
2023 RUSH INTO GI:
AN UPDATE IN GASTROENTEROLOGY AND HEPATOLOGY

Rush University Medical Center
Cancer Center

H. pylori: Updates in Management

Rush University Medical Center
February 3, 2023
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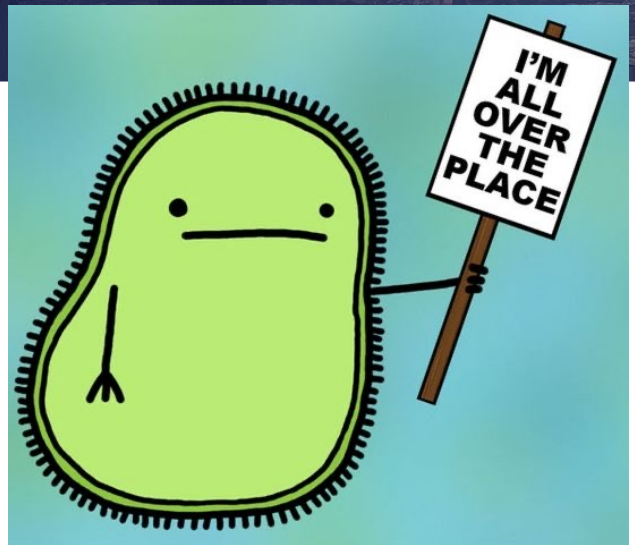
Outline

- The importance of treating H. pylori
- Who to test – are the guidelines sufficient to identify at risk patients?
- Navigating the complexities of management – updates and highlights



The importance of eradication

IT'S STILL OUT THERE

1980s
- H. pylori discovered

1994
- NIH consensus conference recognized HP as a cause of gastric and duodenal ulcers

1994
- International Agency for Research on Cancer (IARC) and World Health Organization (WHO) classified H. pylori as a Class I (definite) human carcinogen

2015
- Recognized as an important transmissible infectious disease involving the stomach

- Cigarette smoking
- HPV
- HCV

Screen for class 1 carcinogens

We don't screen …

- H. Pylori
- The most successful human pathogen
- ~50% human population infected

Why not?

Busuttil RA and Boussioutas A. J Gastoenterol and Hepatology 2000;24:193-201 / deVries AC and Kuipers EJ. Helicobacter 2007;12:22-31
Malfertheiner P et al. Gut 1012; 61:646-664 / Sugano K et al. Kyoto global consensus report on Helicobacter pylori gastritis. Gut 2015; 64:1353-67

But the guidelines say…

WHO TO TEST

Familiar Cases

29yo Caucasian female

- Epigastric abdominal pain
- No alarm features

73yo African American male

- Colorectal cancer screening
- Arthritis
- Asymptomatic

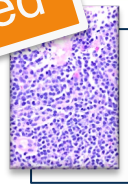
59 yo Korean female

- GERD
- FHx gastric cancer

Would you test?

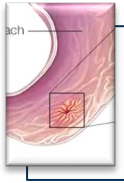
H. Pylori screening

Indicated



Gastric MALT lymphoma

Active peptic ulcer disease



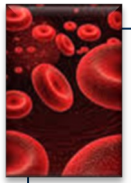
h/o peptic ulcer

h/o early gastric cancer

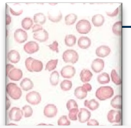
Consider

Dyspepsia <60yo

Taking ASA/
Prior to NSAIDs



Unexplained IDA



ITP

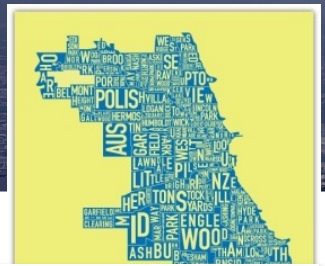
*Assymptomatic not tested

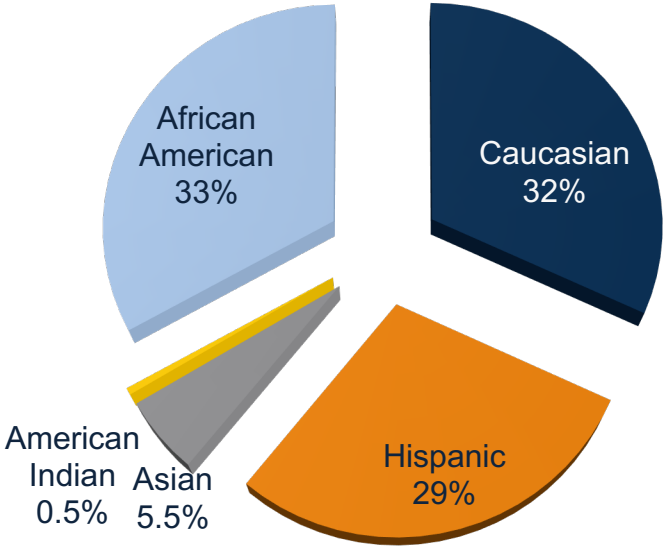
Chey WD et al. ACG Clinical Guideline: Treatment of H. pylori Infection. Am J Gastroenterol 2017;112:212-238

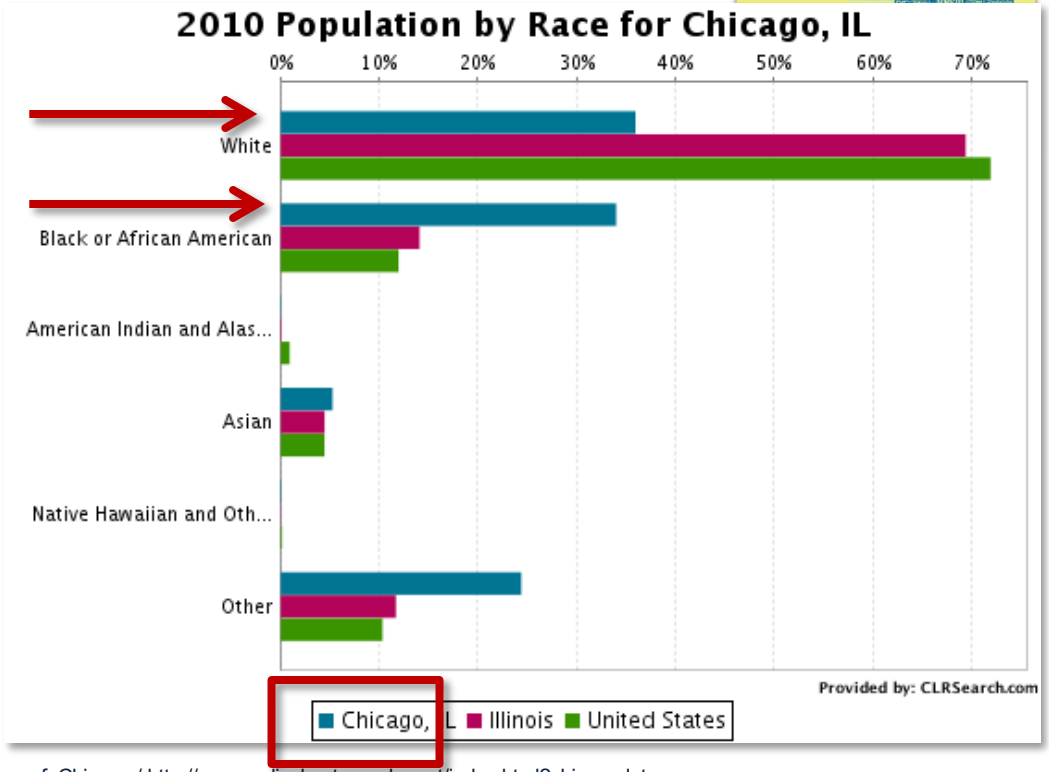
THOUGHT TO BE

The prevalence of disease is low

The question: what is the prevalence among patients in Chicago







http://en.wikipedia.org/wiki/Demographics_of_Chicago / http://www.radicalcartography.net/index.html?chicagodots
en.wikipedia.org/wiki/File:African_American_Population_by_Census_Tract_in_Chicago,_IL_(2011).svg / http://quickfacts.census.gov/qfd/states/17/1714000.html

Methods

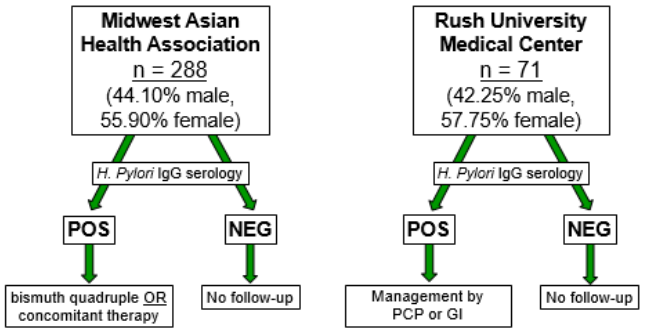


Figure 1. 288 Chinese patients were tested for *H. pylori* at MAHA Gastroenterology Clinic from June 2016 to June 2017 using *H. pylori* IgG serology. Positive patients (>1.0 U/mL) were treated with bismuth quadruple therapy or concomitant therapy. Demographics & GC risk factors were collected from MAHA patients and a group of 71 patients seen at RUMC. The results were compared to determine differences between a Chinese population and the general population of an urban university medical center.

