

Ask Why for PPIs

A toolkit on optimizing the use of proton pump inhibitors for adults and adolescents in a variety of health-care settings.



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Executive Summary

Rationale

Proton pump inhibitors (PPIs) are among the most widely used medications worldwide.¹ While generally safe and effective, PPIs are often prescribed for a longer duration or at a higher dose than guidelines recommend.²

In 2022, data from the Canadian Institute for Health Information (CIHI) indicated that PPIs were the second most prescribed drug (17.3%), following statins. Public drug spending on PPIs was \$263.5 million (1.53%) out of a total of \$17.2 billion budget.³ Between 2000 and 2018, British Columbia's population grew by 20.4%, while the number of PPI users increased by 257%, and annual prescriptions for PPIs rose by 440%.⁴ In Alberta, from 2017 to 2020, 11-12% of the population received at least one PPI prescription, 22-23% of all new prescriptions were for twice-daily therapy, and 75-77% of all prescriptions were written by family physicians.²

Evidence suggests that 30-40% of PPI prescriptions lack an ongoing indication.⁵ Efforts should be made to reduce the dose and duration of treatment, as well as to deprescribe PPIs when the initial indication for use has been resolved, was uncertain, or was based on empirical treatment for symptoms later attributed to another cause.

PPIs carry potential side effects in <1% of patients, including a slightly increased risk of enteric infections, microscopic colitis, low magnesium, low vitamin B12 levels, and interstitial nephritis.^{6,7} Previous concerns about PPI-associated adverse events such as fracture, pneumonia and dementia were primarily based on studies that showed an association with PPI use.^{6,8} However, due to confounding factors, a causal relationship could not be established.

Deprescribing should be based on the lack of an ongoing indication rather than concerns over adverse events.¹⁶ Optimizing PPI use, by prescribing them only when indicated, using the recommended dose and duration, and deprescribing when unnecessary can lead to cost savings for patients and the healthcare system, reduce environmental impact, and lower the potential risks associated with adverse effects and polypharmacy.^{1,5,9,10}

Purpose

Originally developed in 2017 and updated in 2025, this toolkit is designed to support prescribers and pharmacists in implementing effective interventions by:

1. Prescribing PPIs only for appropriate indications, durations and doses
2. Deprescribing PPIs when there is no indication for long-term use
3. Engaging patients in reducing unnecessary continuous PPI use when there is no ongoing indication, the dose can be lowered, or no clear benefit is evident

Target Audience

This toolkit is intended for clinicians and allied health professionals working in primary care, hospital care, pharmacy, community care and long-term care settings. It provides guidance on optimizing PPI prescribing practices, reducing polypharmacy, and minimizing unnecessary health-care costs associated with overprescribing for adults and adolescents.

Recommendations

Don't maintain long-term proton pump inhibitor (PPI) therapy for gastrointestinal symptoms without an attempt to stop / reduce PPI in most patients. When prescribing a PPI, do always ensure an appropriate indication, the correct dose and for the correct duration.

Canadian Association of Gastroenterology

**Recommendation pending approval.*

Don't continue long-term proton pump inhibitor (PPI) therapy for gastrointestinal symptoms without reviewing the indication, dosage and treatment duration, and attempting to stop or reduce (taper) therapy in appropriate patients.

Canadian Pharmacists Association

Don't continue a proton pump inhibitor (PPI) at discharge unless there is a compelling reason to continue therapy.

