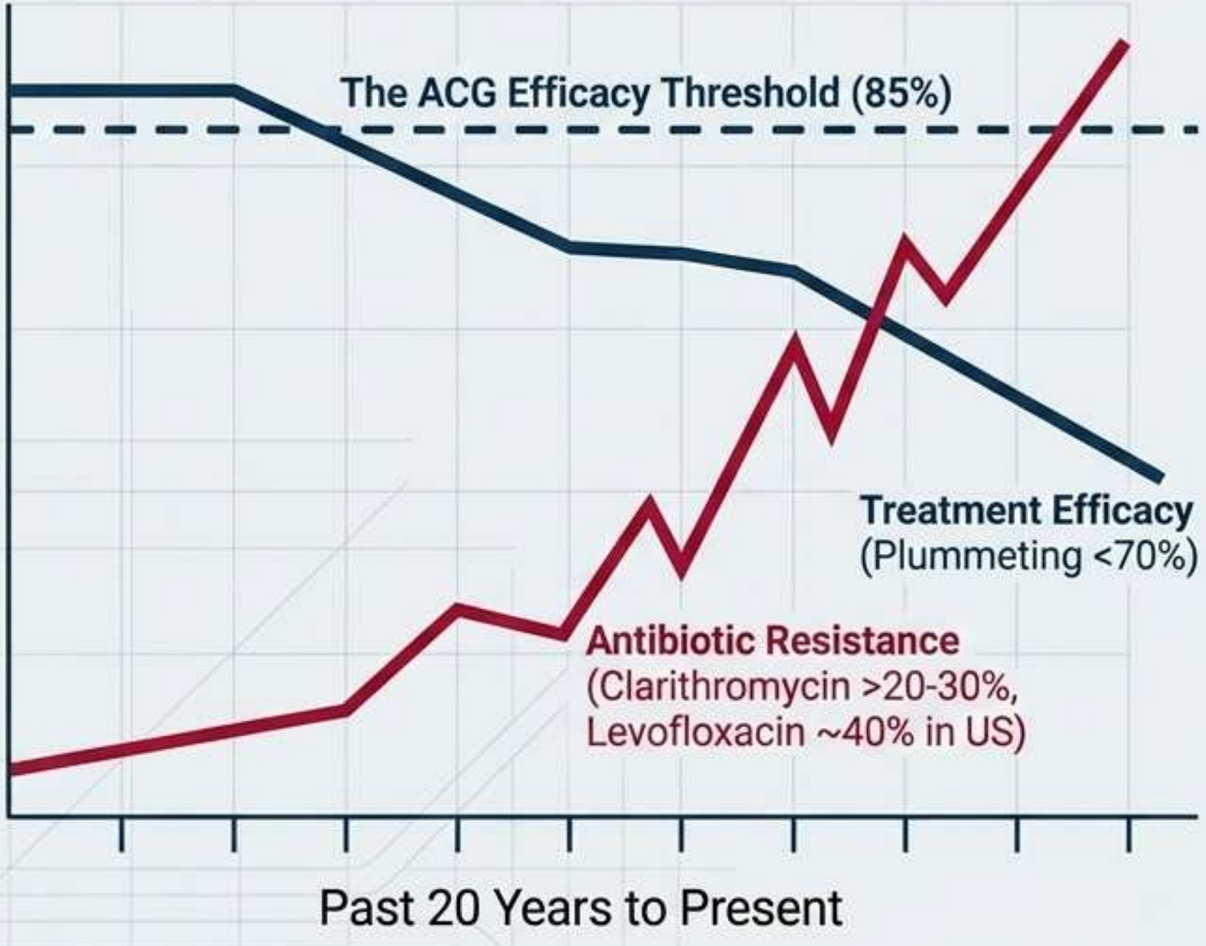
CLINICAL BOTTOM LINE: Rely on UBT or SAT for primary diagnosis and test-of-cure; reserve Culture/PCR for resistance mapping.

The 2024 Standard: First-Line Therapies Matrix

The 2024 Vanguard Therapies
Optimized Bismuth Quadruple (BQT) [Preferred in North America] Standard PPI BID + Bismuth 120-300mg QID + Tetracycline 500mg QID + Metronidazole 500mg TID/QID.
Rifabutin Triple Omeprazole 40mg TID + Amoxicillin 1g TID + Rifabutin 50mg TID. (14 days. Expensive but high efficacy).
Vonoprazan Dual Vonoprazan 20mg BID + Amoxicillin 1000mg TID.
Vonoprazan Triple Vonoprazan 20mg BID + Amoxicillin 1000mg BID + Clarithromycin 500mg BID.