SEROPOSITIVITY

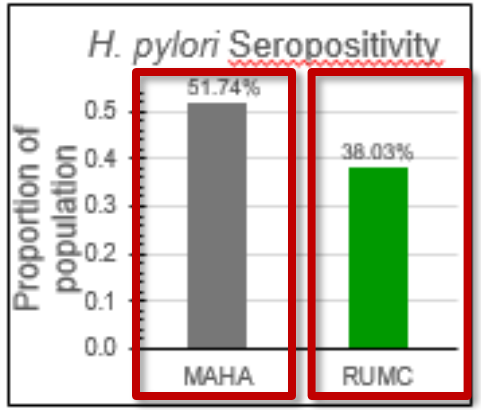


Figure 3. MAHA has higher positivity than RUMC

Lin, CF et al. Addressing gastric cancer risks via general infection rate of Helicobacter pylori in an urban Chinese population. (unpublished) 2019
Eusebi LH et al. Helicobacter 2014;19 (suppl.1):1-5

Principles to know and what is on the horizon

TREATMENT: NAVIGATING THE CHAOS

Not measuring up, new first line therapies

Treat to > 90%

Table 2. Recommended first-line therapies for *H pylori* infection

Regimen	Drugs (doses)	Dosing frequency	Duration (days)	FDA approval
Clarithromycin triple	PPI (standard or double dose)	BID	14	Yes[a]
	Clarithromycin (500 mg)			
	Amoxicillin (1 grm) or Metronidazole (500 mg TID)			
Bismuth quadruple	PPI (standard dose)	BID	10–14	No[b]
	Bismuth subcitrate (120–300 mg) or subsalicylate (300 mg)	QID		

Table 2. Recommended first-line therapies for *H pylori* infection

Regimen	Drugs (doses)	Dosing frequency	Duration (days)
Clarithromycin triple	PPI (standard or double dose)	BID	14
	Clarithromycin (500 mg)		
	Amoxicillin (1 grm) or Metronidazole (500 mg TID)		
Bismuth quadruple	PPI (standard dose)	BID	
	Bismuth subcitrate (120–300 mg) or subsalicylate (300 mg)	QID	
	Tetracycline (500 mg)	QID	
	Metronidazole (250–500 mg)	QID (250)	
		TID to QID (500)	
Concomitant	PPI (standard dose)	BID	
	Clarithromycin (500 mg)		
	Amoxicillin (1 grm)		
	Nitroimidazole (500 mg)[c]		
	PPI, Amox, Levofloxacin (500 mg QD), Nitroimidazole (500 mg)[c]	BID	
LOAD	Levofloxacin (250 mg)	QD	7–10
	PPI (double dose)	QD	
	Nitazoxanide (500 mg)	BID	
	Doxycycline (100 mg)	QD	

BID, twice daily; FDA, Food and Drug Administration; PPI, proton pump inhibitor; TID, three times daily; QD, once daily; QID, four

[a]Several PPI, clarithromycin, and amoxicillin combinations have achieved FDA approval. PPI, clarithromycin and metronidazole is not an FDA-approved treatment regimen.

[b]PPI, bismuth, tetracycline, and metronidazole prescribed separately is not an FDA-approved treatment regimen. However, Pylera, a combination product containing bismuth subcitrate, tetracycline, and metronidazole combined with a PPI for 10 days is an FDA-approved treatment regimen.

[c]Metronidazole or tinidazole.

ER Bis Quad:
RCT 91%
MA 77.6%-85%

ER Concomitant:
RCT 90%
MA 81.7%-88%

Though this was in the ACP guidelines, most trials were from Europe and Asia

Chey WD et al. Am J Gastroenterol . 2017; 112:212–238/ Li BZ et al. Comparative effectiveness and tolerance of treatments for Helicobacter pylori : systematic review and network meta-analysis . BMJ 2015 ; 351 : h4052/ Venerito M et al. Meta-analysis of bismuth quadruple therapy versus clarithromycin triple therapy for empiric primary treatment of Helicobacter pylori infection . Digestion 2013 ; 88 : 33 – 45/ Gisbert JP et al. Update on non-bismuth quadruple (concomitant) therapy for eradication of Helicobacter pylori . Clin Exp Gastroenterol 2012 ; 5 : 23 – 34/ Gatta L et al. Global eradication rates for Helicobacter pylori infection: systematic review and meta-analysis of sequential therapy . Bmj 2013 ; 347 : f4587 .

There is no shortage of guidelines

Tx regimens should be based on susceptibility testing

Houston Consensus Conference

ACG

Change in first line therapy away from Clarithromycin Triple Tx

Kyoto Global Consensus Report

After 2 unsuccessful treatments → consult

Susceptibility tests are routinely performed, even BEFORE 1st line Tx (2022)

Maastricht VI/Florence

Rifabutin triple tx may be considered 2nd line

Themes

- Treating based on local susceptibility data
- Susceptibility testing
- Non clarithromycin based therapy
- Lower threshold to treat with rifabutin

El-Serag HB et al. Clin Gastro and Hepatol 2018;16:992-1002 / Sugano K et al. Gut 2015;64:1353-1367
Shiotani A. et al. Cleve Clin J Med 2017; 84:310-318 / Malfertheiner P, et al. Gut 2022;71:1724-1762

Local Susceptibility Data

MEETING SUMMARY, *continued*

There are data regarding the effectiveness of bioavailability of iron, thyroxin, L-DOPA, possibly delavirdine, and ketoconazole.[64–66]

Antibiotic susceptibility testing and treatment of H pylori *infection approved by both the panel and the external group*

- *Statement 15:* We recommend that empiric eradication therapy for *H pylori* be based on region or population-specific antibiotic susceptibility data (91% agree/strongly agree, Grade 1B).
- *Statement 16:* We recommend consulting an expert following 2 proven unsuccessful treatment attempts with different antibiotics suggesting multidrug resistance (82% agree/strongly agree, Grade 1B).
- *Statement 17:* We recommend that validated diagnostic testing of stool or gastric mucosal biopsy by culture and susceptibility, or molecular analysis be universally available (100% agree/strongly agree, Grade 1).
- *Statement 18:* We suggest that antibiotics that may be routinely evaluated for susceptibility include amoxicillin, clarithromycin, levofloxacin, metronidazole, and tetracycline (100% agree/strongly agree, Grade 2C).
- *Statement 19:* We recommend that professional societies provide the research needed to support evidence-based reimbursement decisions for antibiotic susceptibility testing for *H pylori* (100% agree/strongly agree, Grade 1).

" if we don't have local susceptibility data, how do we know our region ISN'T <15% resistant to clarithromycin?"

Antimicrobial Resistance Incidence and Risk Factors among *Helicobacter pylori*–Infected Persons, United States

William M. Duck,* Jeremy Sobel,* Janet M. Pruckler,* Qunsheng Song,* David Swerdlow,* Cindy Friedman,* Alana Sulka,* Balasubra Swaminathan,* Tom Taylor,* Mike Hoekstra,* Patricia Griffin,* Duane Smoot,† Rick Peek,‡ DavidC. Metz,§ Peter B. Bloom,¶ Steven Goldschmid,¶ Julie Parsonnet,# George Triadafilopoulos,# Guillermo I. Perez-Perez,** Nimish Vakil,†† Peter Ernst,‡‡ Steve Czinn,§§ Donald Dunne,¶¶ and Ben D. Gold*

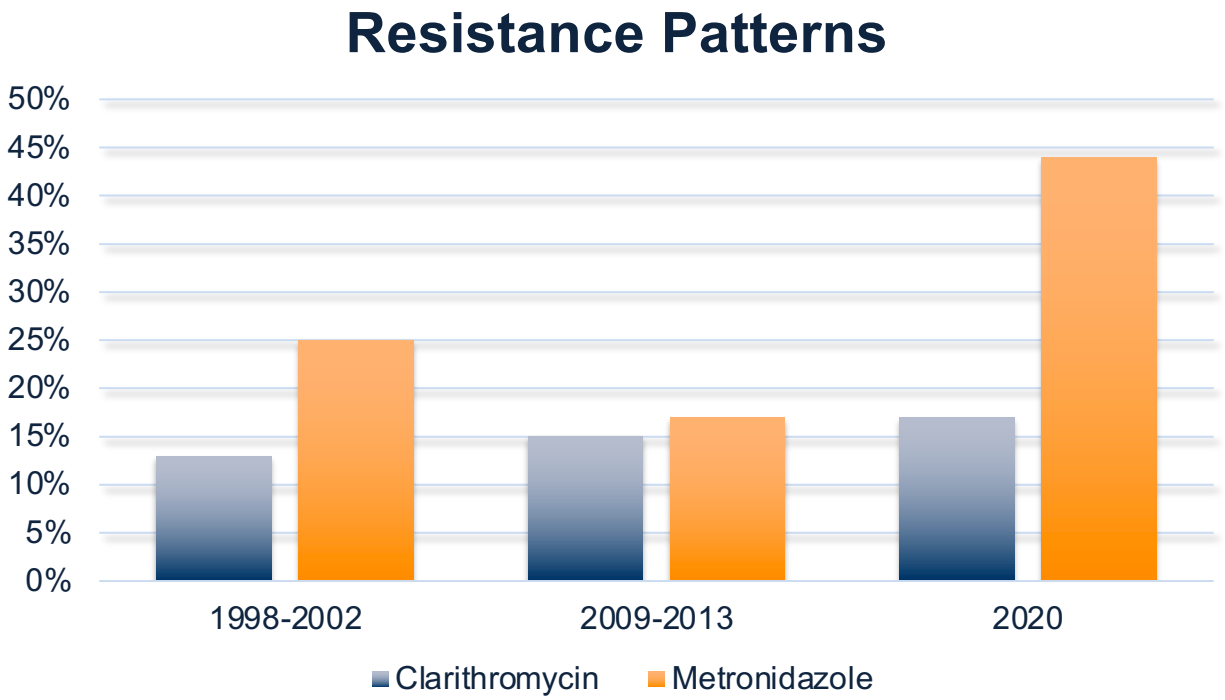
Antibiotic Resistance of *Helicobacter pylori* Among Male United States Veterans

Seiji Shiota,[*,‡] Rita Reddy,[*] Abeer Alsarraj,[*,‡,§] Hashem B. El-Serag,[*,‡,§] and David Y. Graham[*,‡]

[*]Department of Medicine, Section of Gastroenterology and Hepatology, Michael E. DeBakey VA Medical Center, Houston, Texas; [‡]Sections of Gastroenterology and Hepatology, Department of Medicine, Baylor College of Medicine, Houston, Texas, and [§]Houston VA HSR&D Center for Innovations in Quality, Effectiveness and Safety, Houston, Texas

El-Serag HB et al. Clin Gastro and Hepatol 2018;16:992-1002
Duck W et al. Emerg Infect Dis 2004;10:1088-1094
Shiota S et al. Clin Gastroenterol Hepatol 2015;13:1616-1624

Rise of Resistance



Duck W et at. Emerg Infect Dis 2004;10:1088-1094
Shiota S et al. Clin Gastroenterol Hepatol 2015;13:1616-1624
Graham DY et al. Ann Intern Med 2020; 172795-802

