Deprescribing

Proton Pump Inhibitor (PPI)

Done by : Raghad Alkhodair and Fatimah Alanazi.
Presented by : Raghad Alkhodair.
Supervised by: Dr. Mohammed Almeziny and Dr.Eman Obary.

CONTENT

INTRODUCTION

Deprescribing
Proton Pump Inhibitor (PPI)

- **Most patients who utilize home health care (HHC) are elderly >60 years old.**
- **Several aging characteristics make prescribing medications appropriately to elderly patients an extraordinarily challenging and complex process.**
- **A number of these factors exist, such as an increase in chronic diseases and degenerative conditions that require multiple medications, as well as physiological changes associated with aging, which impact the pharmacokinetics and pharmacodynamics of drugs.**

1. Maskrey V, Bond C, Alldred DP, Blyth A, Daffu-O'Reilly A, Inch J, et al. Care-homes independent pharmacist prescribing study (CHIPPS): Experiences from a non-randomised feasibility study. Research in Social and Administrative Pharmacy. 2018;14(8).
2. Awad A, Hanna O. Potentially inappropriate medication use among geriatric patients in primary care setting: A cross-sectional study using the Beers, STOPP, FORTA and MAI criteria. PLoS One. 2019;14(6).

Deprescribing
Proton Pump Inhibitor (PPI)

Beers Criteria, also known as the Beers List, is a widely recognized tool that provides guidance on the appropriate use of medications in elderly patients.

- **It is primarily designed to assist healthcare professionals, including physicians, pharmacists, and other prescribers, in making informed decisions when prescribing medications for elderly patients.**

1. By the 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society, 71(7), 2052–2081. https://doi.org/10.1111/jgs.18372

Deprescribing
Proton Pump Inhibitor (PPI)

The criteria categorize medications into five main categories:

1

Medications considered as potentially inappropriate.

1. By the 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society, 71(7), 2052–2081. https://doi.org/10.1111/jgs.18372

Deprescribing
Proton Pump Inhibitor (PPI)

Inappropriate medication use (IMU):

Is the phenomenon of taking medicines even though there is no clinical benefit or the risks outweigh the benefits.

- **It is often associated with polypharmacy, in which patients of multiple diseases are treated by a combination of medications.**
- **A growing concern among elderly patients is the inappropriate use of a high number of medications with varying degrees of complexity.**

1. Coe A, Kaylor-Hughes C, Fletcher S, Murray E, Gunn J. Deprescribing intervention activities mapped to guiding principles for use in general practice: A scoping review. Vol. 11, BMJ Open. 2021.
2. Smith J, Petrovic P, Rose M, De Souz C, Muller L, Nowak B, et al. Placeholder Text: A Study. Citation Styles. 2021 Jul 15;3.

Deprescribing

Proton Pump Inhibitor (PPI)

TABLE 2 (Continued)

Organ system, therapeutic category, drug(s)[a]	Rationale	Recommendation	Quality of evidence[b]	Strength of recommendation[b]
Endocrine				
Androgens Methyltestosterone Testosterone	Potential for cardiac problems; potential risks in men with prostate cancer.	Avoid unless indicated for confirmed hypogonadism with clinical symptoms.	Moderate	Weak
Estrogens with or without progestins (includes natural and synthetic estrogen preparations)	Evidence of carcinogenic potential (breast and endometrium); lack of cardioprotective effect and cognitive protection in older women. For women who start HRT at age 60 and older, the risks of HRT are greater than the benefits, as HRT is linked to a higher risk of heart disease, stroke, blood clots, and dementia. Evidence indicates that vaginal estrogens for the treatment of vaginal dryness are safe and effective; women with a history of breast cancer who do not respond to nonhormonal therapies are advised to discuss the risks and benefits of low-dose vaginal estrogen (e.g., dosages of estradiol <25 mcg twice weekly) with their healthcare provider.	Do not initiate systemic estrogen (e.g., oral tablets or transdermal patches). Consider deprescribing among older women already using this medication. Vaginal cream or vaginal tablets: acceptable to use low-dose intravaginal estrogen for the management of dyspareunia, recurrent lower urinary tract infections, and other vaginal symptoms.	Oral and patch: high Vaginal cream or vaginal tablets: moderate	Oral and patch: strong Topical vaginal cream or tablets: weak
Insulin, sliding scale (insulin regimens containing only short- or rapid-acting insulin dosed according to current blood glucose levels without concurrent use of basal or long-acting insulin)	Higher risk of hypoglycemia without improvement in hyperglycemia management regardless of care setting. Avoid insulin regimens that include only short- or rapid-acting insulin dosed according to current blood glucose levels without concurrent use of basal or long-acting insulin. This recommendation does not apply to regimens that contain basal insulin or long-acting insulin.	Avoid	Moderate	Strong
Sulfonylureas (all, including short- and longer-acting) Gliclazide Glimepiride Glipizide Glyburide (Glibenclamide)	Sulfonylureas have a higher risk of cardiovascular events, all-cause mortality, and hypoglycemia than alternative agents. Sulfonylureas may increase the risk of cardiovascular death and ischemic stroke. Among sulfonylureas, long-acting agents (e.g., glyburide, glimepiride) confer a higher risk of prolonged hypoglycemia than short-acting agents (e.g., glipizide).	Avoid sulfonylureas as first- or second-line monotherapy or add-on therapy unless there are substantial barriers to the use of safer and more effective agents. If a sulfonylurea is used, choose short-acting agents (e.g., glipizide) over long-acting agents (e.g., glyburide, glimepiride).	Hypoglycemia: High CV events and all-cause mortality: Moderate CV death and ischemic stroke: Low	Strong
Desiccated thyroid	Concerns about cardiac effects; safer alternatives available.	Avoid	Low	Strong

