Implementation of a Post-Fall Medication Reconciliation Assessment Tool

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Abstract

Older adult patients are often prescribed potentially inappropriate medications (PIMs) in the acute care hospital setting. Reducing falls in older adults requires a multi-faceted approach, including thoughtful consideration of medication regimens in this at-risk population. Two medical units in a Charlotte-area hospital experienced a combined 47 falls in older adult patients out of 97 total falls in 2019. Without a process to address PIMs, the Doctor of Nursing Practice project team developed the Post-Fall Medication Reconciliation Assessment Tool. The tool was used specifically for patients 65 and older who fell on Unit A or Unit B to evaluate for PIMs administered within 24 hours of their falls, based on comparing their medication records with the 2019 Beers Criteria. After identification, the nurses were instructed to communicate with the patient's physician to consider PIM discontinuation. During the 11-week implementation phase, 11 falls occurred on the two units, and only 10% of the tools were fully completed. However, for each patient that fell, they were administered an average of 2.4 medications that matched the Beers Criteria. Only one tool indicated a conversation occurred between a nurse and physician. While the project did not directly eliminate PIMs in these older adult patients, there is evidence in the literature that reducing PIMs can improve patient outcomes, reduce health care expenditures, and enhance patient care.

Keywords: older adults, potentially inappropriate medications, patient falls, medication reconciliation

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Section I. Introduction

Background

Significant improvements have been made in preventing falls in the acute care hospital setting. However, various factors contribute to patient falls, which requires multi-faceted approaches to fall risk reduction (Health Research & Educational Trust, 2016). There are vast amounts of information on fall prevention, yet "between 700,000 and 1,000,000 people fall in U.S. hospitals each year" (Health Research & Educational Trust, 2016, p. 4). Most falls occur in the older adult population, and complicated interactions between underlying co-morbidities and medications predispose this population (Patient Safety Network, 2019). Falls are associated with extended hospitalizations, loss of independence, and increased morbidity and mortality (Fritsch & Shelton, 2019). Medications that increase fall risk and polypharmacy are major modifiable risk factors in the older adult population (Ryan-Atwood et al., 2017). Potentially inappropriate medications (PIMs) are associated with adverse events, especially falls (Masumoto et al., 2018).

Organizational Needs Statement

The setting was a 220-bed acute care hospital in the piedmont region of North Carolina ([redacted], personal communication, April 2, 2020). The project focused on two units, called Unit A and Unit B, in the hospital with a higher incidence of patient falls. These units treated similar medical patients with acute and chronic conditions. These medical conditions include, but were not limited to, infections, potential cerebrovascular accidents, altered mental status, and drug/alcohol withdrawal. In 2018, Unit A experienced 46 patient falls, and Unit B experienced 52 patient falls ([redacted], personal communication, April 9, 2020). Members of the hospital's Falls Reduction Action Team committee made significant strides in reducing falls throughout the facility. Bed alarm sensitivity, low-to-the-ground beds, chair alarms, virtual patient observation,

gait belts, and frequent rounding were some of the fall-reduction initiatives implemented throughout the hospital. The organization also recognized “the best predictor for an increased risk of falls is a history of falls” (Jin, 2018, para.1).

The ongoing focus on minimizing patient falls in the hospital led the organization to consider additional contributing factors. Specific factors that contribute to falls include PIMs and polypharmacy. Older adult patients, individuals 65 years of age and older, were commonly admitted to Units A and B. Of the 37 falls on Unit A in 2019, 16 occurred in older adult patients ([redacted], personal communication, April 9, 2020). Comparably, 31 of the 60 falls on Unit B in 2019 occurred in the same patient population ([redacted], personal communication, April 15, 2020). A designated pharmacist assessed the patient’s medication history for benzodiazepine and diuretic prescriptions for any patient who fell in the hospital. However, the review typically occurred weeks after the patient was discharged from the hospital ([redacted], personal communication, April 9, 2020). Between October and December 2019, 50% of the patients 65 years and older who fell on Units A and B were administered at least one medication on the Beers Criteria within the 24 hours preceding their falls ([redacted], personal communication, July 23, 2020).

Unfortunately, there were no specific metrics for decreasing PIMs among older adults in the acute care hospital setting. The Centers for Medicare & Medicaid Services (CMS) did not provide a national benchmark for this issue. While Healthy People 2020 did not address polypharmacy, Healthy People 2030 included a general objective to decrease inappropriate medication use in older adults (Secretary’s Advisory Committee, 2019). The National Quality Strategy and CMS recognized that falls were a significant safety issue that required quality

improvement (QI) in the acute care setting (Centers for Medicare & Medicaid Services [CMS], 2020).

The project addressed all three components of the Triple Aim. Implementing the Post-Fall Medication Reconciliation Assessment Tool allowed for timely recognition of PIMs in older adult patients. The tool was transferrable yet patient-centered, safe, and equitable. The project focused on an at-risk population that benefited from a novel risk-reducing strategy in the acute care setting. Lastly, by addressing PIMs in patients who fell in the hospital and subsequently deprescribing medications, the hospital can decrease healthcare costs for the patients, families, and organization (Lewis, 2014).

Problem Statement

Older adults often experience polypharmacy and are commonly prescribed PIMs. Consequently, these individuals are at a higher risk for initial and subsequent falls in the acute care hospital setting.

Purpose Statement

The purpose of this QI project was to implement a medication reconciliation assessment tool in conjunction with the current Post Fall Huddle Report to evaluate for PIMs in older adult patients. The tool was utilized on two units that treated patients with similar medical conditions in an acute care hospital. Implementation included monitoring registered nurse compliance with the medication reconciliation assessment tool for patients 65 years of age or older that fell on their respective units. Additionally, the tool prompted nurses to communicate the identified PIMs with the physicians, leading to PIM discontinuation in older adult patients who fell on these two units.

Section II. Evidence

Literature Review

The search strategy focused on compiling peer-reviewed articles from various databases. The initial search used four keywords or concepts related to implementing a medication reconciliation tool for older adult patients in the acute care hospital setting. The keywords included older adults, polypharmacy, medication reconciliation tool, and acute care, as well as synonyms to these keywords. Several limits were placed on the search, which consisted of only full-text references, the English language, a published date between 2016 and 2020, and subjects 65 years of age or older. After applying these limits and using appropriate Boolean operators, the searches in PubMed, ProQuest, and Ovid MEDLINE generated 70 total records. Of the 70 documents, 11 articles were retained based on participant age, study setting, and applicability.

The keyword/concept of a medication reconciliation tool was subsequently substituted with a different keyword, post-fall. The three keywords of older adults, polypharmacy, and acute care were then combined with post-fall, as well as relevant synonyms. These search terms, along with the same limits and Boolean operators, were applied in PubMed, Ovid MEDLINE, and Cumulative Index to Nursing and Allied Health Literature Plus to generate 226 additional records. After assessing these results for participant age, study setting, and applicability, nine new articles met the criteria. If the databases permitted narrowing the search based on the level of evidence, such as clinical trials or systematic reviews, this was included as an additional limiting factor. Based on Melnyk and Fineout-Overholt's (2019) hierarchy of evidence, only articles with a level IV or higher met the final inclusion criteria. Nevertheless, the final records were examined for appropriateness based on a review of each article's abstract, objectives, design, results, and discussion sections (see Appendix A).

Current State of Knowledge

Polypharmacy among the older adult population is a highly prevalent issue in health care. Consequently, polypharmacy increases the likelihood of potentially inappropriate medications (PIMs) or medications that are less beneficial to the patient and can potentially cause adverse drug reactions (ADRs) (Thillainadesan et al., 2018). Therefore, research on deprescribing efforts is gaining popularity. Deprescribing encompasses a plan by the health care provider and the patient to safely withdraw PIMs in a setting of polypharmacy (Thillainadesan et al., 2018; Thompson et al., 2019). Fortunately, clinicians and providers can use validated instruments to address and reduce inappropriate medications among older adult patients. A systematic review of nine randomized controlled trials (RCTs) determined that deprescribing interventions aimed at hospitalized older adults appear safe and practical (Thillainadesan et al., 2018).

