

## Appendix 1

### Search strategies

Searches were performed in 4 databases (Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Ovid MEDLINE(R), Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and EMBASE).

Limits: excluded animal studies, conference abstracts/case reports/ editorials/ commentaries

Date limits: published 2000-September 11, 2015.

### PICO1. How has the epidemiology of Hp changed over the past 10 years? Who are the high risk groups?

1	prevalence*.tw. (1023459)
2	epidemiolog*.tw. (646195)
3	1 or 2 (1568924)
4	pylori.tw. (87350)
5	3 and 4 (14260)
6	exp canada/ (270128)
7	(canada or canadian\$ or alberta or british columbia or columbie britannique or saskatchewan or manitoba or ontario or quebec or new brunswick or nouveau brunswick).tw,in,ix. (1595010)
8	(nova scotia or nouvelle ecosse or prince edward island or ile du prince edward or newfoundland or terre neuve or labrador or nun?v?t or nun?v?t or nwt or territoires du nord ouest or northwest territories or yukon).tw,in,ix. (42392)
9	exp United States/ (2228513)
10	(United states or USA or America or American or Alabama or Alaska Arizona or Arkansas or California or Colorado or Connecticut or Delaware or Florida or Georgia or Hawaii or Idaho or Illinois or Indiana or Iowa or Kansas or Kentucky).tw,in,ix. (12450226)
11	(Louisiana or Maine or Maryland or Massachusetts or Michigan or Minnesota or Mississippi or Missouri or Montana or Nebraska or Nevada or New Hampshire or New Jersey or New Mexico or New York or North Carolina).tw,in,ix. (3006974)
12	(North Dakota or Ohio or Oklahoma or Oregon or Pennsylvania or Rhode Island or South Carolina or South Dakota or Tennessee or Texas or Utah or Vermont or Virginia or Washington or West Virginia or Wisconsin or Wyoming).tw,in,ix. (2889350)
13	or/6-12 (15708122)
14	5 and 13 (2796)
15	conference abstract.pt. (1972906)
16	14 not 15 (2484)
17	((exp animals/ or exp nonhuman/ or exp animal experiment/) not (humans/ or human/)) or ((rats or mice or mouse or cats or dogs or cell lines or animal*) not (human* or men or women)).ti. (11094208)
18	16 not 17 (2316)
19	note/ or editorial/ or letter/ or Comment/ or news/ (3649677)
20	18 not 19 (2292)
21	(case report/ or case reports/ or case report.ti.) not (literature review or systematic review).tw. (3836023)
22	20 not 21 (2283)
23	remove duplicates from 22 (1427)
24	limit 23 to yr="2000 - 2015" (1050)
25	limit 24 to english language [Limit not valid in CDSR; records were retained] (1014)

**PICO2. What are the indications for testing and treatment?**

**PICO 3. What are evidence based primary Hp treatment strategies for providers in North America?**

**PICO 4. What are the predictors of successful eradication? Of failure?**

**PICO 8. When primary therapy fails, what are the options?**

**PICO 9. How does one choose salvage therapy? Is there a distinction in treatments used second or third line?**

1 pylori.tw. (87350)  
2 (treat\* or therap\* or manag\* or eradicat\*).tw. (13422102)  
3 1 and 2 (39273)  
4 practice guideline/ or Guideline/ (289373)  
5 (guideline\* or consensus or statement\* or recommendation\* or monograph or task force).tw. (1183530)  
6 (Systematic review or meta-analysis).tw,kw. (268097)  
7 Meta analysis/ or "systematic review"/ (216269)  
8 (Medline or Embase or Cochrane or literature search or literature review).ab. (292916)  
9 random:.mp. or randomized controlled trial.pt. (2736503)  
10 or/4-9 (4199858)  
11 3 and 10 (11030)  
12 limit 11 to english language [Limit not valid in CDSR; records were retained] (9373)  
13 ((exp animals/ or exp nonhuman/ or exp animal experiment/) not (humans/ or human/)) or ((rats or mice or mouse or cats or dogs or cell lines or animal\*) not (human\* or men or women)).ti. (11408696)  
14 note/ or editorial/ or letter/ or Comment/ or news/ (3649677)  
15 (case report/ or case reports/ or case report.ti.) not (literature review or systematic review).tw. (3836023)  
16 conference abstract.pt. (1972906)  
17 or/13-16 (19668904)  
18 12 not 17 (8025)  
19 limit 18 to yr="2000 -Current" (5812)  
20 remove duplicates from 19 (2893)