Canadian Society of Hospital Pharmacists

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Appropriate Prescribing:

Evidence-Based Indications and Duration for PPIs

Main Symptom(s)	Evidence-Based Indication	Helicobacter Pylori Testing*	Initial Prescribing^	Long-Term Treatment	Deprescribing & Tools
Heartburn and/or regurgitation dominant If \geq mild for 2 days a week ¹	Symptomatic gastroesophageal reflux disease (GERD) ²	Not routinely	Standard dose: (SD) PPI 1x day for 4-8 weeks, then reassess symptoms	Some patients will require PPI 1x and/or may need to step up to 2x day to maintain symptom control	Yes Deprescribing Algorithm
Epigastric pain or discomfort is dominant Heartburn and/or regurgitation not dominant but may be present	Dyspepsia ²	Consider testing	If response is equivocal give PPI 2x day for 4-8 weeks, then decide on possible long-term maintenance treatment		
Chronic users of nonsteroidal anti-inflammatory drugs (NSAIDs) with other risk factors [†] ; anti-coagulation and acetylsalicylic acid (ASA), or dual anti-platelet (DAPT) therapy		N/A	Consider upper gastrointestinal (GI) bleeding prophylaxis: PPI 1x day	Depends on indication and patient risk factor profile	Yes, once medications requiring PPI prophylaxis are discontinued Deprescribing Algorithm No, if [†] high-risk patient: >65 years, taking anticoagulants, previous GI bleed, and/or upper GI symptoms

¹ Junghard O, Carlsson R, Lind T. Sufficient control of heartburn in endoscopy-negative gastro-oesophageal reflux disease trials. Scand J Gastroenterol. 2003 Dec;38(12):1197-9. doi: 10.1080/00365520310004920. PMID: 14750636.

² For more information see Alberta Health Services (AHS) GERD Pathway & AHS Dyspepsia Pathway.

* Hp Testing using Hp Stool Antigen Test (SAT) or Urea Breath Test (UBT). Treatment: Antibiotics + PPI2x for 10-14 days. Many patients will still need long term PPI after Hp treatment. For More information See AHS Helicobacter pathway.

^ Initial Prescribing: For Standard Dose (SD) PPIs are considered therapeutically equivalent: Pantoprazole (Pantoloc), 40 mg; Esomeprazole (Nexium), 40 mg; Lansoprazole (Prevacid), 30 mg; Dexlansoprazole (Dexilant), 30 mg; Omeprazole (Losec), 20 mg; Rabeprazole (Pariet), 20 mg.

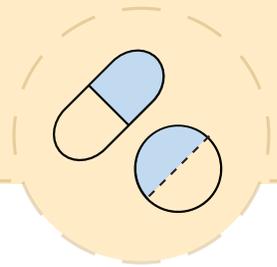
Appropriate Prescribing:

Indications for PPI based on Gastrointestinal (GI) Specialist

Evidence-Based Indication(s)	Helicobacter Pylori Testing*	Initial Prescribing^	Long-term Treatment	Deprescribing Opportunity
Erosive esophagitis (<i>confirmed by gastroscopy</i>)	Not routinely	SD PPI 1x day for 4-8 weeks, then reassess symptoms	Many patients will need to step up to PPI 2x day for symptom control	Yes, if Grade A No, if \geq Grade B
Peptic ulcer disease (PUD), duodenal or gastric ulcer	Recommended: often done during diagnostic gastroscopy (<i>consider ordering if not done</i>)	Uncomplicated ulcer: SD PPI 1x day for 8-16 weeks Bleeding ulcer: PPI 2x day	Yes, but not always. Bleeding ulcers need longer than 4-8 weeks treatment	No, not routinely If considered, may require GI specialist
Barrett's esophagus	No	SD PPI 1-2x day	Yes	No, lifelong PPI
Eosinophilic esophagitis	No	SD PPI 1x day or 2x day	Often yes	No, not routinely If considered, may require GI specialist
Rare Conditions				
Hypersecretory conditions like Zollinger-Ellison (ZE) syndrome	No	SD PPI 1x or 2x day	Yes, dose recommendation by GI specialist	No, lifelong PPI
Non-cardiac chest pain (NCCP) - presumed to be induced by GERD	Not routinely. Requires gastroscopy, cardiac work-up, and often esophageal motility testing, confirming there is no other cause explaining symptoms	PPI 2x day	Yes	Yes, may require GI specialist Deprescribing Algorithm

