Reducing Medication Use in Hospice Patients Residing in Long-Term Care

by

Lee Ann Long

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Dedication

I dedicate this project to my late husband, Brian Long. Brian always supported me every step of my education journey and reminded me often that I could do anything I chose to do. He was never intimidated by my search to improve myself or seek new knowledge, he supported my growth. I know he is proud of my accomplishment and is still supporting my dreams. I miss him very much.

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Abstract

Polypharmacy has been identified as a significant issue in the elderly that leads to an increased risk of adverse drug events resulting in increased emergency room visits and falls, leading to rising costs to the healthcare system. Polypharmacy, although poorly defined, is too many medications or unnecessary medications, which can be considered a risk and potential burden to patients and caregivers. The purpose of this quality improvement project was to educate and empower long-term care (LTC) facility and hospice nurses to recognize polypharmacy and utilize the MedStopper® online tool for recommending medications for deprescribing. Education was provided to the nursing staff regarding the recognition of polypharmacy and how to use the MedStopper® online tool to facilitate medication conversations with the patient, the family, and the provider. The MedStopper® online tool was printed for each patient weekly and reviewed with nursing staff in preparation to recommend medications for deprescribing. Medication reviews were then conducted each week to evaluate the progression of the project. Project progress, written educational articles, and photos were posted at each LTC nursing station during weekly rounding by the primary project manager. At the end of the project, the data revealed a decrease in at least one of the seven targeted drug categories for each patient, vitamin/supplements, gastrointestinal reflux, statins, anticoagulants, cognitive enhancing, antihypertensives, and antihyperglycemics. Nurses are crucial to assisting the prescriber in making excellent medication decisions for all patients and especially those residing in long-term care facilities. Nurses must be educated and empowered to advocate for the medication management of their patients. Collaboration with team members and providers can and should be guided with evidence-based tools such as the MedStopper® online tool.

Keywords: polypharmacy; deprescribing; long-term care (LTC); evidence-based practice

Table of Contents

Acknowledgments....2

Dedication....3

Abstract....4

Chapter One: Overview of the Problem of Interest....11

Background Information....11

Significance of Clinical Problem....13

Question Guiding Inquiry (PICO)....15

Population....15

Intervention....15

Comparison....16

Outcome(s)....16

Summary....17

Chapter Two: Review of the Literature Evidence....18

Methodology....18

Sampling strategies....18

Evaluation criteria....19

Literature Review Findings....19

Limitations of Literature Review Process....28

Discussion....29

Conclusions of findings....29

Advantages and disadvantages of findings....30

Utilization of findings in practice....30

Summary 31

Chapter Three: Theory and Concept Model for Evidence-based Practice 33

Concept Analysis 33

Theoretical Framework 34

Application to practice change 37

Evidence-Based Practice Change Theory 38

Application to practice change 38

Summary 40

Chapter Four: Pre-implementation Plan 42

Project Purpose 42

Project Management 43

Organizational readiness for change 43

Inter-professional collaboration 44

Risk management assessment 45

Organizational approval process 46

Information technology 47

Cost Analysis of Materials Needed for Project 47

Plans for Institutional Review Board Approval 48

Plan for Project Evaluation 49

Demographics 49

Outcome measurement: Nursing Knowledge 49

Evaluation 49

Data analysis 45

Outcome measurement: MedStopper® Compliance 51

Evaluation 51

Data analysis 52

Outcome measurement: Decreasing Identified Medication Category

Utilization 52

Evaluation 52

Data analysis 52

Data management.....53

Summary 54

Chapter Five: Implementation Process 55

Setting 55

Participants.....55

Recruitment.....56

Implementation Process 56

Plan Variation 57

Summary 58

Chapter Six: Evaluation of the Practice Change Initiative 59

Participant Demographics.....59

Intended Outcome(s).....60

Findings.....61

Nursing knowledge 61

Table 1: Pre- and post- Education survey results …….… 62

MedStopper® utilization 62

Polypharmacy reduction 63

Figure 2: Outcomes graph.....64

Vitamin/Supplements.....64

GI Reflux 65

Statins/Cholesterol-lowering.....65

Anticoagulants 65

Cognitive enhancing 65

Antihypertensives 65

Diabetics 66

Summary 66

Chapter Seven: Implications for Nursing Practice.....68

Practice Implications.....68

Essential I: Scientific underpinnings for practice 68

Essential II: Organization and systems leadership for quality improvement and systems thinking 69

Essential III: Clinical scholarship and analytical methods for EBP 70

Essential IV: Information systems/technology and patient care technology for the improvement and transformation of healthcare.....70

Essential V: Healthcare policy for advocacy in healthcare 71

Essential VI: Interprofessional collaboration for improving patient and population health outcomes.....72

Essential VII: Clinical prevention and population health for improving the nation's health 72

Essential VIII: Advanced nursing practice 73

Summary 74

Chapter Eight: Final Conclusions 75

Significance of Findings 75

Project Strengths and Limitations 76

Project Benefits 77

Recommendations for Practice 77

Final Summary 79

References 80

Appendix A: Literature Review 83

Appendix B: Plan, Do, Check, Act Model 91

Appendix C: Hospice Letter of Support 92

Appendix D: Long-term Care Facility Letter of Support 93

Appendix E: Project Budget 94

Appendix F: Atrium Health IRB Approval Document 95

Appendix G: East Carolina University IRB Approval Document 98

Appendix H: Project Education Flyer 99

Appendix I: Pre-Education Survey Tool 100

Appendix J: Post-Education Survey Tool 101

Appendix K: Example of MedStopper® Tool 102

Appendix L: MedStopper® Tool Permission Email 103

Appendix M: MedStopper® Process Map 104

Appendix N: MedStopper® Compliance Tool 105

Appendix O: Targeted Drug Class Data Collection Tool 106

Appendix P: Overall Average of Targeted Medications per Week 107

Appendix Q: Targeted Drug Class Count.....108

Chapter One: Overview of the Problem of Interest

Healthcare providers working with hospice patients residing in long-term care (LTC) facilities face issues regarding their number of medications and the need for certain drugs. Hospice patients, by Medicare definition, have a life expectancy of fewer than six months, and the goal of treatment has transitioned from one of cure and maintenance to one of comfort and palliation of symptoms (U.S. Centers for Medicare & Medicaid Services [CMS], 2019). However, many end-of-life patients residing in LTC facilities continue to be prescribed medications such as statins, anticoagulants, antihyperglycemics, anticoagulants, and antibiotics that may not be congruent with the goals of the hospice patient (van Nordenne, Lavrijsen, Vissers, & Koopmans, 2014). In the terminally ill patient, physiologic changes are intensified by a changing metabolism, a decline in renal and hepatic functions, and loss of body mass, leaving the patient susceptible to harmful side effects and adverse drug reactions (Morin et al., 2017). The purpose of this proposed evidence-based practice (EBP) change project was to recognize and recommend medication reduction in hospice patients residing in LTC.

Background Information

Medications contribute to quality healthcare and quality of life for many patients through the prevention and potential cure of disease (Ailabouni, Tordoff, Mangin, & Nishtala, 2017). However, the use of medication is not risk-free and may contribute to adverse drug events, increased hospitalizations, and decreased quality of life when utilized in the patient at end-of-life. Frail hospice patients often have multiple geriatric syndromes, complex diagnoses, and chronic long-term conditions for which they have been prescribed medications for long-term use and are more vulnerable to medication-related adverse outcomes (Ailabouni et al., 2017). A survey of 307 Registered Nurses (RN)s of a nationally representative sample of LTC facilities

showed that 67.4% of nurses agree or strongly agree that deprescribing would be beneficial to residents, improve residents' quality of life, and reduce the time spent administering medications (Ailabouni et al., 2017).

Polypharmacy presents a challenge to nursing staff caring for patients at the end-of-life. One definition of polypharmacy is the prescribing of too many medications for one patient (Kaufman, 2016). The definition of what constitutes too many is often considered five or more medications. It is common for older adults in the United States, with an estimated 50% of people 65 years and older taking more than five medications (Reeve et al., 2018). However, the prescribing of medications that do not have current indications or are known to be ineffective, unnecessary, or considered duplicate therapy are also polypharmacy and problematic in the elderly (Endsley, 2018).

Patient-centered care means increased patient involvement in health care decision-making, and many adults report wanting to be very involved in these decisions. Still, many physicians report patient resistance or unwillingness to stop taking medications (Reeve et al., 2018). The constant advent of new medications, frequent use of preventative treatments, and a healthcare system focused on single diagnosis-related treatments contribute to polypharmacy (Jokanovic, Tan, Dooley, Kirkpatrick, & Bell, 2015). Cherubini, Corsonello, and Lattanzio (2016) state polypharmacy is caused by the increasing availability of medications, multimorbidity, or the occurrence of multiple diseases in the same patient.

The targeted project site utilizes a national pharmacy vendor. During regular benchmarking calls, it was noted that the project site's average prescriptions per patient were higher than that of other hospices of similar size and type. An internal initiative was undertaken to better identify and utilize medications related to the hospice diagnoses, and there was some

improvement noted. However, the project site remained above the benchmark of 10.2 medications per patient per day, as seen throughout other vendor's hospice clients. A drill-down of the data revealed that hospice patients residing in LTC facilities continued to have higher than average numbers of specific medications. Discussions between nursing, practitioners, and pharmacists led the clinical leadership team to determine that the hospice practitioners had no prescribing authority in these facilities; thus, they had been unable to affect the medication management plans of that patient population positively.

The primary project manager met with the administrators of two locally contracted LTC facilities and discussed the issue. The administrators of both facilities agreed that polypharmacy was an overall problem in the facilities and agreed that the facility staff does not have the education nor the tools to identify or recommend medications for deprescribing. Nurses are in key positions to identify and suggest medications for discontinuation and can determine if the initial indication for certain medications is still valid, if medications still have the desired effect, and whether prescribed medications still meet the goals of patients (Bergman-Evans, 2013). As a result, this project focused on nursing strategies to impact the problem of polypharmacy.

Significance of Clinical Problem

Polypharmacy has been identified as an issue in the elderly that leads to an increased risk of adverse drug events resulting in increased emergency room visits and falls (Jokanovic et al., 2015). These events, in turn, lead to rising costs to the healthcare system. Nearly 50% of the respondents to a cross-sectional survey of 307 RNs working in LTC reported spending 4 to 7 hours completing medication rounds, and 98% of respondents indicated they were aware of the common adverse effect associated with medications (Ailabouni et al., 2017). Overuse and misuse of medications in the frail elderly are also associated with a higher incidence of

unplanned hospitalizations due to drug-related events or falls. An estimated $1.75 is spent treating medication-related issues for every $1.00 spent on medications (Zullo, Gray, Holmes, & Marcum, 2018). Zullo et al. indicate the cost to the healthcare system is significant as the system spends nearly double the amount paid for medications to treat drug-related problems.

Currently, there is very little knowledge known about how the majority of drugs impact older patients or evidence of their effects. Most drug trials exclude the frail elderly, cognitively impaired, or LTC patient. Long-term residence is often the most common reason for exclusion from a randomized controlled trial (Cherubini et al., 2016). As death approaches, physiological changes increase as evidenced by changing metabolism, impaired hepatic and renal functions, and a loss of weight. These changes shift the way medications are utilized in the body, increasing the patient's vulnerability to harmful and sometimes painful side effects (Morin et al., 2017). The question of the appropriateness of the medication must be measured against the burden of medication therapy and the role of nurses in that decision.

Polypharmacy has been associated with increased costs related to drug-related events or falls, but inappropriate and unnecessary medication use may waste limited financial resources and nursing staff time to administer medications (Kojima et al., 2012). Kojima et al. conducted a project to reduce the medications of LTC facility residents and showed an average reduction in the medication costs of $30.71 per patient per month. The project resulted in a decrease in the nursing cost of $22.43 per patient per month. The nursing cost was based on an average hourly rate of $23.10 based on current labor statistics. These results are based upon an average of 3.0 recommendations to deprescribe per patient. It is estimated that for each oral medication added to a patient's oral medication pass it takes an additional 45 seconds; thus, the cost of adding that drug can be between $7 and $21/day per patients; even if the medications are passed at the same

time (Pruskowski, Zarowitz, & Handler, 2018). The reduction of medications in the LTC patient has the potential to decrease overall costs associated with drug-related events as well as costs associated with nursing administration time.

Question Guiding Inquiry (PICO)

Evidence-based practice uses the most current evidence available and begins with the consideration of a well-organized PICO question. PICO is an acronym that assists the individual to identify the population or participants of interest (P), intervention needed for practice (I), comparisons (C) of interventions to decide the best intervention for the practice, and the outcomes (O) needed to measure the intervention (Grove, Gray, & Burns, 2015). The clinical question guiding this inquiry asks; *"For nurses in an LTC setting, does the implementation of polypharmacy education and use of the MedStopper® tool impact reducing the polypharmacy for hospice patients?"*

Population. The target population consisted of hospice and LTC nurses. The hospice and LTC nurses consisted of a mixture of both RNs and licensed practical nurses (LPN). Participant nurses were 18 years of age or older, consisted of both genders and included all ethnicities. These nurses were caring for hospice patients residing in the targeted project site LTC facilities.

Intervention. The targeted intervention consisted of two parts. First, the utilization of the online tool MedStopper® (i.e., http://MedStopper®.com) which focuses on identifying the medications appropriate for deprescribing designed with the frail elderly patient in mind and returns information on whether the medication is likely to provide symptom management, reduce future illness risk, or increase the risk for future harm (Zullo et al., 2018). Polypharmacy can be addressed by the empowerment of nurses through education regarding the identification of

polypharmacy and how to recommend deprescribing to the patient's provider (Ailabouni et al., 2017). When nurses are educated, they are better advocates for identifying those medications that may be stopped based on their assessment of patient's behaviors and function (Bergman-Evans, 2013).

Comparison. There is no comparison group. The MedStopper® tool and polypharmacy education are designed to empower nurses to be more proactive in the medication management of patients. The primary project manager reviewed medications in the targeted drug classes to monitor for deprescribing in such classes.

Outcomes. The first outcome was to increase hospice and LTC nurse's knowledge regarding polypharmacy, identifying medications that may be stopped, and how to recommend deprescribing to the provider. The aim of medications at end-of-life should be based on patient comfort (van Nordenne et al., 2014). Polypharmacy is often fed by the addition of symptom management medications, the retention of long-term preventive medications that may no longer be of any benefit, and a lack of evidence-based guidelines for deprescribing (Morin et al., 2017).

The second outcome was to promote the hospice nurse utilization of the MedStopper® tool in discussing polypharmacy with the LTC nurse. The aim was to utilize the MedStopper® report as a way to recognize polypharmacy and formulate a recommendation for potential deprescribing of medications to the provider. Hospice nurses were provided the MedStopper® report within two working days of project implementation or new hospice admission, and weekly during project implementation. Hospice nurses were to discuss the report with the nurse at the LTC facility at the next routine nursing visit. This discussion was documented in the hospice medical record which were reviewed weekly for compliance.

The third outcome was to decrease polypharmacy in the hospice patient in the LTC setting in the drug categories of vitamin/supplements, statins, anticoagulants, cognitive enhancing, antihypertensives, and antihyperglycemics. Over 50% of nurses surveyed agreed that reducing medications in the LTC patient would improve medication adherence, improve resident's quality of life, and reduce the time spent on medication administration (Ailabouni et al., 2017). Polypharmacy is also associated with increased drug-related events such as drug-drug interactions, adverse drug events, falls, re-hospitalization, and mortality (Cheribini et al., 2016).