The master search was run again in Dec 31 2016 and limited to Canadian /US, n=763

1 pylori.tw. (89093)  
2 (treat\* or therap\* or manag\* or eradicat\*).tw. (13697039)  
3 1 and 2 (40189)  
4 practice guideline/ or Guideline/ (293710)  
5 (guideline\* or consensus or statement\* or recommendation\* or monograph\* or task force).tw. (1218431)  
6 (Systematic review or meta-analysis).tw,kw. (281517)  
7 Meta analysis/ or "systematic review"/ (226988)  
8 (Medline or Embase or Cochrane or literature search or literature review).ab. (304648)  
9 random:.mp. or randomized controlled trial.pt. (2801614)  
10 or/4-9 (4306382)  
11 3 and 10 (11319)  
12 limit 11 to english language [Limit not valid in CDSR; records were retained] (9645)  
13 ((exp animals/ or exp nonhuman/ or exp animal experiment/) not (humans/ or human/)) or ((rats or mice or mouse or cats or dogs or in vitro or in vivo or cell lines or animal\*) not (human\* or men or women)).ti. (10728796)  
14 note/ or editorial/ or letter/ or Comment/ or news/ (3694883)  
15 (case report/ or case reports/ or case report.ti.) not (literature review or systematic review).tw. (3887296)  
16 conference abstract.pt. (2097761)  
17 or/13-16 (19463082)  
18 12 not 17 (8418)  
19 limit 18 to yr="2000 -Current" (6195)

20 exp canada/ (273867)  
 21 (canada or canadian\$ or alberta or british columbia or columbie britannique or saskatchewan or manitoba or ontario or quebec or new brunswick or nouveau brunswick).tw,in,ix. (1623315)  
 22 (nova scotia or nouvelle ecosse or prince edward island or ile du prince edward or newfoundland or terre neuve or labrador or nun?v?t or nun?v?t or nwt or territoires du nord ouest or northwest territories or yukon).tw,in,ix. (43065)  
 23 exp United States/ (2251565)  
 24 (United states or USA or America or American or Alabama or Alaska Arizona or Arkansas or California or Colorado or Connecticut or Delaware or Florida or Georgia or Hawaii or Idaho or Illinois or Indiana or Iowa or Kansas or Kentucky).tw,in,ix. (12613624)  
 25 (Louisiana or Maine or Maryland or Massachusetts or Michigan or Minnesota or Mississippi or Missouri or Montana or Nebraska or Nevada or New Hampshire or New Jersey or New Mexico or New York or North Carolina).tw,in,ix. (3055283)  
 26 (North Dakota or Ohio or Oklahoma or Oregon or Pennsylvania or Rhode Island or South Carolina or South Dakota or Tennessee or Texas or Utah or Vermont or Virginia or Washington or West Virginia or Wisconsin or Wyoming).tw,in,ix. (2937413)  
 27 or/20-26 (15911829)  
 28 19 and 27 (1246)  
 29 remove duplicates from 28 (763)

### PICO 5. What do we know about Hp antimicrobial resistance and its epidemiology in North America?

1 pylori.tw. (87350)  
 2 exp antibiotic resistance/ or exp Drug Resistance, Microbial/ (257963)  
 3 ((antimicrobial\* or antibiotic\* or antibacterial or bacterial or bacterium or microbial or amoxicillin\* or amoxicillin\* or clarithromycin or metronidazole or tinidazole or macrolide or azithromycin or roxithromycin or nitroimidazole or quinolone or ofloxacin or moxifloxacin or levofloxacin) adj3 (resistance or sensitive or sensitivity or culture)).tw. (136260)  
 4 2 or 3 (325901)  
 5 1 and 4 (6937)  
 6 exp canada/ (270128)  
 7 (canada or canadian\$ or alberta or british columbia or columbie britannique or saskatchewan or manitoba or ontario or quebec or new brunswick or nouveau brunswick).tw,in,ix. (1595010)  
 8 (nova scotia or nouvelle ecosse or prince edward island or ile du prince edward or newfoundland or terre neuve or labrador or nun?v?t or nun?v?t or nwt or territoires du nord ouest or northwest territories or yukon).tw,in,ix. (42392)  
 9 exp United States/ (2228513)  
 10 (United states or USA or America or American or Alabama or Alaska Arizona or Arkansas or California or Colorado or Connecticut or Delaware or Florida or Georgia or Hawaii or Idaho or Illinois or Indiana or Iowa or Kansas or Kentucky).tw,in,ix. (12450226)  
 11 (Louisiana or Maine or Maryland or Massachusetts or Michigan or Minnesota or Mississippi or Missouri or Montana or Nebraska or Nevada or New Hampshire or New Jersey or New Mexico or New York or North Carolina).tw,in,ix. (3006974)  
 12 (North Dakota or Ohio or Oklahoma or Oregon or Pennsylvania or Rhode Island or South Carolina or South Dakota or Tennessee or Texas or Utah or Vermont or Virginia or Washington or West Virginia or Wisconsin or Wyoming).tw,in,ix. (2889350)  
 13 or/6-12 (15708122)  
 14 5 and 13 (1214)  
 15 conference abstract.pt. (1972906)  
 16 ((exp animals/ or exp nonhuman/ or exp animal experiment/) not (humans/ or human/)) or ((rats or mice or mouse or cats or dogs or cell lines or animal\*) not (human\* or men or women)).ti. (11094208)  
 17 note/ or editorial/ or letter/ or Comment/ or news/ (3649677)  
 18 (case report/ or case reports/ or case report.ti.) not (literature review or systematic review).tw. (3836023)  
 19 15 or 16 or 17 or 18 (19381447)  
 20 14 not 19 (880)  
 21 limit 20 to yr="2000 - 2015" (628)  
 22 limit 21 to english language [Limit not valid in CDSR; records were retained] (609)  
 23 remove duplicates from 22 (451)