Screening tools and validated instruments that target PIMs are either implicit or explicit (Rankin et al., 2018). An implicit tool is inherently judgment-based, where a clinician or provider assesses the quality and appropriateness of a patient's medication regimen. While an implicit tool is often time-consuming, it allows a clinician to use their expertise and knowledge of the patient's condition and medical history to decide the appropriateness of medications (Urfer et al., 2016). There are no standardized, validated implicit tools, but they are flexible and typically led by a physician or pharmacist. In contrast, explicit tools provide specific lists of medications based on drug or disease classes that should be avoided in older adult patients (Rankin et al., 2018; Urfer et al., 2016). The most familiar and widely published explicit screening tools include Beers Criteria and the Screening Tool of Older Person's Prescriptions (STOPP)/Screening Tool to Alert doctors to the Right Treatment (START) criteria (Hill-Taylor et al., 2016; Kimura et al., 2017; Rankin et al., 2018).

Controlled trials have assessed implicit and explicit tools in the acute care setting. Researchers evaluating interventions to detect PIMs and deprescribing in older adult patients tend to focus on patients' medication regimens upon hospital admission and discharge (Urfer et al., 2016; Van der Linden et al., 2017). For instance, Urfer et al. (2016) assessed the impact of a checklist on reducing PIMs prescribed at discharge. Van der Linden et al. (2017) evaluated for PIMs on admission and the number of medications discontinued by discharge. However, there does not appear to be an RCT or quasi-experimental study that assesses implementing a deprescribing tool shortly after a patient falls in the acute care setting.

Some studies assess the occurrence of PIMs and ADRs, including falls, among older adult patients hospitalized with polypharmacy (Fahrni et al., 2019; O'Connor et al., 2016). In a study by Fahrni et al. (2019), 92 of the 301 older adult patients had at least one PIM identified by the STOPP criteria. Additionally, the authors determined a positive correlation between PIMs and ADRs (Fahrni et al., 2019). Similarly, in a quasi-experimental study by O'Connor et al. (2016), 89 ADRs occurred in the control group compared to 45 ADRs in the intervention group when the STOPP/START criteria were applied to medication histories within two days of hospital admission.

Current Approaches to Solving Population Problem(s)

Reducing polypharmacy and the prevalence of PIMs in hospitalized older adult patients is possible with various interventions. Cossette et al. (2017) conducted a study with 231 hospitalized older adult patients to assess whether a computerized alert system could aid in decreasing PIM use. The automated system, when combined with physician and pharmacist analyses, "resulted in a significant drug cessation and dosage decrease" compared to the control group (Cossette et al., 2017, p. 1241). Similarly, a non-randomized controlled trial by McDonald

et al. (2019) determined an automated clinical decision support tool, MedSafer, increased the percentage of older adult patients with at least one PIM discontinued upon hospital discharge. Dalton et al. (2018) performed a systematic review using eight databases to evaluate the efficacy of using computerized interventions for reducing PIMs in hospitalized older adults. While considering the heterogeneity of the studies, the authors determined that five of the eight studies with computerized interventions resulted in statistically significant reductions in PIM prescriptions. Utilizing a computerized assessment tool for identifying PIMs and alerting providers of their occurrence is valuable, yet this approach is not necessarily feasible for smaller quality improvement (QI) projects.

Pharmacists can also lead deprescribing efforts in the acute care setting. Gutiérrez-Valencia et al. (2019) examined a clinical pharmacist-based intervention in an acute geriatric unit. Upon admission to the hospital, the pharmacist reviewed the older adult patient's medication history and performed the standard geriatric assessment (Gutiérrez-Valencia et al., 2019). This pharmacist-led intervention resulted in a 10.2% reduction in polypharmacy and a 19.2% reduction in patients meeting the STOPP criteria at discharge. A prospective controlled trial by Van der Linden et al. (2017) investigated the impact of a pharmacist-led older adult medication review using the Rationalization of Home Medication by an Adjusted STOPP in Older Patients (RASP) list. Following their application of the RASP list to admitted older adults' home medications, the pharmacists discussed their expert opinions with the physicians. The unique intervention resulted in a greater reduction of PIMs, based on RASP criteria, than in the control group. Similarly, a clinical pharmacist intervention conducted by Van der Linden et al. (2019) elicited a three times greater reduction in RASP PIMs in the intervention group when compared to usual care.

Lastly, explicit criteria are vital tools in reducing polypharmacy and PIMs. The PIM-Check is a validated online program used to assess PIMs in hospitalized internal medicine patients (Blanc et al., 2018). The PIM-Check detected nearly three times the number of PIMs than the STOPP/START criteria. However, approximately 50% of these medications did not require adjustment in the clinical context. A quasi-experimental study by O'Connor et al. (2016) proved that applying the STOPP/START criteria for older adult patients within 48 hours of admission resulted in a significant reduction in ADRs during their hospitalizations. Additionally, the American Geriatrics Society routinely updates the Beers Criteria every three years, and the most recent version was published in 2019 (American Geriatrics Society [AGS], 2019). Two cross-sectional studies conducted in China determined that the Beers Criteria was more sensitive and detected a higher number of PIMs than the STOPP criteria (Li et al., 2017; Ma et al., 2019). While explicit tools vary in design and presentation, implementing Beers Criteria at the bedside, in post-fall situations, appears reasonable for detecting PIMs and prompting deprescribing.

Evidence to Support the Intervention

Due to the limited number of RCTs on deprescribing interventions and heterogeneity among these RCTs, it is challenging for systematic reviews and meta-analyses to determine the most efficacious intervention(s) (Thillainadesan et al., 2018). For instance, how the STOPP/START criteria are implemented drastically affects outcomes and can produce inconsistencies (Hill-Taylor et al., 2016). A systematic review by Thillainadesan et al. (2018) suggested that deprescribing interventions appear safe and can reduce PIMs in hospitalized older adults. These explicit tools can help "guide deprescribing of a specific medication or medication class" (Thompson et al., 2019, p. 178). Identifying PIMs and deprescribing in the acute care hospital can be based on the Beers Criteria. This explicit tool aims to improve the care and

medication selection for adults 65 and older (AGS, 2019). A medication review will allow bedside nurses to assess for PIMs in older adult patients who experience a fall in the hospital. The intervention will also facilitate communication between the bedside nurses and attending physicians. Ultimately, the physicians will choose to continue or deprescribe the identified medications for these patients. This approach applies an explicit tool to improve medication review and safe drug discontinuation (Van der Linden et al., 2017).

Evidence-Based Practice Framework

The project focused on continual improvement by utilizing the Plan-Do-Study-Act (PDSA) Cycle (The W. Edwards Deming Institute, 2020). The PDSA Cycle is a conceptual framework intended to assess the progress of a service or process through a series of four steps. The first phase is the Plan step, where the project's purpose, such as identifying PIMs in older adult patients, is determined. Implementing the post-fall medication reconciliation tool occurred in the Do step. Next, data and outcomes were measured in the Study step, thus prompting a review of initial project successes and failures. The cycle concluded with the Act step, where the findings led to changes in design, implementation, and evaluation. Consequently, the PDSA Cycle aims to repeat the four steps through ongoing assessment and improvement, where completed cycles lead to new cycles. Since this project started small on two units, the PDSA Cycles guided changes throughout implementation.

Ethical Consideration & Protection of Human Subjects

The project aimed to include all older adult patients who experienced falls on Units A and B. Each patient required an in-depth medication profile audit, via a review of the electronic medication administration record, at the time of the fall. The only necessary individual data included patient age and sex. Therefore, protected health information and personal identifiers

were not required or necessary for successful implementation and evaluation. Aggregate data was reported upon project completion. The target population was not expected to experience any harm as a direct result of the intervention. Additionally, each patient's medication profile was evaluated equitably.

The initial preparation for the formal approval process necessitated completing the web-based Collaborative Institutional Training Initiative modules in association with the hospital and university. Next, the hospital's Doctor of Nursing Practice (DNP) council required the project lead to submit a standardized QI Project Summary. The DNP council approved the project topic, based on the QI Project Summary, and forwarded the proposal to the hospital's Institutional Review Board (IRB). The IRB determined the project was evidence-based practice and QI rather than research. The university review process began after receiving the hospital's official IRB approval. The first step for the university review was completing the QI Program Evaluation Self-Certification assessment for faculty approval. After faculty approval, the QI Program Evaluation Self-Certification was submitted to the university, where it was determined the project did not require further IRB review.

Section III. Project Design

Project Site and Population

The quality improvement (QI) project was conducted on two medical units within the same acute care hospital. The hospital was a not-for-profit acute care facility associated with a major health system in the piedmont region of North Carolina.

