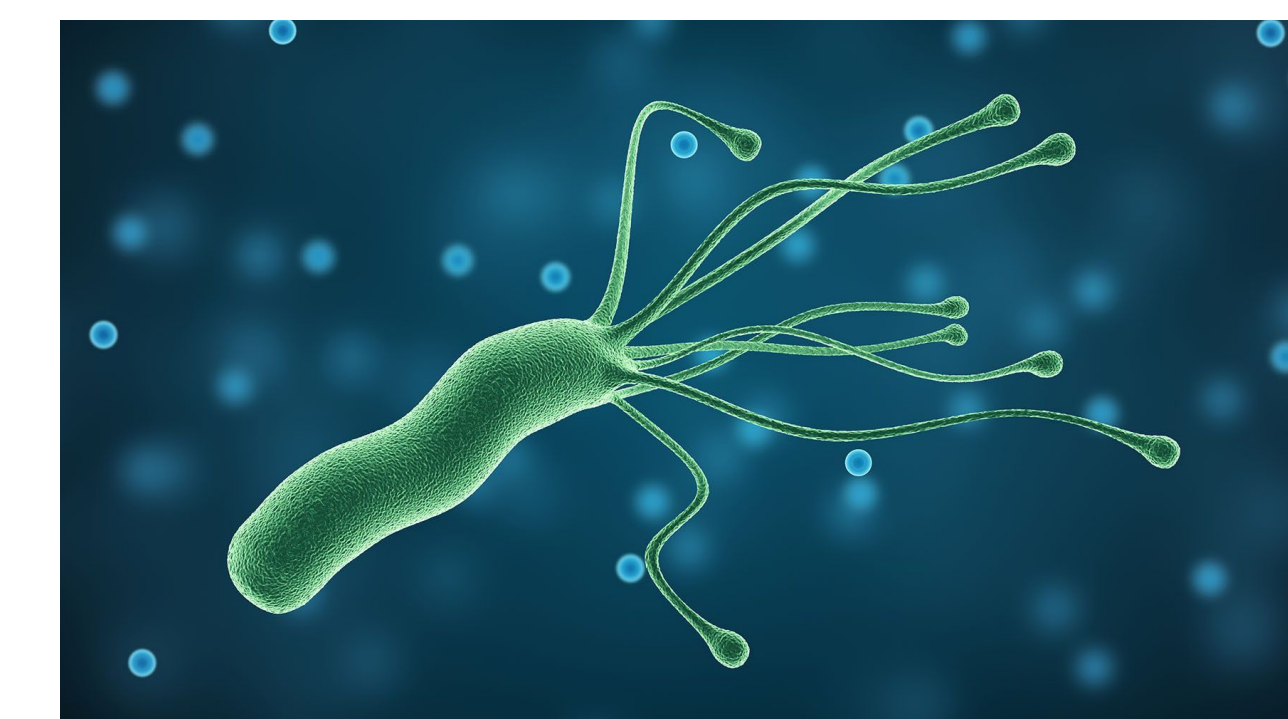


Establishing an Electronic Medical Record Treatment and Eradication Plan for H. pylori Infection at West Virginia University Hospital: A Quality Improvement Study



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BACKGROUND:

Establishing the significance of H. Pylori infection and the need for an EMR-driven eradication plan

SMARTER OBJECTIVE:

S - Specific: Implement an EMR- driven protocol for H. pylori treatment to standardized care and improve compliance with evidence- based quadruple therapy. Inconsistent treatment practices have led to inadequate eradication and increased resistance. Standardization aims to improve patient outcomes and reduce reinfection rates. Focused on optimizing the use of quadruple therapy (PPI, bismuth, tetracycline, and metronidazole) using evidence-based guidelines integrated into the EMR system.

M - Measurable: Track compliance with quadruple therapy, eradication success rates, and reinfection rate. Target: Achieve a 20% increase in compliance with quadruple therapy (from 64% to 84%). Tools: EMR analytics, compliance dashboards, and patient follow up data.

Frequency: Monthly audits and quarterly performance reviews.