**PICO6. How can the information from PICOs 4&5 be translated to improve outcomes in clinical practice?**

1 pylori.tw. (87350)  
2 exp antibiotic resistance/ or exp Drug Resistance, Microbial/ (257963)  
3 ((antimicrobial\* or antibiotic\* or antibacterial or bacterial or bacterium or microbial or amoxicillin\* or amoxicillin\* or clarithromycin or metronidazole or tinidazole or macrolide or azithromycin or roxithromycin or nitroimidazole or quinolone or ofloxacin or moxifloxacin or levofloxacin) adj3 (resistance or sensitive or sensitivity or culture)).tw. (136260)  
4 2 or 3 (325901)  
5 1 and 4 (6937)  
6 exp canada/ (270128)  
7 (canada or canadian\$ or alberta or british columbia or columbie britannique or saskatchewan or manitoba or ontario or quebec or new brunswick or nouveau brunswick).tw,in,ix. (1595010)  
8 (nova scotia or nouvelle ecosse or prince edward island or ile du prince edward or newfoundland or terre neuve or labrador or nun?v?t or nun?v?t or nwt or territoires du nord ouest or northwest territories or yukon).tw,in,ix. (42392)  
9 exp United States/ (2228513)  
10 (United states or USA or America or American or Alabama or Alaska Arizona or Arkansas or California or Colorado or Connecticut or Delaware or Florida or Georgia or Hawaii or Idaho or Illinois or Indiana or Iowa or Kansas or Kentucky).tw,in,ix. (12450226)  
11 (Louisiana or Maine or Maryland or Massachusetts or Michigan or Minnesota or Mississippi or Missouri or Montana or Nebraska or Nevada or New Hampshire or New Jersey or New Mexico or New York or North Carolina).tw,in,ix. (3006974)  
12 (North Dakota or Ohio or Oklahoma or Oregon or Pennsylvania or Rhode Island or South Carolina or South Dakota or Tennessee or Texas or Utah or Vermont or Virginia or Washington or West Virginia or Wisconsin or Wyoming).tw,in,ix. (2889350)  
13 or/6-12 (15708122)  
14 5 and 13 (1214)  
15 conference abstract.pt. (1972906)  
16 ((exp animals/ or exp nonhuman/ or exp animal experiment/) not (humans/ or human/)) or ((rats or mice or mouse or cats or dogs or cell lines or animal\*) not (human\* or men or women)).ti. (11094208)  
17 note/ or editorial/ or letter/ or Comment/ or news/ (3649677)  
18 (case report/ or case reports/ or case report.ti.) not (literature review or systematic review).tw. (3836023)  
19 15 or 16 or 17 or 18 (19381447)  
20 14 not 19 (880)  
21 limit 20 to yr="2000 - 2015" (628)  
22 limit 21 to english language [Limit not valid in CDSR; records were retained] (609)  
23 remove duplicates from 22 (451)  
24 (Systematic review or meta-analysis).tw,kw. (268097)  
25 Meta analysis/ or "systematic review"/ (216269)  
26 (Medline or Embase or Cochrane or literature search or literature review).ab. (292916)  
27 random:.mp. or randomized controlled trial.pt. (2736503)  
28 or/24-27 (3068591)  
29 5 and 28 (1591)  
30 29 not 19 (1336)  
31 limit 30 to english language [Limit not valid in CDSR; records were retained] (1214)  
32 limit 31 to yr="2000 -Current" (974)  
33 remove duplicates from 32 (512)  
34 33 not 23 (419)