Description of the Setting

The QI project was implemented on two similar medical units. Unit A had 34 inpatient beds, and Unit B had 41 inpatient beds, respectively. Units A and B provided care for general medical telemetry patients with chronic diseases. However, Unit A also provided care for patients with neurological disorders, such as transient ischemic attacks and cerebrovascular accidents. Both units had staff consisting of nursing assistants, registered nurses, and clinical supervisors.

The patient population and total bed capacity on these units supported adequate numbers for data collection. Each registered nurse on Units A and B typically cared for five to six patients. Additionally, Unit B was a dedicated unit for patients with COVID-19, while Unit A received fewer positive cases. Fortunately, these units had clinical supervisors readily available to assist with QI measures.

Description of the Population

The QI project focused on older adult patients, individuals 65 years and older, who fell on Units A and B. Older adult patients are at a higher risk of taking potentially inappropriate medications (PIMs), contributing to an increased risk of falls in the hospital setting. Units A and B experienced a larger number of falls than most units in the hospital, so this likely impacted the project implementation phase. While falls occur in patients of all ages, the tool was only

intended for use in older adults, regardless of their admitting diagnoses and underlying health conditions. However, patients were excluded from the project if they were receiving hospice or comfort care.

Project Team

The Doctor of Nursing Practice (DNP) project team consisted of a project lead, DNP faculty advisor, site champion, nurse manager for Unit B, and DNP council mentor. The project lead was a student who collaborated with the site champion to determine the QI project topic. The project lead was responsible for planning the project and compiling and organizing data during the implementation phase. Subsequently, the project lead analyzed the data and presented the completed project to the academic institution and project site. The DNP faculty advisor assisted in project development, oversight, and review. As the nurse manager of Unit A, the site champion supervised daily operations on the unit, arranged communication among project team members, and facilitated project implementation. Management changed on Unit B in late summer 2020, but the new nurse manager was instrumental in designing and implementing the project. The DNP council mentor aided in project development and worked as a liaison between the organization's DNP council and project lead. The project team collaborated with the attending physicians on Units A and B, who were hospitalists.

Project Goals and Outcomes Measures

The purpose of this QI project was to evaluate the number of PIMs in older adult patients who fell on two units within the hospital. Project outcomes included nursing compliance with the Post-Fall Medication Reconciliation Assessment Tool, identification of PIMs based on the 2019 Beers Criteria, communication between nurses and physicians regarding the identified PIMs, and subsequent medication discontinuation.

Description of the Methods and Measurement

The Post-Fall Medication Reconciliation Assessment Tool was a separate document attached to the current Post Fall Huddle Report, a standard form used throughout the hospital after a patient fall. The Post-Fall Medication Reconciliation Assessment Tool allowed nurses to record the patient's PIMs when a medication on their medication administration record was also listed on the 2019 Beers Criteria. Additionally, the tool prompted the nurse to initiate a conversation with the patient's attending physician to discuss the identified PIMs and promote medication discontinuation (see Appendix B). Each paper copy of the Post-Fall Medication Reconciliation Assessment Tool was sequentially numbered for anonymity and reference purposes. The completed tool remained attached to the Post Fall Huddle Report as these documents were stored in two separate binders, one on each unit. Each binder was secured in the locked clinical supervisors' offices on Units A and B. All necessary project data was obtained from these hard copies (see Appendix B).

The Plan-Do-Study-Act (PDSA) cycle served as the operational tool to test and evaluate changes on a small scale. The PDSA cycles encouraged routine project evaluation and analysis. During the review process, data was recorded on one Excel spreadsheet for analysis (see Appendix C). Data analysis included descriptive statistics with frequencies and percentages.

Discussion of the Data Collection Process

The project lead initially visited the project site every two weeks. These visits included meetings with the site champion, reviews of the Post-Fall Medication Reconciliation Assessment Tool, data collection, and retrieval of documents from the clinical supervisors' offices. However, following week two through the conclusion of implementation, the project lead decided to conduct these processes weekly rather than bi-weekly. Lastly, the project lead recorded the data

elements on an Excel spreadsheet without patient identifiers. The spreadsheet was stored on the project lead's personal, password-protected computer.

Implementation Plan

The project lead started implementation by recording an educational presentation via PowerPoint. The presentation included information on the project's purpose, the importance of identifying PIMs with the Beers Criteria, and how to complete the Post-Fall Medication Reconciliation Assessment Tool. Initially, the project lead distributed the presentation to the charge nurses and clinical supervisors on Units A and B. However, by week six of implementation, the project lead sent the presentation via email to all registered nurses on both units. The project lead, site champion, and DNP faculty participated in bi-weekly project management meetings. The PDSA cycles, which consisted of data evaluation and staff feedback, were conducted bi-weekly throughout the 11-week implementation period.

Timeline

The implementation phase officially began on September 1, 2020 and concluded on November 24, 2020. Appendix D depicts the entire project timeline from pre-implementation planning to the dissemination of project findings on April 6, 2021.

Section IV. Results and Findings

Results

The project lead measured the number of falls in patients 65 years and older on Unit A and Unit B and identified the number of medications administered within 24 hours of the falls listed on the 2019 Beers Criteria. Additionally, the project lead used the Post-Fall Medication Reconciliation Assessment Tool to assess whether the nurses had conversations with the attending physicians regarding the identified potentially inappropriate medications (PIMs). Lastly, the project lead evaluated the number of PIMs discontinued after nurses had conversations with the physicians.

The Plan-Do-Study-Act (PDSA) cycle was used as the operational tool to address project concerns throughout the implementation phase. This Doctor of Nursing Practice project consisted of four PDSA cycles, each occurring approximately two weeks apart. The first cycle occurred two weeks after the start of implementation. During this cycle, the project lead decided to visit and collect data at the project site every week rather than the planned bi-weekly visits. Cycle two occurred nearly five weeks into implementation when the project lead focused on expanding the education to include all registered nurses on Units A and B. After reviewing data and discussing findings with nurses, it was apparent the Post-Fall Medication Reconciliation Assessment Tool needed clarification and simplification. Therefore, two weeks later, the tool was revised and redistributed to both units in PDSA cycle three. The fourth and final PDSA cycle started in week nine. During this time, the project lead designed and posted an educational flier on both units with simple tips and reminders for successful tool completion.

Outcomes Data

The project lead utilized descriptive statistics, including frequencies and percentages, for data analysis. Unit A had six falls, while Unit B had five falls in the target population during the 11-week implementation phase. Out of the 11 falls, 10 tools were submitted with the accompanying Post-Fall Medication Reconciliation Assessment Tool attached. Unfortunately, only 1 out of the 10 tools was fully completed, indicating the nurse communicated with the physician regarding the identified PIMs. The project lead expected an average of two PIMs administered during the 24 hours leading up to the falls. Based on an analysis of the five tools that included a medication profile review, an average of 2.4 PIMs matched the Beers Criteria. The most PIMs identified on the Post-Fall Medication Reconciliation Assessment Tool were three PIMs, which occurred in three patients. Additionally, one PIM was identified on a single tool, and two PIMs were recognized on another tool. Six of the tools, including one missing document, did not address the patient's medication profile review (see Appendix E).

The project lead anticipated the results would include several PIMs being discontinued following discussions with the attending physicians. However, only one-time doses of medications were discontinued, which is an automated process in the electronic health record. Unfortunately, there were zero regularly scheduled, or as-needed medications discontinued because of the Post-Fall Medication Reconciliation Assessment Tool. The project lead expected multiple fully completed tools, indicating the nurse communicated with the physician regarding these medications within 24 hours post-fall, yet only 10% (1) of the tools submitted met these criteria.

Discussion of Major Findings

There were a few gaps between what the project lead expected and the project's actual results. While the project lead anticipated the physician to discontinue the identified PIMs following a conversation with the nurse, the only discontinued medications were one-time orders. Therefore, these medication orders were automatically stopped after a single administration. Only one conversation occurred between a nurse and physician regarding the PIMs, but zero medications were discontinued from implementing the Post-Fall Medication Reconciliation Assessment Tool. The lack of interprofessional conversations is multi-faceted. Based on limited staff feedback, it appeared that time constraints, inadequate hand-off between shifts, and nursing judgment likely contributed to deficiencies in successful tool completion.