CLINICAL BOTTOM LINE: Optimized Bismuth Quadruple Therapy (BQT) is the definitive preferred empiric first-line therapy.

The Core Problem: The Fall of Triple Therapy



The Death of Triple Therapy:

- Empirical clarithromycin or levofloxacin regimens wass must be abandoned in treatment–naïve patients.
- Current clarithromycin efficacy has plummeted to <70% overall (and <30% in resistant strains).
- The ACG Threshold: Any regimen with <85% eradication rate should be avoided.

CLINICAL BOTTOM LINE: Empiric Clarithromycin and Levofloxacin regimens no longer meet the 85% efficacy threshold. Retire them.

Spotlight: Optimized Bismuth Quadruple Therapy (BQT)

- BISMUTH
  140 mg dosage
- METRONIDAZOLE
  125 mg dosage
- TETRACYCLINE
  125 mg dosage

The Workhorse

10-14 day course. Can be used regardless of penicillin allergy.

Real-World Efficacy

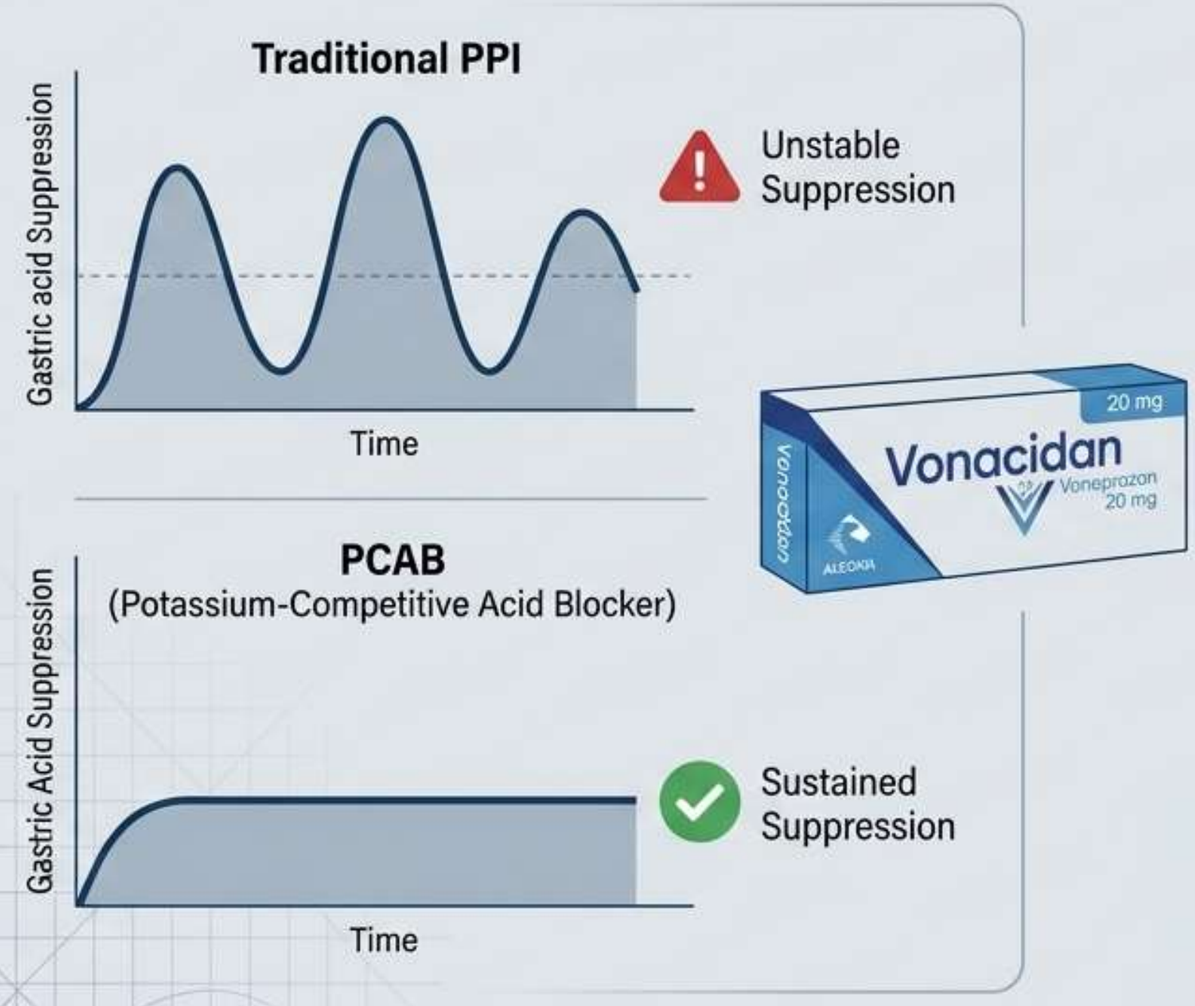
Eradicates infection in ~85% of cases in routine clinical practice.