Myth Busters

Common Myths Around PPI Indications for Health-Care Providers



Myth	Fact
<p><i>“PPIs twice a day controls reflux better than once a day”/ “Prescribe the highest dose of PPI to maximize symptom control”</i></p>	<p>There is no evidence that starting with PPI 2x day for GERD gives better symptom control or better healing of erosive esophagitis (if present).^{1,2} However, some GERD patients will need PPI 2x day to maintain symptom control.</p>
<p><i>“All patients need long-term PPIs”</i></p>	<p>Current guidelines recommend limiting PPI use to specific indications and using the recommended dose to control symptoms.³ Some patients do need long-term PPI, and the indication must be clearly identified to avoid inappropriate deprescribing.³</p>
<p><i>“Some PPIs are more effective than others”</i></p>	<p>Standard Dose (SD) PPIs are considered therapeutically equivalent: Pantoprazole (Pantoloc) 40 mg; Esomeprazole (Nexium) 40 mg; Lansoprazole (Prevacid) 30 mg; Dexlansoprazole (Dexilant) 30 mg; Omeprazole (Losec) 20 mg; Rabeprazole (Pariet) 20 mg.</p>
<p><i>“PPIs are efficacious in all dyspepsia-like symptoms”</i></p>	<p>PPIs are efficacious in reflux-like (e.g., heartburn dominant) and ulcer-like (e.g., epigastric pain dominant) dyspepsia, but not in dysmotility-related (e.g., upper abdominal bloating dominant) dyspepsia.⁴</p>
<p><i>“If PPIs are stopped, symptoms will reappear”</i></p>	<p>Sometimes when a PPI is stopped there will be a temporary overproduction of gastric acid. This rebound acid hypersecretion syndrome (RAHS) is driven by the gastrin hormone, which is elevated when PPIs are used, and may result in symptoms which last up to 1-2 weeks. Patients should be warned about this and should wait to restart the PPI (see next row for more information).</p>

<p><i>"Histamine H₂-receptor antagonists (H₂RA) are as effective as PPI"</i></p>	<p>In patients with RAHS an alternative to restarting PPI is to use antacid or H₂RA. H₂RAs are less potent inhibitors of acid secretion and may not be as effective as PPIs, but they work faster for intermittent symptoms.</p> <p>H₂RAs could also be used as an alternative treatment of GERD, dyspepsia and ulcers. However, standard dose (SD) of H₂RA does not prevent all NSAID ulcers. Over-the-counter (OTC) H₂RAs can also be used. The dose of OTC H₂RAs is lower than standard dose.</p> <p>SD H₂RAs are considered therapeutically equivalent: Ranitidine (Zantac) 150 mg; Famotidine (Pepcid) 20 mg; Cimetidine (Tagamet) 200 mg twice daily.</p>
<p><i>"PPIs can cure chronic cough"</i></p>	<p>PPIs do not work in chronic cough if heartburn is absent. In rare respiratory conditions such as Idiopathic Pulmonary Fibrosis, PPIs may be indicated for long-term use.⁵</p>
<p><i>"PPIs are indicated as part of the treatment for Chronic Obstructive Pulmonary Disease (COPD) and Asthma"</i></p>	<p>PPI are not helpful unless there are associated GERD symptoms.</p>
<p><i>"The use of corticosteroids is an indication for PPI therapy to prevent peptic ulcer disease"</i></p>	<p>Isolated use of corticosteroids (e.g., pulse steroids for exacerbations of conditions like COPD) is not an indication for PPI therapy, but they are indicated if the patient has additional risk factors such as >65 years old, taking anticoagulants, previous GI bleed, and/or upper GI symptoms.</p>

¹ Bate CM, Booth SN, Crowe JP, Hepworth-Jones B, Taylor MD, Richardson PD. Does 40 mg omeprazole daily offer additional benefit over 20 mg daily in patients requiring more than 4 weeks of treatment for symptomatic reflux oesophagitis? *Aliment Pharmacol Ther.* 1993 Oct;7(5):501-7. doi: 10.1111/j.1365-2036.1993.tb00125.x. PMID: 8280818.

