Pharmacist-led Initiative for Proton Pump Inhibitor Deprescribing in a VA Outpatient Primary Care Clinic

by Celina You, PharmD and Anita Kashyap, PharmD, BCACP

Abstract

Objective: Proton pump inhibitors (PPIs) have become one of the most widely prescribed medications for conditions ranging from simple heartburn to chronic hypersecretory syndromes. Long-term use has become increasingly common, especially for inappropriate indications, and can lead to adverse effects such as increased risk of bone fracture, kidney damage, vitamin and mineral deficiencies, neurological impacts, and infections. The objective was to evaluate the success of a pharmacist-led phone intervention for PPI deprescribing in eligible patients.

Methods: This was a single-center, quality improvement project involving patients from three primary care teams in a Veterans Affairs (VA) outpatient clinic. Eligible patients had an active 90-day PPI prescription with refills. If appropriate, PPI usage was tapered based on an approved institution-specific algorithm. Telephone outreach was performed to receive consent to taper the PPI, switch to a histamine-2 receptor antagonist, or discontinue PPI use. Subsequent follow-up telephone calls were made based on the algorithm and appropriately documented.

Results: Out of the 316 identified eligible PPI prescriptions, 100 prescriptions were selected for review. Of these 100 patients, 48 had appropriate indications for chronic PPI use, but 52 did not. Of the 52 patients who were eligible for PPI tapering, 7 (13%) patients declined tapering, 2 (4%) patients were unable to be reached, and 43 (83%) patients attempted the tapering schedule. Of these 43 patients, 39 (91%) had successful deprescribing occur.

Conclusion: An algorithm-based, pharmacist-led intervention for PPI deprescribing is an effective way to minimize inappropriate chronic PPI use.

As North America has one of the highest prevalence of gastroesophageal reflux disease (GERD), it is unsurprising that higher rates of proton pump inhibitor (PPI) utilization occurs.[1] In fact, PPIs were the third-largest selling medication class in 2008, totaling $13.9 billion in sales.[2] Due to the wide spectrum of treatment indications, PPIs have both short-term and long-term recommended durations of use.[3,4] Short-term indications may include GERD and gastrointestinal bleed due to H. pylori infection, while chronic therapy may be indicated in patients with a history of esophageal dilation, dysphagia due to reflux, and hypersecretory syndromes such as Barrett's esophagus that increase risk for esophageal cancer.[4]

The American College of Gastroenterology treatment guidelines on the diagnosis and management of gastroesophageal reflux disease recommend PPIs as short-term therapy for uncomplicated heartburn for a duration of 2 to 8 weeks after which treatment should be tapered or changed to a histamine-2 receptor antagonists (H2RAs) or antacids.[5,6] In addition, lifestyle modifications are just as strongly recommended as pharmacologic therapy and should be incorporated to maintain the lowest effective PPI dose.[6] Lifestyle modifications include reducing meal portion size, avoiding foods that can trigger reflux, elevating the head of the bed, and increasing exercise.[6]

Similarly, the Canadian Family Physician's evidence-based guideline for deprescribing PPIs suggests a short-term PPI duration of 4 to 8 weeks for GERD treatment, and upon symptom resolution PPI use would be decreased, prescribed as needed, or discontinued altogether. This guideline further recommends monitoring at 4-week and 12-week intervals and to consider lifestyle medication and H2RAs or antacids as needed if symptoms recur.[7]

