

# Incorporating a Student Pharmacist in the Deprescribing Process for Long-Term Care Patients

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**P**olypharmacy is defined as the use of five or more medications and is highly prevalent in long-term care facilities (LTCFs).<sup>1,2</sup> Due to the increase in prescribed medications, patients are at an increased risk of receiving a potentially inappropriate medication (PIM). These PIMs have multiple safety risks that outweigh the benefits for most older adults.<sup>3</sup> These risks include poor medical outcomes such as increases in emergency department visits, hospital admissions, disability, and morbidity.<sup>4,5</sup>

Older adults are particularly affected by poor medical outcomes due to a higher likelihood of having multiple chronic conditions such as high blood pressure, high cholesterol, and diabetes compared to younger adults.<sup>4</sup> This can lead to an increased pill burden for older adults as additional medications are prescribed to help manage and treat multiple chronic conditions. This can increase the risk of a patient being prescribed high fall risk medications or PIMs with any adverse event. PIMs indicated in the American Geriatrics Society (AGS) Beers Criteria should be avoided by prescribers when caring for older adults due to the increased risk of poor medical outcomes.<sup>1,4</sup> Drug-drug or drug-disease interactions with these PIMs in older adults have been known to cause an increased risk of falls, fractures, bleeding, decline in renal function, and negative

## Abstract

**Background:** Polypharmacy is defined as the use of five or more medications and is highly prevalent in long-term care facilities (LTCFs). Patients aged 65 or older are at a greater risk of unintended adverse events, such as falls and cognitive impairment, due to polypharmacy.

**Objective:** Quality improvement project describing the benefits of incorporating a student pharmacist into the deprescribing process and evaluating the need to deprescribe therapies to reduce falls and potentially inappropriate medications (PIMs).

**Methods:** Student pharmacist assessed patient profiles for high fall risk medications and PIMs. Medications recommended for tapering were level 1 or 2 fall risk and/or PIMs with any adverse event on the American Geriatrics Society (AGS) Beers Criteria. Medications recommended for discontinuation were level 3 fall risk and PIMs with any adverse event on the AGS Beers Criteria.<sup>1</sup>

**Results:** Every patient identified for the project was taking at least one medication that put them at a greater risk of falling, and 10% were taking at least one PIM. High fall risk medications were the most common with a mean use of 6 medications per patient, whereas the use of PIMs had a mean of 3 medications per patient. Total medication use of all patients included was 1,002 medications with 330 targeted for deprescribing due to posing a high fall risk and/or being a PIM with any adverse event.

**Conclusion:** Pharmacists and student pharmacists have an opportunity to play a more significant role in deprescribing medications. Student pharmacists are a beneficial addition to the medication review and deprescribing process.

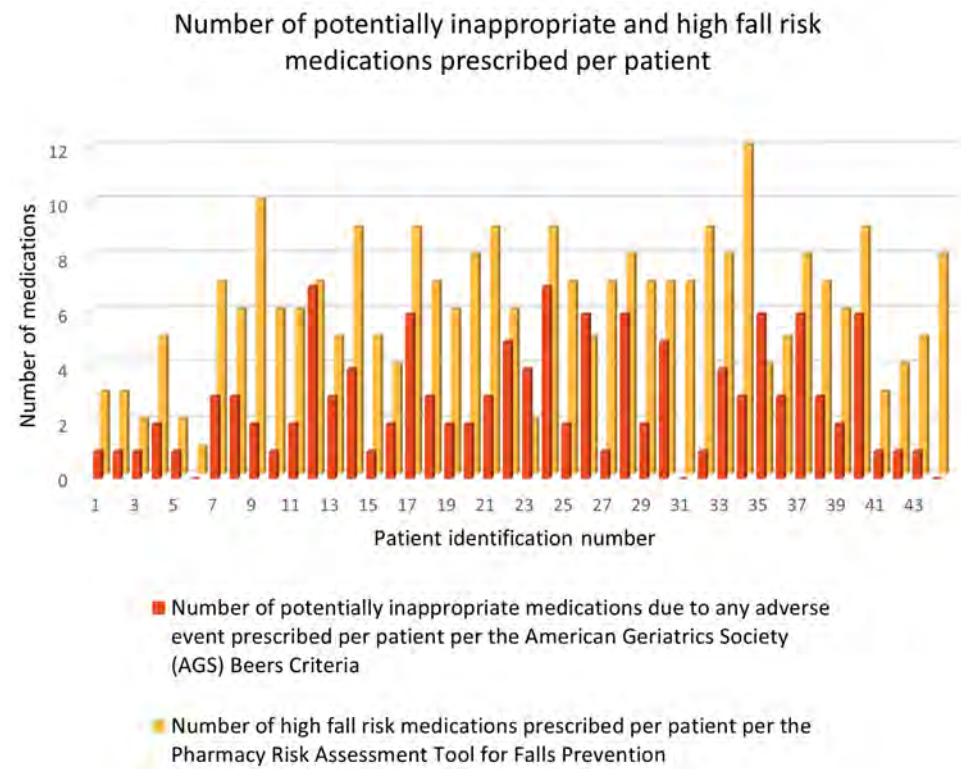
central nervous system (CNS) effects.<sup>1</sup>

