1. Who should be tested for H. pylori?
   • Patients with dyspepsia symptoms
   • Patients with current or past gastric or duodenal ulcers or upper GI bleed
   • Patients with a first degree relative with a history of gastric cancer
   • First generation immigrants from Asia, Africa, Central and South America

2. Alarm features
   - Dyspepsia symptoms plus one or more of the following:
     • Age >60 with new and persistent symptoms (>3 months)
     • GI bleeding (melena or hematemesis) or anemia (if yes, do CBC, INR, PTT as part of referral)
     • Progressive dysphagia
     • Persistent vomiting (not associated with cannabis use)
     • Unintended weight loss (≥5-10% of body weight over 6 months)
     • Personal history of peptic ulcer disease

   Refer for consultation/gastroscopy

3. Diagnosis
   - Test using HpSAT or UBT
   - Before testing, patient must be off antibiotics x4 weeks and off PPI at least 3 days

   Treat according to dyspepsia pathway

4. Treatment
   - Round 1: CLAMET Quad or BMT Quad
   - Round 2 (if needed): CLAMET Quad or BMT Quad
   - Round 3 (if needed): Levo Amox
   - Round 4 (if needed): Rif-Amox or refer to GI

5. Confirm eradication
   - HpSAT or UBT at least 4 weeks after finishing treatment
   - Before testing, patient must be off antibiotics x4 weeks and off PPI at least 3 days

   Yes, continued symptoms

   No

6. Treatment failure
   - Proceed to next round of treatment
   - Option to refer to GI after 3 failed treatment attempts

   Yes, no symptoms = DONE

   No
Expanded Details – Assessment and Treatment

1. Who should be tested for Helicobacter Pylori (Hp)?
   - Patients with dyspepsia, characterized by epigastric pain or discomfort that may be triggered by eating and may be accompanied by a sense of abdominal distention or “bloating”, early satiety, or loss of appetite.
     - For patients with dyspepsia symptoms, testing for Hp may be completed prior to trial of proton pump inhibitor (PPI) or after PPI treatment.
     - Please see the dyspepsia pathway.
   - Patients with current or past gastric or duodenal ulcers or upper GI bleed.
   - Patients who have a personal or first-degree relative with history of gastric cancer should be considered for testing once in adulthood.
   - First generation immigrants from high prevalence areas (Asia, Africa, Central and South America).
   - NOTE: many Hp infected patients are asymptomatic.
   - Most studies suggest that Hp does not play a role in gastro-esophageal reflux disease (GERD), and patients are understandably disappointed when their GERD does not improve after eradication of Hp.
     - Please see the GERD pathway.

2. Alarm Features (warranting consideration of referral for consultation/gastroscopy)
   - Dyspepsia symptoms or Hp diagnosis accompanied by one or more of the following:
     - Age >60 with new and persistent symptoms (>3 months)
     - GI bleeding (hematemesis or melena — see primer on black stool below) or anemia (if yes, complete CBC, INR, PTT as part of referral)
     - Progressive dysphagia
     - Persistent vomiting (not associated with cannabis use)
     - Unintended weight loss (≥ 5-10% of body weight over 6 months)
     - Personal history of peptic ulcer disease
     - First degree relative with a history of esophageal or gastric cancer.
       - For these patients, it is appropriate to test for H. pylori while they are waiting for consultation/gastroscopy, and to initiate treatment if there is a positive result.

Primer on black stool
   - Possible causes of black stool
     - Upper GI bleeding
     - Slow right-sided colonic bleeding
     - Epistaxis or hemoptysis with swallowed blood
   - Melena is dark/black, sticky, tarry, and has a distinct odour
   - Patient history should include:
     - Any prior GI bleeds or ulcer disease
     - Taking ASA, NSAIDs, anticoagulants, Pepto Bismol, or iron supplements
     - Significant consumption of black licorice
     - Significant alcohol history or hepatitis risk factors
     - Any other signs of bleeding (e.g. coffee ground emesis, hematemesis, hematochezia, or bright red blood per rectum)
     - Any dysphagia, abdominal pain, change in bowel movements, constitutional symptoms or signs/symptoms of significant blood loss
3. Diagnosis