Rise of Resistance

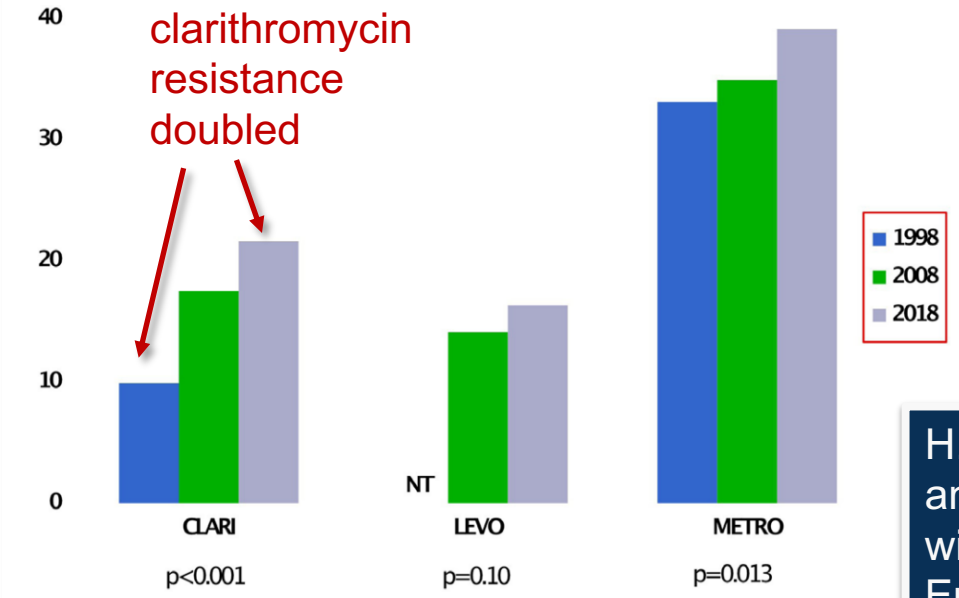
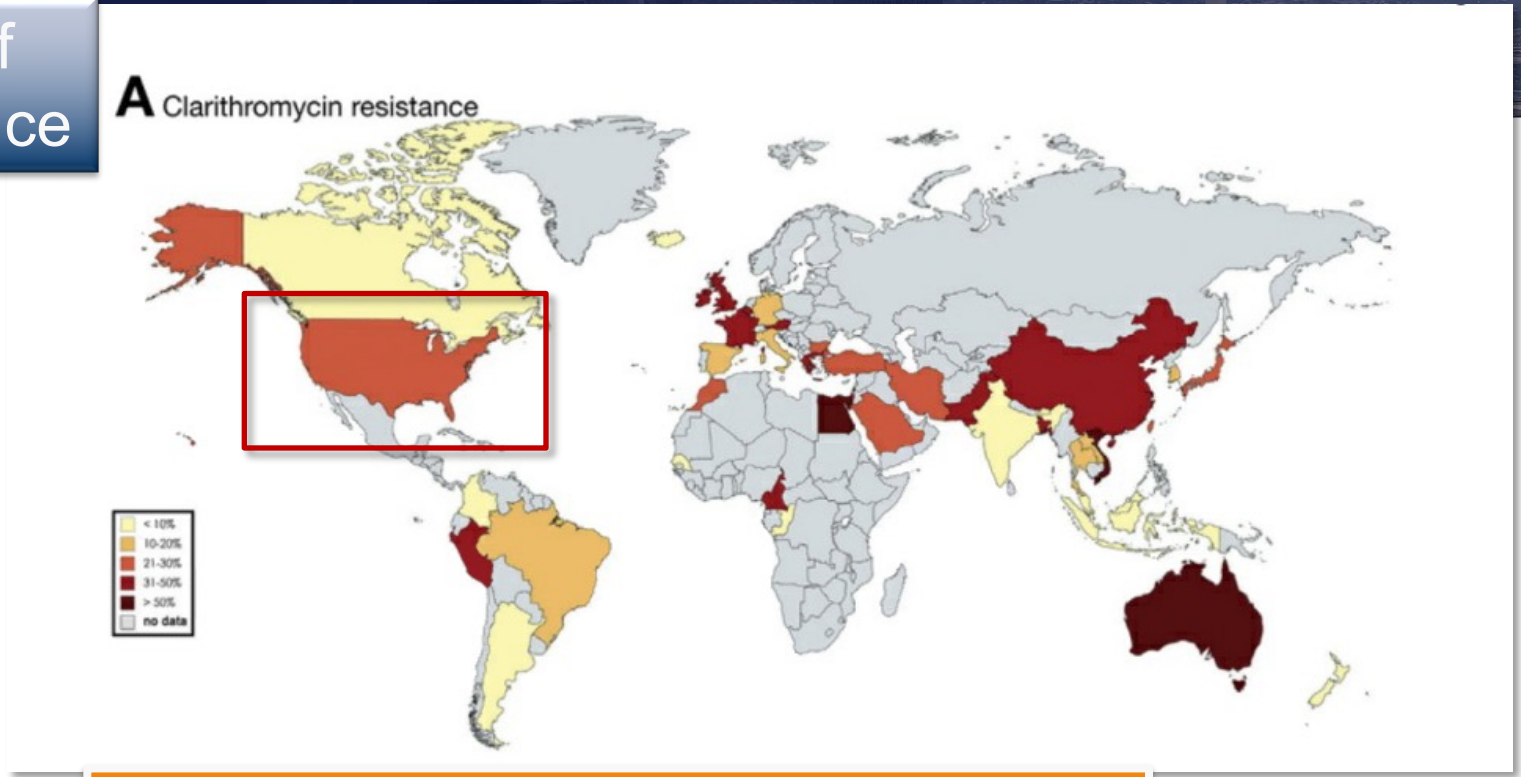


Figure 8 Evolution of *Helicobacter pylori* primary antimicrobial resistance in Europe (1998–2018). NT, not tested.

H. pylori treatment with clarithromycin and levofloxacin should not be started without susceptibility testing in most European countries

Megraud F et al. Helicobacter pylori resistance to antibiotics in Europe in 2018 and its relationship to antibiotic consumption in the community. Gut 2021;70:1815-22.

Rise of Resistance



Maastricht VI consensus → do not use Clarithro
(unless it is KNOWN that there is <15% resistance in that particular region)

Savoldi A et al. Prevalence of antibiotic resistance in Helicobacter pylori: A systematic review and meta-analysis in World Health Organization regions. Gastroenterology 2018; 155: 1372-82

Susceptibility Guided Therapy

GASTROENTEROLOGY

Tailored eradication therapy based on fecal *Helicobacter pylori* clarithromycin sensitivities

Takashi Kawai,* Tetsuya Yamagishi,* Kenji Yagi,† Mikinori Kataoka,* Kohei Kawakami,* Atsushi Sofuni,† Takao Itoi,† Yoshihiro Sakai,† Fuminori Moriyasu,† Yoshiaki Osaka,‡ Yu Takagi,‡ Tatsuya Aoki,‡ Emiko Rimbara,§ Norihisa Noguchi§ and Masanori Sasatsu§

*Endoscopy Center, †Fourth Department of Internal Medicine, ‡Third Department of Surgery, Tokyo Medical University, and §Department of Pathogenic Microbiology, Tokyo University of Pharmacy and Life Science, Tokyo, Japan

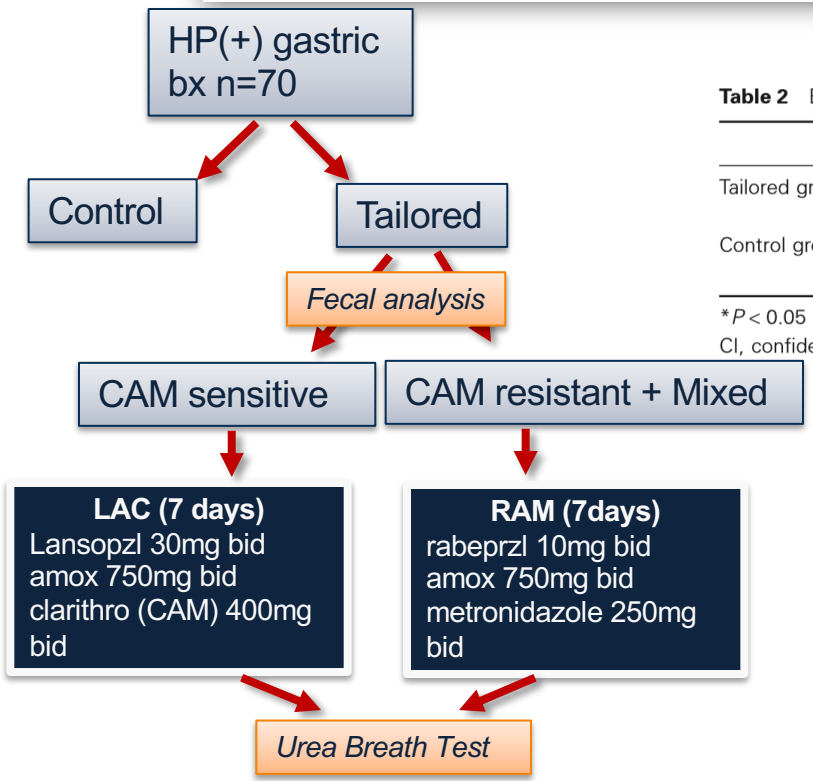


Table 2 Eradication rates for each regimen

	ITT (95% CI)	PP (95% CI)
Tailored group	94.3% (80.8–99.3) *(33/35)	94.3% (80.8–99.3) (33/35)
Control group	71.4% (53.7–85.4) (25/35)	78.1% (60.0–90.7) (25/32)

*$P < 0.05$ compared to control group.

CI, confidence interval; ITT, intention-to-treat analysis; PP, per-protocol.