1. By the 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society, 71(7), 2052–2081. https://doi.org/10.1111/jgs.18372

Deprescribing
Proton Pump Inhibitor (PPI)

The criteria categorize medications into five main categories:

2

Medications potentially inappropriate in patients with certain diseases.

1. By the 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society, 71(7), 2052–2081. https://doi.org/10.1111/jgs.18372

Deprescribing
Proton Pump Inhibitor (PPI)

TABLE 3 2023 American Geriatrics Society Beers Criteria® for potentially inappropriate medication use in older adults due to drug–disease or drug–syndrome interactions that may exacerbate the disease or syndrome.

Disease or syndrome	Drug(s)[a]	Rationale	Recommendation	Quality of evidence[b]	Strength of recommendation[b]
Cardiovascular					
Heart failure	Cilostazol Dextromethorphan-quinidine Nondihydropyridine calcium channel blockers (CCBs) Diltiazem Verapamil Dronedarone NSAIDs and COX-2 inhibitors Thiazolidinediones Pioglitazone	Potential to promote fluid retention and/or exacerbate heart failure (NSAIDs and COX-2 inhibitors, non-dihydropyridine CCBs, thiazolidinediones); potential to increase mortality in older adults with heart failure (cilostazol and dronedarone); concerns about QT prolongation (dextromethorphan-quinidine). *Note:* This is not a comprehensive list of medications to avoid in patients with heart failure.	Avoid: Cilostazol Dextromethorphan-quinidine --- Avoid in heart failure with reduced ejection fraction: Nondihydropyridine calcium channel blockers (CCBs) Diltiazem Verapamil --- Use with caution in patients with heart failure who are asymptomatic; avoid in patients with symptomatic heart failure: Dronedarone NSAIDs and COX-2 inhibitors Thiazolidinediones Pioglitazone	Cilostazol, dextromethorphan-quinidine, COX-2 inhibitors: Low Non-dihydropyridine CCBs, NSAIDs: Moderate Dronedarone, thiazolidenediones: High	Strong
Syncope	Antipsychotics (selected) Chlorpromazine Olanzapine Cholinesterase inhibitors (AChEIs) Donepezil Galantamine Rivastigmine Non-selective peripheral alpha-1 blockers Doxazosin Prazosin Terazosin Tertiary tricyclic antidepressants (TCAs) Amitriptyline Clomipramine Doxepin Imipramine	Antipsychotics listed and tertiary TCAs increase the risk of orthostatic hypotension. AChEIs cause bradycardia and should be avoided in older adults whose syncope may be due to bradycardia. Non-selective peripheral alpha-1 blockers cause orthostatic blood pressure changes and should be avoided in older adults whose syncope may be due to orthostatic hypotension.	Avoid	High	Antipsychotics, non-selective peripheral alpha-1 blockers: Weak AChEIs, tertiary TCAs: Strong

1. By the 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society, 71(7), 2052–2081. https://doi.org/10.1111/jgs.18372

The criteria categorize medications into five main categories:

3

Medications to be used with caution.

1. By the 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society, 71(7), 2052–2081. https://doi.org/10.1111/jgs.18372

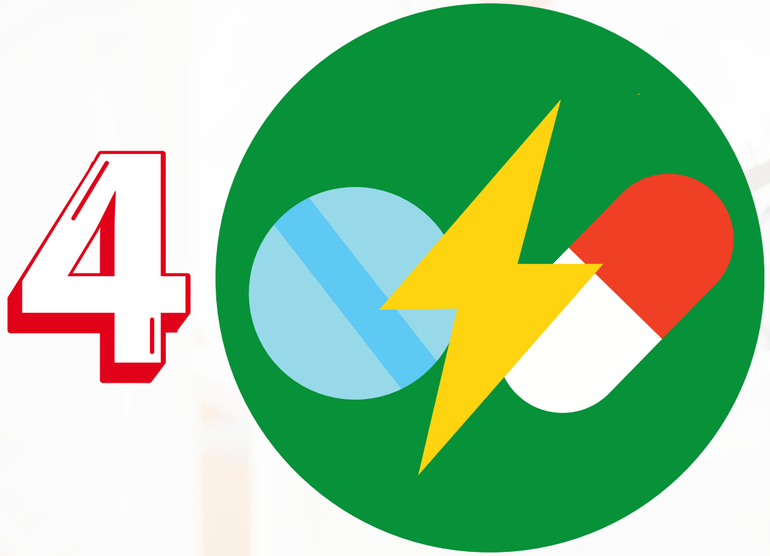
Deprescribing
Proton Pump Inhibitor (PPI)

