

MEDICATION MANAGEMENT EDUCATION IN PRIMARY CARE

by

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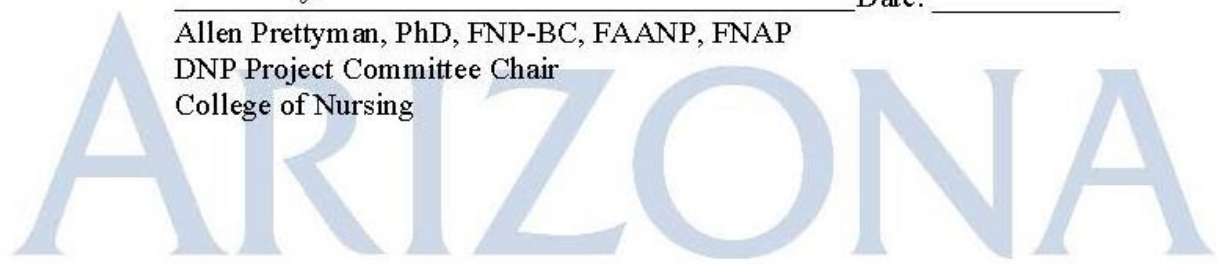


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ABSTRACT

Purpose: This quality improvement project aimed to educate primary care physicians on the “brown bag” medication review and determine their perceived usability of the brown bag medication review.

Background: As chronic disease rates increase, so does the need for complex medication regimens for managing these diseases. The use of multiple medications increases the risks for patient falls, adverse drug events, and hospitalization, especially in the older adult population. Careful monitoring of these complex medication regimens can reduce adverse drug events, which up to 59% can be caused by patient and caregiver medication administration errors. Comprehensive medication reviews can assist in identifying medication-related problems and promote patient involvement in their care. Medication review usefulness can be affected by the tool used to conduct the review. Providers need to determine the most effective tool.

Methods: Participants were all primary care providers at the Copper Queen Community Hospital Douglas Primary Care Clinic. Providers were given a pretest on their current medication review practices then attended a 15-minute PowerPoint presentation on polypharmacy, the “brown bag” medication review, and how to conduct the review. All providers completed five days of conducting medication reviews with their older adult patients and completed a posttest on the final day of implementation.

Results: The posttest showed all providers found problems in at least 25% of patient medication regimens requiring a change in patient medications. The posttest review also showed providers patient knowledge gaps in their medication regimens.

Conclusion: Each provider felt the “brown bag” medication review was useful and are willing to include it in future practice.

INTRODUCTION

Patients with multiple chronic diseases increase the need for multiple medications for managing care. Researchers estimate that “30% of adults over age 65” are on five or more medications (Kim & Parish, 2017, p. 457). This includes prescription medications, over the counter medications (OTCs), and herbal supplements. Multiple medication use places patients at an increased risk for adverse drug events (ADEs), falls, and hospitalizations (Kim & Parish, 2017). Older adults are often affected by medications more severely, placing them at a higher risk for falls. The Beers criteria list medications and medication classes to use cautiously or avoid in older patients. Studies have found that potentially inappropriate medications (PIMs) from the Beers criteria were only responsible for 1.2% of older adult ADE hospitalizations (Antimisiaris & Cutler, 2017). However, “digoxin, warfarin, insulins, oral antiplatelets, and oral hypoglycemic medications were 35 times more likely to result in hospitalization” compared to Beers criteria PIMs (p. 416). The monitoring of commonly prescribed medications for chronic conditions can have the most significant impact on reducing ADEs (Antimisiaris & Cutler, 2017).

Background Knowledge and Significance

While healthcare providers are often the focus of medication error causes, patients can often self-administer medications incorrectly. A 2015 systematic review noted the frequency of patients or their caregivers medication error was “between 19% and 59%,” more often in the older adult population (Mira et al., 2015, p. 815). The most common causes noted for errors was “incorrect dosage, forgetting, mixing up medications, failing to recall indications, and taking out-of-date or inappropriately stored drugs”(p. 815). Although most errors showed no harmful

results, some led to adverse events (Mira et al., 2015). Comprehensive medication reviews, even when only performed annually, have been able to identify medication-related problems in “up to 90% of patients” (Antimisiaris & Cutler, 2017, p. 414). Conducting medication reviews also helps involve patients in their care, increasing overall compliance in care plans (Linsky, Simon, et al., 2017). Patient involvement in care is an integral part of managing polypharmacy and prescribing tools to improve decision-making and identify PIMs. Research continues to show the effectiveness of medication reconciliation. However, it has been shown to be challenging to demonstrate the same effect shown in the research setting due to extensive time requirements and a lack of prioritization in the clinical setting (Pevnick et al., 2016). These difficulties show further need for a comprehensive medication review that can be conducted in a short time frame.

Advanced practice nurses (APNs) continue to be integrated into various healthcare areas, including managing patients with chronic diseases in the primary care setting. APNs focus on evidence-based practice and patient-focused care has led them to become more involved in quality improvement (QI) projects. In 2019 an advanced practice registered nurse (APRN) led a fall prevention program for older adults, focused on fall prevention through exercise, hazard removal, medication education, and reducing polypharmacy and PIMs (Frith et al., 2019). Patients received a medication plan which reviewed current medications and PIMs and OTC medications to avoid. The APRNs conducted medication reconciliations at each follow-up appointment. The study concluded with a decrease in the number of falls, significant improvement in patient knowledge on PIMs, and an average of 4.85% medication reduction (Frith et al., 2019). A 2020 study noted the importance of APRNs utilizing medication screening tools to reduce the amount of PIMs prescribed and encourage deprescribing (Nguyen et al.,

2020). Providers must balance prescribing effective evidence-based treatment plans while reducing the risk for falls associated with the evidence-based treatment plans.

Local Problem

As an emergency department (ED) nurse, this author frequently sees patients who do not carry a medication list, do not know what medications they regularly take, or why they are taking the prescribed medications. Patients often assume the facility or the provider has an updated list of their medications. Patients sometimes may know the class or type of medication, causing providers or staff to guess the medication, which can result in patients stating they take a medication that just happens to sound similar. Patients often forget to include any herbal or OTC medications they are taking when asked about their medications. Incomplete or non-current medication lists can result in prescribing duplicate medications or medication classes or patients taking medications with potential adverse interactions. A significant proponent of providing patient-centered care is encouraging patients to be involved in their care plan and empowering patients to make informed health decisions. Patients who understand what medications they are taking and their purposes can make better-informed decisions on their care management's progress.

The location of this quality improvement (QI) project is in one of the three primary care clinics associated with a critical access hospital. Stakeholders for this project were the providers, clinic staff, and clinic patients. Informing the facility administrators of the evidence-based practice cost reduction associated with the implementation encouraged buy-in. For providers and staff, showing outcome benefits and potential increased medication compliance helped with buy-

in. Patients were interested in the implementation as it showed an increased patient involvement in plans of care and patient-focused care delivered.

A needs assessment was conducted with a local clinic to determine the potential benefit of implanting a comprehensive medication review (CMR) during a typical 15 minute follow up or episodic clinical visits. This author determined the clinic's medical assistants would conduct a short medication review at the beginning of the visit but did not determine if the patients are taking the medications correctly or assess the patient's understanding of the need for the medication. The needs assessment also revealed that providers did not regularly assess the need for the currently prescribed medications and did not determine if medications prescribed by other specialty providers are compatible or included with the current medications. Even with providers who conducted frequent medication reviews, providers did not instruct patients to bring in all medications to verify the current medication list's accuracy.

Intended Improvement

Project Purpose

The purpose of this QI project was to educate primary care physicians (PCPs) on using the "brown bag" medication review (BBMR) and determine its usability. When conducting a medication review selecting the correct tool is as important as conducting the review itself. If a tool can gather all the data for providers to make evidence-based care plans but is so time-consuming, providers are unwilling to use it; the tool is ineffective. This project determined the providers' perceived ease of use, usefulness, and intention to use the BBMR. The BBMR was the selected intervention due to similar rural settings of other studies using the BBMR (Weiss et al., 2016). Patients in rural settings often visit their PCP less frequently due to transportation

barriers, financial resources, and the number of available PCPs (Ford et al., 2016). The BBMR can allow for a comprehensive review and potential deprescribing in the typical 15-minute office visit, which may only happen annually for these patients.

Project Question

Will PCP education on BBMR increase patient education of their medications in one month and reduce PIMs?

Project Objectives

This project aimed to increase the overall rate of CMR by 10% for the clinic, but it was determined there was no documented record to establish the previous number of medication reviews conducted. The primary outcome became to measure the providers' perceived usefulness and likeness to use the BBMR in future practice.

Theoretical Framework

The *chronic care model* (CCM) is an organizational approach to caring for patients with chronic diseases in primary care settings. It can be used at both the individual and population level, making it ideal to use for a small-scale doctor of nursing practice (DNP) project (Wagner, 1998). Wagner notes that meeting the varied needs of chronic disease patients is one of the main challenges of organized healthcare (Wagner, 1998). The CCM was developed to improve the handling of chronic disease patients within the confines of short visits, which are already inundated, attempting to address multiple patient concerns or give concise but brief patient education. The CCM has six components when combined with evidence-based interventions to promote quality care for chronic disease patients; the community, the health system, self-management support, delivery system design, decision support, and clinical information systems.

The community concept is used to determine programs and organizations in the community that can be used to support chronic disease patients (Wagner, 1998). The health system includes self-management support, delivery system design, decision support, and clinical information systems, which can be improved upon to provide patient-centered care (Wagner, 1998). The CCM concepts for improvement are most effective when the concepts are used in coordination but can be used separately if the remaining components are kept in mind.