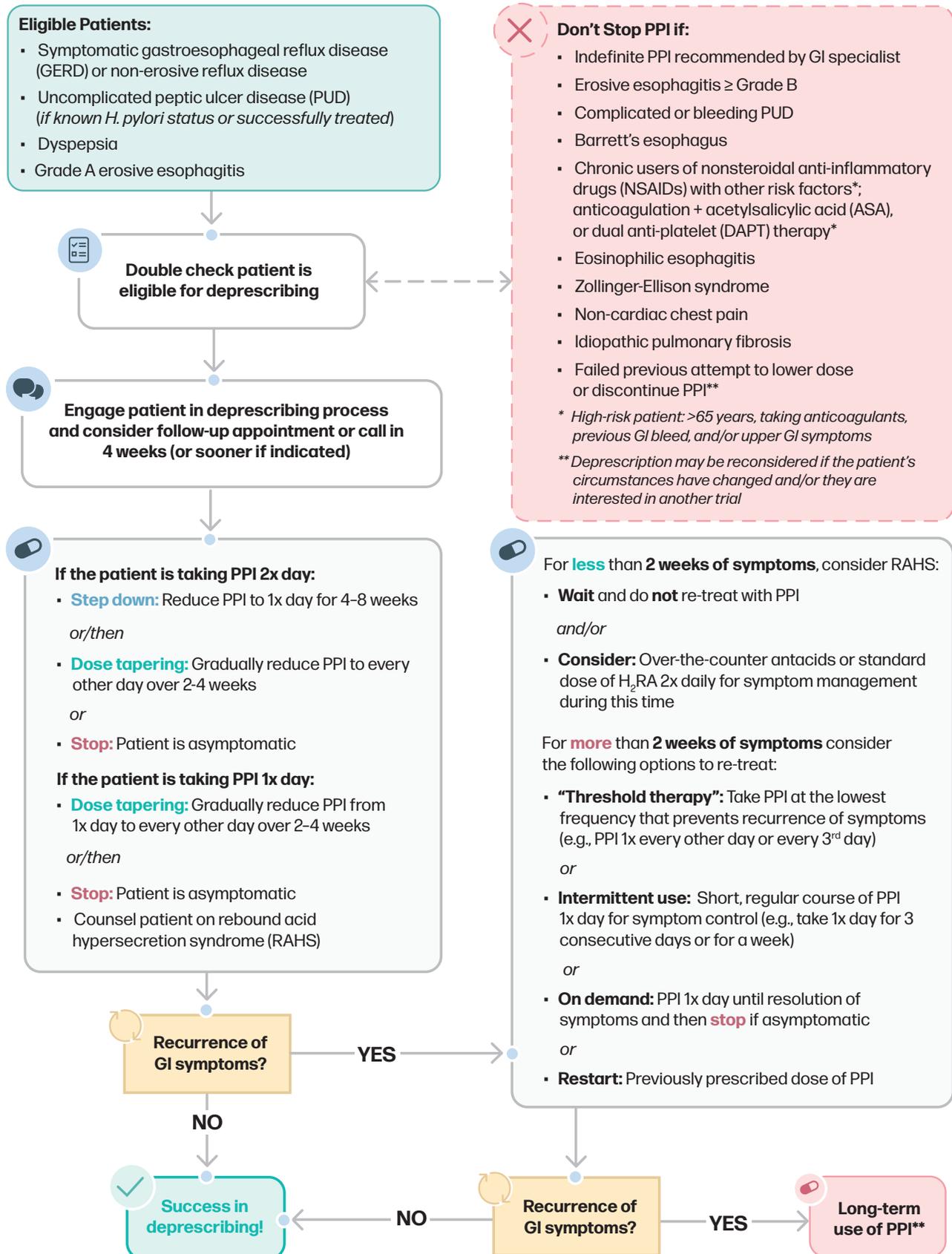
² COMPUS Academic Detailing Upskilling Document, Protom Pump Inhibitirs. April 2007.