A - Achievable: The feasibility of this project was leverage existing EMR infrastructure for integration and monitoring. Conducting training sessions for healthcare providers on the new protocol is key. Utilizing interdisciplinary collaboration for effective implementation. EMR support from IT are the required resources. Continuous feedback mechanisms for real-time adjustments were key for improvement.

R- Relevant: The alignment with broader goals can be seen with the rise in antibiotic resistance due to inconsistent treatment. This aligns with the institutional goals as well, showing improvement in patient outcomes and adherence to evidence- based guidelines. It supports public health objectives for reducing H. Pylori- associated complications such as peptic ulcers and gastric cancer.

T - Time-bound; Deadline:

Implementation Phase: Q1 2024

Full Compliance Achievement: By December 31, 2024

Milestones:

E - Evaluation Method:

Continuous monitoring using EMR analytics and compliance dashboards.

Regular feedback collection from healthcare providers and patients.

Quarterly performance reviews to assess progress towards the 20% compliance increase.

Key Performance Indicators (KPIs)

Compliance Rate with Quadruple therapy.

Eradication Success Rate.

Reinfection Rate.

R - Review Process:

Data driven adjustments based on compliance trends and feedback.

Review meetings every quarter to discuss progress, challenges, and areas for improvement.

Flexibility to update the protocol as new evidence or guidelines emerge.

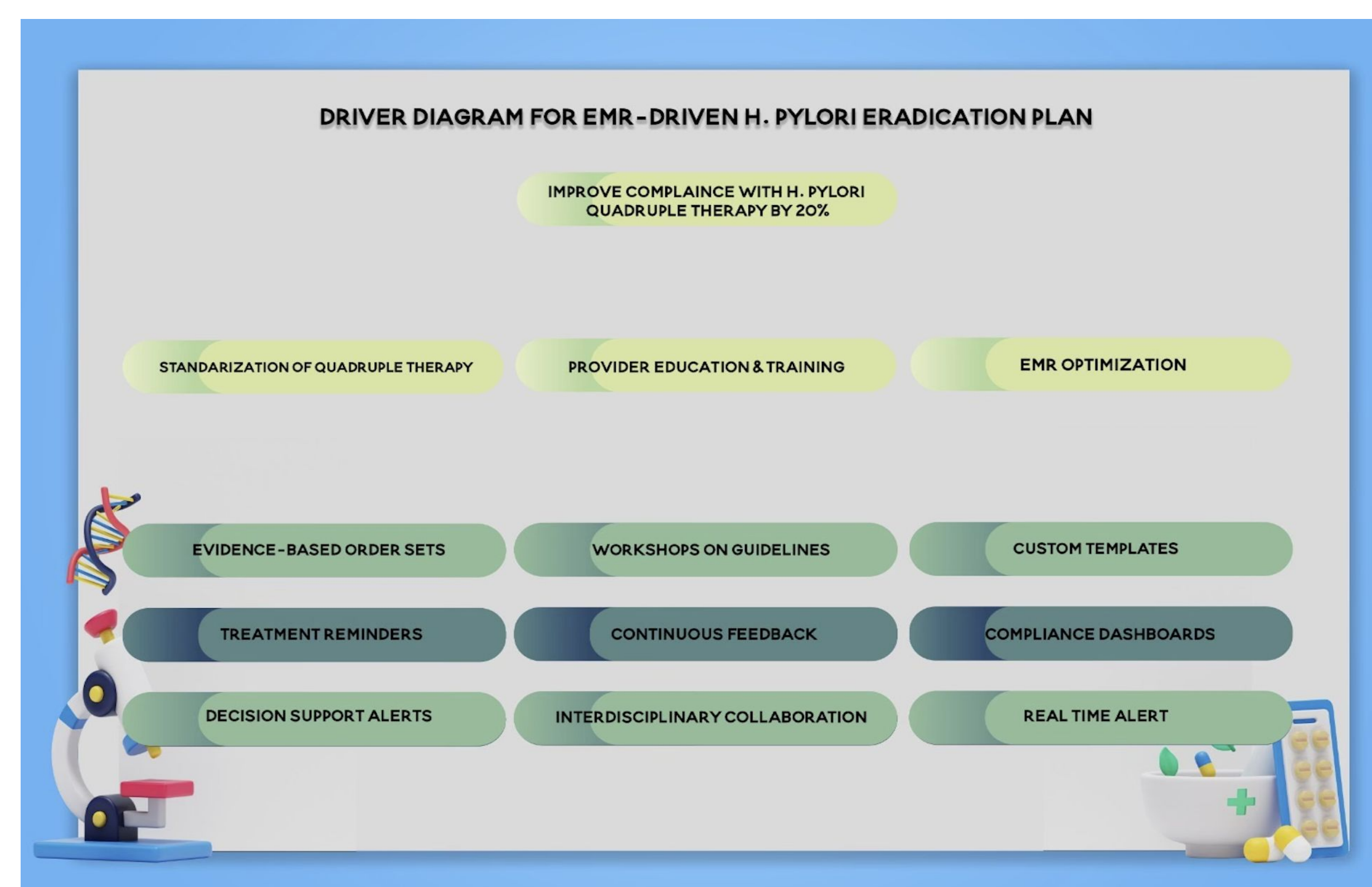
Engagement of stakeholders (physicians, pharmacists, administrators) for continuous improvement.