Drug(s)[b]	Rationale	Recommendation	Quality of evidence[c]	Strength of recommendation[c]
Dabigatran for long-term treatment of nonvalvular atrial fibrillation or venous thromboembolism (VTE)	Increased risk of GI bleeding compared with warfarin (based on head-to-head clinical trials) and of GI bleeding and major bleeding compared with apixaban (based on observational studies and meta-analyses) in older adults when used for long-term treatment of nonvalvular atrial fibrillation or VTE.	Use caution in selecting dabigatran over other DOACs (e.g., apixaban) for long-term treatment of nonvalvular atrial fibrillation or VTE. See also criteria on warfarin and rivaroxaban (Table 2) and footnote[d] regarding choice among DOACs.	Moderate	Strong
Prasugrel Ticagrelor	Both increase the risk of major bleeding in older adults compared with clopidogrel, especially among those 75 years old and older. However, this risk may be offset by cardiovascular benefits in select patients.	Use with caution, particularly in adults 75 years old and older. If prasugrel is used, consider a lower dose (5 mg) for those 75 years old and older.	Moderate	Strong
Antidepressants (selected) Mirtazipine SNRIs SSRIs TCAs Antiepileptics (selected) Carbamazepine Oxcarbazepine Antipsychotics Diuretics Tramadol	May exacerbate or cause SIADH or hyponatremia; monitor sodium levels closely when starting or changing dosages in older adults.	Use with caution	Moderate	Strong
Dextromethorphan-quinidine	Limited efficacy in patients with behavioral symptoms of dementia (does not apply to the treatment of pseudobulbar affect). May increase the risk of falls and concerns with clinically significant drug interactions and with use in those with heart failure (see Table 3).	Use with caution	Moderate	Strong

1. By the 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society, 71(7), 2052–2081. https://doi.org/10.1111/jgs.18372

Deprescribing
Proton Pump Inhibitor (PPI)

The criteria categorize medications into five main categories:



Potentially inappropriate drug-drug interactions.

1. By the 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society, 71(7), 2052–2081. https://doi.org/10.1111/jgs.18372

Deprescribing
Proton Pump Inhibitor (PPI)

Object drug or class	Interacting drug or class	Risk rationale	Recommendation	Quality of evidence[a]	Strength of recommendation[a]
RAS inhibitors (ACEIs, ARBs, ARNIs, aliskiren) or potassium-sparing diuretics (amiloride, triamterene)	Another RAS inhibitor or a potassium-sparing diuretic	Increased risk of hyperkalemia.	Avoid routinely using 2 or more RAS inhibitors, or a RAS inhibitor and potassium-sparing diuretic, concurrently in those with chronic kidney disease Stage 3a or higher.	Moderate	Strong
Opioids	Benzodiazepines	Increased risk of overdose and adverse events.	Avoid	Moderate	Strong
Opioids	Gabapentin Pregabalin	Increased risk of severe sedation-related adverse events, including respiratory depression and death.	Avoid; exceptions are when transitioning from opioid therapy to gabapentin or pregabalin, or when using gabapentinoids to reduce opioid dose, although caution should be used in all circumstances.	Moderate	Strong
Anticholinergic	Anticholinergic	Use of more than one medication with anticholinergic properties increases the risk of cognitive decline, delirium, and falls or fractures.	Avoid; minimize the number of anticholinergic drugs (Table 7).	Moderate	Strong
Antiepileptics (including gabapentinoids) Antidepressants (TCAs, SSRIs, and SNRIs) Antipsychotics Benzodiazepines Nonbenzodiazepine benzodiazepine receptor agonist hypnotics (i.e., "Z-drugs") Opioids Skeletal muscle relaxants	Any combination of ≥3 of these CNS-active drugs	Increased risk of falls and of fracture with the concurrent use of ≥3 CNS-active agents (antiepileptics including gabapentinoids, antidepressants, antipsychotics, benzodiazepines, nonbenzodiazepine benzodiazepine receptor agonist hypnotics, opioids, and skeletal muscle relaxants).	Avoid concurrent use of ≥3 CNS-active drugs (among types as listed at left); minimize the number of CNS-active drugs.	High	Strong
Lithium	ACEIs ARBs ARNIs	Increased risk of lithium toxicity.	Avoid; monitor lithium concentrations.	Moderate	Strong
Lithium	Loop diuretics	Increased risk of lithium toxicity.	Avoid; monitor lithium concentrations.	Moderate	Strong
Non-selective peripheral alpha-1 blockers[b]	Loop diuretics	Increased risk of urinary incontinence in older women.	Avoid in older women, unless conditions warrant both drugs.	Moderate	Strong
Phenytoin	Trimethoprim-sulfamethoxazole	Increased risk of phenytoin toxicity	Avoid	Moderate	Strong

1. By the 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society, 71(7), 2052–2081. https://doi.org/10.1111/jgs.18372

Deprescribing
Proton Pump Inhibitor (PPI)

The criteria categorize medications into five main categories:

5

Medications whose dosages should be adjusted based on renal function.