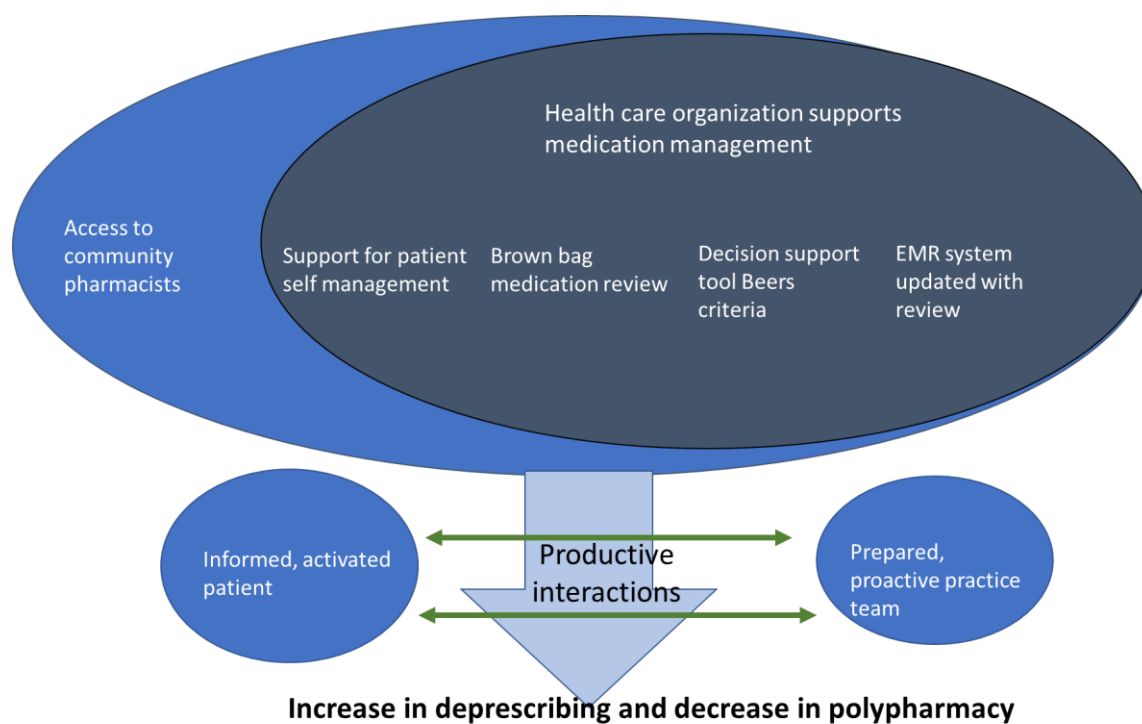
In 2003, the CCM concepts were updated based on the results of health care systems using the model to promote improvements (*The Chronic Care Model: Model Elements*, 2020). There are five additional elements added under the six concepts to provide more specific aspects of managing chronic disease patients. Cultural competency and case management were added to the delivery system design. Patient safety was added to the health systems, community policies were added to the community, and care coordination was added to the health system and clinical information systems (*The Chronic Care Model: Model Elements*, 2020).

The CCM is used to provide an organized way to implement changes to care practices for chronically ill patients. Polypharmacy is the byproduct of increasing multi-chronic disease management, and as such, medication reviews should be an integral part of the overall management of chronic disease patients. Using CCM as a framework for implementation allows for patient-centered care and improving clinical outcomes. The project intervention encouraged patients to be incorporated in their care, understand their medication regimen, and helping to decrease adverse events by deprescribing. A systemic review of studies using the CCM as a model for implementation discussed the facilitators and barriers when used in primary care (Kadu & Stolee, 2015). Several barriers were noted in the review, the complexity of the

intervention, limited guidance, not generally applicable interventions, and limited resources (Kadu & Stolee, 2015). This project's intervention educated providers on a simple intervention that can be applied to all patients and required minimal resources. The focus of the project is on the decision support concept. The evidence-based practice (EBP) guideline of CMR supports improving prescribing and increasing the providers' access to evidence-based research. The study also notes interventions implemented using the CCM had a high provider and staff buy-in and increased patient care compliance (both from increased patient involvement in care & increased patient education) (Kadu & Stolee, 2015). The proposed intervention can also integrate community support and EMR system updates to promote medication review frequency and compliance rates.

Figure 1

Chronic Care Model



(Adapted from Wagner, 1998)

Literature Synthesis

Evidence Search

Evidence was gathered to determine practical approaches in combating polypharmacy by conducting a search using PubMed and CINAHL databases of current literature and studies. Keywords used for the PubMed search were: polypharmacy, polypharmacy AND primary care, and polypharmacy AND tool. Keywords used for the CINAHL search was: polypharmacy AND primary care AND tool. Studies were limited to within the last five years. This resulted in 1,408 articles and publications. These results were further narrowed down by selecting only those in English, those that applied to the out-patient setting, and those which included usage for older adults (aged 65 & older). Articles were ruled out concerning this project's study question, pharmacy-led interventions, and studies on specific disease processes or special populations. This led to 20 articles used for this DNP project (Appendix H).

Comprehensive Appraisal of Evidence

All 20 articles discuss adverse events linked to polypharmacy, such as increase fall rates, increased drug interactions, increased morbidity, increased mortality, and decreased quality of life. Articles were separated into three categories; eight, which discussed complications of polypharmacy and benefits of deprescribing (Antimisiaris & Cutler, 2017; Farrell & Mangin, 2019; Frith et al., 2019; Gabauer, 2020; Kim & Parish, 2017; Linsky, Meterko et al., 2017; Payne, 2016; Verdoorn et al., 2019), six, which discussed patient and provider thoughts on polypharmacy (Ailabouni, 2016; Diggins, 2019; Hoisnard et al., 2019; Le Bosquet et al., 2019; Linsky, Simon, et al., 2017; Schiøtz et al., 2018), and six, which discussed tools to reduce polypharmacy (Bulloch & Olin, 2014; Hill-Taylor et al., 2016; Monteiro et al., 2019; O'Mahony,

2020; Walker et al., 2019; Weiss et al., 2016). Articles included meta-analyses, systemic reviews, randomized clinical trials, longitudinal studies, and qualitative studies.

A 2014 study conducted a literature search using PubMed and Google Scholar to identify tools for healthcare practitioners to assess prescribing practices in older adults (Bulloch & Olin). They identified seven tools and evaluated whether the tool is validated, requires clinical judgment, appropriate setting use, and potential change.

The tools included in the study were: *Assessing Care of Vulnerable Elders-3* (ACOVE-3), *Medication Appropriateness Index* (MAI), *Good Palliative–Geriatric Practice Algorithm* (GPGPA), *Screening Medications in the Older Drug User* (SMOG), *Assess, Review, Minimize, Optimize, Reassess* (ARMOR), *Tool to Improve Medications in the Elderly via Review* (TIMER), and *Assessment of Underutilization* (AOU). The BBMR, since being a part of the health literacy universal precautions toolkit, had been validated by the AHRQ and shown to be a thorough medication review (Brega et al., 2015) ACOVE-3 consists of 12 rules for dose adjustment and medication discontinuation in older adults who will likely pass or become severely disabled within the next two years (Bulloch & Olin, 2014).

The tool was validated but did not require clinical judgment. MAI consists of 10 questions to score medication appropriateness and was developed for out-patient use, but studies have shown this typically needed 10 minutes per medication (Bulloch & Olin, 2014). The tool was validated and requires clinical judgment. GPGPA is a flow algorithm that consists of six yes or no questions, but it does not incorporate medication interactions, duplications, or allergies (Bulloch & Olin, 2014). The tool was validated and requires clinical judgment. SMOG was developed for use by community pharmacists and has only been evaluated in two studies

(Bulloch & Olin, 2014). The tool was not validated but requires clinical judgment. ARMOR is a five-step mnemonic to review medication that required currently kidney and liver function levels, which was also shown to be more beneficial in long-term care facilities (Bulloch & Olin, 2014). The tool was validated and requires clinical judgment. TIMER uses safety, adherence, goals of therapy, and costs to determine how to adjust medications.

However, it has been shown only to identify 25-50% of the drug-related problems the tool is suggested to detect (Bulloch & Olin, 2014). The tool was validated and requires clinical judgment. AOU is a tool to evaluate medications that should have been prescribed to older adults but were not, which is not useful in attempting to deprescribe (Bulloch & Olin, 2014). AOU was primarily used in medication management in the veteran population and noted the time requirements as the most significant barrier (Bulloch & Olin, 2014). The tool was validated and requires clinical judgment.

The study concluded that no single tool was more effective in reducing polypharmacy rates and suggested using multiple tools may be more productive for medication management (Bulloch & Olin, 2014). In practice, selecting a comprehensive review tool such as ARMOR or TIMER may be more beneficial for annual or more extended planned office visits, while other tools such as the MAI or BBMR may be more beneficial for shorter planned office visits (Bulloch & Olin, 2014; Kim & Parish, 2017).

Strengths of Evidence

More often, the risks far exceed the potential benefits of geriatric polypharmacy and are linked to falls, delirium, weight loss, and orthostasis (Kim & Parish, 2017; Linsky, Meterko et al., 2017; Projovic et al., 2016; Walker et al., 2019). One strength noted in many articles is that

comprehensive medication reconciliation and comprehensive medication management, even when conducted only annually, can frequently reduce these medication-related problems (Antimisiaris & Cutler, 2017; Gabauer, 2020; Kim & Parish, 2017; Payne, 2016). Another strength noted is reduced medication use and lowered overall medication use costs (Kim & Parish, 2017). One Australian study estimated that if the average number of medications per person were reduced by just one, the annual saving would be approximately 463 million Australian dollars (equivalent to approximately 310 million dollars) (Reeve et al., 2014).