SCALE UP PLAN:

Implement the order set to be in patient and outpatient in both Gastroenterology clinic and Primary care clinics.

SUSTAINABILITY PLAN:

- Feedback Loops and Iterative Updates.
- Establish a feedback mechanism where the healthcare providers can report challenges and suggest enhancements.
- Conduct quarterly review meetings to discuss feedback and data insights.
- Ensure the protocol evolves based on user experiences and emerging evidence.
- Incorporation into Hospital Policy & Guidelines:
- Integrate the EMR-driven protocol into institutional clinical guidelines and policies.
- Collaborate with clinic leadership and administrative teams to formalize the protocol.
- Ensure it is standard of care, ensuring long term adherence.
- Provide ongoing education and training to new and existing healthcare providers
- Create online modules and refresher courses accessible through the hospitals learning management system.
- Conduct periodic audits to ensure compliance with the EMR protocol.



IMPROVEMENT PLAN WITH ACTIONS TAKEN:

- Pilot Study Setting:

- **Where:** Conducted in the unit group at WVU Medicine, targeting teams managing patients with a high prevalence of H. pylori infections.
- **Who:** Involved interdisciplinary teams, including physicians, pharmacists, nurses, and IT specialists for EMR integration.
- **Why:** This group is selected because of inconsistent treatment practices leading to suboptimal eradication rates and increased antibiotic resistance.
- **How:** Local leadership engaged to support the pilot implementation and resolve escalated issues not addressed by existing protocols.

- Method: cause and effect (Fishbone Diagram was used to identify contributing factors affecting H. pylori treatment) including:

- **Process:** Variability in treatment protocols, leading to inconsistent patient management.
- **People:** Gaps in provider knowledge about updated evidence- based guidelines.
- **Technology:** Underutilization of EMR features for standardizing treatment.
- **Environment:** Differences in clinical practice settings affecting adherence to guidelines.
- **Outcomes:** Identified key barriers and inconsistencies that needed addressing for successful implementation of the EMR- driven protocol.

Compliance Rate with Quadruples Therapy: Targeted a 20% increase in compliance.

Eradication Success Rate: Monitored to evaluate the effectiveness of the protocol.

Reinfection Rate: Measured to assess long-term outcomes and protocol success.

Process Measures:

Order Set Utilization Rate: Tracked the usage of standardized order sets within the EMR.