1. By the 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society, 71(7), 2052–2081. https://doi.org/10.1111/jgs.18372

Deprescribing

Proton Pump Inhibitor (PPI)

Drug	CrCl (mL/min) at which action is required	Rationale	Recommendation	Quality of evidence	Strength of recommendation
Anti-infective					
Ciprofloxacin	<30	Increased risk of CNS effects (e.g., seizures, confusion) and tendon rupture.	Dosages used to treat common infections typically require reduction when CrCl <30 mL/min.	Moderate	Strong
Nitrofurantoin	<30	Potential for pulmonary toxicity, hepatoxicity, and peripheral neuropathy, especially with long-term use. (See also Table 2).	Avoid if CrCl <30 mL/min	Low	Strong
Trimethoprim-sulfamethoxazole	<30	Increased risk of worsening of kidney function and hyperkalemia; risk of hyperkalemia especially prominent with concurrent use of an ACE, ARB, or ARNI.	Reduce dosage if CrCl is 15–29 mL/min. Avoid if CrCl <15 mL/min.	Moderate	Strong

1. By the 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. (2023). American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society, 71(7), 2052–2081. https://doi.org/10.1111/jgs.18372

DEPRESCRIBING

Deprescribing
Proton Pump Inhibitor (PPI)

Physician Survey

Pharmasist Survey

Deprescribing
Proton Pump Inhibitor (PPI)

The term "deprescribing" refers to a process of medication withdrawal, supervised by a health care professional, with the goal of managing polypharmacy and improving outcomes.

1. UpToDate. (n.d.). Uptodate.com. Retrieved December 26, 2023.

Deprescribing
Proton Pump Inhibitor (PPI)

Deprescribing is most commonly employed in:

1- Elderly.

2- People with multiple chronic conditions.

3- People near the end of life.

1. UpToDate. (n.d.). Uptodate.com. Retrieved December 26, 2023.

GOALS OF DEPRESCRIBING

1 Reducing medication burden:

- Careful medication review and aggressive discontinuation can lead to reduction in up to 39 percent of medications used, including reducing use of potentially inappropriate medications by up to 30 to 60 percent or more.

- Reducing medication burden may improve adherence to remaining medications.

1. UpToDate. (n.d.). Uptodate.com. Retrieved December 26, 2023.

2 Reducing risk of falls:

- Many medications increase fall risk among elderly patients, including benzodiazepines and benzodiazepine receptor agonists, antidepressants, antipsychotics, and strongly anticholinergic medications.

1. UpToDate. (n.d.). Uptodate.com. Retrieved December 26, 2023.

3

Improving and/or preserving cognitive function:

- Anticholinergic medications, sedative-hypnotics including benzodiazepines and benzodiazepine receptor agonists, and use of multiple psychotropic medications can negatively affect cognition.

- Discontinuation of benzodiazepines has been shown to improve cognitive function in nursing home residents.

1. UpToDate. (n.d.). Uptodate.com. Retrieved December 26, 2023.

4

Reduce risk of hospitalization and death :

- In vulnerable elderly patients in HHC, trials of interventions incorporating whole-regimen review and deprescribing reduced hospitalization by **36** percent and death by **26** to **38** percent.

1. UpToDate. (n.d.). Uptodate.com. Retrieved December 26, 2023.

PATIENTS AND MEDICATIONS TARGETS FOR DEPRESCRIBING

Deprescribing
Proton Pump Inhibitor (PPI)

Patient characteristics:

- Polypharmacy.
- Multimorbidity.
- Multiple prescribers and transitions of care.
- Medication nonadherence.
- Limited life expectancy.
- Renal impairment.
- Elderly.
- Frailty.
- Dementia.

1. UpToDate. (n.d.). Uptodate.com. Retrieved December 26, 2023.

Medications:

- Strongly anticholinergic medications (eg, first-generation antihistamines).
- Benzodiazepines.
- Benzodiazepine receptor agonists.
- Sulfonylureas.

1. UpToDate. (n.d.). Uptodate.com. Retrieved December 26, 2023.

Medications: cont'd

- Insulins in patients who could reach appropriate glycemic targets with less or safer glucose-lowering therapy.
- **Chronic use of proton pump inhibitors without strong indication.**
- Chronic use of NSAIDs without strong indication.
- Aspirin for primary prevention of cardiovascular disease in older patients.

1. UpToDate. (n.d.). Uptodate.com. Retrieved December 26, 2023.

PROTON PUMP INHIBITOR (PPI)

Deprescribing
Proton Pump Inhibitor (PPI)

- Proton pump inhibitors (PPIs) are the most commonly prescribed antisecretory agents worldwide because of their high **efficacy** and **safety**.
- PPIs are amongst the most commonly used drugs and ranked **3rd most commonly dispensed** therapeutic category in Saudi Arabia during 2018.
- Studies estimate that **25**% to **70**% of PPI prescriptions may be inappropriate or unnecessary.