To prevent adverse events and these interactions, the planned process for tapering or discontinuing these high fall risk medications and PIMs from a patient's medication regimen is known as deprescribing—a method that aims to reduce negative patient-oriented outcomes.<sup>5,6</sup> Deprescribing requires a multifactorial approach involving clinical knowledge, shared decision-making between the patient and/or caregiver, and communication with the healthcare team.<sup>3</sup> Because pharmacists are uniquely positioned and trained to review a patient's medication list and identify potential adverse drug events due to PIMs, they possess the necessary skills to identify and resolve issues related to polypharmacy, especially when caring for older adults.<sup>3</sup> When performing patient medication reviews, pharmacists can identify medications without an appropriate indication and help initiate the deprescribing process.<sup>7</sup>

Thus, pharmacists conducting medication reviews play a significant role in the healthcare team as they aim to optimize medication regimens and reduce adverse outcomes. However, modern healthcare challenges such as limited patient visit time and healthcare resources can prevent pharmacists from being able to make the greatest impact possible. To help reduce the burden placed on pharmacists to review patient charts and tackle these challenges, student pharmacists serving as pharmacist extenders can play a significant role.<sup>4</sup> Integrating trained student pharmacists into the medication review process can lead to an enhanced medication review. Additionally, these opportunities provide an invaluable experience in reviewing medications for the students' future careers, and help develop their critical thinking skills.<sup>8</sup> Trained student pharmacists serving as pharmacist extenders are well positioned to assess medication appropriateness, identify medication-related problems, and alleviate deprescribing burden from pharmacists.<sup>7</sup>

Finally, most literature that focuses on medication review and deprescribing appears to be an evaluation aimed at clinical pharmacists and not student pharmacists.<sup>8</sup> Very few studies have gathered the viewpoints of pharmacists outside of the inpatient setting, such as community or long-term care, on deprescribing in

**FIGURE 1. Medications Targeted for Intervention**



daily practice.<sup>9</sup> Additionally, few studies exist that have evaluated the student pharmacist's role or gathered the student's perspectives on deprescribing as a member of the healthcare team.<sup>4</sup> The primary objective of this quality improvement project was to (1) describe the benefit of incorporating a student pharmacist into the deprescribing process. Secondary objectives included having the student pharmacist (2a) perform retrospective chart reviews of newly admitted patients to the LTCF with a (2b) focus on evaluating the need for deprescribing of therapy to reduce falls and PIMs. The UW-Madison Institutional Review Board (IRB) determined that this work did not meet the definition of research and was therefore qualified as quality improvement.

## Methods

The quality improvement project was conducted as a retrospective chart review to identify opportunities to deprescribe high fall risk medications and PIMs of selected patients after their admission to the skilled nursing facility (SNF). Additionally, a student pharmacist was trained and incorporated into the deprescribing process.

Project members consisted of one consultant pharmacist/faculty member and one second-year student pharmacist from the UW-Madison School of Pharmacy.