Kawai T. et al. J Gastroenterol and Hepatol 2008; 23 Suppl 2: S171-174

Susceptibility Guided Therapy

Table 1. Characteristics and cure rates of included studies

Study author	*n*	Study design	Method for determining antibiotic susceptibility	Successful culture[a]	Empirical treatment cure rates				Susceptibility-guided treatment cure rates			
					ITT (%)	95% CI	PP (%)	95% CI	ITT (%)	95% CI	PP (%)	95% CI
First-line treatment												
Kawai[29]	70	RCT	faecal PCR	unknown	25/35 (71)	54–85	25/32 (78)	60–90	33/35 (94)	79–98	33/35 (94)	79–98
Marzio[33]	80	RCT	agar dilution	41/41	36/39 (92)	79–98	36/39 (92)	79–98	39/41 (95)	84–99	39/41 (95)	84–99
Neri[36]	242	RCT	Etest	unknown	78/121 (65)	55–73	78/116 (67)	55–79	88/121 (73)	63–80	88/116 (76)	65–87
Park[45]	114	RCT	agar dilution	149/237	41/57 (72)	60–83	41/56 (73)	61–85	54/57 (95)	88–100	54/56 (96)	91–100
Romano[37]	150	RCT	Etest	75/75[b]	58/75 (77)	70–85	58/73 (79)	69–87	71/75 (95)	88–98	71/73 (97)	91–99
Toracchio[40]	109	quasi-RCT	agar dilution	49/53	42/56 (75)	61–85	42/52 (81)	67–90	48/53 (91)	78–96	48/49 (98)	87–99
Wang[42]	120	quasi-RCT	not identified	unknown	57/80 (71)	59–80	57/74 (77)	65–85	36/40 (90)	75–96	36/37 (97)	83–99
Zhou[44]	260	quasi-RCT	agar dilution	119/125	107/135 (79)	71–86	107/129 (83)	75–98	117/125 (94)	87–97	117/119 (98)	94–99
Zhuo[46]	813	RCT	agar dilution	313/500	405/500 (81)	77–84	405/472 (86)	82–89	281/313 (90)	86–93	281/305 (92)	88–95
Second-line treatment												
Avidan[23]	10	RCT	Etest	4/5	5/5 (100)	—	5/5 (100)	—	4/4 (100)	30–99	4/4 (100)	—
Lamouliatte[30]	285	RCT	Etest	225/285	83/172 (48)	40–55	72/139 (52)	42–59	84/113 (74)	66–82	65/83 (78)	69–87
Marzio[33]	83	RCT	Etest	unknown	26/32 (81)	63–93	26/32 (81)	63–93	50/51 (98)	90–99	50/51 (98)	90–99
Miwa[34]	82	RCT	dry plate	35/38	36/39 (92)	79–98	36/38 (95)	82–99	31/38 (82)	66–92	30/36 (83)	67–94

[a]Successful culture rate was unknown in the studies that included only patients with positive culture.
[b]Three patients with initial negative culture had a repeat endoscopy and a second culture.

Caution with the comparison…

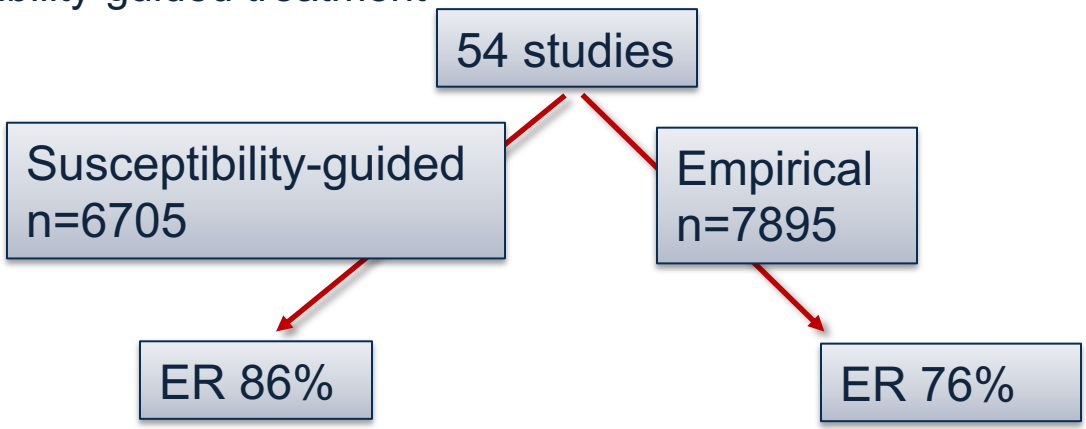
Lopez-Gongora S. et al. J Antimicrob Chemother 2015;70:2447-2455
Arslan N et al. World J Gastroenterol 2017; 23: 2854-2869

Empirical vs. Susceptibility-Guided Treatment of *Helicobacter pylori* Infection: A Systematic Review and Meta-Analysis

*Olga P. Nyssen [1,2,3], Marta Espada [1,2,3] and Javier P. Gisbert [1,2,3]**

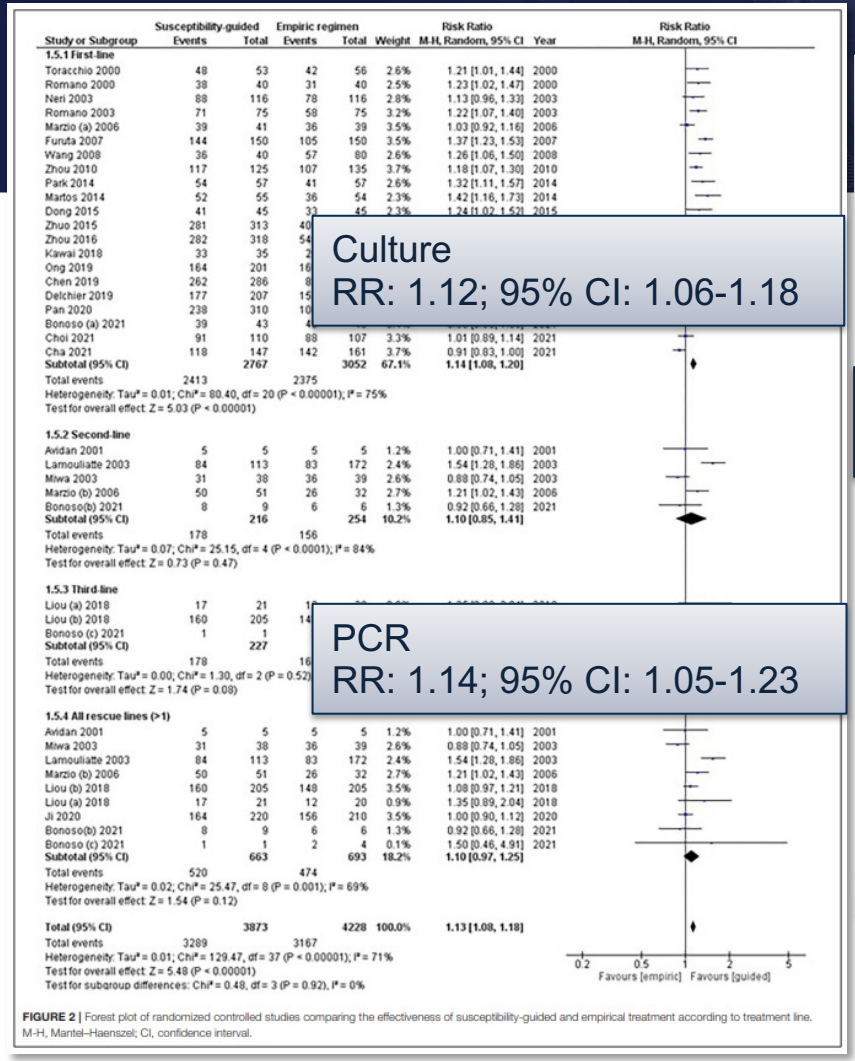
[1] Gastroenterology Unit, Instituto de Investigación Sanitaria Princesa (IIS-Princesa), Hospital Universitario de La Princesa, Madrid, Spain, [2] Universidad Autónoma de Madrid (UAM), Madrid, Spain, [3] Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBEREHD), Madrid, Spain

- Aim: meta-analysis comparing empirical vs. susceptibility-guided treatment of H. pylori
- Methods: electronic search through August 2021 for studies comparing empirical vs susceptibility-guided treatment



RR: 1.12; 95%CI: 1.08-1.17

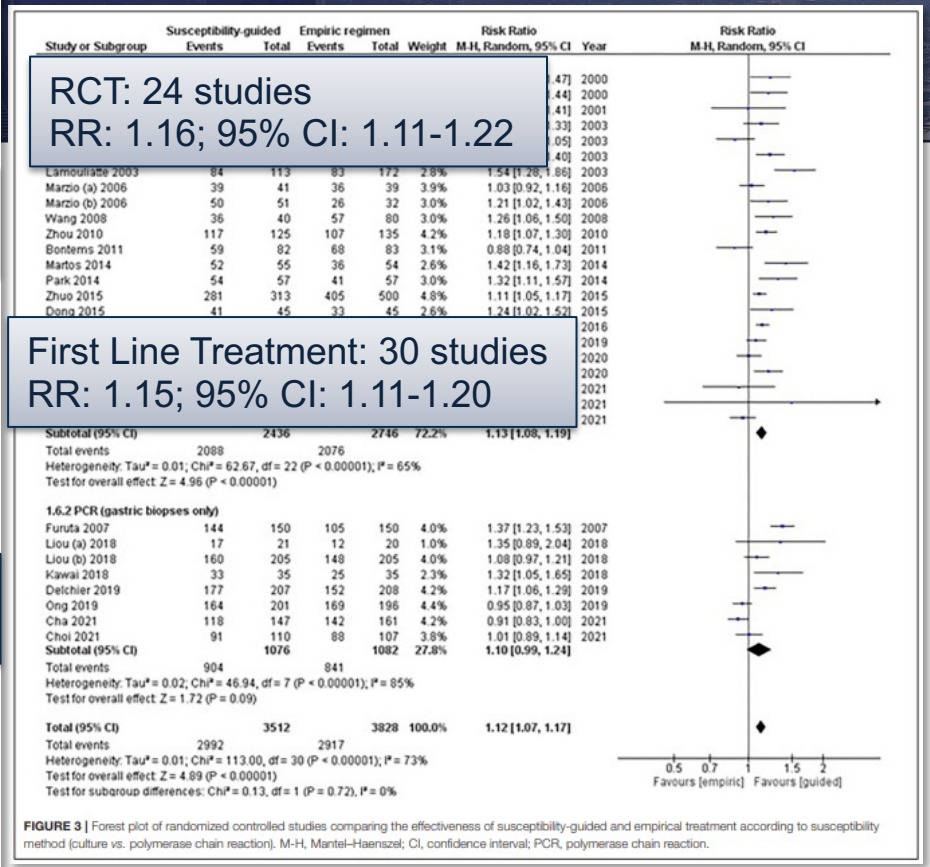
Nyssen OP et al. Empirical vs. Susceptibility-Guided Treatment of Helicobacter pylori Infection: A Systematic Review and Meta-Analysis. United European Gastroenterol J 2020;8:251



Culture
RR: 1.12; 95% CI: 1.06-1.18

PCR
RR: 1.14; 95% CI: 1.05-1.23

FIGURE 2 | Forest plot of randomized controlled studies comparing the effectiveness of susceptibility-guided and empirical treatment according to treatment line. M-H, Mantel–Haenszel; CI, confidence interval.