- Depending on local availability, test with the Hp stool antigen test (HpSAT) or the urea breath test (UBT).
  - HpSAT is the preferred test in the Calgary Zone (due to equivalent accuracy, ease of access and collection for the patient, and faster turnaround time).
- False positive results with both UBT and HpSAT are rare, but false negatives may result from recent use of antibiotics or anti-secretory drugs (PPI or H2-receptor antagonists).
- Accurate test results depend on proper preparation:
  - Patients should be off antibiotics for at least 4 weeks before the test.
  - Patients should not take bismuth preparations (e.g., Pepto Bismol) for two weeks before the test.
  - Patients should be off PPIs at least 3 days before the test, but preferably this should be 2 weeks.
  - Patients with symptoms may take antacids up to 24 hours before their test.
- Patient preparation instructions can be found at the following links:
  - Dynalife (UBT): [https://dynalife.ca/Portals/0/pdf/Patient%20instructions/Urea%20breath.pdf](https://dynalife.ca/Portals/0/pdf/Patient%20instructions/Urea%20breath.pdf)

4. Treatment

- Standard triple therapy regimens (HpPAC, PPI Clarithromycin with amoxicillin, or metronidazole) are no longer recommended (Canadian Association of Gastroenterology, 2016) due to changing resistance.
- Pregnant and nursing women should not be treated for Hp.
- To determine the appropriate treatment regimen for children with Hp infection, consult a pediatric gastroenterologist through Specialist Link or Advice Request (depending on local availability).
- For all other patients, treat as follows:

<table>
<thead>
<tr>
<th>First Round</th>
<th>CLAMET Quad for 14 days</th>
<th>OR</th>
<th>BMT Quad for 14 days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PPI standard dose BID</td>
<td></td>
<td>PPI standard dose BID</td>
</tr>
<tr>
<td></td>
<td>Clarithromycin 500mg BID</td>
<td></td>
<td>Bismuth subsalicylate 2 tabs QID (524mg)</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin 1000mg BID</td>
<td></td>
<td>Metronidazole 500mg QID</td>
</tr>
<tr>
<td></td>
<td>Metronidazole 500mg BID</td>
<td></td>
<td>Tetracycline 500mg QID</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Round</th>
<th>If CLAMET Quad was used as initial treatment, use BMT Quad for second round</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If BMT Quad was used as initial treatment, use CLAMET Quad or consider Levo-Amox</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Round</th>
<th>Levo-Amox for 14 days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PPI standard dose BID</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin 1000mg BID</td>
</tr>
<tr>
<td></td>
<td>Levofloxacin 250mg BID or 500mg once daily</td>
</tr>
</tbody>
</table>
If Hp has not been eradicated after three rounds of treatment, the family physician may:

- Provide Rif-Amox treatment as noted below, if comfortable doing so
  - NOTE: Rifabutin may require special authorization for patients with Alberta Blue Cross coverage
- Consult with GI through Specialist Link or Advice Request (as locally available)
- Refer to GI

**Rif-Amox for 10 days**
- PPI standard dose BID
- Rifabutin 150mg BID
- Amoxicillin 1000mg BID

**IMPORTANT:** Rifabutin has rarely been associated with potentially serious myelotoxicity (low white cell or platelet count). The pros and cons of fourth-line therapy should be decided on a case-by-case basis.

<table>
<thead>
<tr>
<th>Helicobacter pylori treatment regimens for patients (ALLERGIC TO PENICILLIN/AMOXICILLIN)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Round</strong></td>
</tr>
<tr>
<td>Bismuth Quadruple Regimen for 14 days</td>
</tr>
<tr>
<td>1. PPI standard dose BID</td>
</tr>
<tr>
<td>2. Bismuth subsalicylate 2 tabs QID (524mg)</td>
</tr>
<tr>
<td>3. Metronidazole (500mg) four times a day</td>
</tr>
<tr>
<td>4. Tetracycline (500mg) four times a day</td>
</tr>
<tr>
<td><strong>Second Round</strong></td>
</tr>
<tr>
<td>Modified Triple Therapy (PCM) for 14 days</td>
</tr>
<tr>
<td>1. Pantoprazole (40mg) two times a day</td>
</tr>
<tr>
<td>2. Clarithromycin (500mg) two times a day</td>
</tr>
<tr>
<td>3. Metronidazole (500mg) two times a day</td>
</tr>
</tbody>
</table>

* It is recommended to give all Hp treatments in a blister pack to improve adherence.