## Practice Site Description

Collaboration for this project involved Capitol Lakes Health Center, specifically its SNF, and the SNF's medical director. Capitol Lakes Health Center is in downtown Madison, WI and provides various living options for older adults. Residents may reside in and transition through assisted living, skilled nursing, and memory care facilities. As of November 1, 2022, the SNF made a transition from long-term to short-term care and supports 39 beds on 1-floor, providing rehabilitation care for patients with a wide range of diagnoses, including infections, heart failure, hypertension, diabetes, dementia, and falls.<sup>10</sup> The student pharmacist was provided access to the SNF's electronic health record (EHR) and project documents were stored in the pharmacist and student's shared university provided electronic Box folder. All protected health information was de-identified before transfer to the Box folder.

## Participants

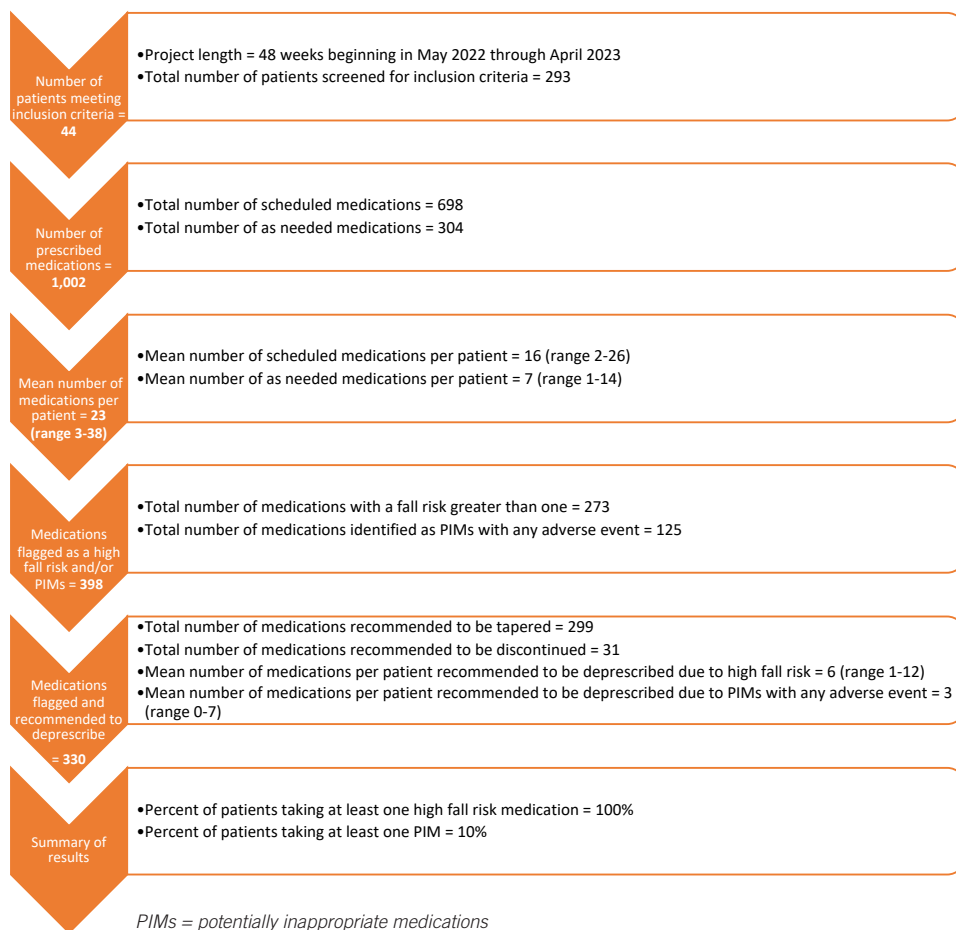
Charts of newly admitted patients to the LTCF were screened by the student pharmacist using the EHR to determine eligibility based on inclusion criteria of (1) 65 years of age or older, (2) new admission (less than 1 week) to the SNF, and (3) largest combined number of scheduled and as needed medications of the residents admitted for the week. One to two patients were selected per week for review by the student pharmacist. If a second patient was selected, they were to meet the listed inclusion criteria, except that they would have the second largest combined number of scheduled and as needed medications of the residents admitted for the week. Patients were excluded from the project if they did not meet inclusion criteria.