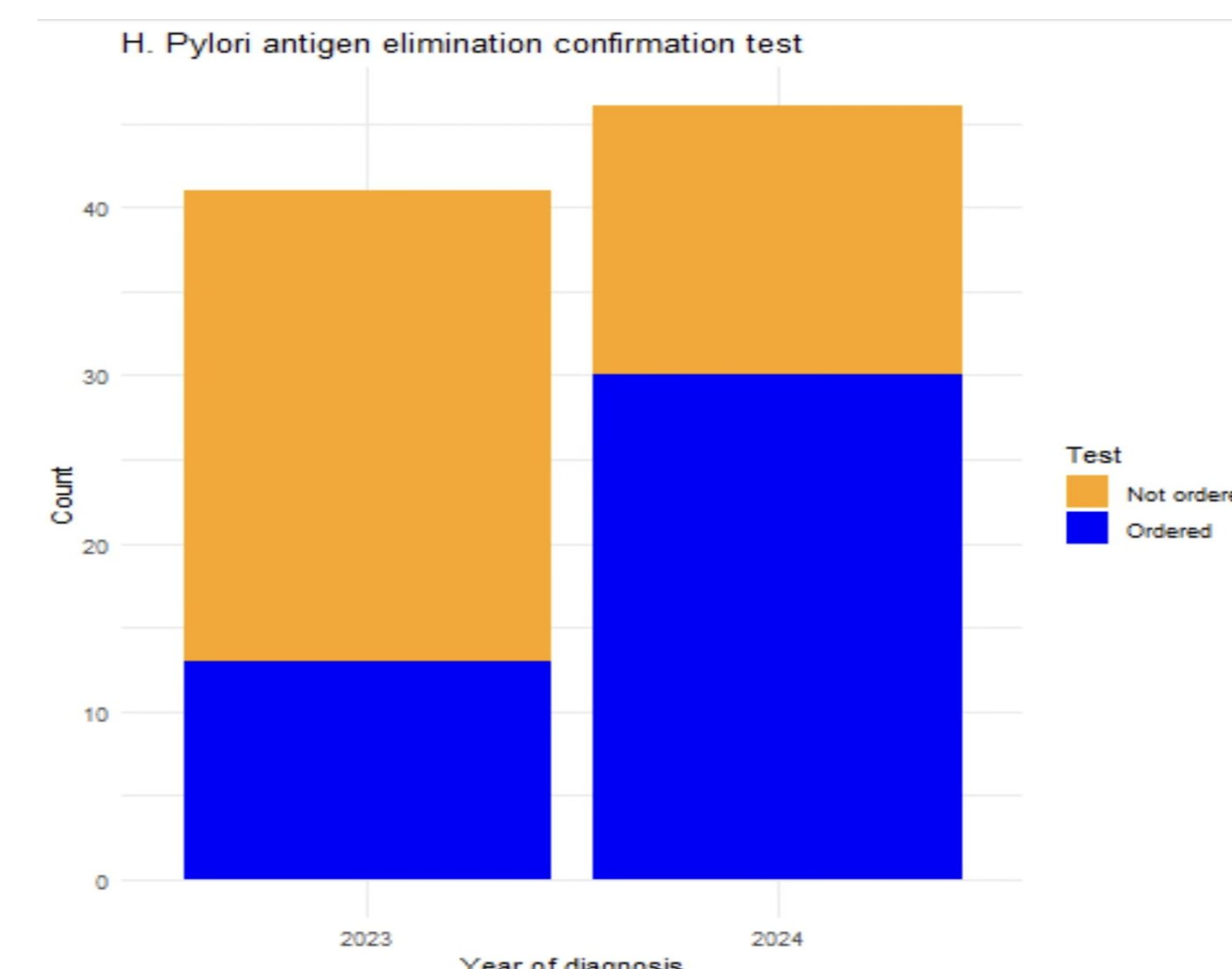
Plan-Do-Study-Act Cycles:

Plan: Implement the EMR protocol in the pilot unit.

Do: Collect baseline compliance data and introduce standardized order sets.

Study: Evaluate initial compliance rates and provider feedback.

Act: Adjust the protocol based on feedback and compliance data.



-The use of the EMR-driven treatment protocol for H. Pylori eradication increased the use of quadruple (bismuth, proton pump inhibitor, tetracycline, and metronidazole) therapy (69% vs 29%; EMR protocol vs prior management).

-Further, the use of bismuth (72% vs 31%, $p < 0.001$), tetracycline (72% vs 29%, $p < 0.001$), and metronidazole (75% vs 35%, $p < 0.001$) increased with the use of the established EMR protocol.

-Implementation of the EMR protocol also improved eradication testing (66% vs 40%, $p < 0.05$) with a trend toward improved eradication rates when compared to previous management approaches (94% vs 83%).

-Lower reinfection rates were also noted in the EMR-driven protocol cohort though 2024 data is right censored.

Overall, these data suggest improved utilization of treatment regimens and outcomes when EMR-driven protocols are in place for the treatment of H. pylori infection.