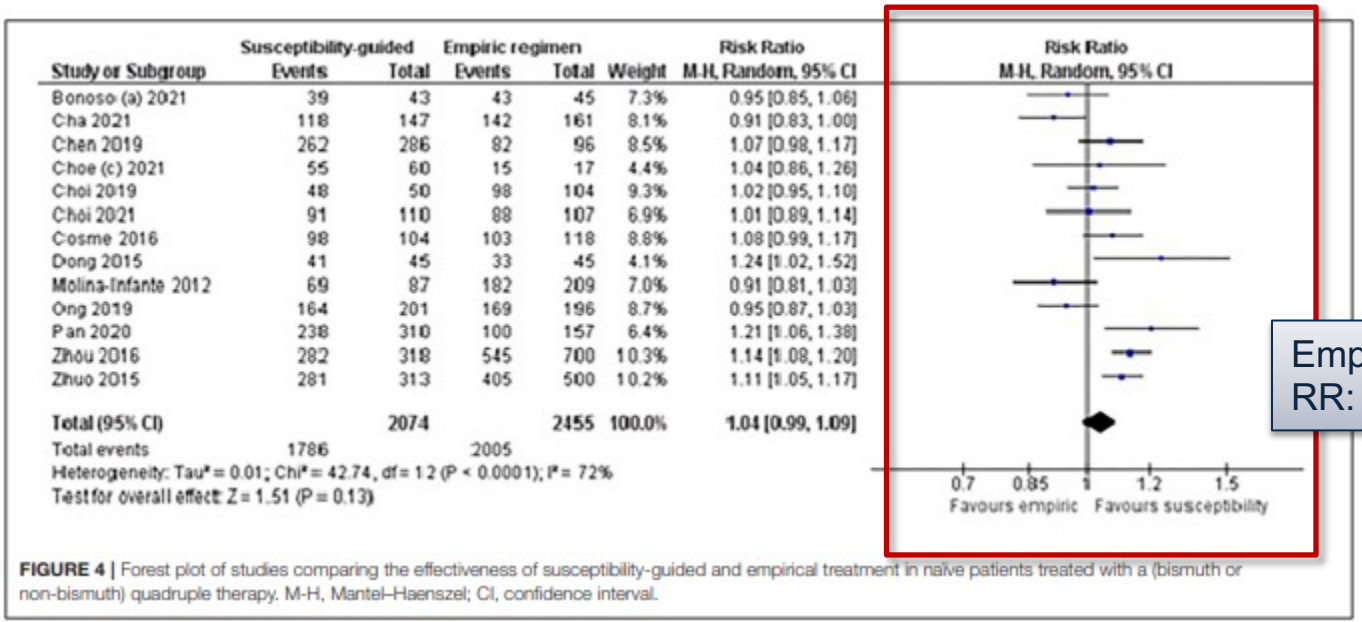


RCT: 24 studies
RR: 1.16; 95% CI: 1.11-1.22

First Line Treatment: 30 studies
RR: 1.15; 95% CI: 1.11-1.20

FIGURE 3 | Forest plot of randomized controlled studies comparing the effectiveness of susceptibility-guided and empirical treatment according to susceptibility method (culture *vs.* polymerase chain reaction). M-H, Mantel–Haenszel; CI, confidence interval; PCR, polymerase chain reaction.

Nyssen OP et al. Empirical vs. Susceptibility-Guided Treatment of Helicobacter pylori Infection: A Systematic Review and Meta-Analysis. United European Gastroenterol J 2020;8:251



Study or Subgroup	Susceptibility-guided Events	Total	Empiric regimen Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
Bonoso (a) 2021	39	43	43	45	7.3%	0.95 [0.85, 1.06]
Cha 2021	118	147	142	161	8.1%	0.91 [0.83, 1.00]
Chen 2019	262	286	82	96	8.5%	1.07 [0.98, 1.17]
Choe (c) 2021	55	60	15	17	4.4%	1.04 [0.86, 1.26]
Choi 2019	48	50	98	104	9.3%	1.02 [0.95, 1.10]
Choi 2021	91	110	88	107	6.9%	1.01 [0.89, 1.14]
Cosme 2016	98	104	103	118	8.8%	1.08 [0.99, 1.17]
Dong 2015	41	45	33	45	4.1%	1.24 [1.02, 1.52]
Molina-Infante 2012	69	87	182	209	7.0%	0.91 [0.81, 1.03]
Ong 2019	164	201	169	196	8.7%	0.95 [0.87, 1.03]
Pan 2020	238	310	100	157	6.4%	1.21 [1.06, 1.38]
Zhou 2016	282	318	545	700	10.3%	1.14 [1.08, 1.20]
Zhuo 2015	281	313	405	500	10.2%	1.11 [1.05, 1.17]
Total (95% CI)		**2074**		**2455**	**100.0%**	**1.04 [0.99, 1.09]**
Total events	1786		2005			

Heterogeneity: Tau² = 0.01; Chi² = 42.74, df = 12 (P < 0.0001); I² = 72%
Test for overall effect: Z = 1.51 (P = 0.13)

FIGURE 4 | Forest plot of studies comparing the effectiveness of susceptibility-guided and empirical treatment in naïve patients treated with a (bismuth or non-bismuth) quadruple therapy. M-H, Mantel–Haenszel; CI, confidence interval.

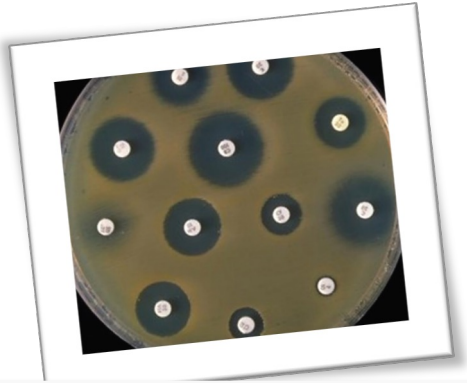
Empirical first-line quad regimens
RR: 1.04; 95% CI: 0.99 - 1.09

No differences in efficacy

Nyssen OP et al. Empirical vs. Susceptibility-Guided Treatment of Helicobacter pylori Infection: A Systematic Review and Meta-Analysis. United European Gastroenterol J 2020;8:251

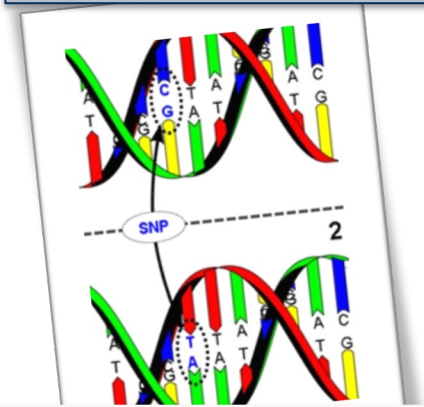
Culture vs. Molecular

When we think about susceptibility we think culture and sensitivity



- Requires endoscopy
- Organism is fastidious to grow
- Special handling and media
- Time to process

Molecular testing becoming more feasible and practical



- Cannot be used for all antibiotics
- Genotype may not equate with phenotype
- stance mechanisms

BEST ADVANTAGE
Molecular methods allow for non invasive means of susceptibility testing

Megraud F et al. Gastroenterol Clin North Am 2015; 44:577-596
Arslan N et al. World J Gastroenterol 2017; 23: 2854-2869

Rifabutin Therapy

Maastricht VI

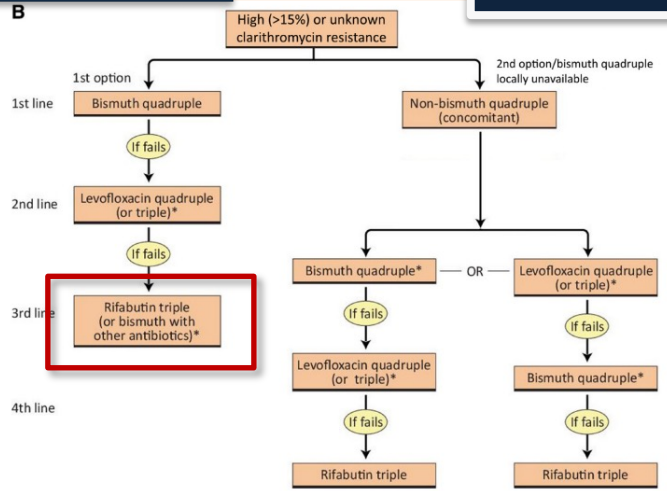
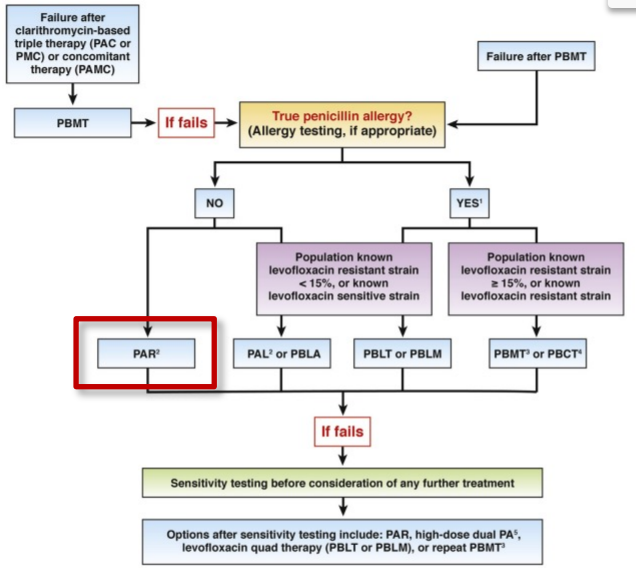


Figure 1 Algorithm for empirical *Helicobacter pylori* eradication if individual antibiotic susceptibility testing is not available. Bismuth quadruple: proton pump inhibitor (PPI), bismuth, tetracycline and metronidazole. Clarithromycin triple: PPI, clarithromycin and amoxicillin; only use if proven effective locally or if clarithromycin sensitivity is known. Non-bismuth quadruple (concomitant): PPI, clarithromycin, amoxicillin and metronidazole. Levofloxacin quadruple: PPI, levofloxacin, amoxicillin and bismuth. Levofloxacin triple: the same but without bismuth. In cases of high fluoroquinolone resistance (>15%), the combination of bismuth with other antibiotics, high-dose PPI-amoxicillin dual or rifabutin, may be an option. *High-dose PPI or P-CAB (vonoprazan where available) plus amoxicillin may be another option. P-CAB, potassium-competitive acid blocker; PPI, proton pump inhibitor.