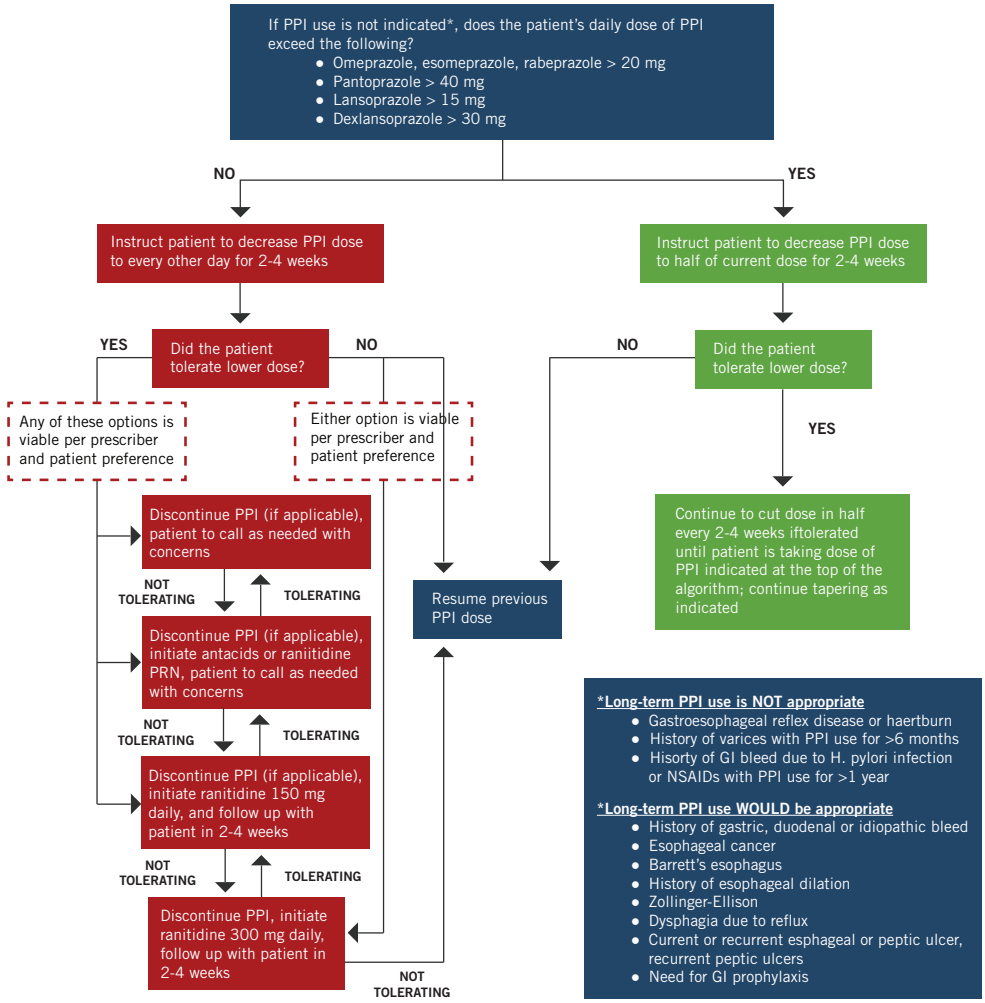
Despite these recommendations, pharmacologic treatment with PPIs is often continued for longer than indicated especially when GERD symptoms are well controlled and treatment is well tolerated.[8] However, more recent literature suggests that long term PPI use may not be without risk.[8] Adverse effects such as deficiencies in calcium, magnesium, and vitamin B12, along with an increased risk of kidney injury, bone fracture, dementia, and infections such as community acquired pneumonia and *Clostridium difficile* associated diarrhea have been correlated with use.[8] Given these potential adverse effects, the risks versus benefits of continuing long term PPI use should be considered for patients with uncomplicated disease and reduction could be accomplished by structured taper and encouraging lifestyle medication.

Previous projects at the William S. Middleton Memorial Veterans Hospital in Madison, Wisconsin identified a need to improve appropriate PPI prescribing and literature reviews were conducted to assist with development of a PPI tapering algorithm in the year prior to the current study. A systematic review by Haastrup et al. summarized that while many PPI tapering strategies have been implemented throughout the recent years, the ongoing absence of guidelines and consensus remains a barrier in defining an

optimal strategy for PPI discontinuation.[9] The review concluded that trials with seemingly less successful strategies opted to solely send patients flyers and surveys, or abruptly stop PPIs.[9] Strategies that led to more successful PPI tapering included patient-specific PPI tapering plans, patient education, supply of anti-reflux medication for breakthrough symptoms during the taper process, and lifestyle education.[9] One algorithm described by Inadomi et al. reduced the PPI dose by half every two weeks, and for those already on the lowest dose available PPIs were discontinued.[10] Patients were managed by a clinic that offered counseling, acute symptom management with H2RA and prokinetics, and ongoing follow up for up to one year.[10] Utilizing methods from tapering interventions with higher success rates, a proposal to assist with de-escalation of PPIs was approved through the Pharmacy and Therapeutics (P&T) Committee at this VA Hospital in September 2016. Guidance on inappropriate and appropriate use of PPI was also included in that proposal.

To the best of our knowledge, no systematic process to implement an institution specific PPI deprescribing protocol has been previously established and applied to patients at the William S. Middleton Memorial Veterans Hospital. The objective of this project was to implement and evaluate the success of an algorithm-driven, pharmacist-led PPI tapering intervention in an ambulatory care setting.