Summary

Polypharmacy in the hospice patient in an LTC facility affects not only the hospice patient but also the providers of that care, and the healthcare system as a whole. The patient is negatively affected as more and more medications lead to increased risk of adverse events, increased the possibility of falls, and increased risk of emergency department visits (Jokanovic et al., 2015). The nursing staff is affected negatively as increased medications lead to an increased workload for staff administering these medications. Nurses are critical components in caring for hospice patients in LTC facilities and are significant influences on prescribing and deprescribing (Ailabouni et al., 2017). Education, empowerment, and the provision of evidence-based, easy to use tools should be used by nurses to provide evidence and empower them to recommend medications to discontinue. The literature is rich with the need to reduce polypharmacy in the frail elderly patient to improve quality of life, reduce adverse outcomes and reduce the burden on the patient, the nursing staff and the healthcare system.

Chapter Two: Review of the Literature

Polypharmacy in the hospice patient residing in the long-term care (LTC) facility has many adverse consequences (Endsley, 2018). Nurses need to be empowered to have a greater understanding of identifying polypharmacy and recommending deprescribing to providers (Kaufman, 2016). Empowering nurses requires access to education and tools to guide decision making. To guide this evidence-based practice (EBP) change project, a comprehensive literature search was conducted to determine evidence-based interventions for understanding and identifying polypharmacy, its risks, and tools to utilize in decision-making. This chapter details the methodology and findings of this literature review.

Methodology

Sampling strategies. A comprehensive electronic literature search was performed using the following databases: PubMed; Cumulative Index to Nursing and Allied Health Literature (CINAHL); Medline via Ovid; and Google Scholar. Eriksen and Frandsen (2018) state the Population, Intervention, Comparison, and Outcome (PICO) model is the most widely used modeling for developing search terms for researching clinical questions; thus, the keywords used in the search were: polypharmacy; polymedicine; nurse; nursing; deprescribing; medication; elderly; older; frail; long-term care (LTC); nursing home; reducing cost; end-of-life; inappropriate medication; Rogers' theory; outcomes; and interventions. Keywords were combined using the Boolean operator "AND" to increase responses. The search was initially conducted without any limitations; however, the return was too vast. Limits were then applied to five and ten years. An exception was made for the search of Everett Rogers' 1983 work on planned change, which serves as the theoretical framework for the project. Limits placed on the search included: English only; clinical journals; nursing journals; pharmacy journals; academic

journals; and news articles. Literature was selected for inclusion based on levels of research evidence as presented by Stevens and Clutter (2007). The evidence rating pyramid is presented as Level I – Evidence Summaries; Level II – Experimental Research Studies; Level III – Non-experimental Studies; and Level IV – Qualitative Studies, Expert Opinion, Theory, and Basic Science (Melnyk & Fineout-Overhold, 2015).

Evaluation criteria. Literature was selected for inclusion based on the relevance to the defined PICO question and the intervention of education regarding polypharmacy in patients residing in the LTC facility. Critical assessments of the studies were conducted by asking: Do the results support the proposed intervention and plan?; Are the results understandable?; and Are the results consistent with other valid studies? Studies were selected to identify and evaluate the clinical problem of polypharmacy and its relevance to patients at the end-of-life. Selected literature provided background and significance of the problem and support of the interventions to utilize the MedStopper® tool and polypharmacy education for the nurses involved in the care to hospice patients residing in a nursing home. The assessment of the studies selected for inclusion from the review of literature is provided in Appendix A.

Literature Review Findings

Ailabouni, Tordoff, Mangin, and Nishtala (2017) conducted a cross-sectional survey of 307 Registered Nurses (RNs) who work in residential aged care facilities. A 48-question questionnaire was used, including closed- and open-ended questions. The RNs were asked questions about each stage of the medication use process, a) prescribing; b) medication chart review; c) receiving dispensed medications; d) administration; and e) monitoring. Nurses concern their opinions on deprescribing and whether the inclusion of a clinical pharmacist on the team would be beneficial. Ninety-one questionnaires were received; a response rate of 29.6%.

Approximately one-half of respondents (50.5%) stated they sometimes suggest reducing or stopping medications. When asked about medication chart reviews, 97.8% report that this is completed for residents within three months. RNs (47.3%) believed that the providers sometimes stop medications after this review, but 8.8% of RNs report that providers rarely stop medications after this review. Barriers to stopping or reducing medications were cited as time constraints, lack of adequate reimbursement, pressure from specialty providers, and patient/family wishes. Ailabouni et al. concluded RNs are key influencers of prescribing and by empowering RNs through education on deprescribing and how to successfully achieve it is a way to overcome this issue. Ailabouni et al. also suggested easy to use references and drug-specific guidelines be used to provide evidence as to why it would be appropriate to stop certain medications they believe are no longer needed by the patient.

Jokanovic, Tan, Dooley, Kirkpatrick, and Bell (2015) conducted a study to investigate the prevalence of and factors associated with polypharmacy in LTC facilities. Articles were searched to locate studies published between January 2000 and September 2014. Forty-four studies were included in the review. Jokanovic et al. found that up to 91% of LTC residents were prescribed more than five medications, and 65% were prescribed more than ten medications. The study also found that there were positive associations for recent hospital discharge. Jokanovic et al. concluded that the prevalence of polypharmacy in LTCs is high, but there is great variability between facilities, geographical locations, and the definitions of polypharmacy being used. Jokanovic et al. cite a need for the use of consistent definitions of polypharmacy in the literature as this causes difficulty in drawing firm conclusions.

Kojima et al. (2012) conducted a quality improvement study at a 180-bed LTC facility. Of the 160 residents at the facility at the time of the study, 74 were identified as having

polypharmacy as defined by the Minimum Data Set criteria of nine or more medications. This definition supports Jokanovic et al.'s (2015) recommendation that there is a lack of consistent definition for polypharmacy as this study does not include patients having less than nine medications prescribed. This project was designed to look at cost savings after a simple physician intervention on polypharmacy. Kojima et al.'s intervention were two-fold. First, medication lists were generated, and physicians then generated a list of recommendations to continue, to taper, or to discontinue. The second step was a review of all medications to be continued using an on-line drug-drug program to assess for contradictions. The second set of recommendations were then generated for each patient. The recommendations were then shared with the LTC and the patient's primary physician for final orders. A total of 151 recommendations were made with an average of 3.0 recommendations per patient. The primary physician accepted 86% of the recommendations. The mean number of medications per patient decreased from 16.6 to 15.5. These changes led to a medication savings of $30.71 per patient per month and a savings of $22.43 per patient per month in nursing costs. Kojima et al. point out that the project utilized "readily available quickly accessible tools" (p. 5). Kojima et al. state that it is important to make individualized decisions with clinical judgment based on the patient's prognosis and goals of care.

Morin et al. (2017) conducted a longitudinal cohort study in Sweden on the burden of medications in older adults at end-of-life. Morin et al. reviewed 511,843 adults over 65 years of age who died in Sweden between 2007 and 2013. The authors reconstructed the patient's medication history over the last 12 months of life. Of the patients in the study, it was found that over 51% had more than five diagnosed chronic conditions including ischemic heart disease, hypertension, congestive heart disease, cancer, atrial fibrillation, and cerebrovascular disease.

Morin et al. discovered that between the first and final months of life the percentage of patients prescribed greater than ten drugs rose from 30.3% to 47.2% with the mean rising from 7.6 drugs to 9.6 drugs. Morin et al. also found that those patients living in LTC facilities had a greater number of drugs prescribed. This trend remained consistent even after excluding analgesics from the total medication count. Morin et al. found that the most commonly prescribed medications were antithrombotic agents, diuretics, analgesics, psychotics, and beta-blocking agents. Morin et al. had two main findings. First, almost half of the patients had an increase in drugs in their last year of life. Second, that polypharmacy is fueled not only by an increase in symptom management medications but by the frequent continuation of long-term preventative treatments and disease-targeted drugs. Morin et al. recommend the withdrawal of medications should be embedded into clinical guidelines, in the same manner, the initiation of medications is incorporated.

Pruskowski, Zarowitz, and Handler (2018) surveyed 637 attendees of the 2017 American Medical Directors Association-The Society for Post-Acute and Long-term Care Medicine Annual Conference. The goal of the study was to describe the current utilization of deprescribing, and perceptions of a deprescribing program in nursing facilities to decrease potentially inappropriate medications. Of note, 88% of the respondents were physicians. The five-page survey was aimed at 1) Explore the familiarity of deprescribing; 2) Investigate the perceived utility of deprescribing, and 3) Describe the desired components of a deprescribing program. The survey asked about barriers to deprescribing, and questions were asked regarding a case study. Respondents were also asked to rate the desired components of a successful nursing facility deprescribing program. Of respondents, 96% stated they were at least somewhat familiar with the term deprescribing with 97% reporting previous experience with deprescribing in the

LTC facility; however, only 74% stated that deprescribing was successful. The respondents agreed to a lesser degree deprescribing programs should target certain medications used for comorbid diseases over those for symptom management. Those respondents felt the priority should be over "low-hanging fruit" versus "high risk" medications. The response to prioritize "low hanging fruit" is in opposition to Morin et al.'s (2017) statement, "the clinical benefit of treatment drugs aiming at preventing diseases during the final month of life is at the least very questionable." (pg. 934). Morin et al. (2017) contend physicians should discontinue drugs that may be appropriate but whose possible harms may outweigh the potential benefits before death occurs. Medications with harm would not always be the "low-hanging fruit" as these medications may require careful discussion and consideration. Pruskowski et al. (2018) did find a surprising statement that indicated the respondents believed a pharmacist should lead a deprescribing program. Pruskowski et al. did state that one limitation of the study was the sampling method and potential bias in the respondent group as most were physicians and may not represent the attitudes of the nursing facilities interdisciplinary team.

van Nordenne, Lavrijsen, Vissers, and Koopmans (2014) conducted an integrative review on decision making about medication changes for comorbid diseases at the end-of-life. The authors selected 67 papers published between 1995 and 2013 for review. van Nordenne et al. looked at different medication groups as they reviewed literature. Those groups included statins, antihypertensives, anticoagulants, antihyperglycemic agents, and antimicrobials. Much like the Morin et al. (2017) study, van Nordennen et al. (2014) found certain medication groups highly prescribed in patients with polypharmacy. van Nordennen et al. make several recommendations/statements based on the review: 1) Continuation of statins has no benefit; 2) Strict blood pressure control has no place at the end of life; 3) The use of anticoagulants can pose

serious risks to patients at end-of-life due to changes in drug therapy and potential drug-drug interactions; 4) Symptom management of diabetes means glucose checks are only indicated when the patient is symptomatic and dietary changes at end-of-life should be considered when deciding to continue antihyperglycemic medications, and 5) The aim of antibiotics at the end-of-life should only be symptom management. van Nordenne et al. conclude that all medications used for comorbid conditions be critically evaluated at the end-of-life. Medications that do not benefit the patient or alleviate symptoms should be stopped.

Reeve et al. (2018) studied the results of round six of the 2016 National Health and Aging Trends Study (NHATS), a national study of Medicare beneficiaries 65 years and older. The sample represents approximately 33.4 million Medicare beneficiaries. The key question reviewed for this study was, "What are the attitudes of older Americans toward deprescribing?" (Reeve et al., 2018, p. E2). Reeve et al. state that patient engagement in health care decision making is central in patient-centered care and physicians report patient resistance to the discontinuation of medications as one of the main factors that prevent deprescribing. The study relied on responses of the NHATS Medication Attitudes model, which was administered to a random sample of one-third of total respondents. The response rate was 94.8%. The study showed 92% of respondents agreed or strongly agreed they would be willing to stop one or more medications if their physician said it was possible. Two-thirds stated they would like to reduce the number of medications they are taking, and nearly half (42.7%) stated they felt they were taking a large number of medications. The respondents were asked to select a maximum number of pills they would be comfortable taking, and 51.9% chose four pills. These results suggest that providers can be reassured about addressing the subject of deprescribing with their older patients. Reeve et al. note that increasing public awareness about the discontinuation of medications is a

needed step toward changing the culture around prescribing, which encourages continuing medications while adding more.

Zullo, Gray, Holmes, and Marcum (2018) reviewed strategies for screening for medication appropriateness in older adults. The objectives were to describe the impact of medication inappropriateness on health outcomes, examine practical ways to screen for medication appropriateness, highlight gaps in knowledge, and to summarize clinical strategies to screen for medication appropriateness. Zullo et al. recommend the incorporation of tools into a daily workflow that provides oversight for medication screening. MedStopper® was one tool suggested by the authors due to its ease of use and intuitiveness. However, it is noted that no studies have confirmed that the use of a tool will improve the screening process for medication appropriateness. Screening has barriers in the nursing home setting due to low physician involvement and high staff turnover. Another significant barrier noted is the absence of evidence about the outcomes of medication use in the frail elderly. Zullo et al. suggest the following strategies for improving the medication screening process: 1) Use a team approach to ensure an accurate medical problem and medication lists; 2) Eliminate unnecessary medications by considering the risk/benefit profile of medications regularly; 3) Identify potentially inappropriate medications and consider dose reduction or discontinuation; 4) Identify conditions not treated and document the reasons why; 5) Remember that many clinically necessary medications can be high risk in particular older adults such as anticoagulants and glucose-lowering agents; 6) Pay close attention to periods when the patient is at high-risk such as transitions of care; and 7) Attention should be given to the patient's preferences and goals of care. Zullo et al. acknowledge screening efforts may appear daunting, but a focused, team-based approach can help providers gain momentum and improve medication safety.

Endsley (2018) wrote a four-part process for deprescribing medications. Endsley describes a straightforward process including: 1) Review all current medications, including all supplements and vitamins, documenting any side effects the patient may be having as a result of medication use; 2) Identify inappropriate, unneeded, or harmful medications using aids such as the Anticholinergic Burden Calculator, the Beers List from the American Geriatric Society, or the website Deprescribing.org developed by a team of physicians and pharmacists; 3) Plan deprescribing with the patient to address their concerns about their conditions worsening or contradicting other physicians; and 4) Regularly rereview medications as tapering or discontinuing medications may need close monitoring. Endsley states that deprescribing is necessary in a world in which patients often take multiple medications prescribed by multiple providers who do not directly communicate with each other.

Kaufman (2016) examined the challenges of polypharmacy for nurses in which the author refers to problems including: 1) Appropriate polypharmacy when medications are prescribed to address unattainable objectives and adverse drug events are present; 2) Inappropriate polypharmacy in which the risks of drug treatment outweigh the benefits or in cases when medications are prescribed to treat the side effects of other medications causing a prescribing cascade; 3) Drug-drug interactions as is common when single disease-specific guidelines are utilized for medication prescribing in patients with multiple comorbidities, thus leading to polypharmacy with potentially harmful outcomes; and 4) Adverse drug reactions such as postural hypotension due to antihypertensive use. Kaufman (2016) expressly points out that older patients are often excluded from clinical trials, and aging affects the way drugs are metabolized and excreted from the body. These physical changes have the potential to impair physical or cognitive functioning as well as causing an increased risk for falls, or malnourishment due to

appetite changes. Kaufman (2016) states that medication review is an opportunity to address deprescribing to use medications more safely.

Bergman-Evans (2013) developed an evidence-based practice guideline to improve the medication management of older clients living in LTC facilities. The guideline was developed for nurse practitioners, but Bergman-Evans states it can also be utilized by other members of the interdisciplinary team, including nurses, pharmacists, physicians, and physician assistants. Bergman-Evans discussed four outcomes, including maintaining functional status, decreasing polypharmacy, avoiding adverse drug reactions, and decreasing inappropriate prescribing. The author states that polypharmacy is a significant burden and brings with it a risk for error. Bergman-Evans report that a nurse may pass medications to 15-30 patients and complete the administration within one hour of the administration time, all while coping with frequent interruptions. This task puts the nurse in a critical position to advocate for identifying medications for discontinuation or reductions based on the patient's condition. By recognizing whether the original indication for the drug is still valid or if the drug has the desired effect, the nurse can assist in making decisions about whether the cost of the drug and burden is worthwhile. Like Endsley (2018) and Zullo et al. (2018), Bergman-Evans (2013) suggests that nurses need good resources for identifying inappropriate medications and recommend current drug guides, references, and pharmacists available to consult with regarding rationale, risks, and benefits of recommending changing or deprescribing medications. Bergman-Evans states that while medications can be beneficial, they can contribute to problems and the use of evidence-based guidelines should be a priority for nurses in the LTC practice.