PAR after 2nd failure

AGA



[1]Limited evidence guiding therapy in individuals with true penicillin allergy

[2]With high-dose or high-potency PPI, amoxicillin 750 mg TID

[3]High-dose metronidazole (1.5–2g divided)

[4]Only if clarithromycin sensitive strain

[5]High-dose dual PA = amoxicillin 2–3g daily in 3–4 divided doses + high-dose PPI BID. PA in place of PAR may be considered, although one study from the US demonstrated superiority of PAR compared to PA as first-line treatment (Graham et al. 2020); however, this has not been directly compared in refractory *H pylori* treatment.

P, PPI; C, Clarithromycin; A, Amoxicillin; M, Metronidazole; B, Bismuth; T, Tetracycline; R, Rifabutin; L, Levofloxacin

Figure 2. Treatment algorithm for refractory *H pylori* infection. PAL, PPI, amoxicillin, levofloxacin; PAR, PPI, amoxicillin, rifabutin; PBCT, PPI, bismuth, clarithromycin, tetracycline; PBLA, PPI, bismuth, levofloxacin, amoxicillin; PBLT, PPI, bismuth, levofloxacin, tetracycline; PBLM, PPI, bismuth, levofloxacin, metronidazole; PBMT, PPI, bismuth, metronidazole, tetracycline.

PAR as 2nd line

Malfertheiner P, et al. Management of Helicobacter pylori infection: the Maastricht VI/Florence consensus report. Gut 2022;71:1724-1762

Shah SC et al. AGA Clinical Practice Update on the Management of Refractory Helicobacter pylori infection: Expert Review. Gastroenterology 2021;160:1831-1841

Rifabutin Therapy

Table 2. Currently available and effective *Helicobacter pylori* therapies in the United States

Empiric therapies	
Bismuth quadruple therapy Bismuth subsalicylate q.i.d. 14 d	Bismuth (e.g., Pepto-Bismol) 2 tablets or 2 capsules q.i.d. 30 min before meals, tetracycline HCl 500 mg, and metronidazole 500 mg 30 min after meals q.i.d. plus a PPI, 30 min b.i.d. before breakfast and with the evening meal (see PPI recommendations below)
Pylera. 3-in 1 formulation of bismuth quadruple therapy with bismuth citrate) metronidazole and tetracycline 14-d	Give combination tablets 4 times daily (with meals and at bedtime) plus a PPI 30 min before breakfast (see PPI recommendations below). If the pharmacist will only dispense a 10-d supply, use 10 d or consider using 14-d generic bismuth quadruple therapy instead (see above)
Rifabutin triple therapy. 14-d	Rifabutin 150 mg b.i.d. 30 after breakfast and the evening meal, amoxicillin 1 g t.i.d. 30 after breakfast, the evening meal, and bedtime plus 40 mg of esomeprazole or rabeprazole 30 min before breakfast and the evening meal (see PPI recommendations below).
Talicia 3-in 1 formulation of rifabutin/ amoxicillin/omeprazole triple therapy. 14-d	4 capsules t.id., as directed by the package insert
Therapies only effective as susceptibility-based therapy. Do not use empirically unless proven to cure >90% locally	
Clarithromycin triple therapy. 14-d	Clarithromycin 500 mg b.i.d., amoxicillin 1 g b.i.d. 30 min after meal plus a PPI b.i.d. 30 min before breakfast and the evening meal (see PPI recommendations below)
Metronidazole triple therapy. 14-d	Metronidazole 500 mg b.i.d., amoxicillin 1 g b.i.d., 30 min after meal plus a PPI b.i.d. 30 min before breakfast and the evening meal (see PPI recommendations below)
Levofloxacin triple therapy. 14-d[a]	Levofloxacin 500 mg in a.m., amoxicillin 1 g b.i.d., 30 min after meal plus a PPI b.i.d. 30 min before breakfast and the evening meal (see PPI recommendations below)
PPI recommendations PPI should preferably be a PPI which is minimally affected by CYP2C19 metabolism (i.e., rabeprazole or esomeprazole) and at least 20 mg per dose (preferably 40 mg) of rabeprazole or esomeprazole b.i.d.	
Therapies containing unnecessary antibiotics that should not be used Regimens that include at least 1 antibiotic that offers no therapeutic benefit and serve to increase global antimicrobial resistance include concomitant, hybrid, reverse hybrid, sequential therapies and vonoprazan clarithromycin and amoxicillin triple therapy (3).	

b.i.d., 2 time daily; HCl, hydrochloride; PPI, proton pump inhibitor; q.i.d., 4 times daily; t.i.d., 3 times daily.
[a]The US Food and Drug Administration recommends fluoroquinolones be used as a last choice because of the risk of serious side effects.
Table adapted from reference (4), with permission.

Graham DY et al. Antimicrobial susceptibility testing for Helicobacter pylori is now widely available: when, how, why. Am J Gastroenterol 2022;117:524-8

Rifabutin Therapy

Rifabutin-Based Triple Therapy (RHB-105) for *Helicobacter pylori* Eradication

A Double-Blind, Randomized, Controlled Trial

David Y. Graham, MD; Yamil Canaan, MD; James Maher, MD; Gregory Wiener, MD; Kristina G. Hulten, PhD; and Ira N. Kalfus, MD

Phase 3 DBRCT

n=455

treatment-naïve adults with epigastric discomfort and H. pylori infection (55 sites in the US)

RHB-105
amoxicillin 3g
omeprazole120mg
rifabutin 150mg

Dual Tx
amoxicillin 3g
omeprazole 120mg

H. pylori eradication rates by UBT

ER for RHB-105 (n=228)
83.8%
(95%CI,78.4% to 88.0%)

ER for Dual Tx (n=227)
57.7%
(95% CI, 51.2% to 64.0%)

p<0.001

Most common adverse events:
- diarrhea 10.1% vs 7.9%
- headache 7.5% vs. 7.0%
- nausea 4.8% vs. 5.3%

Limitations:
- excluded persons of Asian descent (bc of higher prevalence of poor cytochrome P450 2C19 metabolizers)

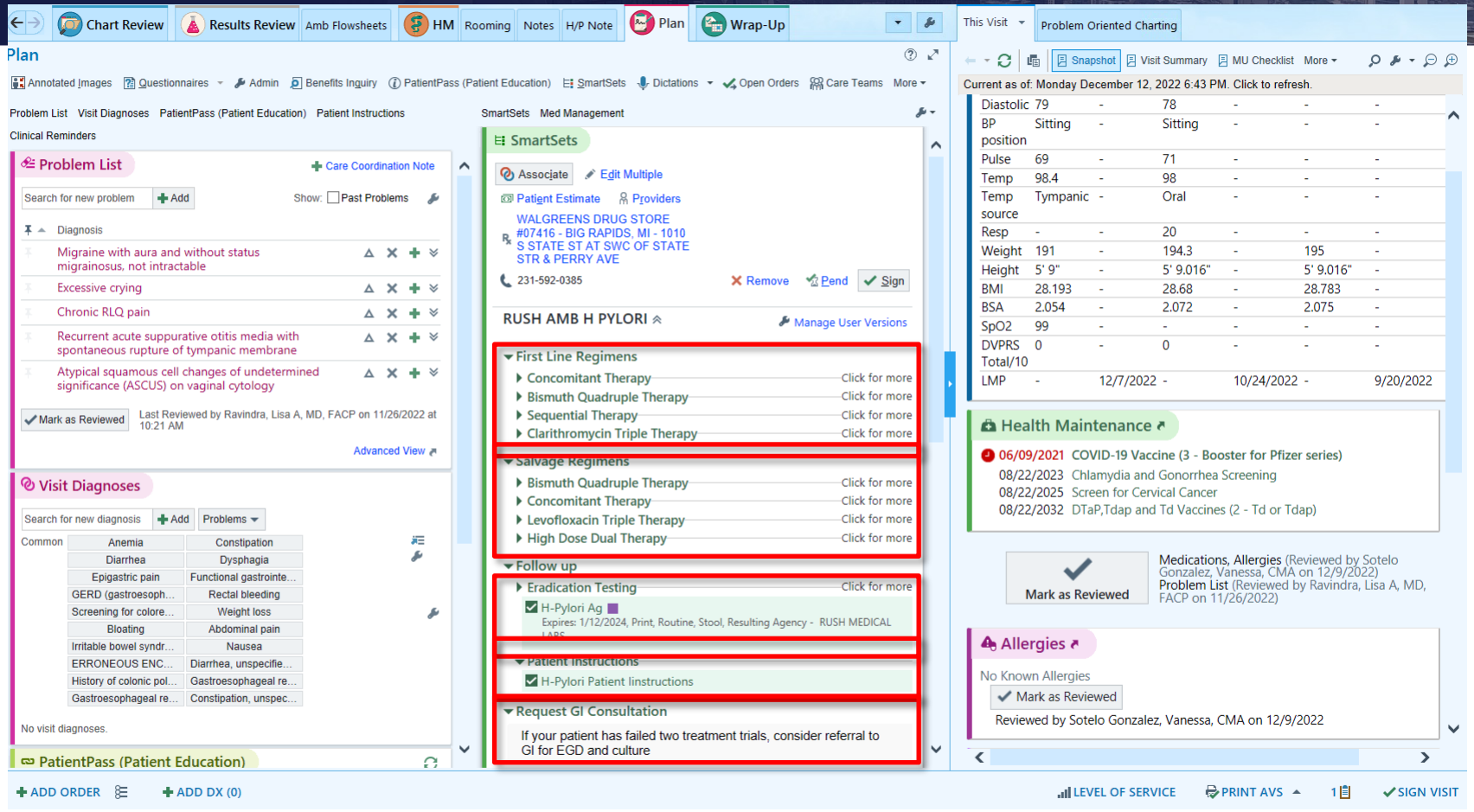
Conclusion:
Potential for RHB-105 as first line empirical therapy

Graham DY et al. Rifabutin-Based Triple Therapy (RHB-105) for Helicobacter pylori Eradication: A Double-Blind, Randomized, Controlled Trial. Ann Intern Med 2020; 172: 795

Must understand key principles to optimize available therapies

NEW THERAPEUTIC OPTIONS?

Host Factors – Compliance!