5. Confirm eradication

- After treatment, patients should be retested for Hp, **no sooner than 4 weeks after completing treatment.** Retesting too soon risks a false negative test.
- The patient must be off all antibiotics (including antibiotics for Hp treatment) for at least 4 weeks and off PPIs for at least 3 days (preferably 2 weeks).
- Once cured, re-infection rate is <2%.
- If symptoms persist, refer to the dyspepsia pathway for additional treatment options.

6. Treatment failure

- Treatment failure may be due to antibiotic resistance, but intolerance or non-adherence must also be explored with the patient.
- **After treatment failure, there is no point in retrying the same regimen - see chart for next option.**
- Referral to GI may be made after three failed rounds of treatment if the family physician does not feel comfortable assessing for/prescribing Rif-Amox treatment. In the referral, outline testing and treatment provided to date.

Additional Background on Helicobacter Pylori Infection

**Epidemiology**

- Overall prevalence in Canada is about 20-30%, depending on age.
- Prevalence is considerably higher in First Nations communities and in immigrants from developing countries in South America, Africa, and Asia. Prevalence of antibiotic resistant strains of Hp is higher in certain immigrant populations (Southeast Asia, Central America, and South America).
- Infection most commonly occurs during childhood.
Complications

- About 5-15% of patients with Hp will develop duodenal or gastric ulcers. This is higher in patients who chronically use nonsteroidal anti-inflammatory drugs including low-dose aspirin.
- Hp increases the risk of gastric adenocarcinoma and MALT lymphoma but overall the lifetime risk of this is very low, less than 1%.
- There is an increased risk of gastric cancer among First Nations people and immigrants from developing countries such as South America and Asia.

Patient Resources

- Patient information sheets on each treatment regimen are attached.

Physician References


Background on Primary Care Pathways

- Digestive health primary care pathways were originally co-developed in 2015 by gastroenterologists from the Cumming School of Medicine at the University of Calgary and family physicians representing Primary Care Networks in the Calgary Zone.
- The pathways were intended to provide evidence-based guidance to support primary care providers in caring for patients with common digestive health conditions within the medical home.
- Based on the successful adoption of the primary care pathways within the Calgary Zone, and their impact on timely access to quality care, the Digestive Health Strategic Clinical Network made the decision in 2017 to lead an initiative to validate the applicability of the pathways for all of Alberta and to spread availability and foster adoption of the pathways across Alberta.

Authors and Conflict of Interest Declaration

- Prior to provincial spread of this primary care pathway, it was reviewed and revised under the auspices of the Digestive Health Strategic Clinical Network in 2018, by a multi-disciplinary team led by family physicians and gastroenterologists. Names of participating reviewers and their conflict of interest declarations are available on request. No conflicts were declared.

Pathway Review Process and Timelines

- Primary care pathways undergo scheduled review every three years, or earlier if there is a clinically significant change in knowledge or practice. The next scheduled review is April 2022, however we welcome feedback at any time. Please submit your comments to the Digestive Health Strategic Clinical Network at Digestivehealth.SCN@ahs.ca.

**DISCLAIMER**

This pathway represents evidence-based best practice but does not override the individual responsibility of health care professionals to make decisions appropriate to their patients using their own clinical judgment given their patients’ specific clinical conditions, in consultation with patients/alternate decision makers. The pathway is not a substitute for clinical judgment or advice of a qualified health care professional. It is expected that all users will seek advice of other appropriately qualified and regulated health care providers with any issues transcending their specific knowledge, scope of regulated practice or professional competence.
Taking CLAMET-PPI Treatment

What is CLAMET-PPI?

Your doctor has prescribed CLAMET-PPI treatment because you have an infection of the stomach (H. pylori). CLAMET-PPI treatment gets its name from the medicine in it (clarithromycin, amoxicillin, metronidazole, and a proton pump inhibitor).

How do I take CLAMET-PPI?

- Most people take CLAMET-PPI treatment without having any problems. If you’re pregnant or breastfeeding, you can’t take CLAMET-PPI treatment.
- You’ll need to take the medicine listed below for 14 days. To make it easier, ask your pharmacist to put your prescriptions in a bubble pack. CLAMET-PPI treatment costs about $130 if generic medicine is used.
- If you don’t take the treatment as recommended, it will not work as well.