Cherubini, Corsonello, and Lattanzio (2016) wrote an editorial regarding how to move forward in addressing polypharmacy in the nursing home resident. Cherubini et al. point out that

the majority of drugs has never been tested in the old, disabled, cognitively impaired adult. These patients are excluded from clinical trials and are an extremely vulnerable population with increased sensitivity to adverse drug events due to aging, multiple comorbidities, and disability. Adverse events in this population are associated with negative outcomes such as falls, delirium, and decline in their ability to perform activities of daily living. Cherubini et al. also state that many LTC patients have reached the terminal phase of their lives when all therapy should be reviewed as to its clinical benefit. Medication issues are attributed to highly complex conditions, low physician involvement in daily care, high rates of staff turnover, and frequent transitions of care such as when a patient is hospitalized. Cherubini et al. cite that the most studied intervention to improve medication management in nursing home patients is education with some improvement noted. Cherubini et al. also point out that multidisciplinary team meetings have been studied and, in most cases, led to significant effects on prescribing habits. Cherubini et al. recommend that there are potential benefits of implementing a physician-led intervention that included promoting greater involvement of the nursing staff.

Limitations of the Literature Review Process

The literature is rich with the need to reduce polypharmacy in the elderly patient to improve quality of life, reduce adverse outcomes, and reduce the burden on the patient, the nursing staff, and the healthcare system. Michael Woodward (2003) is attributed for first coining the term “deprescribing” in an English journal article. The concept of pharmacy and the reduction of medications in the elderly could still be considered in its infancy. Thus, literature addressing the issue are found primarily after 2010. This interest appears to correlate with the aging of the baby boomer generation; as this generation has aged during the prevalence of diagnosed multimorbidity, the use of evidence-based, disease-specific guidelines, and the focus

on patient-centered care in which the patient has greater access to information regarding medications and their availability. Other considerations for selection was the infrequent inference that nursing and the interdisciplinary team had a role to play in the process of deprescribing; however, most articles were written with the responsibility left to the physician or prescribing provider. Rogers' (1983) Theory of Planned Change was evident, though not stated, through the selections as the selections acknowledged a problem exists, sought to create interest in solving the problem by identifying the adverse effects of polypharmacy, sought to focus on literature that supported change, recommended development and implementation of programs to change, and suggest the adaption of interdisciplinary models to affect organization-wide change. Other limitations were the inconsistent definition of the term polypharmacy, small sample sizes, and no randomized controlled trials regarding polypharmacy in the elderly.

Discussion

Conclusion of findings. The context of this literature review was based on medical and nursing articles focused on the concept of polypharmacy in the elderly population. Most evidence focused on the definition of the concept, the identification of the polypharmacy, and a limited focus on the strategies to overcome the issue. Rogers' (1983) Theory of Planned Change explains the model needed for change, including awareness, interest, and adoption. The research discovered and expounded on an awareness that polypharmacy is a problematic issue with elderly, frail patients living in LTC facilities. Articles in the review indicate that the interest in the problem is one that affects not only the patient but LTC staff such as physicians, nurses, and pharmacists. Studies that acknowledge this interdisciplinary problem also acknowledge the solution is multidisciplinary as well. As such, the literature supports the implementation of education of polypharmacy and its effects, the implementation of an evidence-based, easy to

access and use tool for nursing staff as the nursing staff is considered key to the identification of polypharmacy and advocates of the patient to the provider. The literature supports a team-based approach to overcoming the problem of polypharmacy.

Advantages and disadvantages of findings. Advantages of the literature evidence include strong support of the identification of polypharmacy with a multidisciplinary team approach with the nursing staff being acknowledged as crucial stakeholders as nursing is the primary provider of daily care as well as the staff delegated to the administration of all medications. Nurses can determine if medications are still valid based on the patient's condition, are having the desired effect based on the condition of the patient and are causing adverse events to the patient (Bergman-Evans, 2013). By educating and empowering nurses to identify and recommend deprescribing to providers, better decisions can be made about the burden to the patient and the cost burden to the healthcare system.

Disadvantages of the literature evidence are that limited evidence is available to support the outcomes of deprescribing of medications. Most clinical trials and qualitative studies exclude the hospice and LTC patient being reviewed for this project. Thus, there are little in the form of guidelines that address the deprescribing of medications in patients with multimorbidity, advanced age, and limited prognosis. The recommendations focus mostly on the identification of high numbers of medications and the events that may be related to the medications or the prescribing cascade itself. There are limited studies that focus on specific medication groups that can be focused on, and very few studies that recommend evidence-based tools to assist the healthcare team in these decisions.

Utilization of findings in practice. The education implementation of this project was two-fold; first, an education program and training directed to the hospice nurses to teach those

nurses how to identify polypharmacy and its risks, utilize MedStopper® and make deprescribing recommendations. Second intervention will be directed toward the LTC nurses caring for hospice patients residing in LTC to teach them to identify polypharmacy and its risks, utilize MedStopper® and make deprescribing recommendations. This education the potential to reduce inappropriate and unnecessary medications in this population. Education and the utilization of a simple to use tool has been the most studied intervention and has been shown to have positive effects on polypharmacy (Cherubini et al., 2016). The inclusion of the interdisciplinary team also has the potential to have a positive impact on deprescribing habits as nurses are the professional caregiver in contact with the patient daily. By educating and empowering nurses to identify and make recommendations on medication management to the provider, nurses can be a change agent and advocate for the patient. The nurse's role is key to the effectiveness of ensuring appropriate medication management for the frail hospice patient in the LTC setting.

Summary

In summary, there is evidence that supports the implementation of an education program including the use of an on-line tool for hospice and LTC nurses caring for hospice patients in the LTC setting. This education can empower nurses to identify polypharmacy and recommend medications for deprescribing to the provider of the patients. The nurses may face barriers to deprescribing from the providers and patients and families; however, with proper education and support, better decisions can be made regarding the medication management in these patients. Using Rogers' (1983) Theory of Planned Change, nurses, patients, family members, and providers can become more aware of the safety problems and cost issues caused by increased numbers of medications and the continuation of unnecessary/inappropriate medications. By

understanding the problems that result from polypharmacy, interest can grow to solve the problem and thus, organizational change can occur.

Chapter Three: Theory and Concept Model for Evidence-based Practice

According to Grove, Gray, and Burns (2015), theories are the ideas of science, a set of concepts and statements presenting a perspective of experience. Concepts are the words that describe an idea or event and give it a separate identity or meaning. Theory is vital to research and research is, in turn, vital to promoting evidence-based practice (EBP) change. The benefits of EBP change are improved outcomes for patients, providers of care, and the healthcare system as EBP promotes quality, cost-effective care. However, there are barriers to EBP, such as a lack of research regarding the effectiveness of many nursing interventions. Doctor of Nursing Practice (DNP) prepared nurses are in key positions to promote such research and change in healthcare settings. Because EBP is a phenomenon requiring the synthesis of research with clinical expertise and patient values, the DNP prepared nurse is positioned to promote this change. If quality healthcare is to survive, nursing must change based on research and expertise. This chapter analyzes the concept of polypharmacy in the context of the nurse's ability to reduce inappropriate and unnecessary medications through the identification and recommendation of deprescribing to the provider.

Concept Analysis

According to Avant and Walker (as cited in McEwen & Wills, 2019), the reason for analyzing a concept is to clarify the meanings of terms and to define such terms in order for the author and reader to share a common language. Avant and Walker's steps include deciding on the purpose of the analysis and identifying the potential uses of the concepts. The analysis then determines the defining attributes, the identification of cases, the identification of the precedent, and the consequence of the concept. The concept being evaluated for this project is

polypharmacy. Upon examination of the literature, it was found that there was not a consistent definition of polypharmacy.

For this project, it was essential to decide the most appropriate definition for analysis. Pharmacist William Simonson (2015) stated that the "variety of definitions of 'polypharmacy' is really quite remarkable." (p. 467). Polypharmacy is a term used to describe the prescribing of too many medications, the wrong medication for a diagnosis, the use of medications with drug-drug interactions, the prescribing of inappropriate medications or a patient utilizing too many pharmacies for obtaining medications (Gillette, Prunty, Wolcott, & Broedel-Zaugg, 2015). The fact there is no single definition of polypharmacy makes it difficult to identify and offers a significant challenge for healthcare to solve. According to Gillette et al., (2015), the term has been defined in at least 24 distinct ways, causing confusion among researchers, educators, clinicians, and students. However, Simonson (2015), argued in his commentary that the term itself is a misnomer and that the issue is not the number of medications but rather the number of unnecessary medications ordered.

The literature has yet to develop a firm definition of what polypharmacy is or what it is not. There are no tools to measure whether medication use is excessive, nor which medications should be discontinued. Regardless of the definition, the research is clear that polypharmacy in each form leads to or contributes to medication-related problems due to drug-drug interactions and side effects (van Nordenne et al., 2014). Quality of life issues related to the side effects of medications such as dysphagia or loss of appetite are also noted in the literature (van Nordenne et al., 2014). Zullo, et al. reflect that for each dollar spent on medications there is $1.75 spent to treat drug-related problems which result in cost concerns in an already cost-conscious healthcare system (Zullo, et al, 2018).

Theoretical Framework

McEwen and Wills (2019) define a theoretical framework as a set of related concepts that provide a mental image of a phenomenon. A framework supports the concept which begins as just an idea or thought. Through the use of a framework, it was possible to frame the clinical problem and work through the problem. It is this work that has the potential to lead to a change in practice.

Everett Rogers' (1983) Theory of Planned Change detailed in the book, *Diffusion of Innovations,* served as the theoretical framework for the change that was necessary for a nurse working with the dying patient to accept and utilize the knowledge needed to identify and recommend to the providers and the patient. Rogers defines diffusion as a process where innovation is communicated to members of a system or organization over time. Rogers further defines communication as a process in which the members share information in order to reach a mutual understanding. Rogers also explains that innovation is the perception of a new idea or practice. However, the "newness" may be interpreted by the new way an individual or organization perceives the innovation and the willingness to adopt or reject the idea. So, if the individual or organization is somewhat aware of the innovation and has rejected it, there is still an opportunity to renew the interest and persuade the attitude to change.

Rogers' (1983) Theory of Planned Change specifically identifies the steps necessary for the "innovation-decision process" (p.20). Rogers' outlines five steps the learner progresses through as they decide whether or not to make a change: knowledge, persuasion, decision, implementation, and confirmation. During the project, the nurse must first acknowledge that the problem exists and have some basic understanding of the problem to be solved. The nurse must then be persuaded to gain an interest in solving the problem. It is during the persuasion period

that the nurse will develop a favorable or unfavorable attitude toward potential solutions. If the nurse adopts a favorable attitude, Rogers' theory indicates the next step is the implementation phase where the individual takes actions to solve the issue. The final step in change is a period of confirmation during which time the individual will seek reinforcement and decide whether the change was successful.

Rogers' (1983) also classified those who adopted the idea into five adopter categories. First are the innovators who are those who are daring and risk-takers. This group has the ability to apply technical knowledge and understand the innovation. This group may not be well respected by the others in the group but are important as they produce a flow of new ideas into the implementation. Roger's then identifies early adopters as those individuals others in the group will look to before trying a new idea. This group is well respected by their peers and has the highest degree of lay leadership of the group. Rogers' third group is the early majority. This segment makes up about one-third of the total group and while not the leaders they are very interactive with their peers. They tend to adopt new ideas just before the average team member. Then there is the late majority who are the skeptics of the group. They make up another one-third of the overall group. The late majority may adopt the change due to peer pressure but are cautious and seem to need for any uncertainty to be removed before they will fully adopt the change. Then there are the laggards who are the last to accept change. They tend to be sure there is no reason to change as change in the past has been unsuccessful. This group does not have any internal leadership and does not communicate well within the team. The term laggard is not intended to be negative simply that they come to adoption late due to their past experiences.

Application to practice change. Wright, Scott, Buck, and Bhattacharya (2019) state that regardless of the nurse's ability to prescribe medications, they are involved in most aspects of medication administration and education. In this role, the nurse has the opportunity to discuss the patient's attitudes toward the medication they take. Nurses have insights into the barriers faced with polypharmacy and have the training to have skilled communications within a shared decision-making model. By understanding the opportunities to improve quality of life, reduce drug events, and reduce costs, the nurse has a vital role in the deprescribing process.

By using Rogers' (1983) Theory of Planned Change, the nurse can not only move through the steps of change themselves as described previously but also walk with the patient and the prescriber through the steps as described. The nurse can acquire the knowledge necessary to recognize polypharmacy and educate the patient about the possibility of reducing some of their medications and use communication skills to persuade the patient to accept the deprescribing of medication. At this point, the nurse has the opportunity to share this knowledge with the prescriber and persuade the prescriber to consider the discontinuation of a medication that may no longer be appropriate, may no longer be effective or adding to a prescribing cascade. Once a decision has been made by both the prescriber and the patient, the nurse's role is to implement that change and monitor the patient's physical responses and report to the prescriber. At that point, the decision to de-prescribe can be confirmed as either positive or negative, and a determination to continue without the medication can be made. Nurses at the bedside play a tremendous role in this change process and using Rogers' theory can provide the outline for this change.

EBP Change Theory

There is minimal information regarding EBP and the nurse's role in deprescribing with the utilization of an online tool such as MedStopper®. It was necessary to pair Rogers' theory with an EBP theory to the needs of the project. The Stetler Model of EBP (McEwen & Wills, 2019) was chosen for this project. The Stetler Model was initially designed in the 1970s as a quality improvement model and has been revised several times to make it more useful for the nurse at the bedside. The current model is similar to the nursing process, and the phases are incredibly similar to Rogers' theory steps and thus work together exceptionally well. The "phases of the approach include preparation, validation, evaluation/decision-making, application, and evaluation" (McEwen & Wills, 2019, p.112). The Stetler Model utilizes five phases that take into account the clinical situation before using research in the clinical practice at the bedside (McEwen & Wills, 2019). The optimal outcomes should be better patient outcomes and improved nursing practice.

Application to practice change. Each phase was discussed to explain what actions would be taken during that phase of the project. Phase one; the preparation phase requires a definition of the issue and a review of the evidence. This phase correlated with the literature search regarding polypharmacy as a concept and the research available. It is during this phase that a team is developed, and barriers are identified. Desirable outcomes are determined, and investigation is made on the influential factors that can be leveraged (McEwen & Wills, 2019).

Phase two is the validation of the findings (McEwen & Wills, 2019). The literature matrix was used to critique and culminate resources. Levels of evidence were used to determine the best evidence; however, expert opinions were not excluded. Non-credible or sources not found to be appropriate were eliminated if they did not fit the focus population. During this

phase, a project may be ended if there is not enough evidence or research to proceed. This project topic did indicate sufficient research, as evidenced by the works of Jokanovic, Tan, Dooley, Kirkpatrick, and Bell's (2015) systematic review of the prevalence and factors associated with polypharmacy in long term care (LTC) facilities. This review supported the identification of polypharmacy as a serious issue. The Swedish longitudinal cohort study by Morin et al. (2017) supported the need for prescribers to consider discontinuing drugs by considering the patient's life expectancy, the risk of harm, and the patient's goals of care.