Weaknesses of Evidence

Most often, scholars define polypharmacy as taking five or more medications; across various studies, polypharmacy has shown to have multiple definitions to include taking two or more medications and up to taking eleven or more medications (Masnoon et al., 2017). Variability in the definition can alter the effectiveness of polypharmacy, reducing tools, and determining causation. Studies note a lack of communication with specialists as a hindrance to reducing polypharmacy (Ailabouni, 2016; Baruth et al., 2020; Mieirol et al., 2019). PCPs may deprescribe, but this may interfere with the plan of care for another specialist. Additional medications from a specialist may not be relayed to a patient's PCP causing duplicate prescriptions of medication or medication classes leading to adverse events.

Gaps and Limitations

Although polypharmacy is a recurrent problem affecting patients' care in the out-patient setting, there is minimal literature to support effective polypharmacy management in the short timeframe of a typical office visit. There is a concern among providers of a lack of evidence-

based guidelines for older adults with multiple comorbidities (Ailabouni, 2016; Diggins, 2019; Hernandez, 2017).

METHODS

Project Design

The presented DNP project was a QI project, which educated primary care providers on using the BBMR and evaluated their perceived usefulness and intended use of the BBMR. The pretest/posttest surveys were questionnaires that included some opinion-based questions, which were scored on a Likert-type scale. The pretest (Appendix E) assessed current medication reviews and describing practices. The posttest (Appendix E) assessed providers' opinions on the BBMR and changes in practice made by using the BBMR.

Model for Improvement

The *model for improvement* was the Institute of Health Model for Improvement, which includes the *plan-do-study-act* (PDSA) cycle (Appendix H). According to the Institute for Healthcare Improvement (IHI), change concepts for improvement are used to develop specific change ideas (*How to Improve*, n.d.). Change can be tested with PDSA cycles on a small scale to determine the effectiveness of an implantation (*How to Improve*, n.d.). This project would be considered a “focus on the service” as it is an improvement to a process to reduce adverse events associated with polypharmacy (*How to Improve*, n.d.).

Plan

This investigator tested the process of educating primary care providers using BBMR to decrease polypharmacy rates in older adult patients. This involved the providers at the clinic. The

only resource needed was time to educate the providers. Data on providers using the BBMR was also collected.

Do

Providers were educated on BBMR for their older adult patients. Providers were observed conducting BBMR with their older adult patients.

Study

Data was analyzed to determine if providers used the BBMR in their management of older adult patients and if this change decreased polypharmacy rates in older adult patients. Any successes, failures, or unintended consequences were included here.

Act

With the data needed, changes could be made to repeat the cycle, expand the process to the other associated clinics, or creates a new approach to obtain the same goal with a new cycle.

Setting and Stakeholders

The project's setting was at the Copper Queen Community Hospital (CQCH) Douglas primary care clinic in Douglas, AZ. CQCH's medical director and CQCH Douglas clinic manager granted permission to use their facilities for the investigator's project (Appendix A). The PCPs at the CQCH Douglas clinic who see older adult patients aged 60 and older within the organization were informed of the project and asked to participate.

Planning the Intervention

A paper pretest survey was given in person to the clinic PCPs before participating in provider education. Providers were given an educational presentation on polypharmacy concerns, the benefits of conducting regularly scheduled medication reviews, and how to conduct a

BBMR. After the educational presentation, the providers were asked to use the BBMR on all patients aged 60 and older for one week (Appendix F). Providers discussed with patients their current medications' purpose, potential interactions, and how and when they should take the medications. Providers offered patient education to decrease patient knowledge gaps in their medications. After one week, the participating PCPs were given a paper posttest survey to determine if education and use of the BBMR increases the providers' conduction of CMRs. Once posttest surveys were complete, data from all provider surveys Likert-type portions of the surveys were inputted electronically to provide a chart depicting the perceived usefulness and intended use of the BBMR. All providers and appropriate clinic administrative personnel were given an executive summary without biographical data.

Participants and Recruitment

There are seven primary care providers at the CQCH Douglas clinic. Providers were contacted through email if they were interested in participating in a study to increase their knowledge of performing medication reviews to reduce polypharmacy and PIMs. The email described the project, what the providers were asked to do, and the time involved (Appendix C). Of the seven providers, three consented to participate in the study. One participating provider gave electronic consent via email to partake in the study. Two providers had difficulties with their emails and gave signed written consent to participate in the study. These providers were also given a printed copy of the email describing the project.

The inclusion criteria for participating in the project was a licensed provider at the CQCH Douglas who treat patients 60 years and older, at least one year or more of experience, and are over the age of 18. Those who met the criteria were seven providers, including doctors of

medicine (MDs), nurse practitioners (NPs), and physician assistants (PAs). The providers have between 1 year and 25 years' experience, with the median experience of 9 years.

Exclusion criteria were CQCH providers not at the Douglas clinic, providers who did not treat older adult patients, and providers with less than one-year of experience.

Consent and Ethical Considerations

The participating providers were given a consent form detailing knowledge that their participation is voluntary (Appendix B). Providers were notified they may withdraw at any time from the project. Providers were informed to protect their privacy; there were no personal identifiers obtained. Each pre/posttest was assigned corresponding numbers to ensure anonymity. Providers were also informed that biographical data is submitted on a volunteer basis and would not affect their participation in the study. There were no risks associated with participating in this project.

Data Collection

Data was collected through paper pretest/posttest surveys. Providers were given a peer-reviewed 13-question pretest survey ahead of the 15-minute polypharmacy and BBMR presentation. The pretests were assigned numbers one through three, which providers randomly selected. Providers were given the "*Brown Bag Checkup-Participation Medicine Review Form*" (Appendix E) to be used on all patients aged 60 years and older. Providers were informed they may keep the forms to add to the designated patient's chart or for further personal, educational purposes. Providers were instructed to place forms in the facility's secure shred bin after completing the patient visit for those they did not wish to keep. Providers completed the assigned corresponding peer-reviewed 17-question posttest. Data from the survey's Likert-type questions

were transferred to an Excel spreadsheet to analyze the provider perceived effectiveness and usefulness of the given education.

Data Analysis

With only three participants, there was limited data to conduct an effective analysis. The posttest survey evaluated the frequency of patients who brought their medications to the BBMR, knew how and why they were taking their medications, and any changes in their medications that they had not addressed with their PCP. The majority of the survey was descriptive; therefore, it was analyzed for potential emerging themes. A table was created to reflect a visual representation of the results from the questions on the provider's opinion on the usefulness of the BBMR.

RESULTS

Three of the seven qualified providers agreed to participate in this QI project, one physician, one nurse practitioner (NP), and one physician assistant (PA). Participants include two males and one female. All providers were between the ages of 35 to 45 and had at least six years of experience in practice. Project implementation began on September 18, 2020, during the lunch hour at 1200. All providers were given a numbered pretest to fill out; upon completion, the participants placed their completed pretests in a manila folder provided by the principal investigator (PI). After completing the pretest, the PI provided education via PowerPoint presentation on polypharmacy, the BBMR, and how to conduct the BBMR. All questions and concerns were addressed following the completion of the PowerPoint presentation. Providers were provided five copies of the BBMR, with an original to make other copies, to use on all patients aged 60 years or older. Providers were instructed to either keep the BBMR forms for the

designated patient chart or dispose of it in the secure shred bin. Implementation of the providers conducting the BBMR took place over five days, the week of September 21, 2020, through September 25, 2020. At the lunch hour on September 25, 2020, at 1200, providers were given the posttest, selecting their designated numbered posttest. Upon completion, the participants placed their completed pretests in a manila folder provided by the PI.

The most frequent problem found with a patient's medication regimen was the patients did not tell their PCP if they had started or stopped a new prescription medication, OTC medication, or supplement. For two providers, 25 to 49% of patients started or stopped taking a prescription medication, OTC medication, or supplements without notifying their PCP. One provider, less than 25% of patients, discontinued the medication without telling their PCP, but 75 to 99% of their patients stopped an over the counter medication or supplement without telling the PCP. This provider also noted 50 to 74% of patients started a new prescription medication, OTC medication, or supplement telling their PCP. Using the BBMR showed providers a need for medication regimen adjustments, but this was required in less than 25% of all patients.

Outcomes

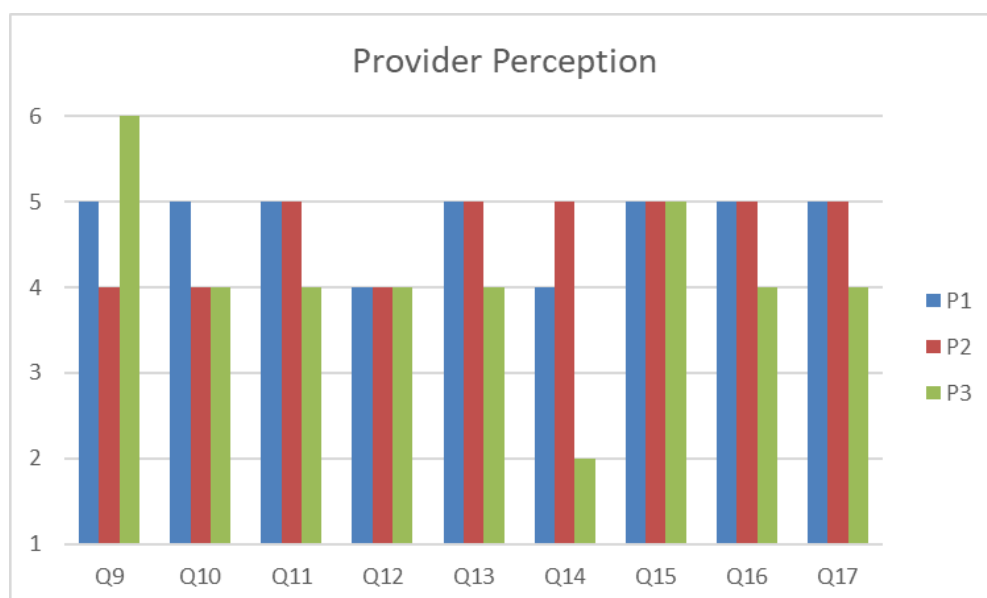
This project aimed to determine the providers' perceived ease of use, usefulness, and intention to use the BBMR. The pretest established the providers' current medication review practices. All providers conducted some form of a medication review with their patients, but none of them have a standardized process or tool they use to complete the reviews. Two of the providers conducted medication reviews quarterly, and one did not have a regular set interval. Two of the providers felt their patients were rarely able to tell them why they are taking their medications and how they should be taking them. One provider felt that their patients could often

give the correct reason they are taking the medications and how to take them. Pre-intervention barriers to conducting medication reviews included lack of chart access before reviews and patients' inability to follow instructions.