## Study Design

Once the weekly patient(s) was selected, an in-depth review process of their current medication list was conducted by the student pharmacist. The review process was conducted in a sequence of five steps: (1) collect medication-specific information such as drug name, dose, frequency, and drug class; (2) identify high fall risk medications on a scale of 1 (low risk) to 3 (high risk) assigned based on drug class by referencing the 2012 Innovations in Pharmacy Risk Assessment Tool for Falls Prevention; (3) identify PIMs due to any adverse event by referencing the 2019 AGS Beers Criteria; (4) formulate deprescribing recommendations for the selected patient(s) using a pharmacist-developed drug regimen review (DRR) format; (5) submit the DRR to the facility's consultant pharmacist and ultimately the medical director for review.<sup>1,11</sup>

Recommendations to taper or discontinue medications were made by the student pharmacist based on pre-determined deprescribing criteria. Medications were recommended to be tapered by lowering the dose or using an alternative medication to eventually discontinue its use if the medication met the criteria of being a level 1 or 2 fall risk and/or a PIM with any adverse event on the AGS Beers Criteria. Medications were recommended to be discontinued by using guideline-directed therapy due to the risk of causing potential harm if the medication met the criteria of being a level 3 fall risk and a PIM with any adverse event on the AGS Beers Criteria.<sup>1,11</sup>

## FIGURE 2. Summary of Results



Prior to submission to the SNF's medical director, patient DRRs were submitted to the consultant pharmacist for review. Biweekly meetings were held between the pharmacist and student pharmacist to review recommendations and discuss rationale. The pharmacist would then present the DRR to the medical director for review.

### Study Outcomes: Objective 1: Incorporation of a student pharmacist into the deprescribing process

The student pharmacist worked alongside the pharmacist for the entire duration of the project. The student pharmacist was incorporated in the project design, documentation procedure, chart reviews, developing deprescribing recommendations, and discussing rationale with the pharmacist. The student pharmacist was able to incorporate guideline-directed therapy into the process as deprescribing recommendations were developed. Finally, the student pharmacist spearheaded the

analysis and summarization of the data collected via descriptive statistics and presented it to the pharmacist for final review.

### Objective 2a: Retrospective review of medication profiles of newly admitted patients to the LTCF

Every Monday during the project duration, the student pharmacist received a list of new admissions for the week prior from the SNF. Upon receiving the list, within one week of patient admission, the student pharmacist would apply the inclusion criteria to determine patient eligibility. Once a patient(s) was selected per the inclusion criteria, an in-depth review of their current medication list occurred to collect information such as drug name, dose, frequency, drug class, fall risk score and yes/no inclusion on the AGS Beers Criteria for applicable medications. Collecting such information allowed the student pharmacist to increase their exposure to common medications, dosages, drug classes, and

indications seen in long-term care patients. De-identified patient information was documented in a running spreadsheet with fall risk medication and PIM drug classes tallied by the student pharmacist.

### **Objective 2b: Focus on evaluating the need for deprescribing of therapy to reduce falls and PIMs**

During the selected patient's medication list review, individual medications were assessed for fall risk based on drug class. By referencing the Pharmacy Risk Assessment Tool for Falls Prevention, the student pharmacist was able to cross-reference medications. Individual medications were rated on a fall risk scale of 1 (low risk) to 3 (high risk) assigned based on drug class and recorded.<sup>11</sup> Medication regimens were also assessed for PIMs with any adverse event by referencing the AGS Beers Criteria. Medications that were currently prescribed to the patient and listed on the AGS Beers Criteria were recorded with the corresponding AGS Beers Criteria table number and therapeutic recommendation, if applicable.<sup>1</sup> Through assessing medication therapies, the student pharmacist advanced their skills of interpreting current deprescribing guidelines and thus developing deprescribing recommendations.

## **Results**

The project ran over the course of 48 weeks from May 2022 through April 2023. A total of 293 patients were screened for inclusion in the project and 44 patients met the inclusion criteria. Patients meeting inclusion criteria were prescribed a total of 1,002 medications during the project. Of those medications prescribed, 698 were administered scheduled and the remaining 304 were administered as needed. The overall mean of scheduled and as needed medications per patient meeting inclusion criteria was 23 medications (range 3-38). More specifically, the mean scheduled medications per patient meeting inclusion criteria was 16 (range 2-26) and the mean as needed medications per patient meeting inclusion criteria was 7 (range 1-14).