FIGURE 1. PPI Tapering Algorithm



PPI, proton pump inhibitor

Methods

This was a single-center, quality improvement project at the William S. Middleton Memorial Veterans Hospital. To prepare for this intervention, the previously P&T Committee approved proposal for PPI deprescribing described above was reviewed and updated to a simplified algorithm (Figure 1).[3-6,9]

The updated algorithm and rationale for PPI deprescribing was presented at primary care clinic provider meetings for feedback and to assess provider interest in project implementation. Three different primary care teams agreed to participate in the pilot intervention of this deprescribing initiative.

From these three primary care patient panels, a list of patients with an active 90-day prescription for PPIs was generated by searching the Veterans Affairs Information System Technology and Architecture (VISTA) database and the hospital's Computerized Patient Record System (CPRS) was used to collect data via chart review. Subsequently, every third patient's medical chart was reviewed. Patients were considered eligible for the intervention if they had an inappropriate indication for chronic PPI use as defined in the algorithm. Patients were considered ineligible for the intervention if they had an appropriate indication for chronic PPI use, a prescription that was written without refills intended for short term use, if off-label PPI use was recommended by specialty clinic providers, or the patient was primarily managed by a non-VA provider and only receiving medications through the VA.

For eligible patients, a telephone contact was made by an ambulatory care pharmacy resident to discuss risks versus benefits of continuing chronic PPI use and to encourage lifestyle modifications. If patients were agreeable, PPI therapy was tapered based on the institution's established algorithm. Education was provided on potential for rebound reflux during the PPI taper and a direct phone contact was provided for patients to report intolerabilities. For the purpose of this project, a telephone encounter was made every three weeks for a maximum of three telephone encounters with the option for patients to initiate phone contact in the interim as needed for symptom concerns or other questions.

To evaluate this pharmacist-driven intervention, success was defined as controlled GERD symptoms despite a

TABLE 1. Baseline Demographics

Demographic	*Result (n=100)*
Age (mean ± standard deviation)	67 ± 12 years
Gender	
Male	99%
Race	
White	92%
African American	2%
Other	6%
Current PPI	
Omeprazole	96%
Pantoprazole	4%
Duration of PPI use	
0-5 years	33%
5-10 years	27%
10-15 years	36%
Greater than 15 years	4%
Total daily PPI dose*	
20mg	54%
40mg	36%
Greater than 40mg	8%
20mg every other day	2%

**All total daily PPI dose were for omeprazole except for 4 patients who were taking pantoprazole. For these 4 patients, 1 was taking 20mg daily pantoprazole, 2 were taking 40mg daily pantoprazole, and 1 was taking greater than 40mg daily pantoprazole. No patients were on lansoprazole or dexlansoprazole. PPI, proton pump inhibitor*

net decrease in PPI use or complete PPI discontinuation, and a secondary outcome of feasibility was analyzed by exploring the number of telephone encounters required to complete this intervention, categorized by pharmacist or patient initiated. This quality assessment project did not require Institutional Review Board (IRB) review as the project did not constitute research as defined under 45 CFR 46.102(d) by the IRB. Data were analyzed using descriptive statistics.

Results

A total of 316 patients with PPI prescriptions were identified, from which 100 were chosen for review. Baseline demographics of the 100 patients reviewed are provided in Table 1.

The most commonly prescribed PPI in the sample was omeprazole and duration of therapy ranged from less than one year to more than 15 years. Of the 100 patients reviewed, 48 had appropriate indications for chronic PPI use and the remaining 52 patients were identified as having inappropriate indications for chronic PPI use. Of those 52 patients, 41 (79%) were prescribed chronic PPIs for uncomplicated GERD and 11 (21%) were prescribed PPIs for other reasons such as hiatal hernia, esophageal stricture without dilation, or gastritis without other gastrointestinal complications.

Initial telephone encounter: of the 52 patients who were eligible for PPI deprescribing, 38 (73%) patients were agreeable to taper and 7 (13%) patients declined. Three patients were already taking the PPI as needed and were agreeable to replace therapy with ranitidine as needed as an alternative. Two patients had self-discontinued their PPI on their own, so no changes were made. Lastly, 2 patients were unable to be reached.