1. Al-Dosari, B. S., Binafeef, B. M., & Alsolami, S. A. (2021). Prescribing pattern of proton pump inhibitors among patients admitted to medical ward at King Abdulaziz University Hospital, Jeddah, Saudi Arabia: A retrospective study. Saudi Medical Journal, 42(12), 1313–1319
2. Ali, M. D., & Ahmad, A. (2020). A retrospective study on prescribing pattern and cost analysis of proton-pump inhibitors used among adults of Saudi Arabia. Journal of Pharmaceutical Health Services Research: An Official Journal of the Royal Pharmaceutical Society of Great Britain, 11(4), 343–347

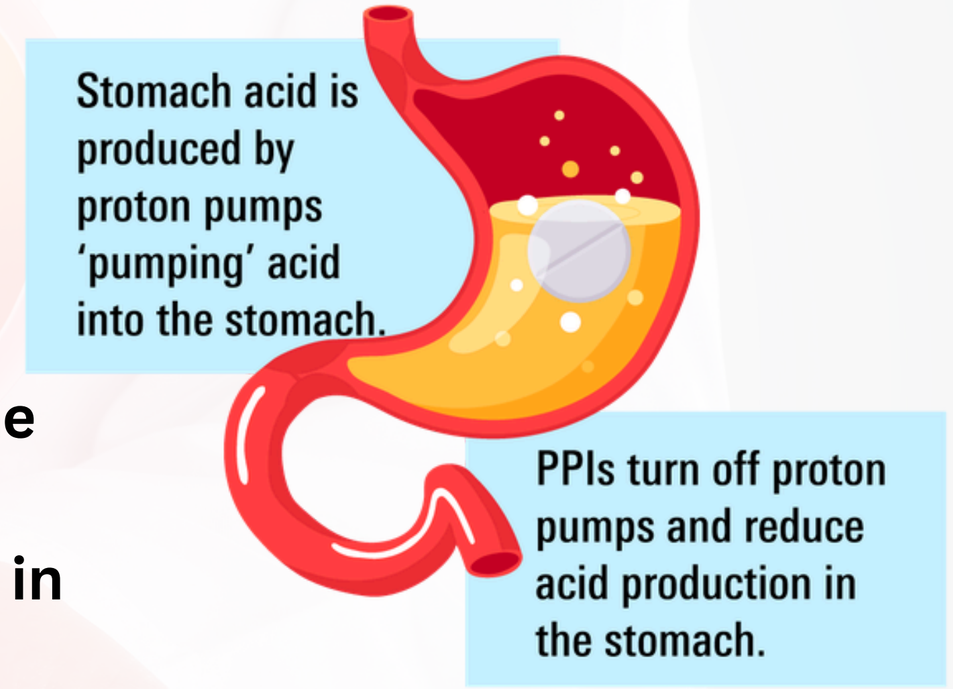
MOA OF PPI

Deprescribing
Proton Pump Inhibitor (PPI)

- **The highly specialized transport system—the proton pump—is responsible for stomach acid production.**

- **By replacing the potassium ions (K+), it releases hydrogen protons (H+) and results in secretion of hydrochloric acid.**

- **PPIs are drugs used to prevent acid secretion in the stomach by blocking the H/K-ATPase, thereby reducing acid production in the stomach resulting in increasing the pH of the stomach (>4).**

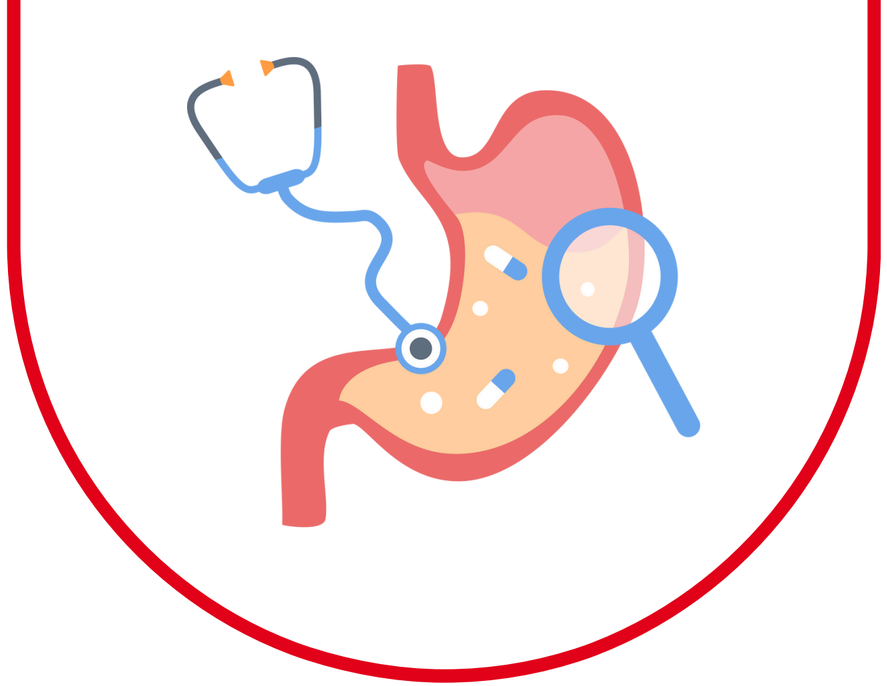


1. Ben Ghezala I, Luu M, Bardou M. An update on drug–drug interactions associated with proton pump inhibitors. Expert Opin Drug Metab Toxicol. 2022 May 4;18(5):337–46.
2. Novotny, M., Klimova, B., & Valis, M. (2019). PPI long term use: Risk of neurological adverse events? Frontiers in Neurology, 9.