A total of 398 medications were flagged as high fall risk medications and/or PIMs, per cross reference with the Pharmacy Risk Assessment Tool for Falls Prevention or AGS Beers Criteria, respectively.<sup>1,11</sup> Two-hundred seventy-three medications were

identified to have a fall risk greater than 1 based on drug class from the Pharmacy Risk Assessment Tool for Falls Prevention and 125 medications were included as PIMs with any adverse event from the AGS Beers Criteria.<sup>1,11</sup> The most common target for deprescribing was the use of high fall risk medications with a mean of 6 (range 1-12) per patient whereas the use of PIMs had a mean of 3 (range 0-7) per patient (Figure 1). Overall, 330 of the 398 of the total medications flagged as high fall risk medications and/or PIMs, or 33% of total prescribed medications of patients meeting inclusion criteria, were recommended by the student pharmacist to be deprescribed. Specifically, 31 medications were recommended to be discontinued and 299 medications were recommended to be tapered. To summarize, 100% of patients selected for review by meeting inclusion criteria were taking at least one medication that put them at a greater risk of falling per the Pharmacy Risk Assessment Tool for Falls Prevention, while 10% of patients were taking at least one PIM with any adverse event per the 2019 AGS Beers Criteria (Figure 2).<sup>1,11</sup>

The most common drug classes that were targeted for deprescribing recommendation were as follows with their corresponding number of medications: (1) analgesic, non-opioid (n=86); (2) antihypertensive (n=63); (3) antidepressant (n=34); (4) analgesic, opioid (n=31); (5) antiseizure (n=26); (6) proton-pump inhibitor (n=22); (7) anticoagulant (n=16); (8) nonsteroidal anti-inflammatory drug (n=10); (9) antiemetic (n=5); (10) histamine H2 antagonist (n=5).

## **Discussion**

Significant findings from this quality improvement project confirm that polypharmacy, including inappropriately prescribed medications and increased risk of negative patient-oriented outcomes, occurs within LTCFs. Additionally, the student pharmacist was able to combine project-specific and nationally recognized deprescribing guidelines when evaluating the need for deprescribing a patient's medication(s) based on fall risk. The student pharmacist worked as a pharmacist extender to enhance their drug knowledge through retrospective reviews and was successfully integrated into the healthcare team to provide recommendations.

To enhance the pharmacists' reach, the student pharmacist was successfully trained to review the medication regimen of selected patients and analyze additional chart information, as needed. The EHR was shared with the student using a fully remote platform that allowed the student to see up-to-date patient specific information. The student pharmacist independently developed workflow steps from the time a new patient arrived at the SNF to the point of making a targeted medication recommendation to the pharmacist. Under the supervision of the pharmacist, the student pharmacist was able to develop project specific deprescribing guidelines while incorporating those that are nationally recognized. These guidelines included deprescribing levels of priority and specific start/stop medication recommendations to present to the pharmacist. The student pharmacist was well equipped to assist the SNF's pharmacist in assessing high fall risk medication appropriateness and developing deprescribing recommendations related to reducing the number of falls.<sup>7</sup>

Through mutual decision making between the pharmacist and student pharmacist, it was decided that therapy recommendations would be developed based on evaluating the need to reduce falls. The student pharmacist was trained how to properly evaluate medications based on risk factors presented in the Pharmacy Risk Assessment Tool for Falls Prevention and 2019 AGS Beers Criteria.<sup>1,11</sup> Specifically referenced by the student, the AGS Beers Criteria contains an explicit list of PIMs that have been known to cause an increased risk of falls and other adverse events in older adults.<sup>1</sup> The student pharmacist identified patient-specific high fall risk medications and/or PIMs, determined the deprescribing need based on pre-determined criteria, and then focused on justifying the recommendation in documentation to the pharmacist. By performing patient medication reviews, the student pharmacist working as a pharmacist extender developed skills to identify high fall risk medications using references and forming written deprescribing recommendations.<sup>7</sup>