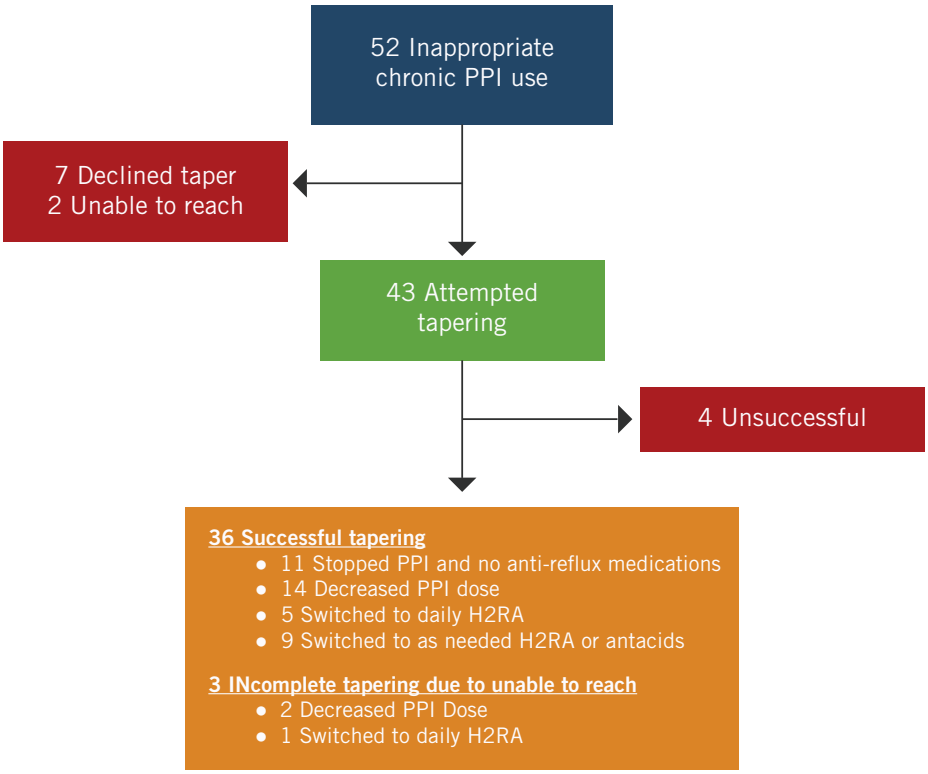
Second telephone encounter: of the 38 patients who were agreeable to PPI taper during the initial phone encounter, 29 (76%) reported symptoms to be adequately controlled on current PPI therapy at the second telephone contact. These patients were then offered five individualized treatment options based on the defined algorithm. Ultimately, 9 patients were agreeable to further taper of PPI therapy, 3 patients stopped PPI therapy and were prescribed daily ranitidine, 4 patients stopped PPI therapy and were prescribed as needed ranitidine or antacids, 8 patients stopped PPI therapy without starting other anti-reflux medications, and 5 patients declined further therapy adjustments. On the other hand, of the 38 patients who were agreeable to PPI taper during the initial phone encounter, 4 (11%) patients reported uncontrolled symptoms and had resumed the previous PPI dose at the time of the second phone contact. However, 2 of the 4 patients were agreeable to re-trial a decreased PPI dose after education on management of rebound acid reflux symptoms. Three (8%) out of the 38 patients did not implement the PPI dose decrease as previously planned, but were agreeable to taper, and 2 (5%) out of the 38 patients were unable to be reached.

Third telephone encounter: 17 patients required a third phone contact follow up due to changes made at prior encounters. Of these 17 patients, 9 (53%) reported symptoms to be adequately controlled. These patients were then offered the same five individualized treatment options as previous. Ultimately, 1 patient was agreeable to further taper of PPI therapy, 2 patients stopped PPI therapy and were prescribed as needed ranitidine or antacids, 2 patients stopped PPI therapy without starting other anti-reflux medications, 4 patients declined further therapy adjustments, and 5 (29%) patients reported uncontrolled symptoms and had resumed the previous PPI dose at the time of the second phone call. One patient was able to taper the PPI earlier than planned and continued to solely use daily ranitidine as previously prescribed. Another patient reported adequately controlled symptoms, but further PPI tapering was not recommended by his primary care physician due to a history of esophageal stricture. Lastly, one patient was unable to be reached at time of phone contact.

Next, the feasibility of this intervention was evaluated. For pharmacist-initiated telephone encounters of the 43 patients agreeable to this intervention, 8 (18%) had 1 telephone encounter, 18 (42%) had 2 telephone encounters, and 17 (40%) had 3 telephone encounters. For patient-initiated telephone encounters of these 43 patients, 36 (84%) did not initiate any telephone calls with the pharmacist, and 7 (16%) initiated one telephone call. There were no patients who initiated telephone contact with questions or intolerabilities to the

Below - Example of a pharmacist-initiated telephone encounter performed by the VA staff.