Phase three is the decision-making phase in which the findings are synthesized, and the decision is made whether to continue and what to use to accomplish the desired outcomes (McEwen & Wills, 2019). When the decision was made to proceed, the recommendations and outcomes were developed, and specific education was planned. During this time, the MedStopper® tool education was also planned, and the tool tested.

During phase four, the application phase (McEwen & Wills, 2019), the education program regarding polypharmacy and MedStopper® was implemented at the LTC facility with all nurses with medication administration duties, the hospice nurses involved in the care of the patients, as well as all nursing administration. A weekly chart review was conducted to monitor the hospice staff nurse compliance with utilizing the MedStopper® tools plan to collaborate with the LTC nurse for medication care planning purposes. The planned outcome was that practice would change after the education and nurses would be more invested in reviewing medications for discontinuation and make recommendations to the prescribing practitioner and that MedStopper® would be incorporated into their regular workflow. As needed during the education programs, education was adjusted to meet the needs of the participating staff.

Phase five is the evaluation step during which outcome evaluation was conducted (McEwen & Wills, 2019) through medication record review to determine improvement as evidenced by a decrease in medications in the following drug classes: statins, anti-hypertensives, anticoagulants, anti-hyperglycemic agents, and antimicrobials. A cost savings evaluation was also conducted to evidence the savings potential for this program. A comparison of pre-education and post-education chart reviews was conducted to assess for a decrease in the number of medications in the identified drug classes and the decrease in costs.

Summary

Education was necessary to increase the nurse's knowledge of polypharmacy and strategies to address the safety issues associated with polypharmacy. Education was also necessary to empower the nurses to make deprescribing recommendations to the prescribing provider as well as the patient and family. Education was a key factor in teaching the nurses the value of the MedStopper® tool. By following Rogers' (1983) Theory of Planned Change, the nurses were provided new knowledge about the concept, which created interest in the issue. Through education based on research, the nurses were then persuaded that deprescribing was beneficial to the patients, the nursing staff, and the organization. After the education, the decision was made to pursue the project and implementation of the MedStopper® tool was initiated, the nurses were empowered to have discussions with patients and families and made recommendations to the prescribing practitioners.

Due to Rogers' theory and the Stetler Model being so similar to the nursing process, this provided a natural way to support the new knowledge and application of the new process. The Stetler Model was well suited to clinical application and easy to follow. Having determined the theoretical foundation and a well-suited EBP change model, the next stage of the project was to

develop a pre-implementation plan of how the project was to progress from initiation to evaluation.

Chapter Four: Pre-implementation Planning

Medications are perhaps the most useful tool in modern medicine; however, they are not without risks. This chapter explores how the project was planned and developed. This chapter also discusses the organizations - readiness for change and the collaboration anticipated for success. Risk management is explored through a review of the risk analysis. Finally, a discussion of the outcome measurements, evaluation tools, plans for data analysis and data management are discussed. The evidence-based project was planned to educate staff regarding polypharmacy, utilization of the MedStopper® tool, and empower nursing staff to recommend deprescribing to the patient's provider.

Project Purpose

The purpose of this proposed evidence-based practice (EBP) change project was to recognize and recommend medication reduction in hospice patients residing in long-term care (LTC). To accomplish this purpose, it was necessary to educate all nursing staff responsible for medication administration or monitoring. This included educating nurses in the hospice program as well as nurses in the long-term care facility. The project included the use of the MedStopper® online program to help nursing staff identify medications appropriate for deprescribing. A 2017 study of 2,623 adults in hospice care indicated that each patient took an average of 10.2 medications every day (Stinson, Gurevitz, & Carrigan, 2019). The anticipated outcome of the project was to demonstrate an overall decrease in medication use in at least one of the targeted drug classes. Success was dependent on the nursing staff's ability and willingness to recommend medications for deprescribing to the provider. Interprofessional teamwork was necessary if the project was to demonstrate a positive outcome.

Project Management

Prior to the implementation of the EBP change project, organizational readiness was assessed to understand the project setting. The area involved in the project was one of the hospice's contracted LTC facilities. The LTC facility averages caring for approximately 15-17 hospice patients per day. The hospice organization had two nurses that served as case managers for the hospice patients residing in the LTC facility. It was recognized by the hospice nurses that LTC patients had a trend toward higher than average medications versus home care patients. This observation was confirmed by the hospice's pharmacy vendor. It was identified that the LTC was a level of care in which the hospice had no direct prescribing authority, and thus was an area for improvement.

Organizational readiness for change. For change to occur, both the hospice and the LTC facility must demonstrate readiness for change. In discussing the issue of polypharmacy in the hospice patient, it was clear that no one organization could effect change without the other. According to Rogers' Theory of Change, it was necessary that both organizations acknowledge a need for change (Rogers, 1983). The hospice was the primary proponent of the project as it was the hospice that recognized the issue of polypharmacy and the associated risk to patients, burden to LTC staff and financial strain on the hospice budget. This was brought to the attention of the LTC administrator by the primary project manager who provided the administrator with benchmarking information. Information shared included data related to the number of medications prescribed to patients per patient day being higher for this hospice as compared to other hospices served by the hospice pharmacy vendor. This information persuaded the LTC administrator that this project would be beneficial to the LTC organization. If successful, this project had the potential to increase the quality of the patient's lives, reduce possible adverse

drug events, decrease time and costs associated with staff medication administration time, and provide education and tools that would elevate staff's ability to recognize and address polypharmacy in patients outside the hospice scope. In conclusion, there was a sense of organizational readiness by both the hospice and the LTC organization to support the project.

Inter-professional collaboration. Assembling an operational team that was well respected and engaged in patient care was the first necessary step in implementing the EBP project. Leaders, whether formal or informal, influence the actions of others. The operational team consisted of a leadership champion and a practice champion. The hospice Vice President of Professional Development, with more than 30 years of hospice experience, served as both the primary practice champion and the primary project manager. The role of the primary project manager was to educate the hospice and LTC staff, provide and review the printout of the MedStopper® tool for each patient to the hospice staff nurse, monitor the patient record for MedStopper® tool compliance in using the tool to collaborate with the LTC nurses, conduct data collection, conduct remedial education as needed and make adjustments for change strategies as needed as indicated through the Plan, Do, Study, Act (PDSA) model (see Appendix B). The LTC Administrator served as the LTC project practice and leadership champion. The role of the LTC administrator was to foster the education, provide mentorship to the staff, and assign leaders to monitor staff for compliance during routine care planning meetings. The hospice leadership champion was the hospice Chief Executive Officer who provided mentorship to the primary project manager.

The rest of the project team includes the hospice nurse case managers whose responsibility was to facilitate discussions of polypharmacy and deprescribing utilizing the MedStopper® report with the LTC nursing staff, facilitate discussions regarding deprescribing

with the provider, and, if necessary, the patient and family, and model deprescribing discussions as needed. LTC providers were educated on polypharmacy and deprescribing by the hospice team's nurse practitioner.

Risk management assessment. An assessment of the change projects' strengths, weaknesses, opportunities, and threats (SWOT) was conducted to identify areas of concern, potential threats, and weaknesses. The SWOT analysis was developed to identify the internal and external factors that may have an impact on the success of the project. This analysis helped to uncover previously unexpected factors that could be capitalized on or addressed as deficits or both.

Strength. One of the identified strengths was the excellent, long-term relationship between the hospice and the LTC facility. Another strength was the resource support of the hospice pharmacy vendor, who was able to provide reports to the hospice. A third strength was the primary project manager who had extensive hospice experience.

Weakness. The potential perception of additional work for staff nurses was identified as an inherent project weakness. Another weakness was the time required to provide education to all hospice and LTC facility nursing staff that were involved in the administration or monitoring of patient's medications, which included staff on nights and weekends. An additional weakness identified was a lack of standardized scripts and written materials for use when explaining the rationale for deprescribing to providers.

Opportunities. Opportunities that were evident for this change project included the collaborative support from the hospice staff working with the LTC facility staff. Additionally, there was the support of the LTC leadership, consulting pharmacist, and staff development coordinator to encourage staff participation in the project. The ability to have the LTC facility

host education sessions at flexible dates and times was another important opportunity. Tremendous LTC administrator support was an opportunity that fostered a successful collaboration on this project.

***Threats*.** Potential threats identified included limited LTC staff attendance at the education sessions and a lack of buy-in. There was an anticipated lack of support from the LTC facility providers accepting deprescribing recommendations from nurses. Another potential threat was a lack of understanding the benefits for patients, such as reduced adverse drug events, decreased hospitalizations and increased quality of life. For staff, medication administration burden and time spent assessing for and treating adverse drug events is time-consuming but any additional focus on medications could have been negative.

For the organization as a whole, the benefits include cost savings by reduced adverse drug events, reduced cost in medication administration leaving more time for staff to provide enhanced patient care, and a decrease in re-hospitalizations. However, it was crucial to use education to overcome the threat associated with the understanding of these potential positive outcomes.

Organizational approval process. Organizational approval was obtained after presenting the hospice pharmacy reports indicating the hospice exceeded the national average for medications per patient for hospice patients residing in LTC facilities. The hospice chief executive officer provided a letter of approval for the project and agreed to serve as the hospice site project champion (see Appendix C). The primary project manager met with the facility administrator and explained the project plan and expected outcomes. Explanations were made that the data, chart reviews, and pharmacy data would all come directly from the hospice medical record and there would be no data mining from the LTC record. It was explained that in order

for the project to be successful, it was necessary to teach both the hospice nursing staff and the LTC facility staff to identify polypharmacy and recommend deprescribing to the providers. It was explained that the primary project manager would collect a pre- and post-education survey tool at the time of the facility education sessions. Organizational approval was obtained from the LTC facility's ownership for the education of staff on MedStopper® (see Appendix D).

Information technology. The online internet-based tool MedStopper® was printed for each hospice patient residing in the LTC facility at the time of project implementation, for each LTC patient admitted to the hospice during the project duration and updated for each patient every week as new medications were added or stopped. The primary project manager printed the MedStopper® report for medications within the target drug classes within two working days and reviewed the report with the hospice nurse, who then reviewed the report with the LTC nurse. An Excel data collection tool was utilized to assess data from weekly hospice chart reviews for each hospice patient to monitor the targeted drug classes to compare and contrast for deprescribing. Patients were not identified in the Excel data collection tool and were assigned a non-identifiable number to manage data analysis.

Education for hospice and LTC nursing staff was presented using a PowerPoint presentation. Staff were provided handouts of the slides and time was allotted for questions during the education session. The primary project manager provided available contact information to the hospice and LTC staff for any further questions.

Cost Analysis of Materials Needed for Project

Minimal materials were needed for the change project. The project materials included: approximately 500 sheets of 8 ½ x 11 copy paper for educational handouts and flyers at an estimated cost of $45.00. The hospice organization and hospice pharmacy vendor provided

computer support for monitoring the data. The MedStopper® program is available online at no cost. Snack food was provided for training of the hospice nursing staff as well as the LTC facility nursing staff at an additional cost of approximately $50.00. The total estimated cost for the project was $95.00 (see Appendix E).

This project had the opportunity to save the LTC facility in a reduction in staff medication administration time. It is estimated that for each oral medication added to a patient's oral medication pass it takes an additional 45 seconds; thus, the cost of adding that drug can be between $7 and $21/day per patient; even if the medications are passed at the same time (Pruskowski, Zarowitz, & Handler, 2018). Therefore, assuming the project would lead to the deprescribing of at least one drug per patient, administered one-time daily times the average hospice caseload of 15 patients the savings for the LTC facility is estimated at daily cost savings of $105.00 at a minimum and $315.00 at maximum. The savings for the hospice program was more difficult to predict as the cost of the drug deprescribed varied widely and could not be easily foreseen prior to implementation. Given these cost-saving projections, the project benefit outweighed the project cost.

Plans for Institutional Review Board Approval

The Institutional Review Board (IRB) is a committee responsible for reviewing research to confirm that the investigator is conducting ethical research (Grove, Burns, & Gray, 2015). Planning for the IRB review process began with meeting with the LTC project champion to discuss the project and the steps for IRB review through the LTC organizational IRB as the hospice organization did not have an IRB committee. The first step of the IRB process was to complete the University QI/Program Evaluation Self-Certification Tool specific to the project for review by faculty lead.

The LTC project site's office that oversees research was consulted by phone for IRB quality improvement project review. A project proposal was emailed to the director on October 10, 2019, and a quality improvement project summary guide was submitted to the LTC organization's IRB office and deemed to be a quality improvement project and granted a waiver of approval. The LTC project site IRB waiver of approval was obtained and forwarded to the primary project manager on November 15, 2019 (see Appendix F). The University QI/Program Evaluation Self-Certification Tool for IRB review process was completed, and an approval waiver was provided by the University and obtained on November 15, 2019 (see Appendix G).

Plan for Project Evaluation

Demographics. Demographics collected included roles of the nursing staff involved in the education sessions as well as years of experience working in the LTC setting. Data was collected on the pre and post-education survey. Roles and years of experience were presented as a mean score and range noted in table format. The purpose of demographics was to gather information to be used during the PDSA cycles to identify any additional educational needs.

Outcome measurement: **Nursing knowledge**. Nursing staff knowledge was chosen as an area of focus. Improving the knowledge of nursing staff in the effects of polypharmacy is vital to the confidence of staff to recommend the deprescribing of medications to the provider. Nursing staff administering medications are in key positions to advocate for identifying the effects and side effects of medications and make recommendations to providers.

Evaluation: Nursing knowledge. Nurses educated were asked to evaluate the education and knowledge perception using a Pre-Education Program Evaluation tool and a Post-education Program Evaluation tool (see Appendices I & J). The Pre-Education tool evaluation measured the nursing staffs' responses regarding the staffs' level of comfort using the following format:

very uncomfortable, uncomfortable, comfortable, and very comfortable with identifying polypharmacy and suggesting deprescribing to the provider (see Appendix I).

The Post-Education tool evaluation measured the nursing staffs' responses regarding the staffs' level of comfort using the following format: very uncomfortable, uncomfortable, comfortable, and very comfortable with identifying polypharmacy and suggesting deprescribing to the provider after education. The post-education tool also included a question related to nursing staffs' response regarding the likeliness to use the information provided during the training. Participants were also asked to indicate specifically what the participant intended to use in their daily practice, what he/she wished had been learned during the education presentation and the primary motivation for attending. These three questions were captured in a narrative format (see Appendix J).

Data analysis: Nursing knowledge. The pre-education survey data was collected via the Pre-Education Nursing Staff Survey tool in January 2020 prior to each educational session. The average scores for each question were recorded in table format using frequencies. The post-education survey data were collected via the Post-Education Nursing Staff Survey tool in January 2020 after each educational session. Answers for each question were then documented in table format displaying the frequency of each answer. A comparison of the aggregate pre- and post-education survey results was reviewed and presented through a table format as well as a chart and summative narrative including percentages (See Appendix K). These results were utilized as a part of the PDSA cycle to focus on additional educational needs for the participants. The final results of the project were displayed in a poster format for presentation at the hospice and LTC facility.

Outcome measurement: MedStopper® compliance. The MedStopper® tool is an online tool designed to assist the professional caregiver to identify and prioritize medications for deprescribing (see Appendix K). This medical tool incorporates other deprescribing resources such as Beers and STOPP criteria as well as the Edmonton Frail Scale. Permission to utilize the MedStopper® tool was obtained for use (see Appendix M).