The posttest included assessing patients' understanding of their medication regimen, problems, or inconsistencies with a medication regimen, and a nine-question Likert-type scale of the providers' perception of the BBMR. Post-intervention, all providers had found issues with patient medication regimens and changed their patients' medication regimens because of the medication review. Post-intervention barriers to conducting the medication review included patients not following directions/bringing in medications. One provider felt the BBMR did not increase their likelihood of deprescribing medications. All providers, at least somewhat agreed, the medication review was easy to use and improves their job performance. All providers will conduct medication reviews more frequently and will include the BBMR in future practice.

Figure 2

Provider Perception of BBMR



DISCUSSION

Summary

This project was initiated due to the PI's observation of patients' frequent lack of knowledge of their home medications, especially those with polypharmacy. Polypharmacy increases the likelihood of patients not being as educated on their medications and places patients at a greater risk for PIMs. Lack of patient knowledge of their medications and infrequent reviews of patient medication lists increases the patient's risk for polypharmacy complications.

The literature review demonstrated adverse events were linked to polypharmacy and how deprescribing with the aid of medication review tools decreases the risk of adverse events. Although there has been no single tool shown to be most effective in reducing polypharmacy rates and increasing patient medication knowledge, the BBMR can be useful in the Douglas clinic setting. The literature review also noted that CMRs conducted only annually were able to reduce medication-related problems. Since 66% of the providers surveyed already conduct medication reviews on at least a quarterly basis, establishing a regularly scheduled medication review for all providers should help decrease medication-related problems. All providers marked either somewhat agree, agree, or strongly agreed for provider perception questions except for one answer. One provider disagreed that using the BBMR increased their likelihood of deprescribing medications. The survey does not have the option for the providers to discuss their reasoning behind their selection, which would provide greater insight into determining barriers to perceived usability. With patients frequently not updating providers on changes to their prescribed medication, it can be challenging to establish a reliable medication list to determine if

deprescribing is needed. Perhaps after multiple rounds of medication reviews, a more reliable medication list will be kept increasing the likelihood of using the BBMR to deprescribe.

The project question of whether PCP education on the BBMR increases patient knowledge of their medications will need to be evaluated at the next medication review to determine if a high percentage of patients understand their current medication regimen. This project aimed to increase the overall rates of CMRs for the clinic, which provided perception shows a likelihood of increasing. Still, it would also need to be evaluated over multiple cycles to determine if medication review frequency rates increased.

Interpretation

This project showed providers are willing to use CMR tools, which are short and simple to aid in monitoring patient medications. These results are similar to a mixed-method study that conducted BBMRs to identify drug therapy problems (Kim & Parish, 2017; Weiss et al., 2016). Like other studies, communication appears to be a factor in conducting CMRs, as frequently patients did not bring in their medications as requested (Ailabouni et al., 2016; Linsky, Meterko et al., 2017). In these instances, repetition of expectations and recurrent medication reviews should increase patient participation. The BBMR showed where there were patient knowledge gaps, which can affect patient medication compliance. This is consistent with studies demonstrating that patients lack knowledge about their medications, particularly those who receive multiple medications (Hoisnard et al., 2019; Linsky, Simon et al., 2017; Schiøtz et al., 2018). The project's implementation was slightly delayed due to waiting for providers' responses to the participation email.

Implications

Practice

This project encourages the use of standardized CMRs to improve patient medication compliance and decrease PIMs. All providers somewhat agreed or agreed they would conduct more frequent medication reviews and use the BBMR in future practice. Hopefully, this project will help providers find a comprehensive medication review that they feel is appropriate to their practice and can be used regularly. One provider has decided to initiate their own QI project to determine the most effective medication review tool to be implemented at the clinic and establish a medication review policy.

Education

There were four providers at the practice who were unable to participate in the project. Hopefully, with the education provided during implementation, the participating providers can disseminate their knowledge gained to the other providers and increase their medication review frequency. The education portion of the implementation also reminded the providers to monitor polypharmacy complications and risk factors and evaluate if future prescription medications are on high-risk lists for older adults, such as the Beer's criteria. Studies have shown patient education on their medications can reduce adverse events (Hoisnard et al., 2019). This continued education increases patient compliance with medication regimens and patient safety (Hoisnard et al., 2019).

Research

As noted in multiple studies, no single tool has shown the capacity to be an all-encompassing, short, and easy to use medication review. This project demonstrated the usability

of the BBMR for the three providers who participated in the study. It would be beneficial to increase the participation number to determine if the BMR is useful for the entire clinic and if this would be useful at the other two associated clinics. Conducting a more extended implementation may help evaluate other barriers to conducting CMRs and determine ways to overcome the seen obstacles.

Policy

There currently have not been any policy changes, but the Douglas primary care clinic is in the process of developing a policy for conducting regularly scheduled medication reviews with the use of the BBMR due to the results from this QI project. Hopefully, initiation of a scheduled medication review will be extended to the other three primary care clinics and eventually be integrated into the electronic medication record.

Limitations

This QI project was conducted at a single site with very small sample size. The sample size goal was for a total of seven providers; only three were able to participate. Many providers also rotate as inpatient providers in the hospital, limiting the time they are available to participate in the project. One provider was unable to participate due to a family emergency. However, with similar years of experience and three provider disciplines, the posttest results were very similar. This similarity may be due to working in the same clinic or the perceived usefulness of the BBMR. With this small sample size, the project does not appear to have generalizability. Still, it does have the potential to help others determine a useful CMR tool to use in the primary care setting. A future project with the same interventions but a larger sample size may help determine if the process could be generalized. Internal validity could be affected by providers and or

medical assistance not informing the patients to bring in all medications to visits or from patients not understanding all medications include prescription medications, OTC medications, and herbal supplements. COVID-19 limited the days in which the project could be conducted and delayed the implementation's start date. One provider was not able to participate due to being quarantined with COVID-19.

DNP Essentials Addressed

This project covered DNP Essentials II, III, and VII. DNP Essential II uses organizational and systems leadership to promote patient safety and excellence in practice (The Essentials of Doctoral Education for Advanced Nursing Practice, 2006). This QI project implements this by focusing on decreasing PIMs causes such as polypharmacy by conducting CMRs. This project also promotes regularly scheduled CMRS, which has facilitated policy changes at the clinic level and may be implemented hospital-wide.

DNP Essential III uses clinical scholarship and analytical methods for evidence-based practice to apply knowledge to problem solve through scholarship (The Essentials of Doctoral Education for Advanced Nursing Practice, 2006). This QI project implemented this by researching CMR tools to educate providers on to decrease the patient knowledge gaps and polypharmacy rates of older adults. The research was conducted to determine the evidence-based tool, which would be most beneficial in the primary care setting.

DNP Essential VII uses clinical prevention and population health for improving the nation's health by increasing health promotion in risk reduction (The Essentials of Doctoral Education for Advanced Nursing Practice, 2006). This QI project implements this by promoting risk reduction associated with polypharmacy and PIMs. The research conducted and seen in

implementation demonstrates that CMRs can decrease the number of prescribed PIMs, reducing falls, and adverse events in older adults.

Conclusion

The project question of will PCP education on BMR increased patient education and medications and reduce PMIs was not answered. Still, it did show providers a gap in patient knowledge of their medication regimens and allowed providers to give medication education. This project aimed to determine the providers' perceived ease of use, usefulness, and intention to use the BBMR. Providers were given a pretest to evaluate their current practice on medication reviews, education on conducting the BBMR, and a posttest to assess the effectiveness and provider perception of the BBMR. Based on the nine-question Likert-type scale portion of the posttest, all providers found the BBMR useful and easy to use. All providers will conduct medication reviews more frequently and will include the BBMR in future practice. This project has demonstrated educating PCPs on a standardized medication review tool, such as the BBMR, can increase patient knowledge of their medications and reduce the likelihood of prescribing a PIM. While patient compliance is a frequent interference to conducting the intervention, recurrent use of CMRs will create a habit of patient adherence to bring in all medications and become more involved in their care.

Plan for Sustainability

Moving forward, the PI will be working with the provider who has decided to initiate their own QI project to establish a policy for medication reviews. This project is still in the planning phase but will likely go through similar testing implementation phases to determine facility-wide usability.

Plan for Dissemination

After project completion, the PI presented a summary of the three participating providers' results in a short in-person lunch briefing. The results will also be distributed to the Douglas clinic's medical director, Dr. Heidi Lodge, to review and disseminate to other providers in the clinic. The results will also be presented for the final defense via zoom with the University of Arizona. All providers at the Douglas clinic will be invited to attend.