FIGURE 2. Summary of Patient Flow During Intervention and Results



PPI, proton pump inhibitor; H2RA, histamine-2 receptor antagonist

treatment plan more than once.

In summary, 52 patients were identified as using chronic PPIs inappropriately. Out of the 43 patients who attempted this deprescribing approach, 36 (84%) patients were able to complete this intervention and had some degree of success (Figure 2).

The 3 patients who were unable to be reached after initial contact also had some degree of decrease in PPI dose. Overall, this pharmacist-driven intervention was successful in in 39 (75%) out of 52 total identified patients.

Discussion

Upon project completion, the majority of patients had a successful net decrease in PPI use with adequate control of reflux symptoms. For most patients, 3 telephone encounters were sufficient to either complete PPI discontinuation or taper to the point where no further changes could be made due to patient preference. On the contrary, 6 (17%) out of 36 patients who completed the three-encounter intervention required primary care appointments with clinical pharmacy specialists for follow up as adjustments to therapy were still needed.

Most patients (73%) were receptive to PPI deprescribing at the initial telephone contact. This could have been due to several factors. First, credibility was established by reporting primary care provider buy-in for this intervention, and most patients are also used to the substantial role pharmacists have as providers in the primary care clinics in the VA setting. Second, many patients reported that they were familiar with the potential adverse effects of chronic PPI use and had already considered de-escalation of therapy. Last, patients may also have felt reassured by the frequent phone follow-up and a specific telephone contact provided during the initial encounter.

Several limitations and barriers were identified with implementation of this population management project. First, past medical histories were not always updated in the medical record and did not always include a clear indication for PPI therapy. In these cases, the exact indication for therapy was unclear and required more intensive chart review or probing patients, which introduced the potential for recall errors. Likewise, the exact duration of PPI use was unknown for patients who started PPI therapy prior to enrolling in VA care due to lack of documentation. In addition, if PPI use was recommended by specialty clinic providers, even for off-label use, then no de-escalation was done for the purposes of this project. Furthermore, some patients did not report to providers about nonadherence to planned dose changes. Some may not have been as comfortable with the algorithm's suggested PPI dose reduction and consequently had a lesser degree of dose change at each encounter, whereas others stopped PPI usage altogether earlier than expected. Lastly, patients using over-the-counter PPIs were not captured in this intervention that focused on active VA medications, which highlights the importance for ongoing education of appropriate PPI use.

Because this intervention was performed in the Veteran population, the results may not be readily applicable to other population groups. However, this general pharmacist-led approach can be extrapolated to non-VA pharmacies or clinics. In the ambulatory care clinic setting, routine monitoring could be done either for face-to-face visits or through telephone encounters. In the retail setting, symptomatic assessments could be done when patients return to the pharmacy for refills or when purchasing over-the-counter PPI products. Deprescribing initiatives can still occur where official collaborative practice agreements have not been established between the physician and pharmacist through establishing relationships with providers and providing recommendations regarding appropriate prescribing for patients.

An excellent example of applying PPI deprescribing in other practice settings was carried out at the Toronto Western Family Health Team.[11] An inter-professional team offered guidance to PPI deprescribing, which was re-evaluated by primary care providers (PCPs), and if appropriate, PPI use was addressed during the PCP's patient encounters.11 The study ultimately concluded that many patients who take chronic PPI for GERD may successfully eliminate and reduce medication use.[11]

An Australian study that focused on medically complex older adults echoed the safety and feasibility of a patient-centered PPI deprescribing initiative.[12] Although it

involved a smaller group of patients, the study saw that all patients who consented to PPI deprescribing had some decrease in PPI dose, and this intervention was sustainable in most patients.[12]

Next steps identified in this pharmacist-led intervention could be additional follow up with patients who had successful PPI tapers or decrease in PPI doses to further assess symptom control and maintenance of control on current therapies or through implementation of lifestyle modifications. In addition, routine evaluation of PPI appropriateness for primary care providers through use of an algorithmic approach to deprescribing PPIs and ongoing provider education could be considered. Lastly, the clinical significance of this intervention could be further explored by assessing for a reduction in PPI-associated adverse effects that have previously been reported in the literature.

Conclusion

Correlations between chronic PPI use and potential adverse effects reinforce the need to evaluate appropriateness of therapy. This algorithm-driven, pharmacist-led intervention at the VA has shown preliminary success in PPI deprescribing. Future steps are needed to investigate the feasibility, sustainability, and clinical significance of this intervention with potential expansion to an entire VA facility. •

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