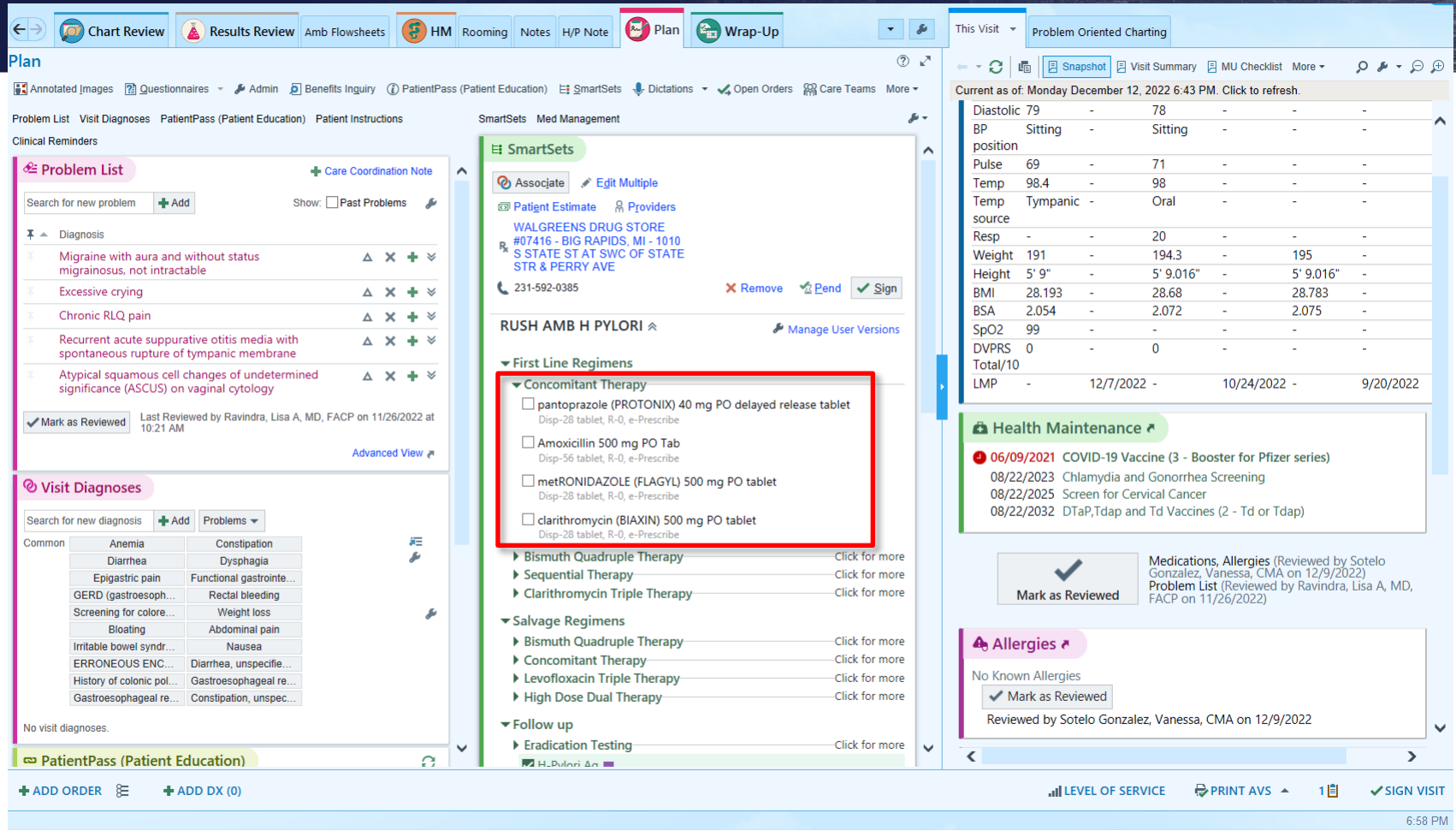
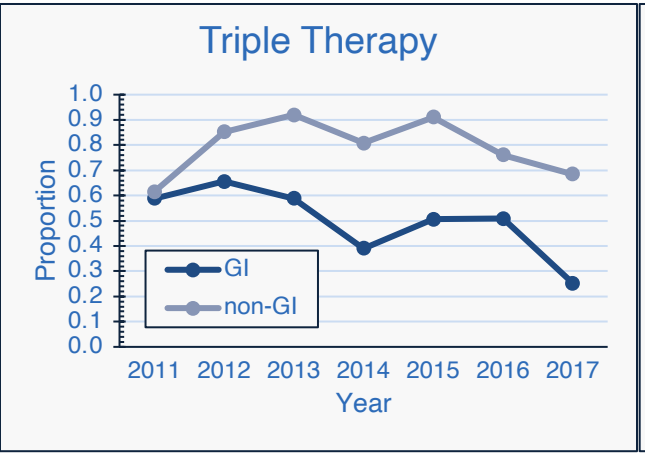
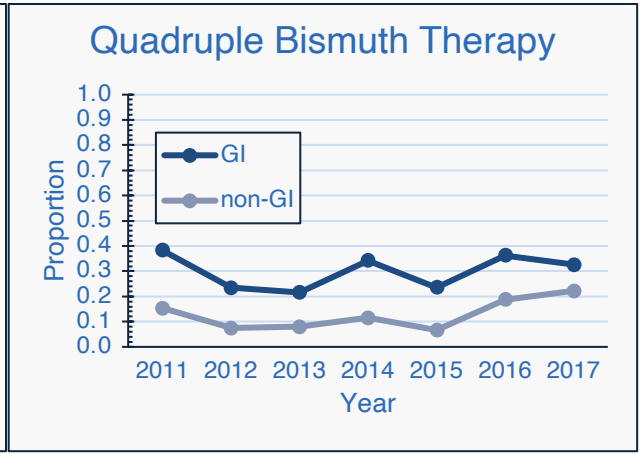


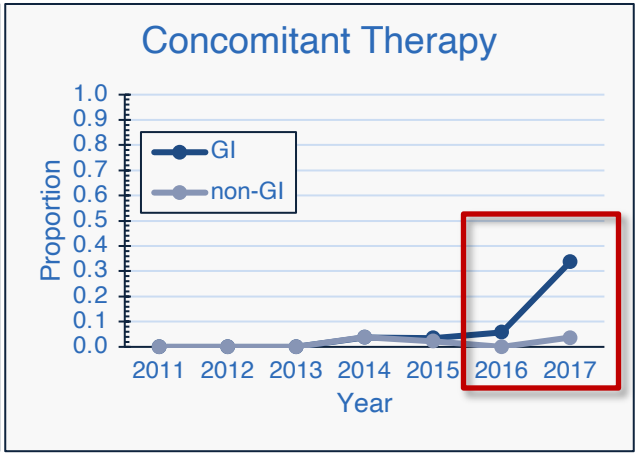
Chart Review
Results Review
Amb Flowsheets
HM
Rooming
Notes
H/P Note
Plan
Wrap-Up
This Visit
Problem Oriented Charting
Plan
Annotated Images
Questionnaires
Admin
Benefits Inquiry
PatientPass (Patient Education)
SmartSets
Dictations
Open Orders
Care Teams
More
Problem List
Visit Diagnoses
PatientPass (Patient Education)
Patient Instructions
SmartSets
Med Management
Clinical Reminders
Problem List
Care Coordination Note
Search for new problem
Add
Show:
Past Problems
Diagnosis
Migraine with aura and without status migrainosus, not intractable
Excessive crying
Chronic RLQ pain
Recurrent acute suppurative otitis media with spontaneous rupture of tympanic membrane
Atypical squamous cell changes of undetermined significance (ASCUS) on vaginal cytology
Mark as Reviewed
Last Reviewed by Ravindra, Lisa A, MD, FACP on 11/26/2022 at 10:21 AM
Advanced View
Visit Diagnoses
Search for new diagnosis
Add
Problems
Common
Anemia
Constipation
Diarrhea
Dysphagia
Epigastric pain
Functional gastrointe...
GERD (gastroesoph...
Rectal bleeding
Screening for colore...
Weight loss
Bloating
Abdominal pain
Irritable bowel syndr...
Nausea
ERRONEOUS ENC...
Diarrhea, unspecifie...
History of colonic pol...
Gastroesophageal re...
Gastroesophageal re...
Constipation, unspec...
No visit diagnoses.
PatientPass (Patient Education)
SmartSets
Associate
Edit Multiple
Patient Estimate
Providers
WALGREENS DRUG STORE #07416 - BIG RAPIDS, MI - 1010 S STATE ST AT SWC OF STATE STR & PERRY AVE
231-592-0385
Remove
Pend
Sign
RUSH AMB H PYLORI
Manage User Versions
First Line Regimens
Concomitant Therapy
pantoprazole (PROTONIX) 40 mg PO delayed release tablet
Disp-28 tablet, R-0, e-Prescribe
Amoxicillin 500 mg PO Tab
Disp-56 tablet, R-0, e-Prescribe
metRONIDAZOLE (FLAGYL) 500 mg PO tablet
Disp-28 tablet, R-0, e-Prescribe
clarithromycin (BIAXIN) 500 mg PO tablet
Disp-28 tablet, R-0, e-Prescribe
Bismuth Quadruple Therapy
Click for more
Sequential Therapy
Click for more
Clarithromycin Triple Therapy
Click for more
Salvage Regimens
Bismuth Quadruple Therapy
Click for more
Concomitant Therapy
Click for more
Levofloxacin Triple Therapy
Click for more
High Dose Dual Therapy
Click for more
Follow up
Eradication Testing
Click for more
H-Pylori Ag
Snapshot
Visit Summary
MU Checklist
More
Current as of: Monday December 12, 2022 6:43 PM. Click to refresh.
Diastolic 79 - 78 - - -
BP position Sitting - Sitting - - -
Pulse 69 - 71 - - -
Temp 98.4 - 98 - - -
Temp source Tympanic - Oral - - -
Resp - - 20 - - -
Weight 191 - 194.3 - 195 -
Height 5' 9" - 5' 9.016" - 5' 9.016" -
BMI 28.193 - 28.68 - 28.783 -
BSA 2.054 - 2.072 - 2.075 -
SpO2 99 - - - - -
DVPRS Total/10 0 - 0 - - -
LMP - 12/7/2022 - 10/24/2022 - 9/20/2020
Health Maintenance
06/09/2021 COVID-19 Vaccine (3 - Booster for Pfizer series)
08/22/2023 Chlamydia and Gonorrhea Screening
08/22/2025 Screen for Cervical Cancer
08/22/2032 DTaP,Tdap and Td Vaccines (2 - Td or Tdap)
Mark as Reviewed
Medications, Allergies (Reviewed by Sotelo Gonzalez, Vanessa, CMA on 12/9/2022)
Problem List (Reviewed by Ravindra, Lisa A, MD, FACP on 11/26/2022)
Allergies
No Known Allergies
Mark as Reviewed
Reviewed by Sotelo Gonzalez, Vanessa, CMA on 12/9/2022
ADD ORDER
ADD DX (0)
LEVEL OF SERVICE
PRINT AVS
1
SIGN VISIT
6:58 PM