TYPS OF PPI AVAILABLE AT PSMMC

Deprescribing
Proton Pump Inhibitor (PPI)

- **Omeprazole (Losec® MUPS)** - tablet 10 mg.
- **Esomeprazole (Nexium®)** - Tablet 20 mg and 40 mg.
- **Pantoprazole (Tecta® , Pantoloc ®)** - Tablet 20mg and 40 mg.



APPROPRIATE INDICATIONS OF PPIS

Deprescribing
Proton Pump Inhibitor (PPI)

Long tearm indications:

- **Barrett’s esophagus.**
- **Chronic NSAID users with bleeding risk.**
- **Severe esophagitis.**
- **Documented history of bleeding GI ulcer.**

1. Ppi, W. is P. T. (n.d.). Proton Pump Inhibitor (PPI) Deprescribing Algorithm August8. Deprescribing.org. Retrieved December 26, 2023.

Deprescribing
Proton Pump Inhibitor (PPI)

Short tearm indications:

- Mild to moderate esophagitis (x4-8 weeks).
- Gastroesophageal reflux disease (GERD) (x4-8 weeks).
- Peptic Ulcer Disease (x2-12 weeks).
- Upper Gl symptoms without endoscopy; asymptomatic (x3 consecutive days).
- ICU stress ulcer prophylaxis (beyond ICU admission).
- Uncomplicated and asymptomatic H. pylori (x2 weeks).

1. Ppi, W. is P. T. (n.d.). Proton Pump Inhibitor (PPI) Deprescribing Algorithm August8. Deprescribing.org. Retrieved December 26, 2023.

ADVERSE EFFECTS

Deprescribing
Proton Pump Inhibitor (PPI)

- **Even though PPIs have an excellent safety profile when used for a short period of time, their extended use can result in serious side effects.**

- **A number of less common, but significantly more serious, adverse effects have been linked to the long-term (and some to short term) use of PPIs.**

1. Novotny M, Klimova B, Valis M. PPI long term use: Risk of neurological adverse events? Vol. 10, Frontiers in Neurology. 2019.
2. Mearns, S. (2022 12). A Guide to Deprescribe Proton Pump Inhibitors (PPIs).

- **The side effects can be due to:**

1- REDUCED OR MODIFIED ABSORPTION OF NUTRIENTS.

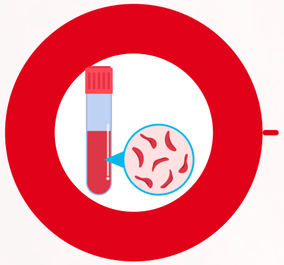
2- ALTERED PH OF THE GASTRIC CONTENTS.

3- CHEMICAL CHARACTERISTICS OF THE PPI MOLECULE (IDIOSYNCRATIC).

1. Novotny M, Klimova B, Valis M. PPI long term use: Risk of neurological adverse events? Vol. 10, Frontiers in Neurology. 2019.
2. Mearns, S. (2022 12). A Guide to Deprescribe Proton Pump Inhibitors (PPIs).

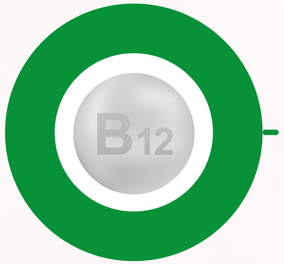
Deprescribing
Proton Pump Inhibitor (PPI)

1- DUE TO REDUCED OR MODIFIED ABSORPTION OF NUTRIENTS



IRON DEFICIENCY

HYPOMAGNESAEMIA



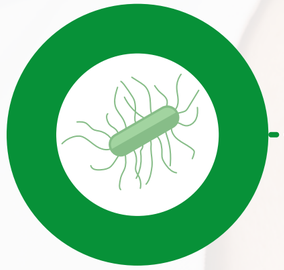
B12 DEFICIENCY

FRACTURE RISK

1. Novotny M, Klimova B, Valis M. PPI long term use: Risk of neurological adverse events? Vol. 10, Frontiers in Neurology. 2019.
2. Mearns, S. (2022 12). A Guide to Deprescribe Proton Pump Inhibitors (PPIs).

Deprescribing
Proton Pump Inhibitor (PPI)

2- DUE TO ALTERED PH OF THE GASTRIC CONTENTS



CLOSTRIDIOIDES DIFFICILE

PNEUMONIA

1. Novotny M, Klimova B, Valis M. PPI long term use: Risk of neurological adverse events? Vol. 10, Frontiers in Neurology. 2019.
2. Mearns, S. (2022 12). A Guide to Deprescribe Proton Pump Inhibitors (PPIs).