³ Targownik L. Discontinuing Long-Term PPI Therapy: Why, With Whom, and How? *Am J Gastroenterol.* 2018 Apr;113(4):519-528. doi: 10.1038/ajg.2018.29. Epub 2018 Mar 20. PMID: 29557943.

⁴ Moayyedi P, Delaney BC, Vakil N, Forman D, Talley NJ. The efficacy of proton pump inhibitors in non-ulcer dyspepsia: a systematic review and economic analysis. *Gastroenterology.* 2004 Nov;127(5):1329-37. doi: 10.1053/j.gastro.2004.08.026. PMID: 15521002.

⁵ Targownik LE, Fisher DA, Saini SD. AGA Clinical Practice Update on De-Prescribing of Proton Pump Inhibitors: Expert Review. *Gastroenterology.* 2022 Apr;162(4):1334-1342. doi: 10.1053/j.gastro.2021.12.247. Epub 2022 Feb 17. PMID: 35183361.

Deprescribing/Dose Reduction: An Evidence-Based Approach to PPIs



Patient Information

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Proton Pump Inhibitors (PPIs)

When you need them, and when you don't.

What are Proton Pump Inhibitors (PPIs)?

PPIs are medications used to treat and prevent problems in the stomach such as:

- Frequent heartburn, also known as gastro-esophageal reflux disease (GERD)
- Stomach ulcers (sores in the stomach lining)
- Stomach bleeding
- Damage caused by medications such as NSAIDs (e.g., ibuprofen)

How do they work?

PPIs help reduce the amount of acid your stomach makes. Too much stomach acid can cause problems like GERD or pain in your upper stomach area. Your health care provider will tell you why you need PPIs. If you are unsure why you were given this medication, ask them for more information.

When do I take a PPI?

PPIs are often taken once a day. The best time to take them is just before breakfast or when you get up in the morning. Sometimes PPIs need to be taken two times a day; one tablet before breakfast and one before an evening meal.

Are they safe?

PPIs work well and are safe. Most people do not have side effects but, in rare cases, they may cause infectious or watery diarrhea, kidney damage, low magnesium levels, or low vitamin B12 levels. Taking medications you don't need may interact with other drugs and cause unwanted side effects.

How long do I take a PPI?

If you want to stop or lower your PPI use, speak with your health-care provider about:

- Whether you need to keep taking it long-term.
- How to reduce the dose or stop the medication completely, if it is safe to do.
- Other ways to manage symptoms, such as stopping smoking or losing weight.
- A follow-up plan, including what to do if you have any problems or symptoms come back.

Proton Pump Inhibitors

Provides information about PPIs, how they work, and the risks of the medications. This resource can help get the conversation started.

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Treating Acid Reflux

Also known as Gastro-Esophageal Reflux Disease (GERD)

What is acid reflux?

Acid reflux happens when stomach acid and food go back into your esophagus. This is the tube that carries food from your mouth to your stomach. When acid reflux symptoms happen often or cause problems, it is called Gastro-Esophageal Reflux Disease (GERD).



What are the symptoms of GERD?

The most common symptoms are:

- **Heartburn:** a burning feeling behind the breastbone or in the middle of your chest.
- **Acid regurgitation:** when acid and food come back up into the chest with a burning sensation. It can reach your mouth and cause a sour or bitter taste.

Why does GERD happen?

GERD happens when stomach acid moves into the esophagus, which is not where it should be. At the bottom of the esophagus, there is a small valve called the lower esophageal sphincter. This valve opens after you eat or drink, then closes again.