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Dose</th>
<th>How Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarithromycin</td>
<td>500 mg (take 1 capsule)</td>
<td>2 times a day</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>1000 mg (take 2 capsules)</td>
<td>2 times a day</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>500 mg (take 1 tablet)</td>
<td>2 times a day</td>
</tr>
<tr>
<td>Proton pump inhibitor</td>
<td>take 1 pill</td>
<td>2 times a day</td>
</tr>
</tbody>
</table>

Do I need to know anything else about taking antibiotics?

Please speak to your pharmacist when you pick up your medications to treat the *Helicobacter pylori* infection. You can expect your pharmacist to provide you with information relating to each medication shown above in the regimen. You can discuss the benefits, potential interactions (food and medications to avoid) and adverse effects of your medication regimen with your pharmacist.
Taking BMT-PPI Treatment

What is BMT-PPI?

Your doctor has prescribed BMT-PPI treatment because you have an infection of the stomach (H. pylori). BMT-PPI treatment gets its name from the medicine in it (bismuth subsalicylate, metronidazole, tetracycline, and a proton pump inhibitor).

How do I take BMT-PPI?

- Most people take BMT-PPI treatment without having any problems. If you’re pregnant or breastfeeding, you can’t take BMT-PPI treatment.
- You’ll need to take the medicine listed below for 14 days. To make it easier, ask your pharmacist to put your prescriptions in a bubble pack. BMT-PPI treatment costs about $80 if generic medicine is used.
- If you don’t take the treatment as recommended, it will not work as well.

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Dose</th>
<th>How Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bismuth subsalicylate (Pepto-Bismol®)</td>
<td>524 mg (take 2 caplets)</td>
<td>4 times a day</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>500 mg (take 1 tablet)</td>
<td>4 times a day</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>500 mg (take 1 capsule)</td>
<td>4 times a day</td>
</tr>
<tr>
<td>Proton pump inhibitor</td>
<td>take 1 pill</td>
<td>2 times a day</td>
</tr>
</tbody>
</table>

Do I need to know anything else about taking antibiotics?

Please speak to your pharmacist when you pick up your medications to treat the Helicobacter pylori infection. You can expect your pharmacist to provide you with information relating to each medication shown above in the regimen. You can discuss the benefits, potential interactions (food and medications to avoid) and adverse effects of your medication regimen with your pharmacist.
Taking LevoAmox-PPI Treatment

What is LevoAmox-PPI?
Your doctor has prescribed LevoAmox-PPI treatment because you have an infection of the stomach (H. pylori). LevoAmox-PPI treatment gets its name from the medicine in it (levofoxacin, amoxicillin, and a proton pump inhibitor).

How do I take LevoAmox-PPI?

- Most people take LevoAmox-PPI treatment without having any problems. If you’re pregnant or breastfeeding, you can’t take LevoAmox-PPI treatment.
- You’ll need to take the medicine listed below for 14 days. To make it easier, ask your pharmacist to put your prescriptions in a bubble pack. LevoAmox-PPI treatment costs about $100 if generic medicine is used.
- If you don’t take the treatment as recommended, it will not work as well.

<table>
<thead>
<tr>
<th>LevoAmox-PPI Treatment</th>
<th>Medicine</th>
<th>Dose</th>
<th>How Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levofoxacin</td>
<td>250 mg (take 1 tablet)</td>
<td>2 times a day</td>
<td></td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>1000 mg (take 2 capsules)</td>
<td>2 times a day</td>
<td></td>
</tr>
<tr>
<td>Proton pump inhibitor</td>
<td>take 1 pill</td>
<td>2 times a day</td>
<td></td>
</tr>
</tbody>
</table>

Do I need to know anything else about taking antibiotics?

Please speak to your pharmacist when you pick up your medications to treat the Helicobacter pylori infection. You can expect your pharmacist to provide you with information relating to each medication shown above in the regimen. You can discuss the benefits, potential interactions (food and medications to avoid) and adverse effects of your medication regimen with your pharmacist.
Taking RifAmox-PPI Treatment

What is RifAmox-PPI?

Your doctor has prescribed RifAmox-PPI treatment because you have an infection of the stomach (*H. pylori*). RifAmox-PPI treatment gets its name from the medicine in it (rifabutin, amoxicillin, and a proton pump inhibitor).

How do I take RifAmox-PPI?