APPENDIX A:
COPPER QUEEN COMMUNITY HOSPITAL (CQCH) DOUGLAS PRIMARY CARE
CLINIC SITE APPROVAL

CQCH Douglas Primary Care Clinic
3333 Main Street
Douglas, AZ 85607

06/03/2020

University of Arizona Institutional Review Board
c/o Office of Human Subjects
1618 E Helen St
Tucson, AZ 85721

Please note that Mrs. Charisse Marks, UA Doctor of Nursing Practice student, has permission of the CQCH Douglas Primary Care Clinic to conduct a quality improvement project at our facility for her project, "Medication Management Education in Primary Care."

Mrs. Marks will conduct a survey of health care providers at CQCH Douglas Primary Care Clinic. She will recruit providers through email. The email will provide a description of the project, what they will be asked to do, and the time involved. Mrs. Marks' activities will be completed by October 31, 2020.

Mrs. Marks has agreed to provide to my office a copy of the University of Arizona Determination before she recruits participants. She will also will present aggregate results to the providers at their monthly staff meeting.

If there are any questions, please contact my office.

Signed,



Dr. Heidi Lodge, MD
Vice Chair Medical Staff
Medical Director CQCH Douglas

APPENDIX B:
CONSENT DOCUMENT (MEDICATION MANAGEMENT EDUCATION CONSENT
DOCUMENT)

MEDICATION MANAGEMENT EDUCATION CONSENT DOCUMENT

Charisse Marks

The purpose of this project is to educate primary care providers on the benefits of regularly scheduled medication reviews.

If you choose to take part in this project, you will be asked to complete a pretest and posttest survey to assess provider's perception of medication reviews, participate in education on polypharmacy and using the Brown Bag Medication Review, and if any changes in practice will be made after provider education. It will take approximately 10 minutes to complete these surveys and approximately 15 minutes to complete the educational presentation. Providers will be asked to conduct the Brown Bag Medication Review with all of their patients 60 years and older. Providers will be given the Brown Bag Medication Review form to be used during the review. Providers may keep these forms for the accompanying patient charts. Any forms which providers do not want to keep will need to be securely shredded. There are no foreseeable risks associated with participating in this project, and you will receive no immediate benefit from your participation. Survey responses are anonymous. While the following biographical data will be obtained; age, gender, race/ethnicity, education level, and profession, not answering these questions will not affect participation in the survey.

If you choose to participate in the project, participation is voluntary, refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw at any time from the project. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this project.

Please reply via email to confirm project participation. For questions, concerns, or complaints about the project, you may call Charisse Marks, RN BSN FNP-DNP student at 520-508-0335 or email at cmarks@email.arizona.edu

APPENDIX C:
RECRUITMENT MATERIAL (RECRUITMENT EMAILS)

Dear _____,

For my Doctor of Nursing Practice (DNP) Project with the University of Arizona, I am conducting a qualitative study to educate Primary Care Providers on the use of the Brown Bag Medication Review (BBMR). The purpose is to determine the usability of the BBMR as a comprehensive medication review which can be conducted during the average 15-minute office visit.

Participants must be a licensed provider at the Community Hospital: Douglas Primary Care Clinic who treat patients 60 years and older and have at least one year or more of experience.

If you meet these criteria and are interested, I will send you a disclosure form with complete information. You will then be asked to complete a survey which assesses current medication review practices. All participants will receive a group education via 15-minute PowerPoint presentation on using the BBMR and polypharmacy. Following 5 days of using the BBMR providers will be asked to complete a post survey to determine perceived ease of use, usefulness, and intention of use of the BBMR.

Please reply via email to confirm project participation at cmarks@email.arizona.edu

Thank you,

Charisse Marks BSN, RN
DNP-FNP Student
University of Arizona

Dear _____,

Thank you for your participation in this project. For the implementation portion of the this project I am asking you or the office medical assistants to request all home medications and supplements be brought in by patients aged 60 and older who will be seen in the clinic for office visits during the implementation time frame. Again, if you have any questions, concerns, or complaints feel free to contact me through voice or text at 520-508-0335 or email at cmarks@email.arizona.edu

Thank you,

Charisse Marks BSN, RN
DNP-FNP Student
University of Arizona

APPENDIX D:
EVALUATION INSTRUMENTS (PROJECT PRE-TEST AND POST-TEST SURVEYS)

Project Pretest Survey

1. What is your age?
 - a. _____ years old
2. What is your gender?
 - a. Male
 - b. Female
3. What is your race/ethnicity? (Select all that apply)
 - a. White
 - b. Hispanic or Latino
 - c. Black or African American
 - d. Native American or American Indian
 - e. Asia / Pacific Islander
 - f. Other (Please specify) _____
4. Highest level of education?
 - a. Bachelor's degree
 - b. Master's Degree
 - c. Doctorate Degree
 - d. Other (Please specify) _____
5. What is your professional background?
 - a. Doctor
 - b. Nurse Practitioner
 - c. Physician Assistant
 - d. Other (Please specify) _____
6. How long have you been in practice as a provider?
 - a. 1-5 years
 - b. 6-10 years
 - c. 11-15 years
 - d. 16-20 years
 - e. Greater than 20 years

7. Do you conduct patient medication reviews?
 - a. Yes
 - b. No
8. How often do you conduct patient medication reviews?
 - a. Never
 - b. No regular interval
 - c. Just initial visit
 - d. Annually
 - e. Quarterly or less frequent
 - f. Quarterly or more frequent
 - g. Every visit
9. When conducting patient medication reviews is there process or tool that you use?
 - a. Yes
 - b. No
 - c. N/A
10. What medication process or tool do you use?
 - a. _____
 - b. N/A
11. Are there any barriers which prevent you from conducting medication reviews?
 - a. _____
12. How often are patients and/or their caregivers able to tell you the correct reason for taking each medicine?
 - a. Never
 - b. Rarely
 - c. Sometimes
 - d. Often
 - e. Always

13. How often are patients and/or their caregivers able to tell you correctly how and when each medicine should be taken?

- a. Never
- b. Rarely
- c. Sometimes
- d. Often
- e. Always

Project Posttest Survey

1. How often did you conduct medication reviews with your patients aged 60 years and old?
 - a. Never
 - b. Less than 25% of patients
 - c. 25%-49% of patients
 - d. 50%-74% of patients
 - e. 75%-99% of patients
 - f. All patients
2. How often were patients and/or their caregivers able to tell you the correct reason for taking each medicine?
 - a. Never
 - b. Rarely
 - c. Sometimes
 - d. Often
 - e. Always
3. How often were patients and/or their caregivers able to tell you correctly how and when each medicine should be taken?
 - a. Never
 - b. Rarely
 - c. Sometimes
 - d. Often
 - e. Always
4. Were any problems found with the patient's medicine regimen?
 - a. Yes
 - b. No (skip question 5)
5. What problems were found with the medicine regimen? Please mark all that apply.
 - a. Duplicate medicines.
 - i. How often:
 1. Never

2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
- b. Expired medicines.
- ii. How often:
 1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
- c. Patient had contraindications for one or more medicines.
- iii. How often:
 1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
- d. Drug-drug interactions could be possible.
- iv. How often:
 1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients

- e. Medicine was correct, but dose was incorrect.
 - v. How often:
 - 1. Never
 - 2. Less than 25% of patients
 - 3. 25%-49% of patients
 - 4. 50%-74% of patients
 - 5. 75%-99% of patients
 - 6. All patients
- f. Patient stopped taking a prescription medicine without telling you or any other clinician in this practice.
 - vi. How often:
 - 1. Never
 - 2. Less than 25% of patients
 - 3. 25%-49% of patients
 - 4. 50%-74% of patients
 - 5. 75%-99% of patients
 - 6. All patients
- g. Patient stopped taking an over-the-counter medicine or supplement without telling you or any other clinician in this practice.
 - vii. How often:
 - 1. Never
 - 2. Less than 25% of patients
 - 3. 25%-49% of patients
 - 4. 50%-74% of patients
 - 5. 75%-99% of patients
 - 6. All patients
- h. Patient started taking a new prescription medicine (i.e., prescribed by another doctor, prescription samples) without telling you or any other clinician in this practice.
 - viii. How often:

1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
- i. Patient started taking a new over-the-counter medicine or supplement without telling you or another clinician in this practice.
- ix. How often:
1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
- j. Containers brought in by patient did not match the medicine list in the patient's record.
- x. How often:
1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
- k. Patient not taking medicine as prescribed.
- xi. How often:
1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients

4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
 1. Patient failed to get medicine(s) refilled.
 - xii. How often:
 1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
 - m. Patient changed to cheaper medicine.
 - xiii. How often:
 1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
 - n. Other—Please specify: _____
 - xiv. How often:
 1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
 6. Were any changes made to a patient's medicine regimen because of the review?
 - a. Yes

b. No (skip question 7)

7. What changes were made to the medicine regimen? Please mark all that apply.

a. The number of medicines was reduced.

i. How often:

1. Never
2. Less than 25% of patients
3. 25%-49% of patients
4. 50%-74% of patients
5. 75%-99% of patients
6. All patients

b. The number of medicines was increased

ii. How often:

1. Never
2. Less than 25% of patients
3. 25%-49% of patients
4. 50%-74% of patients
5. 75%-99% of patients
6. All patients

c. Expired medicines were discontinued (thrown away).

iii. How often:

1. Never
2. Less than 25% of patients
3. 25%-49% of patients
4. 50%-74% of patients
5. 75%-99% of patients
6. All patients

d. Updated prescriptions were written for expired medicines.

iv. How often:

1. Never

2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
- e. Alternate medicines were prescribed to replace existing medicines.
- v. How often:
 1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
- f. New medicines were prescribed.
- vi. How often:
 1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
- g. Medicine regimen was simplified (e.g., fewer doses per day).
- vii. How often:
 1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients

- h. Other (Please specify) _____
- viii. How often:
1. Never
 2. Less than 25% of patients
 3. 25%-49% of patients
 4. 50%-74% of patients
 5. 75%-99% of patients
 6. All patients
8. Are there any barriers which prevent you from conducting medication reviews?
- a. _____

For the following questions please mark on a scale from 1 to 6 your opinion on the usefulness of the Brown Bag Medication Review.