Section V. Interpretation and Implications

Cost-Benefit Analysis

Overall, the project had a minimal financial burden on the organization as it did not require new equipment, software, or staffing. One of the largest project costs was developing the Post-Fall Medication Reconciliation Assessment Tool. Based on the seven hours it took to create and revise the tool, this component alone would have cost the organization $231 (see Appendix F). The initial tool design was an integral part of creating educational materials, presentations, and documentation for Units A and B. While the project lead created the tool free of charge, formal integration into the electronic health record or further adaption will likely require added financial resources.

Another financial implication for the project was printing the tool and Beers Criteria in color and laminating these documents. Secondly, developing staff education materials was another free component of the project since the project lead created and edited the presentation for the nursing staff. However, staff education is intricate and requires ongoing evaluation. The timing of educational sessions requires thoughtful consideration because if staff are required to participate in training outside of regularly scheduled work hours, there are additional financial implications for the organization. If education is conducted via a huddle or in-service presentation, this may reduce overall costs. Lastly, time was another critical component in terms of reviewing the falls data for participating units on a weekly or bi-weekly basis. The nurse who resumes the project lead's responsibilities will likely add this time to their traditional work schedule. The estimated overall project budget, in its current format, is $700 (see Appendix F).

The quality improvement (QI) project can easily benefit the organization by examining prescribing practices for older adults in the hospital setting. Not only will physicians and

providers be more cautious of prescribing potentially inappropriate medications (PIMs) in an at-risk population, but they should be made aware of the likelihood of patients taking PIMs upon hospital admission. Similarly, nurses are often familiar with the Beers Criteria, but they may be unfamiliar with the specific medications and pharmacologic categories within the guidelines. Increasing nurses' and providers' knowledge can improve patient care and outcomes, both financially and clinically, by identifying patients with a higher risk of falls.

The organization had a good return on its investment because of the minimal financial costs related to project development and implementation. The project enhanced the current post-fall process used throughout the hospital by incorporating a pertinent medication review for older adults. Consequently, identifying PIMs in older adult patients may have significant financial implications for the organization. Depending on the severity, a single fall in a hospitalized patient can cost anywhere between $1,139-$30,931 (Spetz et al., 2015). Older adults often face managing several chronic conditions on fixed incomes, with an increased burden on drug expenditures (Health Policy Institute, n.d.). While the average adult spends $177 annually for the out-of-pocket cost of prescription medications, older adults' prescription out-of-pocket spending is significantly higher at $456 to $530 annually. Patients who fall are at a greater risk for future falls. Therefore, identifying and alleviating risk factors, including PIMs, can contribute to significant patient and organizational savings with time, resources, and expenses.

Resource Management

The organization was in a great position to achieve successful project outcomes. The nursing staff were aware of the organization-wide fall prevention initiative that highlighted the importance of identifying patients with fall risk factors and reducing the incidence of falls. Similarly, the organization used a standardized Post Fall Huddle Form, where the patient care

nurse described the patient's fall risk factors, details surrounding the event, and potential areas of improvement. Each unit collected these Post Fall Huddle Forms in a designated binder for periodic review by the hospital's Falls Reduction Action Team (FRAT) committee. The nurse managers for Units A and B were instrumental throughout the project as they provided experience and knowledge with QI and the Beers Criteria.

Under normal circumstances, the organization conducts extensive in-person education sessions and meetings for staff members in the hospital's conference room. However, hospital administration strongly discouraged in-person meetings throughout the COVID-19 pandemic. In-person meetings may have enhanced staff compliance along with successful tool completion on both units. As an alternative, virtual meetings were highly promoted as an option for communicating with large groups. Staffing issues, burnout, and personal or family obligations created logistical problems for conducting meetings outside of work that could adequately accommodate employees' schedules. It is highly likely the organization can utilize virtual meetings with bedside nurses, clinical supervisors, and nurse managers to improve education and engagement surrounding the QI project. It is crucial to consider the additional financial cost of educating staff with virtual meetings, as some individuals may participate in education outside of their regular work hours. Interprofessional communication should progress throughout the organization with dedicated collaborative opportunities between pharmacists, providers, and nurses regarding prescribing practices. The organization also has the technological resources and personnel to enhance the current electronic health record with post-fall documentation and identifying PIMs.

Implications of the Findings

While the DNP project did not produce much data, it did provide valuable insight into various aspects of patient care. Patients rely on evidence-based practices and QI initiatives to improve the quality of health care. Identifying PIMs and addressing inappropriate prescribing in hospitalized older adults, with the help of registered nurses and providers, can reduce health care expenditures, reduce adverse events, and enhance overall patient experiences.

Implications for Patients

The project data revealed that older adult patients who fall in this hospital are consistently given PIMs within 24 hours of their falls. Patients expect physicians to review their medication profiles and assess for inappropriate medications, regardless of admitting diagnoses. By recognizing PIMs in the hospital, nurses and providers can reduce patient complications and adverse events. While patients may not consider the risks associated with medications, patients are the cornerstone of the Triple Aim. Addressing inappropriate medications in older adults can reduce patients' pill burden, morbidity and mortality, risk of falls or subsequent falls, and health care expenses. Increasing registered nurse and provider awareness of PIMs and their increased risk for adverse events may improve patient education and overall patient satisfaction.

Implications for Nursing Practice

One of the cornerstones of nursing practice is providing safe care. Therefore, nurses should have the ability to quickly review the Beers Criteria and understand how to apply the guidelines to patients' medication profiles. Specifically, the Beers Criteria is an excellent explicit tool for identifying PIMs that may contribute to adverse events in older adult patients, including those without histories of falls. Similarly, nurses need to consider the impact PIMs can have on patients throughout the care continuum. Patients may enter or leave the hospital with a variety of

PIMs. Lastly, it appears that nurses are identifying PIMs with the Post-Fall Medication Reconciliation Assessment Tool, but they are not communicating these findings with the attending physicians. Enhancing communication between nurses and providers may positively influence health care delivery throughout the acute care setting.

Implications for Healthcare System

The project findings highlight the need to assess for PIMs in every older adult admitted to the hospital. While it is necessary to evaluate PIMs after a patient falls in the hospital, it may be prudent to address PIMs during the provider's initial medication reconciliation process. Falls remain a critical patient safety issue in the acute care setting. Time constraints, staffing concerns, and patient acuity may interfere with successful Post-Fall Medication Reconciliation Assessment Tool completion, but this intervention closely aligns with the Triple Aim. Eliminating unnecessary prescriptions in older adult patients can reduce the risk of polypharmacy and iatrogenic complications while improving a population's health. Patient falls are serious events that may negatively impact hospital reimbursement, increased length of stays, and patient outcomes. With the increasing complexity of medical care, interprofessional communication is now more important than ever. Having a physician representative from the hospitalist team on the FRAT committee may encourage collaboration and effective communication between nurses and providers.

Sustainability

The organization plans to continue using the Post-Fall Medication Reconciliation Assessment Tool, in conjunction with the Beers Criteria, on Unit A and Unit B. There are minimal financial costs to continue this intervention in its current format since it does not require additional staff, supplies, or software. The project lead agreed to allow the organization to

continue utilizing the revised Post-Fall Medication Reconciliation Assessment Tool for patients 65 and older. Each unit is required to have a fall champion who reports to the hospital's FRAT committee. In 2020, the organization determined one clinical supervisor from each unit would serve as their unit's fall champion for the committee. This committee discusses data trends, implementing fall risk-reducing strategies, and educating staff on important fall updates. The fall champion is currently responsible for reviewing the Post Fall Huddle Form and presenting at the FRAT committee meetings. Therefore, each unit's fall champion is in the best position to resume the project lead's responsibilities and gather data on a weekly or bi-weekly basis. The fall champion can provide ongoing staff education regarding the Post-Fall Medication Reconciliation Assessment Tool and Beers Criteria through in-services, brochures, and emails.

Dissemination Plan

The dissemination plan started with the project lead participating in a virtual presentation for the project site's DNP Council on the afternoon of March 24, 2021. Attendees included the site champion, nurse manager from Unit B, DNP council mentor, and fellow DNP Council members. The project lead also presented virtually at the university's DNP Project Poster Presentation on April 6, 2021. Furthermore, the project lead submitted the final DNP paper to the university's Scholarly Repository for public access by April 26, 2021. The project lead aims to submit an abstract for publication to the Journal of the American Geriatrics Society. It is an organization dedicated to improving the care of older adults and is responsible for publishing the Beers Criteria. An additional consideration is submitting an abstract to the Joint Commission Journal on Quality and Patient Safety since this publication focuses on advancing health care quality.