The MedStopper tool was printed for each hospice patient residing in the LTC facility at the time of project implementation by the primary project manager. Additionally, the MedStopper tool was printed for each new hospice patient admitted during the 12-week implementation period and weekly for all hospice patients in conjunction with weekly medication order reviews. The MedStopper tool's printed plan was given to the hospice nurse responsible for the hospice care of the patient, and the plan was reviewed. The hospice nurse then utilized the plan to facilitate a medication plan discussion with the LTC facility nurse. This discussion provided an opportunity for the staff to discuss potential deprescribing recommendations for the provider to consider. This collaboration was documented by the hospice nurse in the clinical notes of the hospice electronic medical record. A process map was designed to outline the process for the utilization of the MedStopper® tool and report (see Appendix N).

Evaluation: MedStopper® compliance. The primary project manager created a MedStopper® Compliance Tool Excel spreadsheet for weekly use (see Appendix O). A chart review was conducted weekly, by the project manager, to evaluate hospice nurse utilization of the MedStopper® tool. Monitoring the MedStopper® tool utilization assisted in the evaluation of staff compliance and identify opportunities for improvement in the process.

Data analysis: MedStopper® compliance. Descriptive statistics using percentages and frequencies were utilized to displaying results. Weekly chart was used to track utilization compliance. A compliance percentage was determined by dividing the number of "Yes" answers by the total number of MedStopper® tools, the number was then multiplied by 100 to get a percentage of compliance. A 95% compliance rate was expected by the primary project manager.

Outcome measurement: Polypharmacy reduction. The expected outcome of the education intervention was to see a decrease in at least one drug in at least one of the following drug categories: vitamin/supplements, statins, anticoagulants, cognitive enhancing, antihypertensives, and antihyperglycemics. Education of the nursing staff in polypharmacy and initiating discussions with providers regarding deprescribing of medications were crucial for the actual deprescribing of such medications. As part of the PDSA review cycle, the number of medications being deprescribed in the hospice patient guided further education with hospice and LTC facility staff.

Evaluation: Decreasing identified medication category utilization. A Data Collection Tool was created to track weekly medication usage (see Appendix P). The tool consists of an unidentifiable patient number, the number of drugs prescribed per each drug category. Weekly chart review by the primary project manager review was conducted using the hospice medical record and hospice pharmacy vendor reports to evaluate patient medication usage.

Data analysis: Decreasing identified medication category utilization. Hospice medication records were reviewed weekly and transcribed to the Excel Data Collection Tool to evaluate trends in deprescribing. Weekly review monitoring for a decrease in the medications in the targeted drug classes was completed. Data were evaluated for a goal of a decrease in at least

one medication from at least one targeted medication category for each patient. Overall medication utilization was not monitored as it was expected that symptom management medications would be added as the condition of the patient declined. Data were utilized to determine if further education in a specific drug category was indicated, as part of the PDSA cycle. This data was presented weekly utilizing a table that showed the number of prescribed medications in each category to monitor for a decrease.

Data management. Paper survey tools were collected before and after each education session. No identifying information was included in the pre and post-survey tools. The pre and post-survey results were aggregated into an Excel table format and stored in a password-protected computer file located on the personal computer in the home office of the primary project manager. Copies of the survey tools were transported in a locked briefcase and subsequently stored in a locked file drawer located in the home office of the primary project manager.

Patients were not identified in the Excel data collection tool but were assigned a non-identifiable number to manage data analysis. Data was collected on an Excel data collection tool and stored on a password-protected computer in the private home office of the primary project manager. The primary project manager utilized a code sheet that tracked the patient's hospice medical record number and non-identifiable number for ongoing data collection and monitoring. The code sheet was stored in the locked office of the primary project manager. The completed MedStopper® Compliance Tool was kept on a password-protected computer in the private home office of the primary project manager. The home office of the primary project manager is accessible only by the primary project manager. Only aggregate findings were presented in PowerPoint presentation to the hospice and LTC facility. All survey tools, hard copy data files,

and digital files will be kept for five years after the conclusion of the project. All digital files will be deleted, and hard copies of all survey tools will be shredded.

Summary

The education of nursing staff and collaboration between the hospice nursing staff and the LTC nursing staff was vital to providing a base for identifying and recommending medications for deprescribing in the hospice patient. Simple, easy to use tools are key to ensuring understanding and fostering discussions. There is sufficient literature to support the theory that nurses are key to the identification of polypharmacy and thus have a vital role in collaborating with the provider to ensure safe and effective medication management. Tools such as MedStopper® can be used to foster an awareness of the importance of good medication stewardship. This training was used to expand the nurses' knowledge and foster confidence in recommending medications for deprescribing.

The planning phase of any change project is crucial to the project's success. Learning and understanding the needs of both the hospice and the LTC organization, learning and understanding the requirements of each organization's IRB process, discovering the strengths and weaknesses of each organization, a plan for success was then possible. The next step of this change project was to begin the implementation phase.

Chapter Five: Implementation Process

Implementation is the step in any quality improvement project in which planned interventions are put into action and evaluated. This chapter explains the setting where the interventions took place, staff participating in the project, how the participants were recruited, and each step of the implementation process. Variations in the plan were made as a result of the weekly review as a part of the Plan, Do, Study, Act (PDSA) model. These variations are discussed in this chapter.

Setting

There were two settings for this 12-week quality improvement project. First was a rural, free-standing, non-profit hospice with an average daily census of approximately 160 patients per day. Of those 160 patients, approximately 10% of those patients reside in long-term care (LTC) facilities and are primarily cared for by the staff of the LTC facility with the hospice staff visiting twice weekly to provide hospice and palliative oversight. The second was the LTC facility located in the service area of the hospice. This LTC facility is owned and operated by a major, well-established southeast healthcare system located in central North Carolina (NC) and is a crucial part of the local hospital's discharge planning. Both the hospice and the LTC facility are in a rural county with a July 1, 2018 census of 97,645. Of the county's population, 18.69% is over the age of 65 years (United States Census Bureau, 2019).

Participants

The participants of this project are LTC and hospice nurses caring for the hospice patients residing in the specified LTC facility. The Centers for Medicare and Medicaid Services (CMS) specifies in Hospice Regulation §418.112 that the hospice staff and the LTC staff must collaborate to provide care for the hospice patient residing in the nursing home. This project was

designed to provide education and a deprescribing tool that would be used by both the hospice and LTC nurses caring for the individual hospice patient. CMS holds the hospice responsible for the professional management of the care plan of these patients. Thus, the hospice needed to take responsibility for developing medication recommendations for deprescribing (U.S. CMS, 2019). Participants included the hospice nurses and the LTC nurses responsible for administering medications or supervising those nurses.

Recruitment

The nurses at both the hospice and the LTC facility were required to attend one of the education sessions provided by the primary project manager. The education sessions were scheduled on multiple dates and times for attendance to be convenient for those participants. Flyers were posted at the nursing stations of the LTC facility as well as the clinical area at the hospice facility to inform participants of the upcoming training and generate interest in the topic (see Appendix H). The primary project manager was available to provide individual training for any staff not able to attend previously scheduled education sessions as well as to those staff members that had specific questions not answered by the mandatory education sessions.

Implementation Process

The project was implemented by the primary project manager in January 2020. An initial chart review of all of the medication records for hospice patients at the LTC facility was conducted the week before implementation to gather baseline information. Education included an overview of the project, a review of the MedStopper® tool, a review of the process map, and strategies for recommending deprescribing to providers. Before each education session, a survey was given to all participants to evaluate the comfort level in identifying polypharmacy and recommending deprescribing to providers. Education was provided to the participants over one

week at the LTC facility that included the LTC nurses as well as the hospice nurses. Following the education, a second survey was distributed to all participants to evaluate the comfort level in identifying polypharmacy and recommending deprescribing to providers after education. The post-education survey also evaluated the participant's likelihood to use the education provided and asked what specifically was learned and what more the participant wished had been provided. The pre- and post-education surveys were placed in a box at the entrance of the room, collected by a member of the LTC staff, and given to the primary project manager at the end of each education session.

MedStopper® reports were printed and provided to the hospice nurses in the first week of implementation for all active patients in the LTC facility. The hospice electronic medical record (EMR) was reviewed weekly by the primary project manager to monitor for new patients, for patients that had been discharged, and for any newly prescribed or deprescribed medications for those patients in the project. Compliance was documented in the MedStopper® compliance tool (see Appendix N). Each week over 12 weeks, the EMR was reviewed by the primary project manager to evaluate compliance with the hospice nurse using the MedStopper® report to collaborate with the LTC facility nurses. Weekly reviews of the Targeted Drug Classification tool were conducted to evaluate a reduction in medication usage (see Appendix O).

Plan Variation

The project manager planned to make on-site reviews of medications throughout the project implementation. Through the Plan, Do, Study, Act (PDSA) model, the project manager learned that it was necessary to utilize some way to keep the LTC employees engaged in the project. This realization led to the development of a one-page tool, including the outcome graphs, short narratives supporting deprescribing, and photos of staff with the project mascots,

two pink stuffed elephants LTC staff named "Polly" and "Macy". The mascots were placed in prominent areas of each nursing station with the intent to inject a sense of anticipation and fun into the participation in the project.

A worldwide COVID-19 pandemic made it impossible to enter the LTC at the end of the implementation period. As a result, the project manager used WebEx and Zoom virtual meeting platforms to review medication lists with the hospice nurse, the LTC pharmacist, and the hospice nurse practitioner (NP) on two occasions. The project manager was able to continue the use of the one-page LTC updates. These one-page updates were provided to the hospice nurse who was able to place these at the nursing stations, the LTC physician/NP office, and the LTC administrator's office every other week. While these changes were necessary, they may have impacted the LTC staff's ability to feel fully integrated into the project.

Summary

Implementation of this evidence-based project involved the project manager in using skills learned throughout the doctoral program. Skills included gaining knowledge regarding the settings for the project, including obtaining the support of the administration of both the hospice and the LTC facility. Also, participants were recruited, and education provided to ensure engagement in the project. Implementation required the use of technology to educate as well as share period outcomes to facilitate on-going commitment. The PDSA process was used, leading to slight variations to increase engagement. As a corona virus pandemic forced the abandonment of personal interventions, the project varied again to engage staff via other means such as computerized meetings and the use of the hospice nurse to deliver updates to staff.

Chapter Six: Evaluation of the Practice Change Initiative

After the implementation of the Doctor in Nursing Practice (DNP) project, evaluation of the practice change initiative was conducted. Measures included determining the knowledge of the nursing staff before implementation by evaluating the feedback provided by attendees through a pre-education and a post-education survey. Additional measures were to determine the compliance of the hospice nurse utilization of the MedStopper® tool to collaborate with the long-term care (LTC) facility nurses and providers and finally evaluate for a decrease in medications prescribed for hospice patients within the identified medication categories. The purpose of this chapter is to discuss the evaluative measures in detail.

Participant Demographics

Education sessions were held at the LTC facility to provide information regarding the topic of polypharmacy. Live education was provided to the LTC and hospice nurses responsible for managing medications. Training included how to recognize polypharmacy and how to initiate discussions with patients and family members. Training also covered how to communicate with providers and how to recommend deprescribing medications. Twenty-two LTC and hospice staff nurses attended the live training with 16 returning the pre- and post-education surveys. Of those that returned surveys, 56% (n=9) identified as licensed practical nurses (LPN), 13% (n=2) identified as registered nurses (RN), and 31% (n=5) identified as RN supervisors. It was essential to gather this demographic data to guide one-on-one education during the project manager's rounding at the LTC facility.

Intended Outcomes

This project had three defined outcomes. The first outcome was to measure the education of the staff nurses included in the project before and after the education session. It was expected that at least 50% of the LTC staff nurses would attend a live education session, which was recorded for remaining staff nurses to view. The involved nurses needed to understand the terms, the intent of the project, and the value that deprescribing had for the patient, facility, and nursing staff. It was also vital the nurses felt empowered to contribute to the project's success. Attendees were asked to complete a survey before the training. The survey asked nurses to identify how comfortable they were in recognizing polypharmacy and recommending deprescribing to the provider. After the education was presented, the nurses were again asked to identify how comfortable they were in recognizing polypharmacy and recommending deprescribing to the provider. As a part of the post-education survey, attendees were also asked how likely they were to use the information, and specifically what they had learned. This information was then used during rounding at the LTC facility.

The second outcome stated that the hospice nurse would be compliant with the utilization of the MedStopper® report. The MedStopper® tool utilizes Beers, STOPP criteria, and the Edmonton Frailty scale to identify which medications should be considered for deprescribing. This tool's report provided the hospice nurse and the LTC facility nurse with a guideline for initiating deprescribing conversations with patients, family members, and providers. Compliance in using MedStopper® report was measured through dialogue with the hospice nurse and weekly chart reviews. For success, the nurses needed this additional education specific to each patient and medication regimen.

The third outcome was to evaluate any decrease in medications in the seven identified drug categories. Hospice medical records were reviewed weekly to monitor trends in the identified drug categories. Success was a decrease in at least one drug for each patient in one of the drug categories. Successful deprescribing represents nurses that felt confident and comfortable in recommending discontinuing medications to the providers as well as having discussions with patients and families. A decrease in unnecessary medicines has the potential to improve patient's quality of life and decrease the possibility of adverse medication events that lead to poor patient outcomes as well as financial strain on the healthcare system.

Findings

Nursing knowledge. Findings indicate that the educational portion of the project was impactful on the individual nurse level. For data collections, attendees signed an attendance sheet upon admission to count the number of attendees. Sixteen attendees completed a pre-education survey that included questions regarding their role and years of experience in order to understand the demographics of the staff. The evaluation also included questions asking attendees to rate comfort recognizing polypharmacy and comfort in suggesting deprescribing to the provider. In response to the comfort recognizing polypharmacy, a total of 16 (73%) pre-education surveys were returned. Nine (56%) out of 16 stated they were comfortable with recognizing polypharmacy with five (31%) out of 16 stating they were very comfortable with recognizing polypharmacy. Attendees then rated comfort suggesting deprescribing to the provider with 56% (n=9) stating they were comfortable recognizing polypharmacy and 31% (n=5) stating they were very comfortable suggesting deprescribing to the provider.

Immediately following the education session, attendees were asked to complete a post-education survey asking comfort recognizing polypharmacy, comfort in suggesting deprescribing

to the provider, and the likelihood to use the education provided. Sixteen post-education surveys were returned with seven (44%) out of 16 reporting they were now comfortable recognizing polypharmacy and nine (56%) out of 16 stating they were now very comfortable suggesting deprescribing to the provider. The attendees also rated their likeliness to use the education provided, and 13 (81%) out of 16 indicated they were very likely to use the education. The post-education survey included a question asking the attendee to write what they were likely to use. The responses fell into two main categories, with eight (62%) out of 13 indicating they would use a better understanding of medications and five (38%) out of 13 indicating they better understood how to communicate with the provider, the patient/ family, or the hospice nurse.

Table 1

Pre- and Post- Education Survey Results

		Pre-Education	**Post-Education**
Comfortable recognizing polypharmacy	Very uncomfortable	1	0
	Uncomfortable	1	0
	Comfortable	9	7
	Very Comfortable	5	9
	no answer	0	0
Comfort suggesting deprescribing	Very uncomfortable	0	0
	Uncomfortable	2	0
	Comfortable	9	9
	Very Comfortable	5	7
	no answer	0	0
Likelihood to use education	Very unlikely	n/a	0
	Unlikely	n/a	0
	Likely	n/a	3
	Very likely	n/a	13
	no answer	n/a	0

Note. A total of 22 staff attended education with 16 participants returning a survey.

MedStopper® utilization. The utilization of the MedStopper® report was measured weekly through chart review and conversations with the hospice nurse. Utilization was defined as taking the MedStopper® report to the LTC facility, reviewing the report with the staff, and

placing the report on the hard copy LTC facility chart. In the 12 weeks of review, 132 of 145 (91%) reports were utilized by the hospice nurse. A 95% compliance rate was expected; however, the primary hospice nurse was on vacation for a total of six days and the nurse seeing the LTC patients did not utilize the MedStopper® tool during the visits. The hospice nurse, the hospice nurse practitioner, and the project manager felt that providing a tool to the LTC staff provided needed evidenced-based education that would be useful in improving communication with the patient, patient's family, and providers about the possibility of deprescribing.