1-Strongly Disagree 2-Disagree 3-Somewhat Disagree 4-Somewhat Agree 5-Agree

6-Strongly Agree

1. ___ The Brown Bag Medication Review was easy to use.
2. ___ The Brown Bag Medication Review can be used in the average 15-minute patient visit.
3. ___ The Brown Bag Medication Review improves my job performance.
4. ___ Using the Brown Bag Medication Review makes it easier to update patient medication lists.
5. ___ Using the Brown Bag Medication Review reduced the number of potentially inappropriate medications taken by patients.
6. ___ Using the Brown Bag Medication Review increased my likelihood of deprescribing medications.
7. ___ I will conduct medication reviews more often.
8. ___ I will use Brown Bag Medication Review in future practice.
9. ___ Overall, I found the Brown Bag Medication Review to be useful.

A modified version of the Medicine Review Form from the Health Literacy Universal Precautions Toolkit (Health Literacy Universal Precautions Toolkit, 2nd Edition: Medication Review Form, 2015).

APPENDIX E:
PARTICIPANT MATERIAL (EDUCATIONAL POWERPOINT AND BROWN BAG
MEDICATION REVIEW FORM)

MEDICATION MANAGEMENT EDUCATION IN PRIMARY CARE

Charisse Marks BSN,RN
DNP - FNP Candidate

Polypharmacy

- Defined as taking 5 or more medications
- 30% of adults over 65 are on five or more medications
- Increase risk of:
 - Adverse drug events
 - Falls
 - Hospitalizations

Polypharmacy cont.

- PIMs from the Beers criteria only account for 1.2% of ADE hospitalizations
- ADE more likely from commonly prescribed medications:
 - Digoxin
 - Warfarin
 - Insulin

Medication Errors

	When an Error Occurs			
	PRESCRIBING	DISPENSING*	ADMINISTERING	TAKING†
ERRORS OF OMISSION				
• Drug not prescribed	x			
• Drug not dispensed		x		
• Drug not administered			x	
• Drug not taken				x
ERRORS OF COMMISSION				
• Wrong drug	x	x	x	x
• Wrong dose	x	x	x	x
• Wrong substitution for a drug	x			
• Wrong patient	x	x	x	x
• Wrong regimen				
• Frequency of administration	x	x	x	x
• Timing of administration	x	x	x	x
• Duration	x	x	x	x
• Wrong route of administration	x	x	x	
• Allergic reaction	x	x	x	
• Drug interaction				
• With another drug	x		x	x
• With food	x		x	x
• With other therapies	x		x	x
• Communication failure				
• Illegible handwriting	x	x	x	
• Incomplete prescribing order	x			
• Vague instructions	x	x	x	
• Prescription not recognized	x	x		
• Unknown prescriber or illegible prescriber identification	x			
• Failure to follow appropriate policies	x	x	x	
• Failure to follow drug-specific instructions	x	x	x	x
• Overuse of a drug without therapeutic benefit	x			x

* Includes transcribing, verifying, and dispensing medications. Generally involves nurses and pharmacists.
 † Includes patient compliance.

Rates DW, et al. *J Am Med Inform Assoc* 1999;6(4):313-21; Rupp MT, et al. *Med Care* 1992;30(10):926-40.



Comprehensive Medication Reviews

- Benefits
 - Can identify medication-related problems in up to 90% of patients
 - Reduced overall healthcare costs
 - Encourages patient involvement in their care
 - Promotes interprofessional collaborative care

- CMR tools
 - ACOVE-3
 - MAI
 - GPGPA
 - SMOG
 - ARMOR
 - TIMER
 - AOU
 - BBMR

Brown Bag Medication Review




- Comprehensive
- Short
- Validated by the AHRQ
- Promotes patient-centered care

 					
Brown Bag Checkup - Participant Medicine Review Form					
Date:	Participant #: _____ Lives in what ward or Zip Code: _____				
Site:	_____				
Participant Name:	Phone #: _____				
Participant Diagnosis:	_____				
<input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Ethnicity: <input type="checkbox"/> Hispanic or Latino					
What race (Check all that apply): <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian <input type="checkbox"/> African American <input type="checkbox"/> Native American or Pacific Islander <input type="checkbox"/> White <input type="checkbox"/> Other: _____					
Person's/ies Completing Form: _____					
Please check all that apply: <input type="checkbox"/> Medication <input type="checkbox"/> Medical <input type="checkbox"/> Both <input type="checkbox"/> Other Insurance <input type="checkbox"/> No insurance					
1. How many medicines (prescription, over the counter, vitamins/minerals/injectables) were brought by the Participant? _____					
2. Did the Participant say they brought in all their prescription medicine containers? <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"><input type="checkbox"/> Yes, brought all their prescription meds</td> <td style="width: 50%;"><input type="checkbox"/> No, brought some of their prescription meds</td> </tr> <tr> <td><input type="checkbox"/> No, only brought medicine list</td> <td><input type="checkbox"/> Other: _____</td> </tr> </table>		<input type="checkbox"/> Yes, brought all their prescription meds	<input type="checkbox"/> No, brought some of their prescription meds	<input type="checkbox"/> No, only brought medicine list	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Yes, brought all their prescription meds	<input type="checkbox"/> No, brought some of their prescription meds				
<input type="checkbox"/> No, only brought medicine list	<input type="checkbox"/> Other: _____				
3. Did the Participant say they brought in all their over the counter medicines and supplements? <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"><input type="checkbox"/> Yes, brought all over the counter meds and supplements</td> <td style="width: 50%;"><input type="checkbox"/> No, brought some over the counter meds and supplements</td> </tr> <tr> <td><input type="checkbox"/> Other: _____</td> <td></td> </tr> </table>		<input type="checkbox"/> Yes, brought all over the counter meds and supplements	<input type="checkbox"/> No, brought some over the counter meds and supplements	<input type="checkbox"/> Other: _____	
<input type="checkbox"/> Yes, brought all over the counter meds and supplements	<input type="checkbox"/> No, brought some over the counter meds and supplements				
<input type="checkbox"/> Other: _____					
4. Has anyone asked you about your medications in the last 6 months, not including today's discussion? <input type="checkbox"/> Yes <input type="checkbox"/> No					
5. Could the Participant state what each medicine was for? <input type="checkbox"/> Yes <input type="checkbox"/> No					
6. Could the Participant state how and when they should take each medicine? <input type="checkbox"/> Yes <input type="checkbox"/> No					
7. A number of conditions may be identified regarding medicine regimens, provide information on _____					

Questions?

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 Quality Improvement Organizations Sharing Knowledge. Improving Health Care. CENTERS FOR MEDICARE & MEDICAID SERVICES		 Atlantic Quality Innovation Network NY · DC · SC		 DELMARVA FOUNDATION Serving the District of Columbia	
Brown Bag Checkup - Participant Medicine Review Form					
Date:		Participant #:		Lives in what ward or Zip Code:	
Site :					
Participant Name:				Phone #:	
Participant Diagnosis:					
<input type="checkbox"/> Male		<input type="checkbox"/> Female		Ethnicity: <input type="checkbox"/> Hispanic or Latino	
What race (Check all that apply): <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian <input type="checkbox"/> African American <input type="checkbox"/> Native American or Pacific Islander <input type="checkbox"/> White <input type="checkbox"/> Other: _____					
Person/s Completing Form:					
Please check all that apply: <input type="checkbox"/> Medicare <input type="checkbox"/> Medicaid <input type="checkbox"/> Both <input type="checkbox"/> Other Insurance <input type="checkbox"/> No insurance					
1. How many medicines (prescription, over the counter, vitamins/minerals/nutraceuticals) were brought by the Participant? _____					
2. Did the Participant say they brought in all their <i>prescription</i> medicine containers				<input type="checkbox"/> Yes, brought all their prescription meds <input type="checkbox"/> No, brought some of their prescription meds <input type="checkbox"/> No, only brought medicine list <input type="checkbox"/> Other: _____	
3. Did the Participant say they brought in all their <i>over the counter</i> medicines and <i>supplements</i> ?				<input type="checkbox"/> Yes, brought all over the counter meds and supplements <input type="checkbox"/> No, brought some over the counter meds and supplements <input type="checkbox"/> Other: _____	
4. Has anyone asked you about your medications in the last 6 months, not including today's discussion? <input type="checkbox"/> Yes <input type="checkbox"/> No					
5. Could the Participant state what each medicine was for?					<input type="checkbox"/> Yes <input type="checkbox"/> No
6. Could the Participant state how and when they should take each medicine?					<input type="checkbox"/> Yes <input type="checkbox"/> No
7. A number of conditions may be identified regarding medicine regimens, provide information on _____					
1 Page					

APPENDIX F:
PROJECT TIMELINE

Completion Date	Planning	Pre-Implementation	Implementation	Evaluation
03/09/2020	Meet with key stakeholders to obtain support			
06/03/2020		Obtain consent to conduct implementation		
08/12/2020		Submitted IRB application		
08/26/2020		Recruitment emails sent to providers		
09/18/2020			Conduct education on BBMR and polypharmacy	Pretest
09/20/2020-09/25/2020			Providers conduct BBMR	Posttest on last day
10/05/2020				Provide an executive summary to providers and administrative staff