Deprescribing
Proton Pump Inhibitor (PPI)

3- DUE TO SPECIFIC CHEMICAL CHARACTERISTICS OF THE PPI MOLECULE (IDIOSYNCRATIC).

ACUTE INTERSTITIAL NEPHRITIS AND POSSIBLY OTHER KIDNEY DISEASE.

INTERFERENCE WITH BIO-AVAILABILITY OR METABOLISM OF OTHER MEDICATIONS.

1. Novotny M, Klimova B, Valis M. PPI long term use: Risk of neurological adverse events? Vol. 10, Frontiers in Neurology. 2019.
2. Mearns, S. (2022 12). A Guide to Deprescribe Proton Pump Inhibitors (PPIs).

PROTON PUMP INHIBITOR (PPI) DEPRESCRIBING

Deprescribing
Proton Pump Inhibitor (PPI)

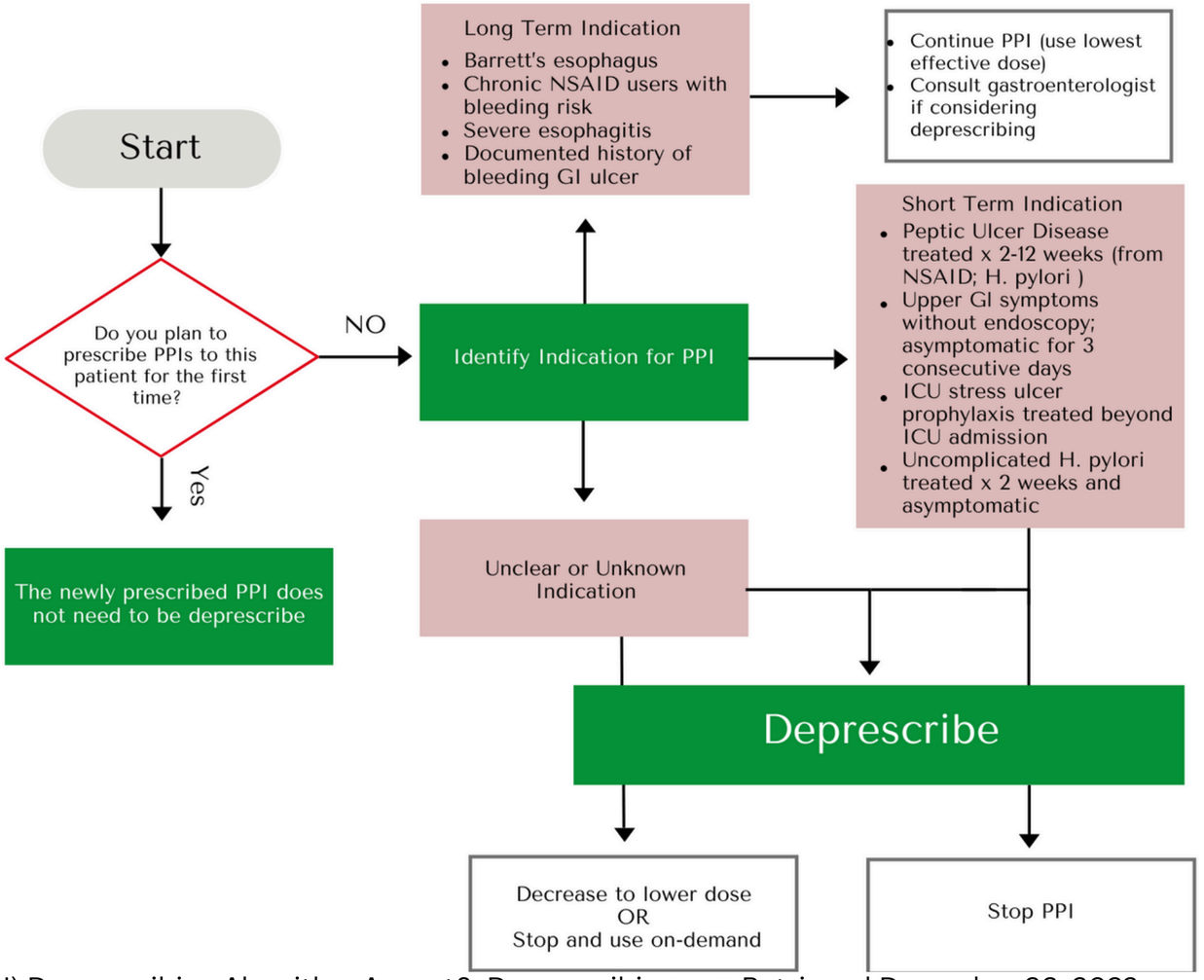
- PPI deprescribing can be carried out by **stopping**, **reducing** the dosage or switching to “**on-demand**” use.

- Safely deprescribing PPIs can lead to reduced inappropriate polypharmacy while increasing the patient’s overall health status and reducing health care costs.

1. Vidonscky Lüthold, R., Henz, N. C., Fuhrer, C., Häner, A., Schenk, M., Jungo, K. T., & Streit, S. (2023). Inappropriate proton-pump inhibitor prescribing in primary care - an observational study with quality circles. Swiss Medical Weekly, 153, 40119.