Section VI. Conclusion

Limitations

The most significant barrier encountered throughout the Doctor of Nursing Practice (DNP) project was the COVID-19 pandemic. The pandemic led to increased registered nurse turnover, higher patient acuity, and greater staffing issues at the project site for several months. The planning and implementation stages were completed during this pandemic, which added to the project's complexity. Therefore, one of the project limitations included the inability to provide in-person education to the nursing staff on Unit A and Unit B before implementation. Instead, the project lead recorded a PowerPoint presentation that briefly described the quality improvement (QI) project. He initially emailed the presentation to the charge nurses and clinical supervisors on both units. In retrospect, the presentation should have been distributed to all nursing staff on both units to inform everyone about the project expectations.

Another significant limitation was the small amount of data collected during the implementation phase. Fortunately, this was an expected occurrence as the project lead and project team members did not want any patient falls. There was also a narrow window for data collection as the implementation phase was only 11 weeks. An extended implementation may have provided additional data and insight. Unit B also hired a new nurse manager in late summer 2020. The project lead planned to begin the Post-Fall Medication Reconciliation Assessment Tool on both units simultaneously, but the new hire resulted in a three-week delay to project implementation.

Recommendations for Others

This DNP project can be replicated in a variety of situations. However, the best outcomes will likely occur at a project site that routinely serves older adult patients, such as an acute care

hospital. The project would be most beneficial for areas that commonly experience falls in older adult patients rather than those younger than 65. The project site or organization should already have processes and policies in place that require fall-risk assessments and allow nurses to evaluate falls in real-time. Additionally, if the organization currently has a method for assessing older adult patients' medications, this QI project may be redundant. One component this DNP project lacked was integrating the Post-Fall Medication Reconciliation Assessment Tool and Beers Criteria into the electronic health record (EHR). There are additional financial and labor costs to implementing EHR changes, but nurses and providers may experience increased safety and efficiency with these improvements. For instance, nurses could be notified of a potentially inappropriate medication (PIM) via automatic pop-up notifications during medication scanning. Similarly, providers might receive flags or alerts when they order PIMs in adults 65 or older.

In terms of implementation, it is best to start the staff education early. A face-to-face educational session is ideal as it allows for more accessible communication between the project lead and nurses. All nurses involved in patient care should receive the required education from the outset. Staff education should also be concise but informative. Brochures or handouts are valuable tools for staff to reference and should be disseminated at the beginning of implementation. Realistically, the education will likely need to be revised at least monthly or when there are changes in the project tool or design. Routinely providing staff with reminders and helpful tips every few weeks can reinforce project expectations and promote engagement. If the Post-Fall Medication Reconciliation Assessment Tool is used, it should remain attached to the other post-fall documents. Additionally, all post-fall documents should be stored in a centralized location at the project site. Lastly, the best project partners and site champions are

those who value QI and communication. Frequent communication is a necessity among the project lead, site champion, and other team members.

Recommendations for Further Study

Deprescribing interventions is a unique yet essential topic for providers. Unfortunately, most deprescribing research focuses on identifying PIMs from a medication profile review upon hospital admission. However, it would be valuable to assess for PIMs administered within a specific timeframe of the falls, thus identifying another potential contributing factor. The research on deprescribing in hospitalized older adults is also very heterogeneous. Similar studies, specifically randomized controlled trials, should be conducted to validate or disprove previous findings. While the Beers Criteria is a highly recognized explicit deprescribing tool, additional research needs to compare the 2019 Beers Criteria with the STOPP criteria in older adults. It would be valuable to investigate nurses' and providers' perceptions of prescribing PIMs in the hospital setting. Similarly, it may be beneficial to collect qualitative data on possible barriers to effective communication and collaboration between nurses and physicians on medical units.

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Appendix A

Literature Matrix

Authors	Year Pub	Article Title	Theory	Journal	Purpose and take home message	Design/Analysis/Level of Evidence	IV DV or Themes concepts and categories	Instr. Used	Sample Size	Sample method	Subject Charac.	Comments/critique of the article/methods GAPS
Hill-Taylor, B., Walsh, K. A., Stewart, S., Hayden, J., Byrne, S., and Sketris, I. S.	2016	Effectiveness of the STOPP/START (Screening Tool of Older Persons' potentially inappropriate Prescriptions/Screening Tool to Alert doctors to the Right Treatment) criteria: Systematic review and meta-analysis of randomized controlled studies.	n/a	*Journal of Clinical Pharmacy and Therapeutics*	update the previous systematic review from 2013 to assess the effect of STOPP on PIMs	Level I: Systematic review	n/a	database search of RCTs	3 new RCTs were added to the original 1 RCT and 12 observational studies	adults >/= 65 y.o.	n/a	Limitations: various implementations, populations, outcomes, and duration / Usefulness: systematic review about PIM rates with STOPP/START
Gutiérrez-Valencia, M., Izquierdo, M., Beobide-Telleria, I., Ferro-Uriguen, A., Alonso-Renedo, J., Casas-Herrero, A., & Martínez-Velilla, N	2019	Medicine optimization strategy in an acute geriatric unit: The pharmacist in the geriatric team	n/a	*Geriatrics & Gerontology International*	describe a new med optimization strategy and its potential for reducing polypharmacy	Level IV: prospective, quai-experimental	**IV: polypharmacy; drug regimen / DV: prevalence of polypharm at discharge**	clincal pharmacist-led med optimization strategy was integrated into the CGA	250 patients initially; only 234 were analyzed	patients >/= 75 y.o. who were admitted to a geriatric unit in a tertiary hospital	avg age = 87.6; 61.1% women	Limitations: lack of randomization; only used 1 pharmacist / Usefulness: intervention showed a decrease in polypharmacy
Kimura, T., Ogura, F., Yamamoto, K., Uda, A., Nishioka, T., Kume, M., Makimoto, H., Yano, I., & Hirai, M.,	2017	Potentially inappropriate medications in elderly Japanese patients: effects of pharmacists' assessment and intervention based on Screening Tool of Older Persons' Potentially Inappropriate Prescriptions criteria ver.2	n/a	*Journal of Clinical Pharmacy and Therapeutics*	assess the prevalence of PIMs and the effectivenss of a hospital-based pharmacist intervention using the STOPP criteria version 2	Level IV: prospective, observational study	**IV: polypharmacy / DV: prevalence of PIMs upon discharge**	pharmacists detected PIMs based on the STOPP ver.2 criteria they would recommend, to the doctor, to stop/change the med	822 inpatients who were prescribed >/= 1 daily med	admitted patients >/= 65 y.o.	median age = 75; 54.9% were male	Limitations: observational study that was conducted at 1 hospital in Japan; did not assess for patient outcomes Usefulness: first study about the prevalence of PIMs based on STOPP ver.2 criteria in old adults patients in Japan
Li, H., Pu., S., Liu, Q., Huang, X., Kuang, J., Chen, L., Shen, J., Cheng, S., Wu, T., Li, R., Li, Y., Mo, L., Jiang, W., Song, Y., & He, J.	2017	Potentially inappropriate medications in Chinese older adults: The beers criteria compared with the screening tool of older persons' prescriptions criteria	n/a	*Geriatrics & Gerontology International*	assess the prevalence of PIMs use using Beers and STOPP criteria; determine which is better for assessing PIMs in older adults	Level IV: retrospective cross-sectional study	**IV: Beers and STOPP criteria / DV: number of PIMs detected**	Beers and STOPP criteria	6337 patients	admitted patients >/= 65 y.o.	mean age = 81.3 y.o.; 75.7% male	Limitations: single-center study; used the older versions of explicit tools / Usefulness: Beers criteria detected more PIMs than the STOPP criteria; Beers criteria was more sensitive
Rankin, A., Cadogan, C. A., Patterson, S. M., Kerse, N., Cardwell, C. R., Bradley, M. C., Ryan, C., & Hughes, C.	2018	Interventions to improve the appropriate use of polypharmacy for older people.	n/a	*Cochrane Database of Systematic Reviews*	identiy the interventions which can improve polypharmacy in older adults	Level I: Systematic review	**n/a**	database search of RCTs, controlled before-after studies, non-randomized studies	18 studies	adults >/= 65 y.o.	n/a	Limitations: herteorgenous studies; few commonalities among the studies / Usefulness: implicit tools improve the appropriateness of medications used
O'Connor, M. N., O'Sullivan, D., Gallagher, P. F., Eustace, J., Byrne, S., & O'Mahony, D	2016	Prevention of hospital-acquired adverse drug reactions in older people using Screening Tool of Older Persons' Prescriptions and Screening Tool to Alert to Right Treatment criteria: A cluster randomized controlled trial	n/a	*Journal of the American Geriatrics Society*	determine if the STOPP/START criteria reduce hospital acquired ADRs	Level III: single-blind cluster RCT	**IV: STOPP/START criteria / DV: ADR in hospitalized patients**	STOPP/START criteria w/in 48 hr of admission	732 patients	admitted patients >/= 65 y.o.	372 in control group; 360 in intervention group	Limitations: not double-blinded study; only in 1 hospital / Usefulness: showed the STOPP/START can significantly reduce ADRs in the hospital setting
Thompson, W., Lundby, C., Graabaek, T., Nielsen, D. S., Ryg, J., Søndergaard, J., & Pottegård, A	2019	Tools for deprescribing in frail older persons and those with limited life expectancy: A systematic review	n/a	*Journal of the American Geriatrics Society*	summarize tools that can assist provider in deprescribing PIMs	Level I: systematic review	**n/a**	database search of RCTs	15 articles	frail older adults	n/a	Limitations: focused on individuals with limited life expectancy / Usefulness: tools can be used as models or frameworks for pharmacotherapy
Blanc, A.-L., Spasojevic, S., Leszek, A., Théodoloz, M., Bonnabry, P., Fumeaux, T., & Schaad, N.	2018	A comparison of two tools to screen potentially inappropriate medication in internal medicine patients	n/a	*Journal of Clinical Pharmacy and Therapeutics*	compared 2 PIM screening tools STOPP/START and PIM-Check on internal med patients	Level IV: retrospective observational study	IV: STOPP/START Criteria and PIM-Check DV: number of PIMs detected	explicit tools, mentioned earlier	50 patients	random sample of 50 patients from an internal medicine unit	pt with a 30-day preventable readmission	Limitations: small sample size; retrospective design Usefulness: both tools are highly sensitive
Cossette, B., Éthier, J.-F., Joly-Mischlich, T., Bergeron, J., Ricard, G., Brazeau, S., Caron, M., Germain, O., Payette, H., Kaczorowski, J., & Levine, M.	2017	Reduction in targeted potentially inappropriate medication use in elderly inpatients: A pragmatic randomized controlled trial.	n/a	*European Journal of Clinical Pharmacology*	asssess the degree of change in PIMs using a computerized alert system (CAS)-based pharmacist-physician intervention	Level II: RCT	**IV: CAS with pharm and MD intervention / DV: number of PIMs detected**	CAS-based intervention	231 patients	older adults admitted to the hospital	mean age = 81; 60% female	Limitations: time-consuming; costly Usefulness: RCT; CAS-based system is effective at reducing polypharmacy
Dalton, K., O'Brien, G., O'Mahony, D., & Byrne, S.	2018	Computerized interventions designed to reduce potentially inappropriate prescribing in hospitalized older adults: A systematic review and meta-analysis	n/a	*Age and Ageing*	assess whether a computerized intervention can reduce PIMs	Level I: meta-analysis	**n/a**	electronic lit search on 8 databases	8 studies included out of 653 records	search on 8 databases for older adults with polypharmacy	n/a	Limitations: only included 2 RCTs / Usefulness: insuficient evidence to suggest computerized intervention can improve patient outcomes