APPENDIX G:
LITERATURE REVIEW GRID

Author's Last Name (Pub Year)	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
Ailabouni, N. J., Nishtala, P. S., Mangin, D., & Tordoff, J. M. (2016)	Challenges and Enablers of Deprescribing: A General Practitioner Perspective	Qualitative study with face-to-face interviews	The survey showed there were four major themes; recognition of the problem, behavior change factors, deprescribing considerations and challenges, and deprescribing enablers. Communication continues to be a major factor in providing comprehensive and effective care	It is important to identify the challenges and enablers to be able to deprescribe effectively. This can also help to identify if providers are not deprescribing due to lack of knowledge or other barriers.
Antimisiaris, D., & Cutler, T. (2017)	Managing Polypharmacy in the 15-Minute Office Visit	Narrative review	Optimal polypharmacy management can be achieved with monitoring of medications, deprescribing, avoiding prescribing cascades, and individualizing therapy plans. However, this cannot be done in a typical 15-minute visit, but all measures should be addressed systemically through each visit.	Medication reconciliation through brown bag assessment can be conducted at these visits allowing for review and potential deprescribing.
Diggins, K. (2019)	Deprescribing: Polypharmacy management in older adults with comorbidities	Systemic review	Based on the review of literature on polypharmacy management, this table provides suggested stepwise approach for deprescribing.	A focused approach to deprescribing recognizes that patients' needs are key in any medication regimen, and that these needs are dynamic based on appropriate measurement of chronic disease outcome indicators

Author's Last Name (Pub Year)	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
Farrell, B. & Mangin, D. (2019)	Deprescribing Is an Essential Part of Good Prescribing	Editorial	The five steps to individualize deprescribing practices to each patient are (1) to identify potentially inappropriate medications; (2) to determine if the medication dosage can be reduced or the medication stopped; (3) to plan tapering; (4) to monitor (for discontinuation symptoms or the need to restart) and support the patient; and (5) to document outcome	To maximize a life worth living for older patients, the focus should be as much on when and how to stop medications as on starting them. Family medicine is ideally placed to rise to this challenge.
Frith, Karen H., Hunter, Amy N., Coffey, Sharon S., & Khan, Z. (2019)	A Longitudinal Fall Prevention Study for Older Adults	Longitudinal study	<p>The mean number of medications at intake in the study was 10.65, and the SLUMS score (measure of cognitive functioning) was 25.85; 24 is considered intact.</p> <p>The 4-Stage Balance Test was conducted at baseline and at every 3 months for a year. Only the fourth position, standing on 1 foot with arms crossed, was statistically significant from baseline (M=5.40, SD=3.864) to 12 months (M=6.20, SD=3.736) $t=-2.449$, $df=9$, $P<.05$.</p> <p>The intervention group exhibited a reduction in the number of falls from baseline (M=2.20, SD=4.35) to the end of the study (mean=0.35, SD=.875). However, the difference was not statistically significant ($t=1.863, df=19, P=078$). When comparing the falls for the intervention group</p>	An evidence-based fall prevention program that focuses multifocal assessment, treatment, and follow up can be expected to provide improvements gait and balance and reduce the number of falls. Nurse practitioners are particularly well-suited to introducing and maintaining a fall prevention program in their primary care practices because of their role in health promotion and chronic disease management.

Author's Last Name (Pub Year)	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
			<p>(M=0.35, SD=.875) to the control group (M=1.42,SD=.607) there was a statistically significant difference (t=4.419, df=37, P<.000), demonstrating the effectiveness of the fall prevention program.</p> <p>Participants in the case control group were on 10.9 medications at baseline and had a group average of 4.85% reductions.</p>	
Gabauer, J. (2020)	CE: Mitigating the Dangers of Polypharmacy in Community-Dwelling Older Adults	Analytical study	Levy categorizes these tools as either “explicit” approaches, such as the Beers Criteria and the STOPP/START tools, which are grounded in the findings of extensive literature reviews and expert opinion, or “implicit” approaches, such as the ARMOR protocol and the Tool for Identifying and Discontinuing Potentially Inappropriate Drugs, which are based on the provider's interpretation of clinical data and the patient's medication regimen. These criteria and tools can help providers identify drugs known to cause harm in older patients. Although none were developed explicitly for nurses, all can be used by nurses working in conjunction with a prescribing clinician.	It is not simply the number of medications a patient takes that defines problematic usage; inappropriate prescribing and oversight can cause patients adverse drug reactions, functional decline, and geriatric syndromes. A multidisciplinary, systematic approach to identifying and safely discontinuing potentially inappropriate medications can improve outcomes and enhance quality of life for older adult patients.
Hill-Taylor, B., Walsh, K. A., Stewart, S., Hayden, J., Byrne,	Effectiveness of the STOPP/START (Screening Tool of Older Persons' potentially inappropriate Prescriptions/Screening Tool to	Systemic review and meta-analysis	The studies included in the analysis were full text, RCTs articles. The meta-analysis found although not statistically significant, using the STOPP criteria reduced the rates of potentially	Performing medications reviews while using tools to decrease potentially inappropriate medication

Author's Last Name (Pub Year)	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
S., & Sketris, I. S. (2016)	Alert doctors to the Right Treatment) criteria: systematic review and meta-analysis of randomized controlled studies		inappropriate medications. The study notes using the criteria did decrease fall rates, medication costs, ED visits, but did not show improvements in mortality or quality of life.	
Hoisnard, L., Santos-Eggimann, B., Chauvin, P., Hiance-Delahaye, A., & Herr, M. (2019)	Do older adults know the purpose of their medications? A survey among community-dwelling people	Cross-sectional survey	<p>On average, patients had good knowledge of 80.6% of the drugs reported. The highest knowledge levels were demonstrated for non-steroidal anti-inflammatory drugs, antidiabetics, analgesics, and endocrinological drugs and the lowest for platelet aggregation inhibitors, minerals, anticoagulants, and other narrow therapeutic index drugs.</p> <p>Overall, 66% of participants had good knowledge of the purpose of all the drugs of interest.</p>	This study showed that education about drugs was lacking among patients that received multiple drugs, particularly patients that used anticoagulants and antiplatelet inhibitors, medications commonly associated with adverse events.
Kim, J. & Parish, A. L. (2017)	Polypharmacy and Medication Management in Older Adults	Narrative review	Polypharmacy is a multifactorial issue which can often times be unavoided in older adults. It is important to regularly evaluate medication treatment plans especially in the older adult.	The study notes that managing multicomorbidities can result in prescribing cascades causing polypharmacy due to treatment of side effects and not actual new health conditions. The study also notes the BBMR helps clarify the patient's current medication list and allow for patient education opportunities

Author's Last Name (Pub Year)	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
Le Bosquet, K., Barnett, N., & Minshull, J. (2019)	Deprescribing: Practical Ways to Support Person-Centered, Evidence-Based Deprescribing	Systemic Review	<p>Deprescribing should be seen as part of the prescribing process and:</p> <p>Should occur as part of a shared decision-making process, focusing on the patient's main problems.</p> <p>Working with the patient to find solutions is likely to support this relationship.</p> <p>Medication should be stopped when the patient or carer and clinician decide together that the medication's benefits no longer outweigh the risks for that patient, including:</p> <p>Use of tools is advisable to aid in the identification of medications that require review and to provide advice for the safe removal or reduction of medication.</p> <p>Clear documentation is important to ensure meeting legal requirements and, as with prescribing, consent is key.</p>	Patient involvement in care is an integral part of managing polypharmacy and prescribing tools can improve decision making and identify PIMs.
Li, G., Andrews, H.F., Chihuri, S. et al. (2019)	Prevalence of Potentially Inappropriate Medication use in older drivers	Longitudinal study	<p>Overall, 545 out of the 2949 study participants with medication data available used at least one PIM, yielding a point prevalence of 18.5%.</p> <p>The prevalence of PIM use increased progressively with the total number of medications used. Use of PIMs was</p>	Implementation of evidence-based interventions to reduce PIM use in older drivers may confer both health and safety benefits.

Author's Last Name (Pub Year)	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
			highest among older drivers taking 12 or more medications; over one-third (34.3%) of this group used PIMs, compared with 21.4% of those on 8–11 medications, 13.4% of those on 5–7 medications and 6.0% of those on four or fewer medications ($p < 0.001$).	
Linsky, A., Meterko, M., Stolzmann, K., & Simon, S. R. (2017)	Supporting medication discontinuation: provider preferences for interventions to facilitate deprescribing	Qualitative study	The top choice for a change that would help improve their ability to discontinue medications was "Requiring all medication prescriptions to have an associated 'indication for use.'" This preference was followed by "Assistance with follow-up of patients as they taper or discontinue medications is performed by another member of the Patient Aligned Care Team (PACT)" and "Increased patient involvement in prescribing decisions."	Clinicians are willing to make changes to decrease the incidences of polypharmacy, they just need assistance with finding evidence-based tools to help know when and how to deprescribe.
Linsky, A., Meterko, M., Stolzmann, K., & Simon, S. R. (2017)	Patient Perceptions of Deprescribing: Survey Development and Psychometric Assessment	Qualitative study with face-to-face interviews	The 5 factors that affect a patient's perception of deprescribing were "medication concerns," "provider knowledge," "interest in stopping medicines," "unimportance of medicines, and "patient involvement in decision-making."	The Patient Perceptions of Deprescribing questionnaire is a great measurement patients' attitudes and experiences related to medication discontinuation that can be used to determine how to best involve patients in deprescribing decisions.