Polypharmacy Reduction: Hospice medical records were reviewed initially before the education and implementation of the MedStopper® tool and subsequently for 12 weeks to evaluate trends in deprescribing for the seven identified drug categories, vitamin/supplements, gastrointestinal (GI) reflux, statins, anticoagulants, cognitive enhancing, antihypertensives, and antihyperglycemics. The goal of the project was to see a reduction in at least one drug in at least one drug category for each patient. Initially, there were 13 patients reviewed. Medication reviews were conducted each week on Saturday or Sunday, measuring the total numbers of drugs in the targeted drug categories and developing an average of medications in each drug category by dividing the number of drugs by the total number of patients. Of the 13 initial patients at the LTC facility, there were a total of 32 drugs in the targeted categories, which was an average of 2.46 targeted medications per patient. The project had a total of 18 patients through the 12-week period with 6 patients dying, 2 patients transferring out of the LTC, and 1 patient revoking out of the hospice program leaving only 10 patients in the project at its conclusion. At the conclusion of the project there was a decrease in total targeted medications from 2.6 to an average of 1.3 per patient (See Appendix P).

In reviewing each drug category, all medications resulted in an overall decrease by the end of the project. There were fluctuations throughout the 12 weeks as medications were deprescribed, and new patients entered the project, and patients dropped out of the project by death or discharge. Drugs ordered for GI reflux reflected the most decrease with significant decreases noted in the use of vitamin supplements and antihypertensive drugs. Of note, there were very few patients on statins or cholesterol-lowering medications and no patients throughout the project on cognitive-enhancing medications (see Appendix Q).

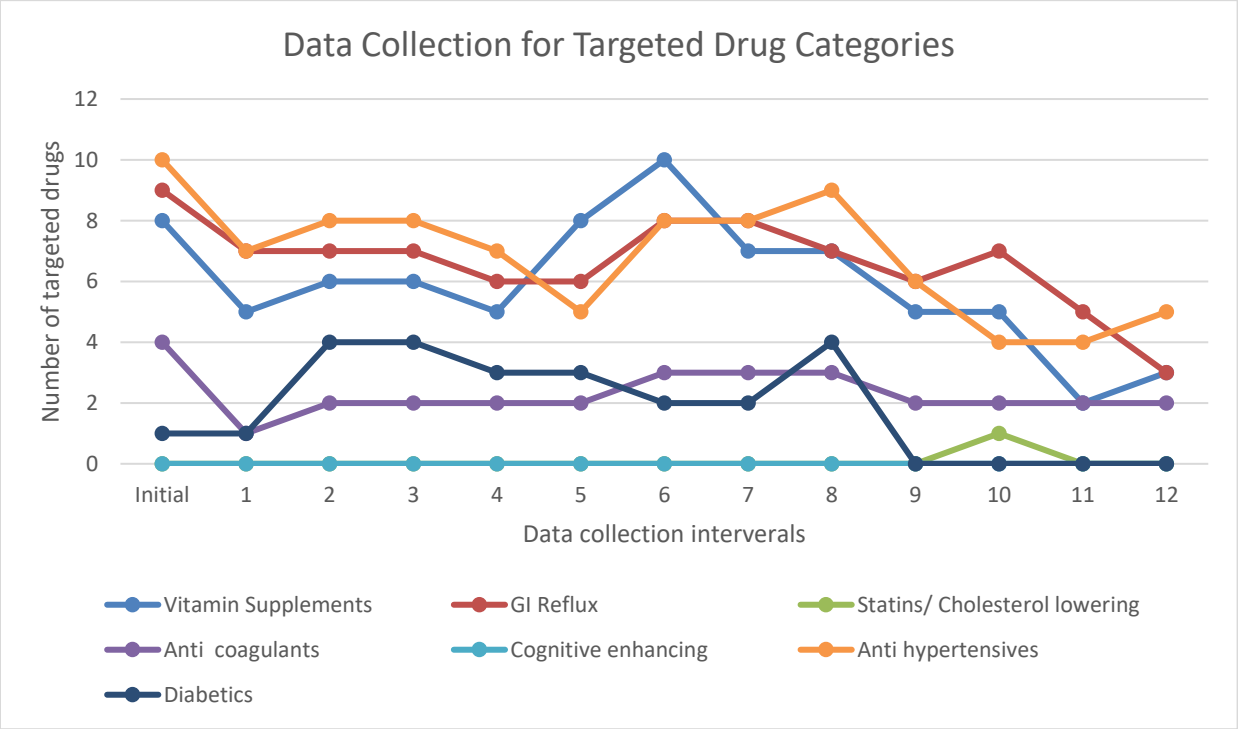


Figure 2. Targeted medication category throughout the data collection period.

Vitamin supplements. Vitamins increased in weeks 5 and 6 significantly. This increase was noted to be due to two patients admitted into the project. By week 7, the first patient's medication profile was reviewed, and the patient's three vitamin supplements were deprescribed. During week 8, the second new patient's vitamin supplements were reduced from 2 to 1 vitamin.

Gastrointestinal (GI) reflux. It was noted that the majority of the patients in the project were taking a GI medication. In data analysis, 8 (62%) of the initial 13 patients were taking GI medications. Three of the next four patients admitted into the project were taking a GI drug, and of those patients, all but one was able to have their GI drug deprescribed before the end of the project.

Statins/ cholesterol-lowering. Unexpectedly, only one patient in the project was taking medication to lower their cholesterol. A new patient admitted to the project in week10 was admitted on a statin. This medication was deprescribed within a week of admission into the project. In the project participants, cholesterol-lowering drugs were not the issue anticipated.

Anticoagulants. Initially, 4 (31%) of 13 patients were taking an anticoagulant. In analyzing the diagnoses of the patients, most of these patients had a diagnosis of atrial fibrillation as a secondary diagnosis. It was not possible to determine how long each patient had been on this medication due to access only to the hospice medical records. Two additional patients admitted into the project were also prescribed an anticoagulant. Only two (33%) of the six patients were able to have the anticoagulants deprescribed.

Cognitive enhancing. It was a very unexpected finding that none of the patients involved in the project were on a cognitive enhancing medication, despite the fact that many patients had a dementia diagnosis listed as a secondary diagnosis. Chart reviews did not give insights of whether the patients had failed these medications or if these medications had been previously prescribed. It was anticipated during the planning that this medication would be a problematic medication for family members and providers to agree to deprescribing.

Antihypertensive. Seven (54%) of the initial 13 patients in the project were taking medications intended to lower blood pressure. Within the first week of the project, two patients

were able to have their antihypertensive deprescribed. Two of the subsequent four patients admitted into the project were taking blood pressure-lowering drugs. Of note, one patient admitted into the project in week six was taking three antihypertensives. This particular patient even required the addition of a 4th medication during week ten, but the total number was reduced back to 3 during week 11. A chart review of this patient revealed a primary cardiac diagnosis and hypertension as a significant issue, thus, and it was not medically appropriate to recommend deprescribing this medication for this patient.

Diabetics. In the initial 13 patients, only one patient was prescribed a diabetic medication. In week two, a new patient admitted into the project was taking three different antidiabetic medications. In week 6, it was possible to deprescribe one of the medicines, but the patient indicated a need to remain on two medications for optimal control of their blood sugar. Chart review of this patient indicated that control remained stable with only two medications. In week 8, another patient was admitted into the project with two diabetic medications; however, that patient died within a few days, and no deprescribing was recommended.

Summary

Overall, there were 18 patients admitted to the project in the 13 weeks. Initially, 13 patients were in the project with six patients admitted into the project as they were admitted into the hospice program. During the 13 weeks, nine patients were discharged out of the project by death or transfer out of the LTC facility.

The LTC and hospice nursing staff reported increased comfort in recognizing polypharmacy after the education session. The nurses also reported a higher comfort level in suggesting deprescribing to the providers after the education. Over 80% also reported they were

very likely to use the education provided indicating that increasing knowledge was a positive step toward decreasing unnecessary medications.

The MedStopper® tool's printed plan was printed weekly and reviewed by the hospice nurse responsible for the hospice care of the patient. The hospice nurse then utilized the plan to facilitate a medication plan discussion with the LTC facility nurse. This discussion provided an opportunity for the staff to discuss potential deprescribing recommendations for the provider to consider. The plan was placed in the patient's medical chart for review by the LTC team to support the deprescribing of medications.

The data analysis showed a decrease in the medications in the targeted drug categories. Each drug category, despite increases when patients were admitted into the program, showed an overall decrease by the end of the project. This deprescribing trend demonstrated that the project's interventions were effective.

Chapter Seven: Implications for Nursing Practice

The American Association of Colleges of Nursing (AACN, 2006) established the eight Doctor of Nursing Practice (DNP) essentials to serve as "the foundational outcome competencies deemed essential for all graduates of a DNP program regardless of specialty or functional focus" (p. 8). These essentials were used to guide the project's steps and ensure the project was approved by leadership, was evidence-based, advanced nursing practice, and shared as appropriate with all stakeholders. This chapter outlines how this DNP project met the AACN essentials.

Practice Implications

Essential I: Scientific underpinnings for practice. Essential I serves to take the knowledge gained in nursing science to the highest level of nursing practice (AACN, 2006). The doctor of nursing practice (DNP) prepared nurse is responsible for integrating nursing science as well as science from other disciplines such as medicine, pharmacy, and ethics into their practice. DNP nurses are also expected to use existing knowledge and theories to generate new nursing knowledge that leads to improved practices.

A literature review was completed to determine the background and clinical significance of polypharmacy in the patient residing in the long-term care facility. Based on the literature review, a quality improvement project was implemented to translate the research to practice at the hospice and long-term care clinical sites. The literature indicated that polypharmacy was indeed a problem for many patients residing in the long-term care setting and had the potential to lead to adverse drug events, increased costs, and a decreased quality of life for the patient.

Everett Rogers' Theory of Planned Change served as the theoretical framework for this project and the concepts were reviewed as part of the literature review. The Plan, Do, Study, Act

(PDSA) model served as the evidence-based quality improvement model to implement the project and assess for changes required throughout the project. The nurses at both the hospice and the long-term care facility (LTF) site needed the project manager to plan a model based on the literature available and then develop interventions that were then reviewed and updated as needed. A future recommendation is for organizations and DNP leaders to be grounded in a strong theoretical framework to provide the structure needed to critically think through an evidenced-based project to achieve the most positive outcome.

Essential II: Organization and systems leadership for quality improvement and systems thinking. Essential II requires the advanced practice nurse to include organizational and systems leadership components to foster positive health outcomes and ensure patient safety (AACN, 2006). A future recommendation is that the DNP prepared nurse to commit to understanding the stakeholders, the leadership as well as cost issues and then use that knowledge to lead the organization to develop and initiate quality improvement projects to improve the quality of the care provided to the population of patients being cared for.

The project was designed to meet the needs of hospice patients residing in long-term care (LTC). Key stakeholders at the LTC site, the hospice site were included during the planning stages to determine the need, the degree to which participation would be expected and the outcomes that would be expected. A project budget was developed, and education plans were made to facilitate the project. An Institutional Review Board (IRB) waiver and approval for the primary clinical site were obtained for the quality improvement project. Through the PDSA model, it was apparent that sharing the outcomes with the staff was important and thus outcomes were shared frequently during the project through 1-page newsletters that were posted at the nursing stations.

Essential III: Clinical Scholarship and analytical methods for EBP. Essential III focuses on translating new science, collaborative research, and generating evidence through clinical practice to guide improvements and outcomes of care (AACN, 2006). The DNP prepared nurse must take existing research and new science and determine the outcome that has the most potential to affect positive change. The future implication is for the DNP nurse to use existing knowledge and determine organizational practices and protocols that need to be changed and then facilitate sustainable change that will benefit the organization, clinical practice, and patient outcomes.

This quality improvement project used recent research, articles, and evidence-based guidelines to develop a quality improvement project using both education and the use of an on-line tool, MedStopper, to assist nurses in making effective, efficient recommendations about patient care. Outcomes were monitored weekly and data was analyzed and shared with stakeholders periodically to sustain the change. The outcomes were disseminated to the stakeholders, the leaders of both the hospice and the long-term care facility.

Essential IV: Information systems/technology and patient care technology for the improvement and transformation of healthcare. Essential four ensures that the DNP prepared nurse can utilize technology to initiate quality improvement, support practice, and administrative decision-making. The essential also ensures the student uses technology to monitor and report quality improvement outcomes (AACN, 2006). It is recommended the DNP nurse be responsible for knowing how to extract data from the electronic health record and create plans based on this data. The DNP must then use technology to compile data into spreadsheets and graphs that can be utilized by organizations to monitor the need for change as well as to share the data with stakeholders during and after the completion of a quality improvement project.

This project utilized an on-line program, MedStopper, to generate deprescribing recommendations. The MedStopper® on-line tool is designed to support the nurses as they made recommendations for the deprescribing of medications for the hospice patient in the LTC facility. The DNP project manager obtained written permission to utilize the tool from the tool's creator before using the technology. Education for the nursing staff was provided using PowerPoint slides and was recorded via the long-term care facility's education director's iPhone for staff unable to attend to be able to view. Technology was also incorporated during the analysis and reporting phase through the use of Excel tools and graphing technology. The data was compiled weekly using Excel spreadsheets and then graphed through Excel for periodic dissemination to the staff nurses at the long-term care facility and the hospice to maintain interest in the project.

Essential V: Healthcare policy for advocacy in healthcare. The DNP graduate is prepared to assess, analyze and implement policy at the institutional, local, state, regional, federal, and international levels while serving as leaders in the practice arena thus serving as a bridge between research, policy and resulting practice (AACN, 2006). A future implication of this essential is that the DNP nurse analyzes current policies and develop new policies for all nursing levels and must provide professional leadership regarding the implementation of those policies in nursing practice.

This project analyzed and recognized a need to provide front-line nursing staff with an evidence-based tool to assist in decision making for medication management in the hospice patient. While the unspoken policy was for medical staff to make all decisions, this project sought to alter this policy at the institutional level by empowering nurses to use research and tools to change practice and ultimately encourage nurses to make deprescribing

recommendations that would improve the quality of life for patients, reduce the pharmacy cost incurred and reduce the likelihood of patient hard due to adverse drug events.

Essential VI: Interprofessional collaboration for improving patient and population health outcomes. DNP prepared graduates are required to be efficient in collaborating with interprofessional members of the healthcare team to change policy and practice (AACN, 2006) effectively. It is recommended that the DNP nurse incorporates the multi-disciplinary team to develop health policy, the DNP must assume responsibility for facilitating communication between the multi-disciplinary team members to develop sustainable best practices that are supported by all.

This project required the collaboration of the long-term care facility and hospice site directors and project champions as well as the nursing leadership of both organizations. The LTC leadership, medical staff, and nurses were included in education regarding the project implementation and were key in the PDSA stages of the project. During regular rounding at the facility, the nursing staff was instrumental in making changes to improve the outcomes. A fellow DNP student and I collaborated on this project. This collaboration allowed both to collaborate with the LTC facility's leadership team, medical staff, pharmacy staff, and nursing staff. This collaboration allowed focus on both the medical aspect of deprescribing as well as the nursing issues surrounding polypharmacy. Collaboration was important in implementing a project that involved the professional stakeholders from multiple disciplines in this quality improvement project and thus led to the policy change that was made at this facility.