McDonald, E. G., Wu, P. E., Rashidi, B., Forster, A. J., Huang, A., Pilote, L., Papillon-Ferland, L., Bonnici, A., Tamblyn, R., Whitty, R., Porter, S., Battu, K., Downar, J., & Lee, T. C.		The MedSafer study: A controlled trial of an electronic decision support tool for deprescribing in acute care	n/a	*Journal of the American Geriatrics Society*	improve PIM burden by implementing the MedSafer electronic decision support tool	Level III: non-randomized controlled before-and-after study	**IV: MedSafer utilization DV: proportion of patients with >/= 1 med deprescribed**	MedSafer tool	1066 patients	4 internal med teaching units	65 years of age or older	Limitations: does not assess adverse events Usefulness: MedSafer significantly reduced PIMs in older adult patients
Thillainadesan, J., Gnjidic, D., Green, S., & Hilmer, S. N.	2018	Impact of deprescribing interventions in older hospitalized patients on prescribing and clinical outcomes: A systematic review of randomized trials.	n/a	*Drugs & Aging*	evaluate the efficacy of deprescribing interventions in older inpatients	Level I: Systematic review	**n/a**	electronic lit search on 8 databases	9 RCTs	older, hospitalized adults with polypharmacy	n/a	Limitations: small number of RCTs; the RCTs were all different in design / Usefulness: deprescribing intervention targeted at older adult in the hospital can reduce PIM and they are safe
Van der Linden, L., Decoutere, L., Beerten, L., Delva, T., Spriet, I., Flamaing, J., & Tournoy, J.	2019	External validation of a clinical pharmacy intervention in geriatric inpatients: a controlled study	n/a	*International Journal of Clinical Pharmacy*	asssess the reduction in PIMs with the implementation of the RASP list along with a clinical pharmacist med review	Level III: prospective, controlled single-blinded study	**IV: RASP list with pharm. Med review / DV: PIM reduction**	RASP list	61 patients	admitted patients >/= 65 y.o.	median age = 86 y.o.; length of stay avg 12 days	Limitations: small sample size; didn't assess patient outcomes / Usefulness: more RASP PIMs were stopped in the intervention group
Fahrni, M. L., Azmy, M. T., Usir, E., Aziz, N. A., & Hassan, Y.	2019	Inappropriate prescribing defined by STOPP and START criteria and its association with adverse drug events among hospitalized older patients: A multicentre, prospective study	n/a	*PLoS ONE*	determine if PIMs as defined by the STOPP criteria led to adverse drug events	Level IV: prospective cohort study	**IV: STOPP criteria DV: number of PIMs identified and number of adverse drug events**	STOPP criteria	301 patients	3 hospitals that admitted older adult patients with acute illness	median age = 72 y.o.	Limitations: non-randomized / Usefulness: explicit criteria is useful for identifying ADEs in older adults
Ma, Z., Zhang, C., Cui, X., & Liu, L.	2019	Comparison of three criteria for potentially inappropriate medications in Chinese older adults	n/a	*Clinical Interventions in Aging*	compare the prevalence of PIMs among Chinese geriatric patietns using 3 explicit tools	Level IV: retrospective, cross-sectional study	**IV: 1 of 3 explicit tool DV: number of PIMs detected**	either the 2015 Beers criteria, 2014 STOPP criteria, or the Chinese criteria	863 patients	admitted patients >/= 65 y.o.	54% male; age range 65-98 y.o.	Limitations: Chinese criteria isn't used in the U.S. / Usefulness: Beers criteria identified more PIMs than STOPP criteria
Urfer, M., Elzi, L., Dell-Kuster, S., & Bassetti, S.	2016	Intervention to improve appropriate prescribing and reduce polypharmacy in elderly patients admitted to an internal medicine unit	n/a	*PLoS ONE*	test the efficacy of a checklist in reducing polypharmacy	Level III: single-center, quasi-experimental	**IV: 5-point checklist DV: number of meds discontinued**	5-point novel checklist	900 total patients split into 2 even groups	admitted patients >/= 65 y.o.	median age = 76 in intervention group; median age 79 years in control group	Limitations: conducted in 1 hospital / Usefulness: an easy-to-use checklist significantly reduced the occurrence of inappropriate meds upon dischage
Van der Linden, L., Decoutere, L., Walgraeve, K., Milisen, K., Flamaing, J., Spriet, I., & Tournoy, J.	2017	Combined use of the Rationalization of Home Medication by an Adjusted STOPP in Older Patients (RASP) list and a pharmacist-led medication review in very old inpatients: Impact on quality of prescribing and clinical outcome	n/a	*Drugs & Aging*	evaluate a pharmacist intervention with the RASP list on polypharmacy	Level III: prospective, controlled trial	**IV: pharmacist-led intervention w/ RASP list / DV: number of PIM discontinued**	RASP list	214 patients	older adults admitted to the hospital	avg age = 84.5	Limitations: only conducted in 1 hospital w/ significant staff turnover / Usefulness: the combined intervention resulted in significant and safe med discontinuation

Appendix B

Copy of the Post-Fall Medication Reconciliation Assessment Tool

Document #

Post-Fall Medication Reconciliation Assessment Tool (Ver.2)

Completed by the Charge Nurse/Clinical Supervisor after the Post-Fall Huddle Report
Please keep the 2 fall documents stapled together

Date & Time of Fall: _____
Patient's Age: _____

↓

Is the patient 65 years or older?