European & Latin American Validation (2024)

Hungria et al. (UEG 2024) demonstrated 91.3% success vs 75.2% for standard triple.
Olmedo et al. (Hp-EuReg, N=49,690) confirmed >90% efficacy.

CLINICAL BOTTOM LINE:
Optimized BQT reliably clears the 85% efficacy threshold globally, establishing it as the absolute anchor of modern therapy.

Spotlight: The Vonoprazan Revolution



The Mechanism: Vonoprazan-based regimens appear fundamentally superior to older PPI-based regimens for acid suppression.

The Advantage: Dramatically lower pill burden and less complex dosing schedules compared to BQT. FDA approved as Voquezna Dual/Triple Pak.

Global Data: A 2024 Chinese meta-analysis confirmed 86.6% eradication at 10 days, climbing to 90.6% with a 14-day course.

CLINICAL BOTTOM LINE:
Vonoprazan dual/triple therapies offer >85% efficacy with vastly simplified dosing, ideal for patients who cannot tolerate BQT.

Rifabutin Triple Therapy

- Low-dose rifabutin triple therapy is an **alternative first-line option** for treatment-naïve individuals. We reserve its use for select patients in whom optimized BTQ is not an option.

- Low-dose rifabutin triple therapy demonstrates **high rates of *H. pylori* eradication**, and its dosing schedule may be easier to take than that of BQT. However, it is expensive.

DOSING AND ADMINISTRATION

Low-dose rifabutin triple therapy consists of a **14-day** course of:

RIFABUTIN
50 mg
Once daily

+

AMOXICILLIN
1 g
Three times daily

+

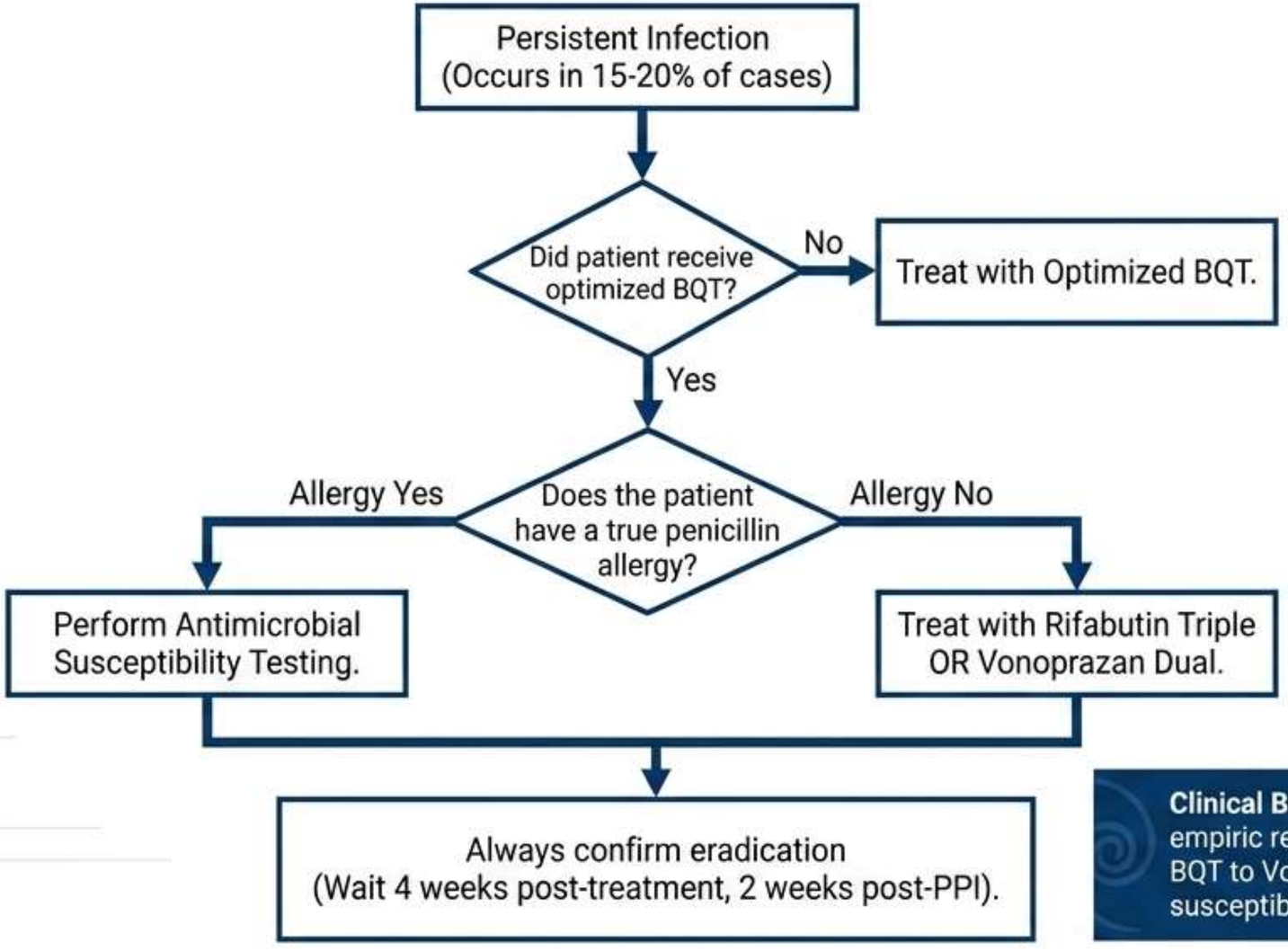
OMEPRAZOLE
40 mg
Three times daily

14 DAYS
Duration of therapy

Consider rifabutin triple therapy as a **practical and effective alternative** for patients who cannot receive **optimized bismuth-based quadruple therapy (BTQ)**.

Always confirm eradication after therapy.

The Salvage Pathway: Managing Treatment Failure



Clinical Bottom Line: Never repeat a failed empiric regimen. Move systematically from BQT to Vonoprazan/Rifabutin, escalating to susceptibility testing when needed.

Special Clinical Considerations

Pregnancy & Lactation

- Standard antimicrobials (Bismuth, Metronidazole, Levofloxacin) are contraindicated.
- Guideline: Defer treatment until after delivery and breastfeeding.
- The risks of antimicrobials outweigh the evidence linking *H. pylori* to hyperemesis gravidarum.

Adjuvant Probiotics

- Not standard monotherapy.
- Data: A 40-trial meta-analysis shows adjuvant use increases overall eradication success.
- Significantly reduces treatment side effects.

Clinical Bottom Line: Defer eradication during pregnancy. Consider adjuvant probiotics to boost compliance and mitigate antibiotic side effects.

Executive Synthesis & Next Steps

1

Treat Every Active Infection

Eradication is primary gastric cancer prevention; asymptomatic does not mean harmless.

2

Abandon Historic Empirics

Immediately stop prescribing empiric Clarithromycin or Levofloxacin due to **plummeting <70% efficacy.** ⚠

3

Adopt The 2024 Vanguard

Default entirely to Optimized Bismuth Quadruple Therapy (BQT) or Vonoprazan-based regimens.

4

Mandate Test-of-Cure

Never assume eradication. Always confirm with UBT or SAT at least 4 weeks post-treatment.

Clinical Bottom Line: The era of standard triple therapy is over. Shift to BQT or PCABs to halt the acceleration of gastric cancer.

TAKE-HOME MESSAGES

Helicobacter pylori Infection — 2026 Update

DIAGNOSIS

Test-and-treat strategy remains recommended in appropriate patients.

Urea Breath Test (UBT) and Stool Antigen Test (SAT) are the preferred non-invasive tests.

BEFORE TESTING

- Stop PPIs / PCABs for **2 weeks**
- Stop antibiotics & bismuth for **4 weeks**

Confirmation of eradication is mandatory in all patients.

TREATMENT

Optimized Bismuth Quadruple Therapy (BQT) is the preferred empiric first-line regimen in regions with high or unknown clarithromycin resistance.

Avoid empiric:

- Clarithromycin-based therapy
- Levofloxacin-based therapy

unless susceptibility is known.

NEW THERAPEUTIC TRENDS

Vonoprazan-based regimens offer:

- stronger acid suppression
- lower pill burden
- promising eradication rates.

Rifabutin triple therapy is an effective alternative/salvage option in selected patients.

REFRACTORY INFECTION

Persistent infection requires:

Assessment of adherence → Review of prior antibiotic exposure → Consideration of antimicrobial susceptibility testing

FINAL MESSAGE

> **The era of empirc clarithromycin therapy is ending; personalized and resistance-guided therapy is the future of *H. pylori* management.**

REFERENCES

- Maastricht VI / Florence Consenuss 2022
- ACG Clinical Guideline 2024
- AGA Clinical Practice Updates 2025


Thanks for
listening