With GERD, the valve doesn't close properly. It stays open after meals or when you lie down. This lets food, liquid, and acid move back up into the esophagus, causing heartburn and acid reflux.



What are some ways I can improve my GERD symptoms?



Quit smoking:
This can help GERD symptoms improve. Medications also work better if you don't smoke.



Lose weight:
If you are overweight, losing weight can help reduce GERD symptoms and problems.



Avoid trigger foods:
Limit foods that cause symptoms. Eating smaller meals and not eating late at night may help.

Treating Acid Reflux

Provides information about treating acid reflux, how to manage symptoms and when to speak with a health-care provider.

Download

Implementation Tips

1. Obtain consensus of care team regarding appropriate indications for long-term PPI use.

2. Document and flag the PPI indication and expected duration of treatment on the prescription with the help of a multidisciplinary team (e.g., nurse, registered practical nurse, pharmacist or physician assistant) when possible.

3. Create an (electronic medical record) EMR search to identify patients on PPIs with upcoming appointments.

- Flag charts of adults taking PPI for >8 weeks and booked for an upcoming appointment
 - Ensure that patients with an indication for long-term PPI have this documented in a standardized way
 - Send an EMR message to clinicians: “Consider deprescribing PPI or decreasing the dose” could be placed into charts of active (visit within past 3 years) patients who had a PPI in their current medication list, where that PPI had been prescribed for >8 weeks and who are eligible for deprescribing
 - Standardize EMR message for a telephone or in-person follow-up after 4 weeks (or sooner if indicated) to assess deprescribing effort and help troubleshoot recurrence of symptoms
-

4. Share decision making with patients.

- Post educational posters in work spaces to encourage discussion
 - Inform patients that rebound acid hypersecretion syndrome (RAHS) can occur for 1-2 weeks after cessation of PPI but that if it continues, they should be reassessed
-

5. Monitor for any patients who were accidentally deprescribed who required long-term treatment and didn't meet eligibility criteria.

- Remove inaccurate EMR alerts for deprescribing when appropriate long-term or continued PPI use
-

Measuring Your Impact

1. Chart Audits: Perform monthly and use a graph to see response to interventions over time by tracking a family of measures (see suggestions below)
2. Use EMR to provide a list of active patients prescribed PPI with upcoming appointments. This function can be useful in creating a drug database for focused chart reviews
 - Develop a search for active patients (e.g., those with a visit in the past 3 years). You may want to put an age restriction, e.g., > X years. (A)
 - Within group (A), search patients with current PPI in medication field, of duration > 8 weeks (or longer duration if you wish, e.g., 6 months)
 - Determine number of patients on PPI 1x day and PPI 2x day (B)
 - Calculate percentage of active adult patients on long-term PPI = $(B/A) \times 100\%$

Family of Measures	Examples
<p>Outcome Measures The main improvement that you are trying to achieve</p>	<ul style="list-style-type: none"> ▪ Percentage of active eligible patients (lacking indication for ongoing PPI use) with current prescription for PPI of duration >8 weeks ▪ Percentage of patients on PPI 1x day and 2x day ▪ Percentage of eligible patients attempting deprescribing
<p>Process Measures Ensure the intervention is being carried out and delivered as intended</p>	<ul style="list-style-type: none"> ▪ Percentage of patients (whose charts were flagged) who are engaged in discussion of indications, benefits and risks of ongoing PPI use ▪ Percentage of patients (whose charts were flagged) who were given a handout ▪ Percentage of prescriptions issued for PPI which have indication & expected duration of treatment documented
<p>Balancing Measures Any intervention may create new, unintended consequences that need to be measured</p>	<ul style="list-style-type: none"> ▪ Measure additional clinician time per patient to deprescribe. Consider having a nurse, registered practical nurse, pharmacist or physician assistant to measure this task ▪ Percentage of inaccurate EMR alerts for deprescribing

Interested in Learning More?