If YES, continue
If NO, stop

↓

Is the patient receiving Hospice Care or Comfort Care?

If YES, stop
If NO, continue

↓

The following **2 items** are required to continue:

A.) Copy of the 2019 AGS Beers Criteria Pocket Guide
B.) Copy of the patient's MAR

↓

Write down **EACH** med from the patient's MAR that was identified in Table 1 of the Beers Criteria (STEP 1)

Only include medications that were administered within 24 hours of the patient's fall

STEP 1: Reviewed by (RN's initials _____)	STEP 2
Meds on the MAR listed in the Beers Criteria	Mark an "X" if the med was discontinued
1.	
2.	
3.	
4.	
5.	
If no meds were identified, write "None" _____	

(continue to back page)

After **STEP 1**, initiate a dialogue with the attending provider regarding the identified Beers Criteria medication(s).

Did this conversation occur within 24 hours post-fall? (circle one)
YES NO

*If YES, include the Date and Time of conversation: _____ Provider's initials: ____

*If NO, list the barriers or reason for not completing:
_____

In **STEP 2**, mark the corresponding box for each medication discontinued after a conversation with the provider (see table on page 1).

Date & Time tool completed: _____

Give the two completed Post-Fall documents to the Clinical Supervisor

Helpful Tips

- If the fall occurs overnight, complete as much of **STEP 1** as possible during your shift. At report, handoff the document to the dayshift charge RN who will discuss these findings with the MD to complete **STEP 2**.
- After completing STEP 2, please submit the Post-Fall forms to the Clinical Supervisor.
- Only use Table 1 of the Beers Criteria as it is organized by Therapeutic Category.
- Change the MAR date and time range to display the medications administered within the previous 24 hours.
- The MAR can be sorted by medication class (along the left-hand side).
- A printed 72-hour MAR provides a different perspective of medication administration times.

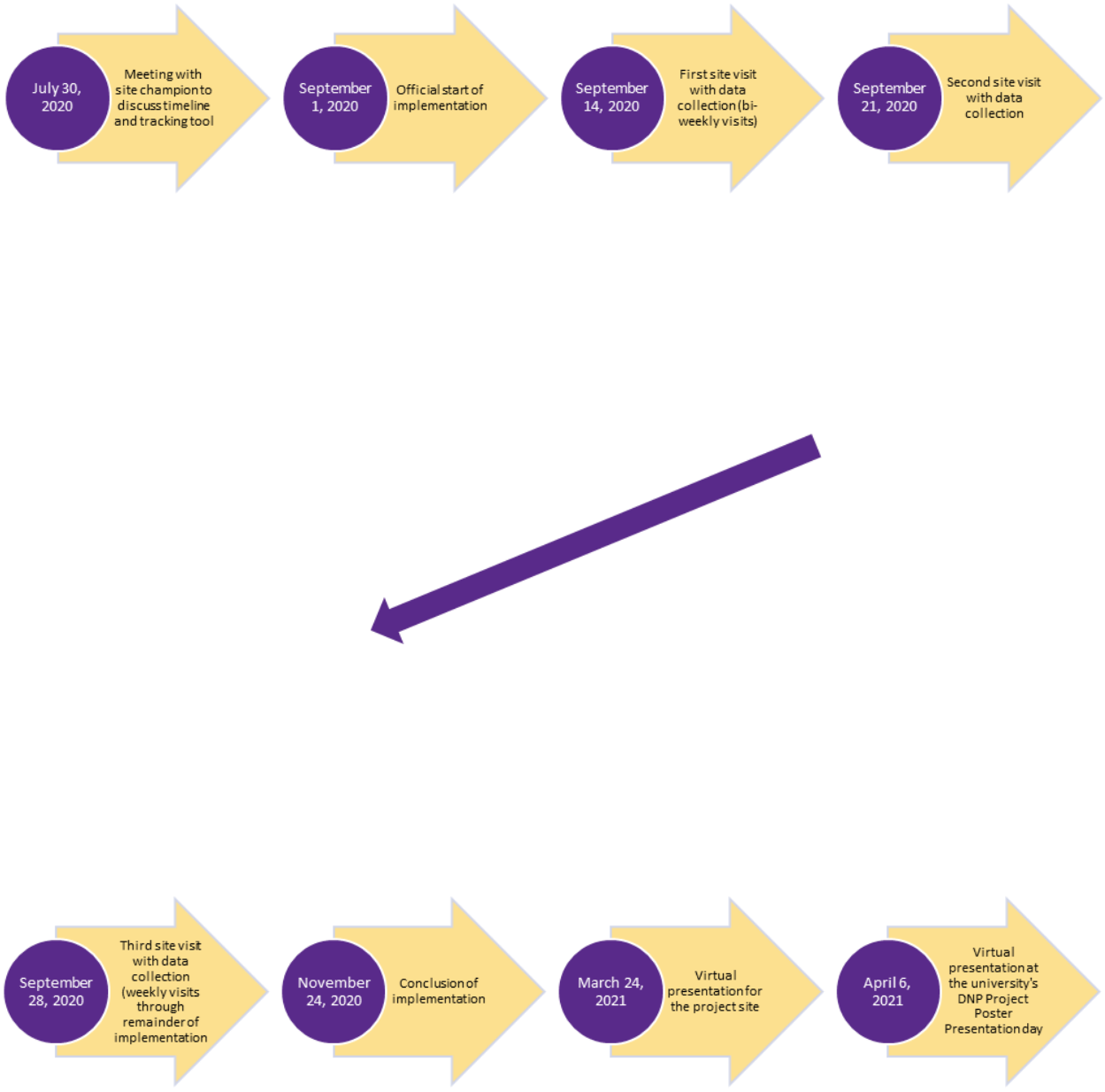
Appendix C

Data Collection Tool

Tool #	Unit	Patient Age	Fall Date	Fall Time	RN Reviewer Initials	Number of Patient Meds Identified on the Beers Criteria	Medications ID'd	Convo. with MD w/in 24hr (Y/N)	# Meds D/C'd
14	B	65	9/8/2020	21:45	[redacted]	3	gabapentin, zyprexa, methadone	N	0
3	A	74	9/22/2020	23:45	[redacted]	Not Completed	not completed	N	0
4	A	74 (same pt in tool #3)	9/24/2020	8:05	[redacted]	1	cyclobenzaprine	N (med was already suspended)	0
11	A	92	10/3/2020	19:00	[redacted]	Not Completed	not completed	N	0
8	A	67	10/11/2020	16:06	[redacted]	3	Librium, Seroquel, Ativan	N (meds were medically necessary)	0
6	A	71	10/10/2020	10:05	[redacted]	3	Butalbital, Toradol, Ativan	Y	0 (only 1x doses)
17	B	83	10/10/2020	14:00	not completed	Not Completed	not completed	N	0
32	B	82	10/22/2020	19:25	not completed	2	insulin lispro (SSI), clonidine	N	0
24	A	89	11/21/2020	19:27	not completed	Not Completed	not completed	N	0
30	B	78	11/10/2020	13:45	not completed	Not Completed	not completed	N	0
N/A (no tool attached)	B	65	11/12/2020	8:30	not completed	Not Completed	not completed	N	0