Author's Last Name (Pub Year)	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
Masnoon, N., Shakib, S., Kalisch-Ellett, L., & Caughey, G. E. (2017)	What is polypharmacy? A systematic review of definitions	Systemic review	Articles not only defined polypharmacy but associated terms such as minor and major polypharmacy. As a result, a total of 138 definitions of polypharmacy and associated terms were obtained. There were 111 numerical only definitions (80.4% of all definitions), 15 numerical definitions which incorporated a duration of therapy or healthcare setting (10.9%) and 12 descriptive definitions (8.7%). The most commonly reported definition of polypharmacy was the numerical definition of five or more medications daily (n = 51, 46.4% of articles), with definitions ranging from two or more to 11 or more medicines. Only 6.4% of articles classified the distinction between appropriate and inappropriate polypharmacy, using descriptive definitions to make this distinction.	Polypharmacy definitions were variable. Numerical definitions of polypharmacy did not account for specific comorbidities present and make it difficult to assess safety and appropriateness of therapy in the clinical setting
Monteiro, L., Maricoto, T., Solha, I., Ribeiro-Vaz, I., Martins, C., & Monteiro-Soares, M. (2019)	Reducing Potentially Inappropriate Prescriptions for Older Patients Using Computerized Decision Support Tools: Systematic Review	Systematic review	More than half (n=10) of the studies were randomized controlled trials, one was a crossover study, and five were pre-post intervention studies. Computerized decision support tools consistently reduced the number of potentially inappropriate prescriptions started and mean number of potentially inappropriate prescriptions per patient. However, in several studies, statistical significance was not achieved. A meta-analysis was not possible due to the significant	Computerized decision support tools may reduce potentially inappropriate prescriptions and potentially inappropriate medications.

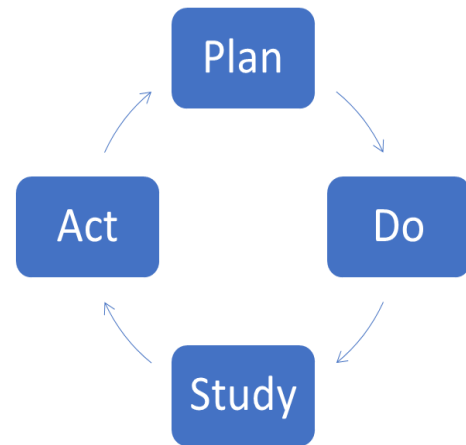
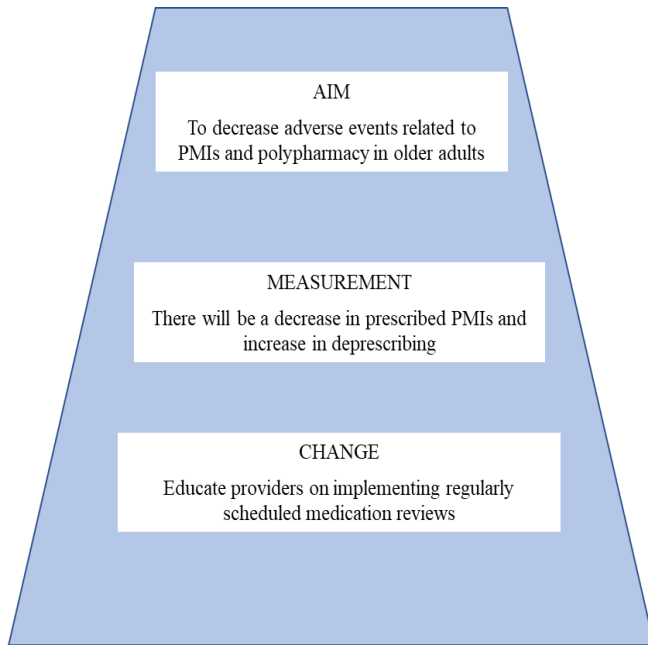
Author's Last Name (Pub Year)	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
			heterogeneity among the systems used and the definitions of outcomes.	
O'Mahony, D. (2020)	STOPP/START criteria for potentially inappropriate medications/potential prescribing omissions in older people: origin and progress	Systemic review	<p>Inappropriate prescribing (IP) is highly prevalent among older people in all clinical settings who experience multi-morbid illness which inevitably leads to polypharmacy.</p> <p>STOPP/START explicit IP criteria are designed to detect common and/or important potentially inappropriate medications (PIMs – STOPP criteria) and potential prescribing omissions (PPOs – START criteria).</p> <p>Two large-scale multi-center trials (SENATOR and OPERAM) examining the impact of software-generated STOPP/START criteria on incident ADRs and drug-related hospitalizations will report their findings in 2020.</p>	Five single-center clinical trials show that application of STOPP/START criteria significantly improves medication appropriateness, reduces medication cost, reduces falls, and diminishes incident adverse drug reactions
Payne, R. A. (2016)	The epidemiology of polypharmacy	Narrative review	Polypharmacy is an increasing and global concern effecting out-patient and inpatient care. Age and multi-morbidity play a large role in the increased rates of polypharmacy.	It is important for providers to understand this growing problem and who it effects in order to appropriately decrease the rates of polypharmacy.

Author's Last Name (Pub Year)	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
<p>Schiøtz, M. L., Frølich, A., Jensen, A. K., Reuther, L., Perrild, H., Petersen, T. S., Kornholt, J., & Christensen, M. B. (2018)</p>	<p>Polypharmacy and medication deprescribing: A survey among multimorbid older adults in Denmark</p>	<p>Qualitative study</p>	<p>Patients who fulfilled the inclusion criteria: age 65 years and above and having 10 or more prescribed medication on the day of their visit to one of the two out-patient clinics were included in the study.</p> <p>More than half of the participants (59, 59%) rated their health as fair or poor. The major part of the participants (93, 93%) reported that they felt that it was very easy or easy to talk about health issues with healthcare professionals and to follow guidance from healthcare professionals</p> <p>85% reported that they would be willing to stop taking one or more of their regular medications if their doctor told them they could do so</p>	<p>Most patients would prefer and benefit from deprescribing. Although many felt their medications were necessary, patient education on their medication may show patients are more open to deprescribing.</p>

Author's Last Name (Pub Year)	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
Verdoorn, S., Kwint, H. F., Blom, J. W., Gussekloo, J., & Bouvy, M. L. (2019)	Effects of a clinical medication review focused on personal goals, quality of life, and health problems in older persons with polypharmacy: A randomised controlled trial (DREAMeR-study)	RCT	<p>Participants were community-dwelling older persons (greater than or equal to 70 years) with polypharmacy (greater than or equal to 7 long-term medications). Over 6 months, in the intervention group, HR-QoL measured with EQ-VAS increased by 3.4 points (95% confidence interval [CI] 0.94 to 5.8; $p = 0.006$), and the number of health problems with impact on daily life decreased by 12% (difference at 6 months -0.34; 95% CI -0.62 to -0.044; $p = 0.024$) as compared with the control group. There was no significant difference between the intervention group and control group for HR-QoL measured with EQ-5D-5L (difference at 6 months = -0.0022; 95% CI -0.024 to 0.020; $p = 0.85$) or total number of health problems (difference at 6 months = -0.30; 95% CI -0.64 to 0.054; $p = 0.099$). Compared to the control group, in the intervention group, the total number of long-term medications decreased with -0.32 medications after 6 months ($\beta = -0.054$ per month; 95% CI -0.094 to -0.014; $p = 0.008$). A mean number of 1.7 (SD 1.7) drugs per patient was added in the intervention group compared to 1.4 (SD 1.7) drugs in the control group ($p = 0.011$); a mean number of 1.5 (SD 1.5) drugs was stopped in the intervention group compared to 1.0 (SD 1.3) in the control group ($p < 0.001$).</p>	Comprehensive medication reviews allow for decreased in medication associated health problems and reduce the number of prescribed medications.

Author's Last Name (Pub Year)	Title of Publication	Type of Study	Main Outcomes or Findings	Support for and or link to project
Walker, B. S., Collier, B. R., Bower, K. L., Lollar, D. I., Faulks, E. R., Matos, M., Nussbaum, M. S., & Hamill, M. E. (2019)	The prevalence of beers criteria medication use and associations with falls in geriatric patients at a level 1 trauma center	Longitudinal study	Multivariate logistic regression analyses were used to calculate odds ratios of falls for specific PIMs. In all, 2181 patients met the inclusion criteria. Overall, 71.2 per cent of geriatric trauma patients were prescribed at least one PIM-73.1 per cent of falls compared with 68.6 per cent for other mechanisms. Specific PIM use varied by age group. PIMs associated with fall risk in all patients included antipsychotics, benzodiazepines, and diclofenac. For those aged 65 to 74 years, antihistamines, diclofenac, proton pump inhibitors, and promethazine were associated. In those aged 75 to 84 years, alprazolam, antipsychotics, benzodiazepines, cyclobenzaprine, diclofenac, and muscle relaxants were implicated. No significant associations were found for patients aged ≥ 85 years.	Geriatric falls were associated with using ≥ 1 PIM and multiple specific PIMs implicated.
Weiss, B. D., Brega, A. G., LeBlanc, W. G., Mabachi, N. M., Barnard, J., Albright, K., Cifuentes, M., Brach, C., & West, D. R. (2016)	Improving the Effectiveness of Medication Review: Guidance from the Health Literacy Universal Precautions Toolkit	Mixed method (controlled before and after with qualitative interviews)	Conducting "brown bag" reviews of patient medications at primary care visits resulted in an increase of medication reviews and double the number of identified problematic drug therapies. This in turn increased the percentage of revisions of medication therapies.	Simple interventions such as the brown bag review can decrease polypharmacy rates and potentially inappropriate medications without impacting clinic costs or resources.

APPENDIX H:
OTHER DOCUMENTS AS APPLICABLE TO THE PROJECT (PDSA CYCLE FOR
IMPROVEMENT)



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