Essential VII: Clinical prevention and population health for improving the nation's health. Essential VII prepares the DNP graduate to analyze data related to population health (AACN, 2006). As part of this project, scientific data was reviewed related to polypharmacy in

the elderly, specifically patients living in long-term care facilities. A future implication is that the DNP nurse will constantly study nursing and related science and use existing knowledge related to population health and then commit to relating that knowledge to the population being served at the local level. The DNP will understand how changes in proposed care will affect the community, the environment, the culture as well as the larger population. It is recommended that the DNP nurse thinks past the here and now and consider the future of nursing practice.

Data regarding prescribing cascades, medication-related adverse drug events, and readmissions to acute care was also evaluated for this specific population. The project then addressed gaps related to nursing education and confidence regarding recommending deprescribing to the provider. This project was designed to share with other long-term care facilities, other hospices, the North Carolina State Hospice Association as well as the National Hospice and Palliative Care Organization to empower long-term facility staff to consider how polypharmacy affects the hospice patient.

Essential VIII: Advanced nursing practice. The DNP prepared nurse is expected to be able to design, implement, and assess therapeutic interventions based on nursing sciences as well as other sciences (AACN, 2006). This requires the DNP graduate to demonstrate excellent clinical judgment and an ability to collaborate with nurses and other healthcare professionals to facilitate optimal patient care and outcomes. It is recommended that the DNP utilize analytical assessment skills to further nursing practice as well as develop collaborative relationships with other professionals to foster best practice. It is also recommended that the DNP nurse uses these skills to mentor, foster learning, and support other nurses.

This project was based on evidence from the nursing, medical and pharmaceutical sciences. These sciences provided the necessary knowledge to guide and mentor nursing staff

through the project. The project manager then used analytical skills to assess patient outcomes and professional relationships to collaborate with the facility physician, the facility nurse practitioner, the facility pharmacist, the facility leadership, and staff nurses to successfully implement the project.

Summary

The AACN (2006) DNP essentials were used by the project manager to facilitate project planning, implementation, and evaluation of the patient outcomes. This project was based on sciences from nursing as well as medicine and pharmacy. The MedStopper tool was evidence-based and elements of each DNP essential were used throughout the project. To guide movement through the project, the PDSA model ensured that interventions were adapted, and the outcomes of the project were met. Adaptations were made to meet the needs of the project's stakeholders, and implications for future utilization were recommended.

Chapter Eight: Final Conclusions

Polypharmacy presents a challenge to nursing staff caring for patients at the end-of-life. The definition of polypharmacy is widely defined but commonly considered five or more medications or the use of unnecessary medications. It is common for older adults in the United States, with an estimated 50% of people 65 years and older taking more than five medications (Reeve et al., 2018). The patient is negatively affected as more and more medications lead to increased risk of adverse events, raising the possibility of falls, and increasing the risk of emergency department visits (Jokanovic, Tan, Dooley, Kirkpatrick, & Bell, 2015). The nursing staff is negatively affected as increased medications lead to an increased workload for staff administering these medications. Nurses are significant influences on prescribing and deprescribing (Ailabouni, Tordoff, Mangin, & Nishtala, 2017). Education, empowerment, and the provision of evidence-based, easy to use tools proved useful for nurses in recommending medications for deprescribing. This chapter discusses the significance of the findings as well as the project's strengths, limitations, benefits, and recommendations for practice.

Significance of Findings

The most significant result was that the data revealed a decrease in at least one drug for each patient in one of the drug categories identified. Successful deprescribing represents nurses that felt confident and comfortable in recommending discontinuing medications to the providers as well as having discussions with patients and families. Although fluctuations were noted throughout the project period as patients entered and exited the project group, medications in the targeted drug categories were routinely deprescribed. The medication categories most improved were antihypertensives with an overall 50% decrease, vitamin/supplements with a 37.5% decrease, and gastrointestinal (GI) reflux medications with a 33% decrease. In a review of the

average number of targeted drugs per patient, it should be noted that at the onset of the project, the per-patient average was 2.46. After the project, the per-patient average had decreased to 1.3 targeted medications. None of the patients involved in the project experienced any adverse effects from deprescribing medications, and the medications did not need to be restarted after being stopped during the project.

Positive findings were also the improvement in the nursing staff's knowledge in recognizing polypharmacy and suggesting deprescribing to the providers of the facility. Of the education attendees, 100% indicated a likeliness to use the education presented. As nurses are critical advocates for patients, and being the most knowledgeable about the patients, increasing their comfort level is vital in ensuring patient medication regimens are appropriate.

The utilization of the MedStopper® tool was defined as taking the MedStopper® report to the long-term care (LTC) facility, reviewing the report with the staff, and placing the report on the hard copy LTC facility chart. While a 95% compliance rate was expected the project only resulted in a compliance rate of 91%. It was determined the primary hospice nurse was on vacation for a total of six days and the nurse going to the LTC did not utilize the MedStopper® tool during the patient visits.

Project Strength and Limitations

Several strengths contributed to the success of the project. One of the key strengths was the excellent, long-term relationship between the hospice and the LTC facility. Another strength was the resource support of the hospice pharmacy vendor, who was able to provide reports to the hospice and the primary project manager. An additional strength was the collaboration between the primary project manager, the hospice nurse practitioner, the hospice nurse visiting in the LTC

facility, and the LTC staff. All working together were key to the project maintaining its momentum.

One limitation of the project was the number of patients involved in the program. A larger sample would have provided more information about the overall deprescribing challenges faced by nurses caring for the LTC patient at the end-of-life. Another significant limitation was the impact of the Coronavirus pandemic. Coronavirus limited the number of times the hospice nurse could make patient visits and eliminated the rounding visits being made by the primary project manager, making maintaining engagement with the project more challenging. Also, the pandemic contributed to the small patient sample size as the LTC reduced admissions to the facility due to the pandemic.

Project Benefits

One of the main benefits of this project was the empowerment of the nurses as well as providing them with a tool to help them to make deprescribing recommendations. The MedStopper® on-line tool is a simple, free resource nursing staff can use to facilitate a discussion about medications with the patient, family members, and providers. The MedStopper® tool provides the nurse with a prioritized list of drugs to be considered for deprescribing. The tool also provides suggestions for tapering, if needed, as well as symptoms for nursing staff to be aware of during taper or after discontinuation.

Recommendations for Practice

Several recommendations could be put in place based upon the findings of this project. The initial intervention was to increase the nurse's knowledge of polypharmacy and their comfort level of suggesting deprescribing. The next step would be to establish on-going education regarding polypharmacy and the use of the MedStopper® tool through regular

training. Such training would be beneficial during new nurse orientation and annual training for both LTC and hospice nurses. In addition to education, it would be helpful to continue the collaboration between the LTC nurse, the hospice nurse and the hospice nurse practitioner as this collaboration allows for nurses to talk through suggestions before approaching the patient, family, and provider with a recommendation.

It is recommended that this project and its findings be shared with the LTC and hospice leadership teams to garner support to continue the use of the MedStopper® tool with staff periodically. It is also important to share these outcomes with staff nurses. As it was the work of the staff that led to the project's success, sharing the findings has the potential to empower the nurses to continue to be the voice for the patient as it relates to the medication risks of their patients. Finally, sharing this project's findings with those outside the project participants has the potential to demonstrate how LTC and hospice can work together, using evidence-based tools and collaboration to provide the best care for the patient. Suggestions for dissemination are the Hospice and Palliative Nurses Association' Clinical Practice Forum, the National Hospice and Palliative Care Organization's Virtual Interdisciplinary Conference, and the Annual Atrium Health Nursing Research Symposium.

The MedStopper® tool is not specific to only hospice patients residing in LTC facilities but rather to all patients who fall into the category of the frail, elderly. Thus, this tool could be utilized for any patient considered frail and elderly regardless of prognosis or location of care. This tool could be used throughout healthcare to assist all professional caregivers in making the best decisions about when to discontinue medications. Sharing this project and its results through a journal submission such as *The Hospice and Palliative Nursing Journal* has the

opportunity for many to see the benefits of using a tool to identify medications that may be deprescribed.

Final Summary

Medications are the key to excellent care of patients at the end-of-life, and while most medications are prescribed with a reasonable indication, when to deprescribe medications is a topic not often considered. Not considering stopping medications can easily lead to a prescribing cascade and polypharmacy; thus, leading to increased risk of adverse drug events, increased risk for falls, the potential for non-compliance, and additional burden on LTC nursing staff providing care. Educating and empowering nurses in recognizing polypharmacy as well as how to recommend deprescribing to providers is key to successful medication management. Education and easy to use tools to guide decision-making and increase the confidence of the nurse can lead to more engagement in assisting the provider in making the right medication decisions. With the information discovered through this evidence-based quality improvement project, it is essential to note that the appropriate management of medications is considered necessary in maintaining a satisfactory quality of life in the hospice patient. Engagement and collaboration combined with education and evidence-based tools can ensure the best care is provided, and overall, that is the ultimate goal of nursing.

References

Ailabouni, N., Tordoff, J., Mangin, D., & Nishtala, P. (2017). Do residents need all their medications? A cross-sectional survey of RNs' views on deprescribing and the role of clinical pharmacists. *Journal of Gerontological Nursing*, *43*(10), 13-20. doi:10.3928/00989134-20170914-05

American Association of Colleges of Nursing. (2006). *The essentials of doctoral education for advanced nursing practice.* Washington, DC: American Association of Colleges of Nursing.

Bergman-Evans, B. (2013). Improving medication management for older adult clients residing in the long-term care facilities. (Schoenfelder, Ed.) *Journal of Gerontological Nursing, 39*(11), 11-17. doi:10.3928/00989134-20130904-01

Centers for Medicare and Medicaid Services. (2020). *Provider enrollment and certification QAPI*. Retrieved from PDSA Cycle Template: https://www.cms.gov/medicare/provider-enrollment-and-certification/qapi/downloads/pdsacycledebedits.pdf

Cherubini, A., Corsonello, A., & Lattanzio, F. (2016). Polypharmacy in nursing home residents: What is the way forward? *The Journal of Medical Directors Association, 17*(1), 4-6. doi:10.1016/j.jamda.2015.2015.07.008

Endsley, S. (2018). Deprescribing unnecessary medications: A four-fart process. *Family Practice Management, 25*(3), 28-32. Retrieved from https://www.medscape.com/viewarticle/896726_print

Eriksen, M., & Frandsen, T. (2018). The impact of patient, intervention, comparison, outcome (PICO) as a search strategy tool on literature search quality: A systematic review. *Journal*

of the Medical Library Association, 106(4), 420-431. doi:dx.doi.org/10.5195/jmla.2018.345

Grove, S., Gray, J., & Burns, N. (2015). *Understanding nursing research building an evidence-based practice* (6th ed.). St. Louis: Elsevier.

Jokanovic, N., Tan, E., Dooley, M., Kirkpatrick, C., & Bell, J. S. (2015). Prevalence and factors associated with polypharmacy in long-term care facilities: A systematic review. *The Journal of the American Medical Directors Association, 16*(6), 535.e1-535.e12. doi:10.1016/j.jamda.2015.03.003

Kaufman, G. (2016). Polypharmacy: The challenge for nurses. *Nursing Standard, 30*(39), 52-58. doi:10.7748/ns.30.39.52.s45

Kojima, G., Bell, C., Tamura, B., Inaba, M., Lumimir, K., Blanchette, P., Iwasaki, W., & Masaki, K. (2012). Reducing costs by reducing polypharmacy: The polypharmacy outcomes project. *Journal of American Medical Directors Association, 13*(9), 818.e11-818.e15. doi:10.1016/j.jamda.2012.07.019

Melnyk, B., & Fineout-Overhold, E. (2015). *Evidence-based practice in nursing & healthcare: A guide to best practice* (3rd ed.). Philadelphia: Wolters Kluwe.

Morin, L., Vetrano, D., Rizzuto, D., Calderon-Larranaga, A., Fastbom, J., & Johnell, K. (2017). Choosing wisely? Measuring the burden of medications in older adults near the end of life: nationwide, longitudinal cohort study. *The American Journal of Medicine, 130*(8), 927-936. doi:10.1016/j.amjmed.2017.02.028

Pruskowski, J., & Zarowitz, B. (2018). Perceptions of nursing facility providers on the utility of deprescribing. *The Consult Pharmacist, 33*(7), 386-402. doi:10.4140/TCP.n.2018.386

Reeve, E., Wolff, J., Skehan, M., Bayliss, E., Hilmer, S., & Boyd, C. (2018). Assessment of attitudes toward deprescribing in older medicare beneficiaries in the United States. *The Journal of the American Medical Association Internal Medicine*, 178(12), E1-E8. doi:10.1001/jamainternmed.2018.4720

Rogers, E. (1983). *Diffusions of innovations* (4th ed.). New York: The Free Press.

U.S. Centers for Medicare & Medicaid Services. (2019). *Hospice care coverage*. Retrieved from: https://www.medicare.gov/coverage/hospice-care

United States Census Bureau. (2019). *Quick facts Cleveland County*. Retrieved from https://www.census.gov/quickfacts/fact/table/clevelandcountynorthcarolina#

von Nordenne, R., Lavrijsen, J., Vissers, K., & Koopmans, R. (2014). Decision making about change of medications for comorbid disease at the end of life: An integrative review. *Drugs Aging, 31*(7), 501-512. doi:10.1007/s40266-014-0182-4

Woodward, M. (2003). Deprescribing: Achieving better health outcomes for older adults through reducing medications. *Geriatric Therapeutics, 33*(4), 323-328. doi: 10.1002/jppr200334323

Wright, D.J., Scott, S., Buck, J., & Bhattacharya, D. (2019). Role of nurses in supporting proactive deprescribing. (2019). *Nursing Standard, 34*(3), 44-50. doi:10.7748/ns.2019.e11249

Zullo, A., Gray, S., Holmes, H., & Marcum, Z. (2018). Screening for medication appropriateness in older adults. *Clinical Geriatric Medicine*, *34*(1), 39-54.

Appendix A

Literature Review

Article (APA Citation)	**Level of Evidence (**I to VII)	**Data/ Evidence Findings**	**Conclusion or Summary**	**Use of Evidence in EBP Project Plan**
Ailabouni, N., Tordoff, J., Mangin, D., & Nishtala, P. (2017). Do Residents Need All Their Medications? A Cross-Sectional Survey of RNs' Views on Deprescribing and the Role of Clinical Pharmacists. Journal of Gerontological Nursing, 43(10), 13-20. doi:10.3928/00989134-20170914-05	Level 6	67.4% of nurses agreed or strongly agreed the pharmacist would be beneficial in deprescribing. 50.5% agreed deprescribing could benefit quality of life and 35.2% agreed it would reduce the length of time to administer medications.	Study sheds light on important concerns and challenges faced by nurses regarding medication management. The study supports pharmacist involvement to assist nurses with overall medication management in older adults	Educated nurses to utilize multidisciplinary resources incusing the pharmacist for deprescribing identification and strategies.

Bergman-Evans, B. (2013). Improving Medication Management for Older Adult Clients Residing in the Long-Term Care Facilities. (Schoenfelder, Ed.) *Journal of Gerontological Nursing, 39*(11), 11-17. doi:10.3928/00989134-20130904-01	Level 7	Evidence-based practice guidelines for nursing staff in long-term care facilities. Illustrates four outcomes: function, decrease polypharmacy, avoid adverse drug reactions, and minimize inappropriate prescribing.	Guideline provides recommendation for medication review at specific intervals. Guideline states nurses are in key positions to identify medications for deprescribing or tapering based. States nurses need education and resources for identification.	Provide education and evidence-based tool to utilize in identification of polypharmacy, potential adverse reactions of polypharmacy and inappropriate medications, and recommendations for medications that can be stopped or tapered.
Cherubini, A., Corsonello, A., & Lattanzio, F. (2016). Polypharmacy in Nursing Home Residents: What is the Way Forward? *The Journal of Medical Directors Association, 17*(1), 4-6. doi:10.1016/j.jamda.2015.2015.07.008	Level 7	Editorial regarding polypharmacy in nursing home residents	Author states the most studied intervention is staff education which usually includes face to face teaching by health care professionals. Author states education led to improvement in the majority of cases reviewed. Also, noted was the effectiveness of multidisciplinary team meeting regarding medications.	Provide education to nurses in identification of polypharmacy, potential adverse reactions of polypharmacy and inappropriate medications, and recommendations for medications that can be stopped or tapered.