**PICO7. What are current standards for eradication testing? Whether we should test after treatment (the 1st subset of the PICO components)? Use philosophical arguments and also get help from cost-effectiveness and modeling studies**

1 pylori.tw. (87350)  
2 (treat\* or therap\* or manag\* or eradicat\*).tw. (13422102)  
3 (decision analysis or simulation\* or Markov).tw. (452781)

4 (cost effective\* or cost benefit or willingness to pay or QALY or QoL or QoLS or quality adjusted life year or quality of life).tw. (674733)  
5 cost analysis.tw. (11708)  
6 or/3-5 (1116128)  
7 1 and 2 and 6 (1478)  
8 limit 7 to english language [Limit not valid in CDSR; records were retained] (1283)  
9 ((exp animals/ or exp nonhuman/ or exp animal experiment/) not (humans/ or human/)) or ((rats or mice or mouse or cats or dogs or cell lines or animal\*) not (human\* or men or women)).ti. (11348702)  
10 (case report/ or case reports/ or case report.ti.) not (literature review or systematic review).tw. (3836023)  
11 note/ or editorial/ or letter/ or Comment/ or news/ (3649677)  
12 conference abstract.pt. (1972906)  
13 or/9-12 (19615030)  
14 8 not 13 (1150)  
15 limit 14 to yr="2000 -Current" (789)  
16 remove duplicates from 15 (419)

**PICO 10. What are the options for Hp resistance testing and when should this be incorporated into clinical practice?**

1 pylori.tw. (87350)  
2 (treat\* or therap\* or manag\* or eradicat\*).tw. (13422102)  
3 1 and 2 (39273)  
4 (culture or epsilometer or "E test" or qPCR or PCR or "susceptibility-guided" or "resistance-guided" or agar dilution or agar disk diffusion or broth microdilution or genotyp\* resistance).tw. (1897124)  
5 3 and 4 (5110)  
6 limit 5 to english language [Limit not valid in CDSR; records were retained] (4457)  
7 ((exp animals/ or exp nonhuman/ or exp animal experiment/) not (humans/ or human/)) or ((rats or mice or mouse or cats or dogs or cell lines or animal\*) not (human\* or men or women)).ti. (11094208)  
8 (case report/ or case reports/ or case report.ti.) not (literature review or systematic review).tw. (3836023)  
9 note/ or editorial/ or letter/ or Comment/ or news/ (3649677)  
10 conference abstract.pt. (1972906)  
11 or/7-10 (19381447)  
12 6 not 11 (3271)  
13 remove duplicates from 12 (1761)  
14 random:.mp. or randomized controlled trial.pt. (2736503)  
15 controlled study/ or major clinical study/ (6144269)  
16 controlled clinical trial.pt. (176336)  
17 (trial\* or groups or controlled stud\* or clinical stud\* or blind\*).tw. (5846041)  
18 clinical trial.mp. or clinical trial.pt. (2068335)  
19 or/14-18 (12126462)  
20 13 and 19 (1195)

**PICO11. In In “penicillin allergic” patients with H pylori infection [in North America] does treatment X have acceptable efficacy and safety [when compared to other treatments] (as 1st line, 2nd line etc.)**

1 pylori.tw. (87350)  
2 (treatment or treat or treated or therapy or eradicated or eradication or eradicating).tw. (10979767)  
3 1 and 2 (36760)  
4 ((allergy or allergic) adj5 penicillin\*).tw. (4156)  
5 3 and 4 (112)  
6 limit 5 to english language [Limit not valid in CDSR; records were retained] (87)  
7 conference abstract.pt. (1972906)  
8 note/ or editorial/ or letter/ or Comment/ or news/ (3649677)  
9 (case report/ or case reports/ or case report.ti.) not (literature review or systematic review).tw. (3836023)

10 ((exp animals/ or exp nonhuman/ or exp animal experiment/) not (humans/ or human/)) or ((rats or mice or mouse or cats or dogs or cell lines or animal\*) not (human\* or men or women)).ti. (11408696)  
11 or/7-10 (19668904)  
12 6 not 11 (55)  
13 limit 12 to yr="2000 -Current" (33)  
14 remove duplicates from 13 (19)