- Most people take RifAmox-PPI treatment without having any problems. If you’re pregnant or breastfeeding, you can’t take RifAmox-PPI treatment.
- You’ll need to take the medicine listed below for 10 days. To make it easier, ask your pharmacist to put your prescriptions in a bubble pack. RifAmox-PPI treatment costs about $170 if generic medicine is used.
- If you don’t take the treatment as recommended, it will not work as well.

<table>
<thead>
<tr>
<th>RifAmox-PPI Treatment</th>
<th>Medicine</th>
<th>Dose</th>
<th>How Often</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rifabutin</td>
<td>150 mg (take 1 tablet)</td>
<td>2 times a day</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin</td>
<td>1000 mg (take 2 capsules)</td>
<td>2 times a day</td>
</tr>
<tr>
<td></td>
<td>Proton pump inhibitor</td>
<td>take 1 pill</td>
<td>2 times a day</td>
</tr>
</tbody>
</table>

Do I need to know anything else about taking antibiotics?

Please speak to your pharmacist when you pick up your medications to treat the *Helicobacter pylori* infection. You can expect your pharmacist to provide you with information relating to each medication shown above in the regimen. You can discuss the benefits, potential interactions (food and medications to avoid) and adverse effects of your medication regimen with your pharmacist.
Taking Bismuth Quadruple Regimen

What is Bismuth Quadruple Regimen?

Your doctor has prescribed Bismuth Quadruple Regimen treatment because you have an infection of the stomach (Helicobacter pylori), and an allergy to penicillin. The Bismuth Quadruple Regimen includes the following medications: a proton pump inhibitor, bismuth subsalicylate, metronidazole, and tetracycline.

How do I take is Bismuth Quadruple Regimen?

- Most people take Bismuth Quadruple Regimen treatment without having any problems. If you’re pregnant or breastfeeding, you can’t take the Bismuth Quadruple Regimen.

- You’ll need to take the medicine listed below for 14 days. To make it easier, ask your pharmacist to put your prescriptions in a bubble pack. The Bismuth Quadruple Regimen treatment costs about $80 if generic medicine is used.

- If you don’t take the treatment as recommended, it will not work as well.

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Dose</th>
<th>How Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proton pump inhibitor</td>
<td>take 1 pill</td>
<td>2 times a day</td>
</tr>
<tr>
<td>Bismuth Subsalicylate</td>
<td>524 mg</td>
<td>4 times a day</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>500 mg</td>
<td>4 times a day</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>500 mg</td>
<td>4 times a day</td>
</tr>
</tbody>
</table>

Do I need to know anything else about taking antibiotics?

Please speak to your pharmacist when you pick up your medications to treat the Helicobacter pylori infection. You can expect your pharmacist to provide you with information relating to each medication shown above in the regimen. You can discuss the benefits, potential interactions (food and medications to avoid) and adverse effects of your medication regimen with your pharmacist.
Taking Modified Triple Regimen

What is Modified Triple Regimen?

Your doctor has prescribed Modified Triple Regimen treatment because you have an infection of the stomach (*Helicobacter pylori*) and an allergy to penicillin. The Modified Triple Regimen includes the following medications: a proton pump inhibitor known as pantoprazole, clarithromycin and metronidazole.

How do I take Modified Triple Regimen?

- Most people take Modified Triple Regimen treatment without having any problems. If you're pregnant or breastfeeding, you can't take the Bismuth Quadruple Regimen.
- You'll need to take the medicine listed below for **14 days**. To make it easier, ask your pharmacist to put your prescriptions in a bubble pack. The Modified Triple Regimen treatment costs about $100 if generic medicine is used.
- If you don’t take the treatment as recommended, it will not work as well.

<table>
<thead>
<tr>
<th>Modified Triple Regimen</th>
<th>Medicine</th>
<th>Dose</th>
<th>How Often</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pantoprazole</td>
<td>40 mg</td>
<td>2 times a day</td>
</tr>
<tr>
<td></td>
<td>Clarithromycin</td>
<td>500 mg</td>
<td>2 times a day</td>
</tr>
<tr>
<td></td>
<td>Metronidazole</td>
<td>500 mg</td>
<td>2 times a day</td>
</tr>
</tbody>
</table>

Do I need to know anything else about taking antibiotics?

Please speak to your pharmacist when you pick up your medications to treat the *Helicobacter pylori* infection. You can expect your pharmacist to provide you with information relating to each medication shown above in the regimen. You can discuss the benefits, potential interactions (food and medications to avoid) and adverse effects of your medication regimen with your pharmacist.