Throughout the project's duration, the role that student pharmacists can play when acting as pharmacist extenders and the skills gained by students from exposure to deprescribing in the long-term care setting

were recognized. This project supports the integration of student pharmacists into the medication review process, which led to an increase in successfully completed patient chart and medication reviews under the SNF's pharmacist. This project also served as an invaluable experience in reviewing medications for the student's future career as a practicing pharmacist.<sup>8</sup> Through independent and guided training, the student pharmacist continually developed a screening and chart review workflow focused on deprescribing high fall risk medications and PIMs. Similarly, once the student pharmacist was able to successfully identify the high fall risk medications and/or PIMs, their focus could shift to developing the skill of how to formally present patient specific information to a fellow healthcare professional. There is the understanding that the skills developed now as a student will translate to the workplace with increased comfort approaching medications eligible to be deprescribed in the future, helping to combat the rates of polypharmacy across all patient populations. Of note, though this project focused on deprescribing high fall risk medications and/or PIMs, student pharmacists can be trained to identify medications eligible for deprescribing due to various other reasons, including as needed medication not being used, medications without indications, drugs causing side effects, etc.

The benefits of incorporating student pharmacists into the deprescribing process go far beyond increasing drug knowledge, learning common indications, confidence in presenting recommendations to a provider, and developing project guidelines. However, several studies have indicated that student pharmacists possess limited exposure to the deprescribing process.<sup>4</sup> In a study with 91 participants, 59.3% of students reported exposure to the deprescribing process in their didactic coursework. But only those students who reported exposure within their coursework were more likely to agree that their program prepared them to deprescribe in practice.<sup>3</sup> This demonstrates the need for pharmacy programs to incorporate the exposure of medication deprescribing into their curriculum.

Over the course of the project, limitations were identified that affected the extent to which the deprescribing initiative could be implemented. First, the project

included patients from only one SNF that cared for patients needing short-term rehabilitation. Throughout the course of the project, the patients admitted to the facility had a broad range in the number of prescription and non-prescription medications. However, the inclusion criteria for the project only selected for patients with the highest total number of prescription and non-prescription medications from that week's group of new admissions.

Second, during the project, the SNF transitioned from a 2-floor to 1-floor facility with a maximum of 39 beds by November 1, 2022. This was due to the facility transitioning from long- to short-term care and changes in the admitted patient population. This change resulted in fewer patients admitted per week by the SNF and thus fewer patients eligible to be screened for inclusion criteria. This reduced the potential of having a patient meet the project's weekly inclusion criteria. Additionally, this change resulted in rapid patient turnover and hindered the project's future potential of measuring the number of deprescribing implementations made by the SNF's healthcare team based on the student pharmacist's recommendations.

Finally, due to the SNF's transition from long- to short-term care and changes in the admitted patient population, the portion of the project that incorporates the student pharmacist will not be continued. The low weekly census made it challenging for the student pharmacist to continue identifying high-quality patients using the project's specific inclusion criteria. Incorporation of the student pharmacist into the project collected sufficient data to show active polypharmacy within the SNF's patient population and many patients taking medications which put them at a higher risk of falling. The project encouraged the SNF's healthcare team to continue the project and grow the facility's deprescribing initiative, as demonstrated by their established ownership of workflow to taper or discontinue medications since the beginning of the project. Additional benefits for patients would come from the healthcare team transitioning the scope of the project to measure outcomes such as the number of successful deprescribing implementations within a designated period.

## Conclusion

Despite the facility's transition in care, the data gathered and information analyzed is a valuable addition to the current literature on the significance of polypharmacy within LTCFs. Project findings highlight the heightened risks, such as falling, faced by patients 65 years of age and older when taking multiple prescription and non-prescription medications.

Incorporating a student pharmacist into the medication review and deprescribing process has been a successful implementation. The SNF and pharmacist were able to successfully complete an extensive amount of additional patient chart and medication reviews with the help of the student pharmacist. Likewise, this opportunity has allowed for an extension of classroom learning into real-world application for the student pharmacist while being exposed to deprescribing concepts not widely taught in the Doctor of Pharmacy curriculum. The student pharmacist was able to gain experience in developing workflows, fostering professional relationships, project management, presenting written and oral deprescribing recommendations, and scientific resource utilization.

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Jenna Harnish indicates that she had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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