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Originally Prepared By:

Dr. Kimberly Wintemute, MD, CCFP, FCFP

Previous Primary Care Co-Lead, Choosing Wisely Canada

Updated in 2025 By:

Dr. Elaine S. Bland, BM, MRCGP, CCFP(PC), FCFP, MAvMed

Family Physician

2024/25 Choosing Wisely Canada Healthcare Improvement Fellow

Clinical Lecturer, Cumming School of Medicine, University of Calgary

Dr. Sander Veldhuyzen van Zanten, MD, FRCPC, MSc, MPH, PhD

Emeritus Professor of Medicine

Former AHS Senior Medical Director, Digestive Health, Strategic Clinical Network

Division of Gastroenterology, Department of Medicine, University of Alberta

Dr. Mercedes Magaz, MD, MHSc

Quality Improvement Specialist, CQuIPS

Dr. Olivia Ostrow, MD, FAAP

Associate Director, CQuIPS

Director of Quality & Safety, Division of Pediatric Emergency Medicine, Hospital for Sick Children

Associate Professor, Department of Pediatrics, University of Toronto

Advisory Group:

Sara Hosseina, MN (NP)

Family Nurse Practitioner, Fraser Health Authority (Primary Care)

Quality Improvement/ Research Committe, Nurse Practitioner Association of Canada

Dr. Alex Kumachev, MD, MSc, FRCPC

Staff Physician, University Health Network

Division of general internal Medicine

Division of Clinical Pharmacology and Toxicology

Assistant Professor, university of Toronto

Tony Leamon

Patient Advisor with Choosing Wisely Canada Patient Advisory Council

Dr. Katrina L. Piggott, MD, MSc, FRCPC

Assistant Professor, Geriatric Medicine, The University of Toronto

Director, Co-Learning Curriculum in Quality Improvement, Department of Medicine

Lead, Choosing Wisely Geriatrics, Choosing Wisely Canada

Assistant Professor, Quality Improvement & Patient safety, IHPME

Tammy Quinn, BSc (Pharm), RPh

Clinical Editor, Canadian Pharmacists Association

Community Pharmacist, Sydney, Nova Scotia

Dr. Laura E. Targownik, MD, MSHS, FRCPC

Associate Professor of Medicine

Departmental Division Director (Gastroenterology and Hepatology), University of Toronto

Ontario Medical Association Tariff Lead, Section of Gastroenterology

Past chair, Diversity and Equity, Canadian Association of Gastroenterology

Staff Gastroenterologist, Mount Sinai Hospital

Dr. Peter E. Wu, MD, MSc, FRCPC

Internal Medicine and Clinical Pharmacology & Toxicology Specialist

Internal Medicine and Clinical Pharmacology & Toxicology Specialist

Division Director, Clinical Pharmacology & Toxicology, University of Toronto

Associate Professor, Department of Medicine, University of Toronto

Staff, Division of General Internal Medicine, University Health Network

Medical Director of Quality and Safety, University Health Network

Dr. Jennifer Young, MD, CCFP-EM

Community family physician Collingwood, Ontario

Associate Professor Department of Family Medicine, McMaster University

Physician Advisor, College of Family Physicians of Canada

Peer-Reviewed By:

Dr. Michael Kolber, BSc, MD, CCFP, MSc

Rural Family Physician with Special Interest in Gastrointestinal medicine

Professor, University of Alberta Department of Family Medicine

Associate Director, PEER Team

Dr. Mark MacMillan, MD, FRCPC, CAGF

Gastroenterology & Hepatology

Medical Endoscopy Director

Assistant Clinical Professor, Dalhousie University & Memorial University

Dr. Everett Chalmers Regional Hospital

Dr. Emily McDonald, MD, FRCPC, MSc

General Internal Medicine

Associate Professor, McGill University

Director, Canadian Medication Appropriateness and Deprescribing Network

Dr. Guylène Thériault, MD, CCFP

Family Physician

Primary care Co-Lead, Choosing Wisely Canada



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