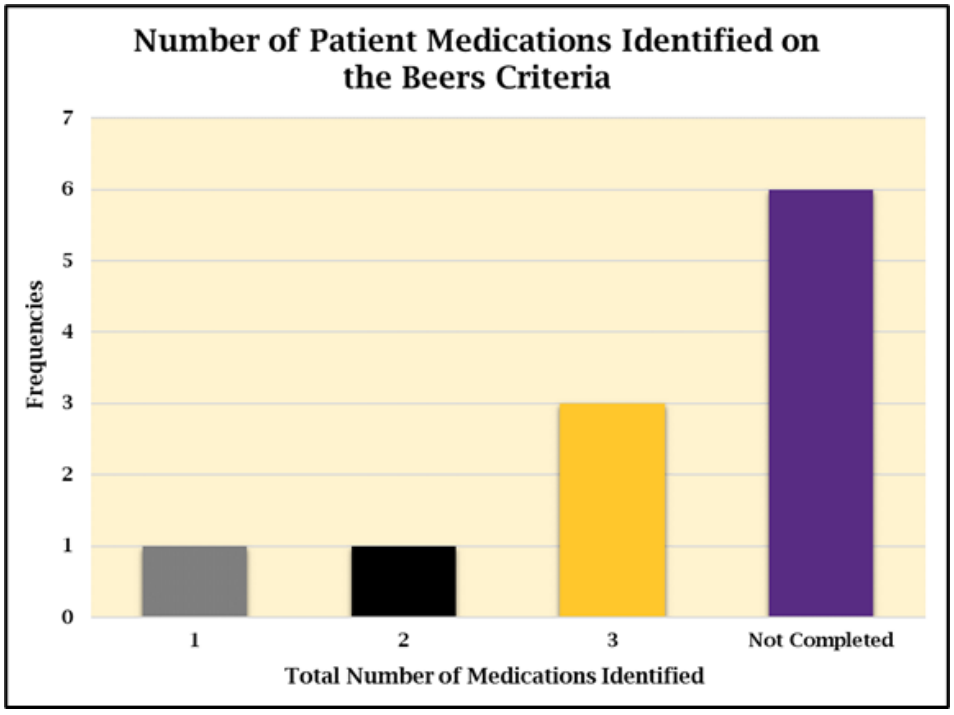
Appendix D

Project Timeline



Appendix E

Potentially Inappropriate Medications Administered Within 24 Hours of the Patients' Falls



Appendix F

Itemized (Estimated) Project Budget for the Organization

Item	Quantity	Cost per unit (or hour)	Total
Post-Fall Medication Reconciliation Assessment Tool Development	7 hours	$33	$231
Developing the Staff Presentation and Educational Materials	5 hours	$33	$165
Copy Paper	1 ream	$8	$8
Black Ink	1 cartridge	$20	$20
Tri-Color Ink	1 set	$25	$25
Laminating Sheets	1 pack	$20	$20
Data Review and Compilation	7 hours	$33	$231
Grand Total	$700		

Appendix G

Doctor of Nursing Practice Essentials

	Description	Demonstration of Knowledge
Essential I ***Scientific Underpinning for Practice***	**Competency** – Analyzes and uses information to develop practice **Competency -**Integrates knowledge from humanities and science into context of nursing **Competency -**Translates research to improve practice **Competency -**Integrates research, theory, and practice to develop new approaches toward improved practice and outcomes	A detailed literature review was initially completed to determine the best available strategies for deprescribing in older adult patients in the acute care hospital setting. The Beers Criteria, a validated tool, was also an integral component in the implementation phase and the Post-Fall Medication Reconciliation Assessment Tool.
Essential II ***Organizational & Systems Leadership for Quality Improvement & Systems Thinking***	**Competency** –Develops and evaluates practice based on science and integrates policy and humanities **Competency** –Assumes and ensures accountability for quality care and patient safety **Competency -**Demonstrates critical and reflective thinking **Competency -**Advocates for improved quality, access, and cost of health care; monitors costs and budgets **Competency -**Develops and implements innovations incorporating principles of change **Competency** - Effectively communicates practice knowledge in writing and orally to improve quality **Competency** - Develops and evaluates strategies to manage ethical dilemmas in patient care and within health care delivery systems	This DNP project was a quality improvement project aimed at identifying potentially inappropriate medications (PIMs) while promoting collaboration among nurses and physicians. The project lead was integrating the process change, collecting data, communicating with teammates, and presenting to the project site and the university.
Essential III ***Clinical Scholarship & Analytical Methods for Evidence-Based Practice***	**Competency** - Critically analyzes literature to determine best practices **Competency** - Implements evaluation processes to measure process and patient outcomes **Competency** - Designs and implements quality improvement strategies to promote safety, efficiency, and equitable quality care for patients **Competency** - Applies knowledge to develop practice guidelines **Competency** - Uses informatics to identify, analyze, and predict best practice and patient outcomes **Competency** - Collaborate in research and disseminate findings	The Plan-Do-Study-Act (PDSA) framework was used to evaluate and refine the project during the implementation phase continually. A total of four PDSA cycles were used to improve the Post-Fall Medication Reconciliation Assessment Tool and compliance with this process change. The Beers Criteria is a widely accepted tool for improving medication selection in older adult patients. Melnyk and Fineout-Overholt's levels of evidence were also used consistently to evaluate sources during the literature review.
Essential IV ***Information Systems – Technology & Patient Care Technology for the Improvement & Transformation of Health Care***	**Competency** - Design/select and utilize software to analyze practice and consumer information systems that can improve the delivery & quality of care **Competency** - Analyze and operationalize patient care technologies **Competency** - Evaluate technology regarding ethics, efficiency, and accuracy **Competency** - Evaluates systems of care using health information technologies	The project lead developed the initial staff education presentation through PowerPoint, which was distributed to nurses on Unit A and Unit B. Data were compiled on an Excel spreadsheet to analyze compliance with the Post-Fall Medication Reconciliation Assessment Tool.
Essential V ***Health Care Policy of Advocacy in Health Care***	**Competency-** Analyzes health policy from the perspective of patients, nursing and other stakeholders **Competency** – Provides leadership in developing and implementing health policy **Competency** –Influences policymakers, formally and informally, in local and global settings **Competency** – Educates stakeholders regarding policy	Prior to project implementation, the project lead submitted documentation to the organization and university's IRBs which determined the project was quality improvement. The Healthy People 2030 objective of decreasing inappropriate medication use in older adult patients closely aligns with this project. The project also meets

	Competency – Advocates for nursing within the policy arena **Competency**- Participates in policy agendas that assist with finance, regulation, and health care delivery **Competency** – Advocates for equitable and ethical health care	the Triple Aim objectives by improving quality and reducing costs for an at-risk population.
Essential VI ***Interprofessional Collaboration for Improving Patient & Population Health Outcomes***	**Competency**- Uses effective collaboration and communication to develop and implement practice, policy, standards of care, and scholarship **Competency** – Provide leadership to interprofessional care teams **Competency** – Consult intra-professionally and inter-professionally to develop systems of care in complex settings	The entire DNP project relied heavily on intra-professional collaboration among nurses from various specialties. Teamwork and communication were keys to successfully implementing the project on two medical units during a pandemic. Completing the tool required interprofessional collaboration between the nurses and physicians.
Essential VII ***Clinical Prevention & Population Health for Improving the Nation's Health***	**Competency**- Integrates epidemiology, biostatistics, and data to facilitate individual and population health care delivery **Competency** – Synthesizes information & cultural competency to develop & use health promotion/disease prevention strategies to address gaps in care **Competency** – Evaluates and implements change strategies of models of health care delivery to improve quality and address diversity	This DNP project was developed to address a gap in care. Since the organization did not have a method of reconciling medications immediately following a patient fall, the Post-Fall Medication Reconciliation Assessment Tool was implemented to detect PIMs and encourage communication among nurses and physicians regarding these findings.
Essential VIII ***Advanced Nursing Practice***	**Competency**- Melds diversity & cultural sensitivity to conduct systematic assessment of health parameters in varied settings **Competency** – Design, implement & evaluate nursing interventions to promote quality **Competency** – Develop & maintain patient relationships **Competency** –Demonstrate advanced clinical judgment and systematic thoughts to improve patient outcomes **Competency** – Mentor and support fellow nurses **Competency**- Provide support for individuals and systems experiencing change and transitions **Competency** –Use systems analysis to evaluate practice efficiency, care delivery, fiscal responsibility, ethical responsibility, and quality outcomes measures	The quality improvement project did not stop after the implementation phase. The project evaluation and implications required thoughtful consideration of the impact this intervention had on the staff, patients, and organization. An analysis of the data also provided insight into potential areas of growth and change on a larger scale, some of which may require integration with the electronic health record. The project was also nurse-led, with essential input from nurses with various practice backgrounds. The project lead also synthesized the literature on deprescribing PIMs in hospitalized older adult patients to improve advanced nursing practice.