Deprescribing
Proton Pump Inhibitor (PPI)

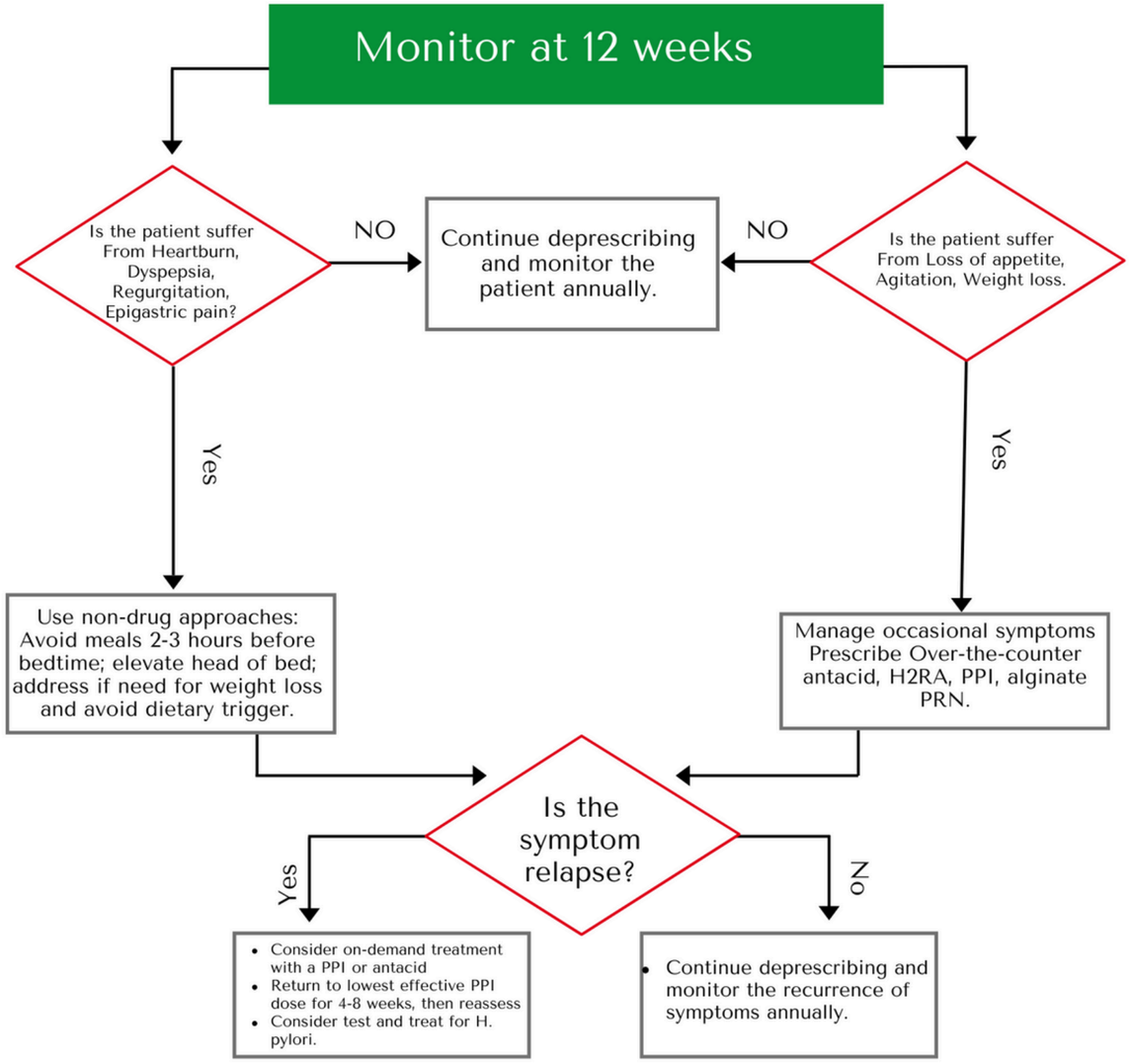
PPIs Deprescribing algorithm



1. Ppi, W. is P. T. (n.d.). Proton Pump Inhibitor (PPI) Deprescribing Algorithm August8. Deprescribing.org. Retrieved December 26, 2023.

Deprescribing

Proton Pump Inhibitor (PPI)



1. Ppi, W. is P. T. (n.d.). Proton Pump Inhibitor (PPI) Deprescribing Algorithm August8. Deprescribing.org. Retrieved December 26, 2023.

Deprescribing
Proton Pump Inhibitor (PPI)

This tool will help you to decide whether you should continue prescribing PPI to your patient or deprescribe it.

Deprescribing
Proton Pump Inhibitor (PPI)

In Conclusion :

- Many patients take PPIs for long periods and/or at high doses, without a clear indication for their use.
- Use of PPIs beyond the recommended duration may outweigh the benefits.
- PPI deprescribing can be carried out by stopping, reducing the dosage or switching to “on-demand” use.
- Safely deprescribing PPIs can lead to reduced inappropriate polypharmacy while increasing the patient’s overall health status and reducing health care costs.

Thank you!