Prescriber Factors – Updating Practice

Prescribing patterns RUMC

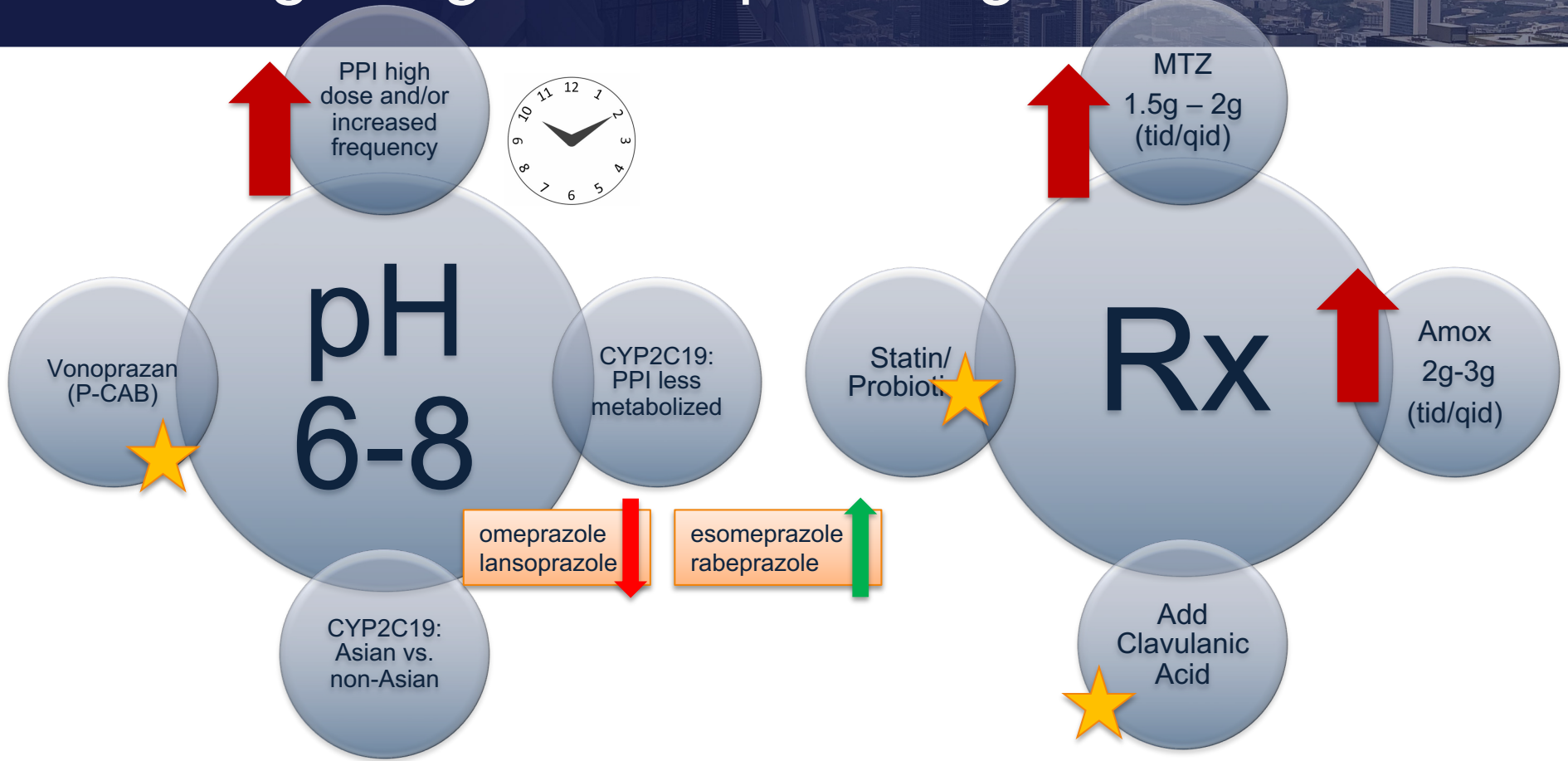






Lin, CF et al. Prescribing patterns for the Treatment of H. pylori in a University Medical Center. (unpublished). 2019

Putting it together: Optimizing what we have



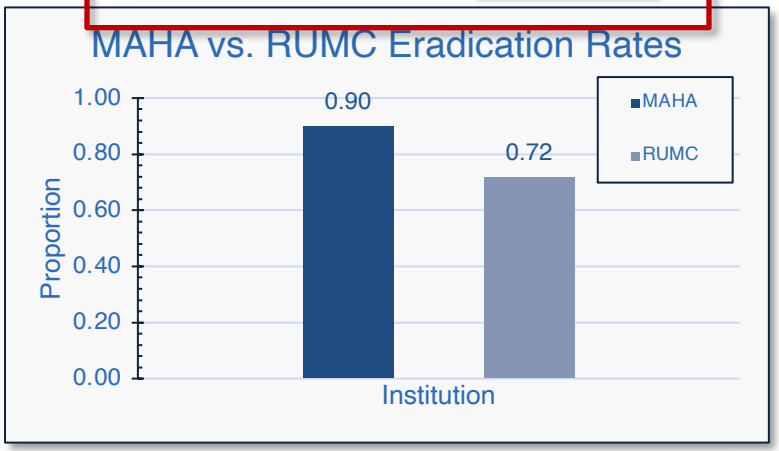
Shah SC et al. AGA Clinical Practice Update on the Management of Refractory Helicobacter pylori infection: Expert Review. Gastroenterology 2021;160:1831-1841

Concomitant Therapy

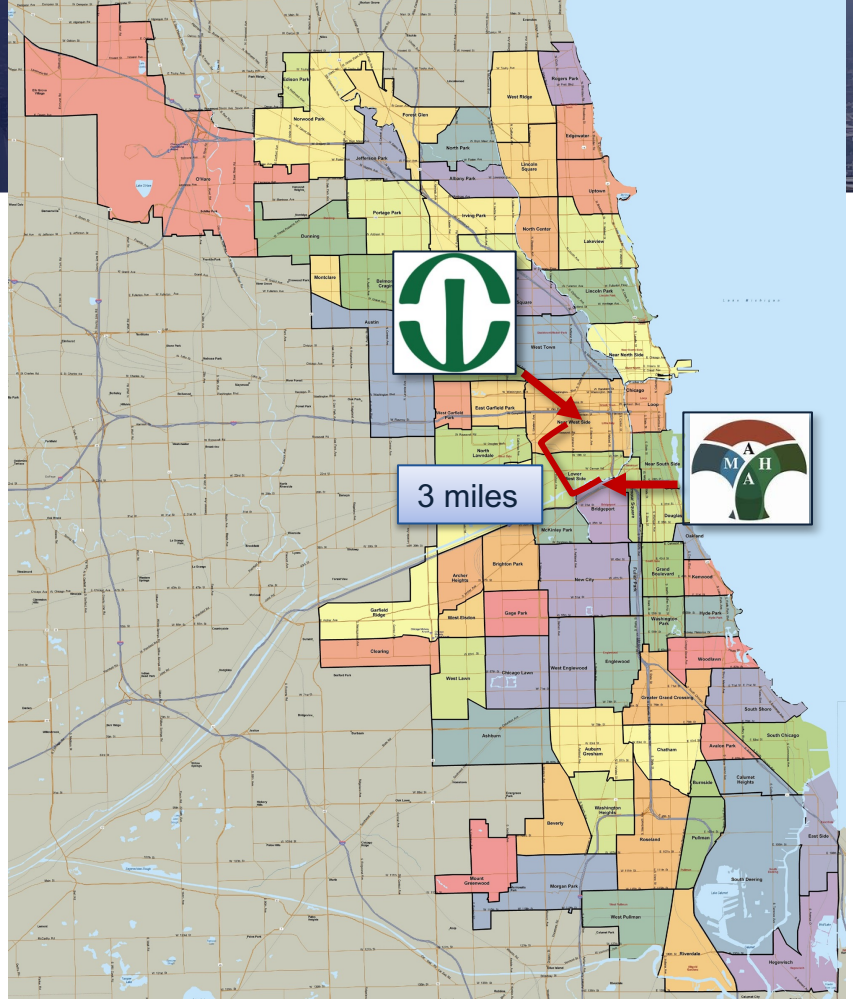
Chinatown GI — *n=30* — ER 90%

RUMC GI — *n=25* — ER 72%

p= 0.085



MAHA: Midwest Asian Health Association
RUMC: Rush University Medical Center, GI Clinic

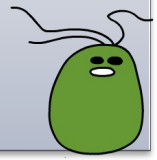


Lin, CF et al. Comparing concomitant therapy eradication rates of Helicobacter pylori between immigrant Chinese and general American populations in an urban setting (unpublished). 2019

Back to our cases

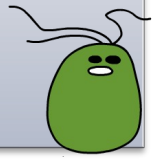
29yo Caucasian female

- Epigastric abdominal pain
- No alarm features



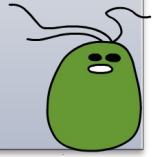
73yo African American male

- Colorectal cancer screening
- Arthritis
- Asymptomatic



59 yo Korean female

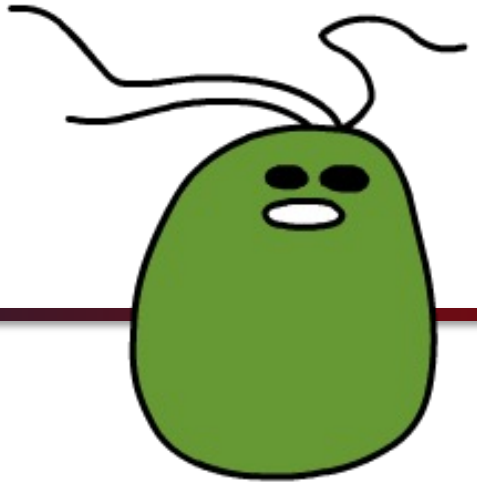
- GERD
- Failed Triple Tx 5 yrs ago
- Quad therapy, no TOE
- FHx gastric cancer



How would you treat

Summary

- United States' unique demographic in context of guidelines
- Optimize management based on understanding of patient, health systems, bacteria and available therapies
- New tools on the horizon
  - Potassium competitive acid blockers
  - Data on statins/ probiotics/ rifabutin
  - Increased use and experience with susceptibility testing



THANK YOU