Endsley, S. (2018). Deprescribing Unnecessary Medications: A Four-Part Process. *Family Practice Management, 25*(3), 28-32. Retrieved from https://www.medscape.com/viewarticle/896726_print	Level 7	Author presents a 4-part deprescribing process utilizing a case study	Author outlines a 4-part process for deprescribing unnecessary medications including: review all medications, identify problematic medications using a deprescribing tool, plan deprescribing with the patient, regularly conduce medication reviews.	Provide education regarding on-line deprescribing tool MedStopper® to identify medications for discontinuation or tapering.
Jokanovic, N., Tan, E., Dooley, M., Kirkpatrick, C., & Bell, J. S. (2015). Prevalence and Factors Associated With Polypharmacy in Long-Term Care Facilities: A Systematic Review. *The Journal of the American Medical Directors Association, 16*(6), 535.e1-535.e12. doi:10.1016/j.jamda.2015.03.003	Level 1	Forty-four studies revealed polypharmacy in long-term care is most often defined as 5 or more medications with up to 91%, 74%, and 65% of residents taking 5,9 and 10 medications respectively	The prevalence is high and associated with comorbidity, recent hospitalization, and number of prescribers.	Problem identification and the need for increased attention to reviews around patients with comorbid conditions, recent transitions in care and number of prescribers. This can be incorporated into the nursing education.

Kaufman, G. (2016). Polypharmacy: the challenge for nurses. *Nursing Standard, 30*(39), 52-58. doi:10.7748/ns.30.39.52.s45	Level 7	Expert opinion to educate nurses on various aspects of polypharmacy	Education on the identification of polypharmacy, links between appropriate and inappropriate polypharmacy, links to drug-drug interactions and adverse drug reactions, actions nurses can take to promote safety.	Incorporate information into the educational intervention for nursing staff.
Kojima, G., Bell, C., Tamura, B., Inaba, M., Lubimir, K., Blanchette, P., . . . Masaki, K. (2012). Reducing Costs by Reducing Polypharmacy: The Polypharmacy Outcomes Project. *Journal of American Medical Directors Association, 13*(9), 818.e11-818.e15. doi:10.1016/j.jamda.2012.07.019	Level 6	70 residents in project, interventions included reviewing all medication lists using first the Beers criteria and second the Epocrates on-line drug-drug program. Results showed an average of 3 recommendations per resident to deprescribe with resulting decreases in drug costs and cost in nursing administration time.	Cost savings proved to be evident with a simple physician intervention.	Awareness and use of a tool to identify high-risk medications in long-term care residents can achieve a significant medication cost reduction as well as potentially decreased nursing administration time and reduce drug-related adverse events.

Morin, L., Vetrano, D., Rizzuto, D., Calderon-Larranaga, A., Fastbom, J., & Johnell, K. (2017). Choosing Wisely? Measuring the Burden of Medications in Older Adults near the End of Life: Nationwide, Longitudinal Cohort Study. The American Journal of Medicine, 130(8), 927-936. doi:10.1016/j.amjmed.2017.02.028	Level 4	Review of 511,843 older adult's medication lists during last 12 months of life showed exposure to ≥10 drugs rose from 30.3% to 47.2%. Study identified 5 common drug classes commonly used: analgesics, diuretics, psycholeptics, and beta blocking agents.	Authors concluded that medication increase is not only fueled by symptom management medications but those long-term preventative medications. Authors questioned the benefits of such treatments and recommend clinical guidelines to help guide deprescribing.	Incorporate specific medication class information into the educational intervention for nursing staff and analyze specific drug classes to determine success rather than total number of medications pre- and post- intervention.

Pruskowski, J., Zarowitz, B., & Handler, S. (2018). Perceptions of Nursing Facility Providers on the Utility of Deprescribing. *The Consult Pharmacist, 33*(7), 386-402. doi:10.4140/TCP.n.2018.386	Level 6	Survey of conference attendee with 637 respondents, 88% were physicians. 97% reported experience with deprescribing but only 74% considered the experience successful.	Respondents most strongly agreed medications that are no longer indicated should be stopped or considered high-risk and considered the discontinuation successful of the patient reported an improved quality of life. Respondents felt that medications for deprescribing should be prioritized and not random or chosen simply due to ease of stopping.	Incorporate information regarding prioritizing medications to be deprescribed into the educational intervention for nursing staff. Analyze specific drug classes to determine success rather than total number of medications pre- and post- intervention.
Reeve, E., Wolff, J., Skehan, M., Bayliss, E., Hilmer, S., & Boyd, C. (2018). Assessment of Attitudes Toward Deprescribing in Older Medicare Beneficiaries in the United States. *The Journal of the American Medical Association Internal Medicine, 178*(12), E1-E8. doi:10.1001/jamainternmed.2018.4720	Level 3	Cohort study of US Medicare beneficiaries over age 65 to determine attitudes toward deprescribing. 92% reported willingness to stop 1 or more medications if their physician said it was possible. 51.9% reported being comfortable in taking 4 or less medications.	The majority of older adults are willing to have a medication deprescribed thus reassuring the physician who may be concerned about broaching the topic.	Reassure nurses during educational training that patients are not automatically opposed to discontinuing medications within the framework of shared decision making.

van Nordenne, R., Lavrijsen, J., Vissers, K., & Koopmans, R. (2014). Decision Making About Change of Medications for Comorbid Disease at the End of Life: An Integrative Review. *Drugs Aging, 31*(7), 501-512. doi:10.1007/s40266-014-0182-4	Level 1	67 articles were included in review. The authors reported no hard evidence and that the articles offered only suggestions about decision making in medication changes.	As a result of review, the authors did make several recommendations regarding the use of several drug classes at end of life and concluded all medications used for comorbid conditions at end of life should be critically evaluated and any that do not benefit the patient or provide symptom control should be stopped.	Incorporate specific medication class information into the educational intervention for nursing staff and analyze specific drug classes to determine success rather than total number of medications pre- and post- intervention.
Woodward, M. (2003). Deprescribing: Achieving Better Health Outcomes for Older Adults Through Reducing Medications. *Geriatric Therapeutics, 33*(4), 323-328. doi: https://doi.org/10.1002/jppr2003334323	Level 7	Expert opinion regarding reduction of medications.	Author discussed medications to be used with caution and provided deprescribing guidelines. Author also recommended planning deprescribing with the patient and those caring for the patient, i.e. nurses.	Incorporate information into the educational intervention for nursing staff.

Zullo, A., Gray, S., Holmes, H., & Marcum, Z. (2018). Screening for Medication Appropriateness in Older Adults. *Clinical Geriatric Medicine*, *34*(1), 39-54.	Level 7	Expert opinion regarding screening for medication appropriateness.	The author provided extensive information regarding screening including the use of on-line tools and a team-based strategy.	Incorporate the MedStopper® tool as well as medication screening strategies into the educational intervention for nursing staff.
Wright, D.J., Scott, S., Buck, J., & Bhattacharya, D. (2019). Role of nurses in supporting proactive deprescribing. *Nursing Standard*, *34*(3), 44-50. doi:10.7748/ns.2019.e11249.	Level 7	Expert opinion on the nurse's role in deprescribing	The authors provided information to assist the nurse to recognize the importance of, barriers to, and their role in the process of deprescribing.	Incorporate information into the educational intervention for nursing staff

Appendix B

Plan, Do, Study Act (PDSA) Model

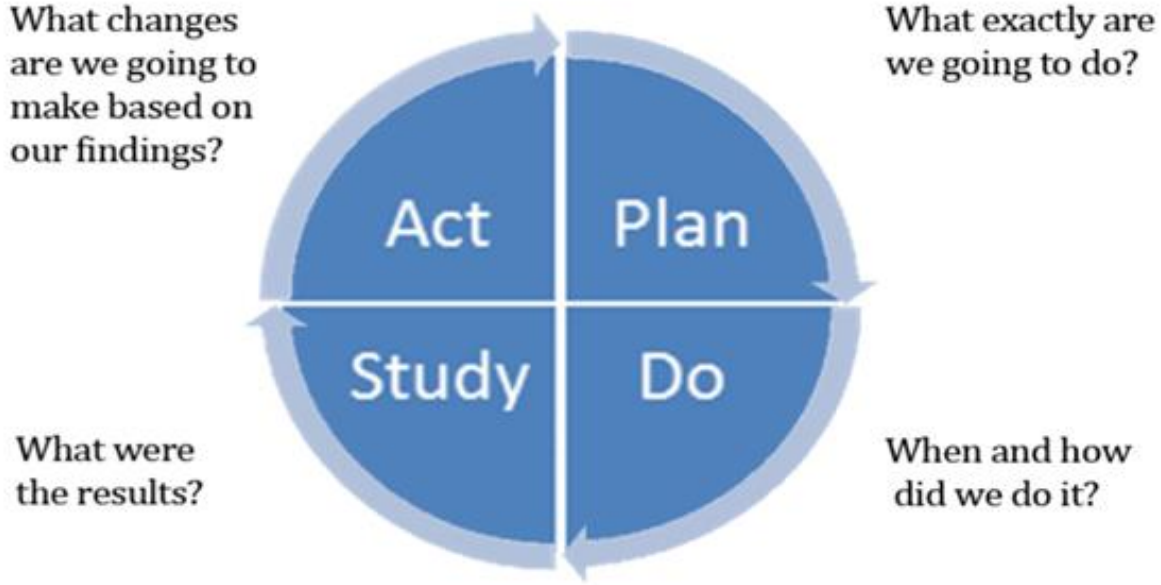
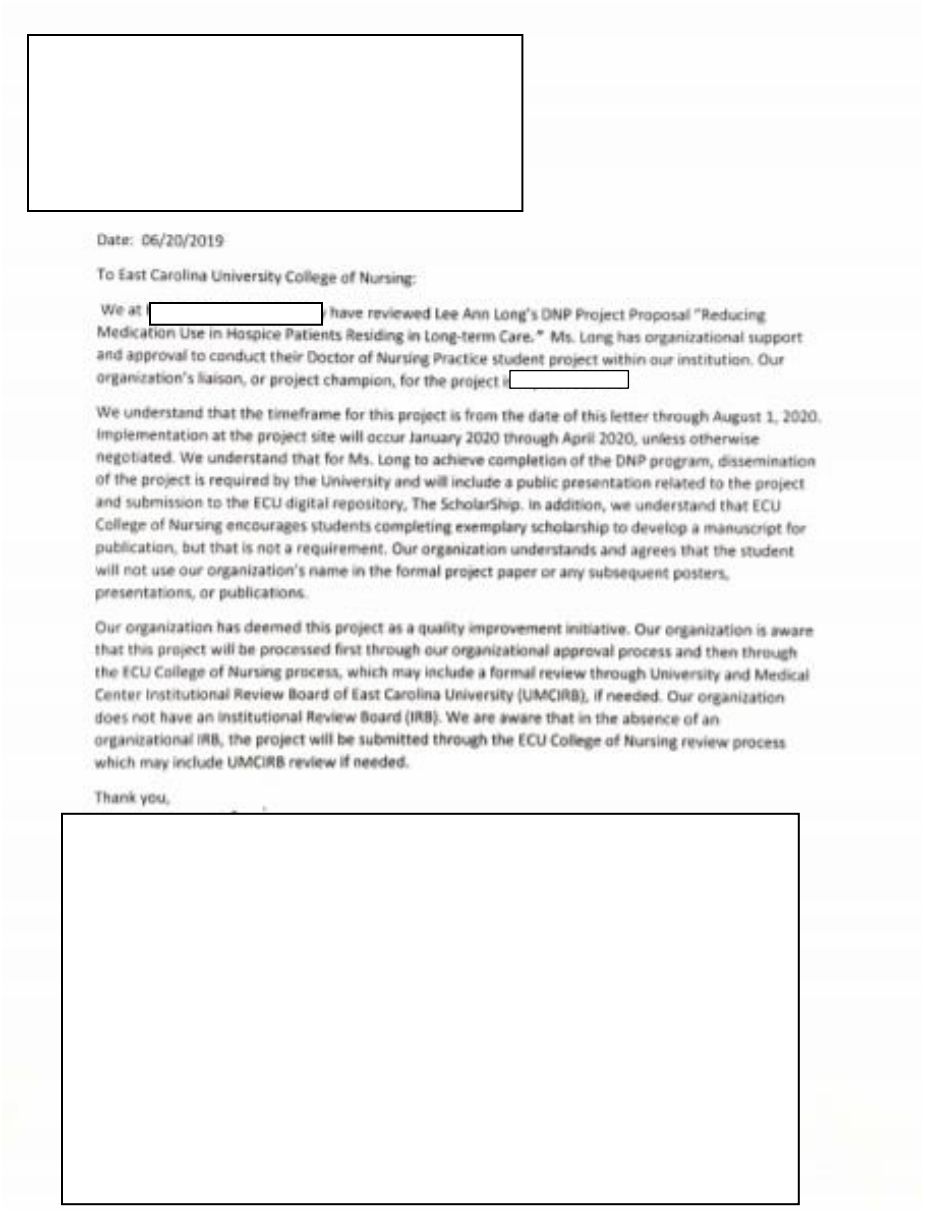


Figure 1. Plan, Do, Study, Act Model. (Centers for Medicare and Medicaid Services, 2020).

Appendix C

Hospice Project Site Letter of Support



Date: 06/20/2019

To East Carolina University College of Nursing:

We at [redacted] have reviewed Lee Ann Long's DNP Project Proposal "Reducing Medication Use in Hospice Patients Residing in Long-term Care." Ms. Long has organizational support and approval to conduct their Doctor of Nursing Practice student project within our institution. Our organization's liaison, or project champion, for the project is [redacted]

We understand that the timeframe for this project is from the date of this letter through August 1, 2020. Implementation at the project site will occur January 2020 through April 2020, unless otherwise negotiated. We understand that for Ms. Long to achieve completion of the DNP program, dissemination of the project is required by the University and will include a public presentation related to the project and submission to the ECU digital repository, The ScholarShip. In addition, we understand that ECU College of Nursing encourages students completing exemplary scholarship to develop a manuscript for publication, but that is not a requirement. Our organization understands and agrees that the student will not use our organization's name in the formal project paper or any subsequent posters, presentations, or publications.

Our organization has deemed this project as a quality improvement initiative. Our organization is aware that this project will be processed first through our organizational approval process and then through the ECU College of Nursing process, which may include a formal review through University and Medical Center Institutional Review Board of East Carolina University (UMCIRB), if needed. Our organization does not have an Institutional Review Board (IRB). We are aware that in the absence of an organizational IRB, the project will be submitted through the ECU College of Nursing review process which may include UMCIRB review if needed.

Thank you,

[redacted]

Appendix D

Long-Term Care Facility Letter of Support

[redacted]

Atrium Health

[redacted]

Date: October 18, 2019

To East Carolina University College of Nursing:

We at [redacted] have reviewed Lee Ann Long's DNP Project Proposal "Polypharmacy in the Hospice Patient Residing in the Long-Term Care Facility." Ms. Long has organizational support and approval to conduct their Doctor of Nursing Practice student project within our institution. Our organization's liaison, or project champion, for the project is [redacted]

We understand that the timeframe for this project is from the date of this letter through August 1, 2020. Implementation at the project site will occur January 2020 through April 2020, unless otherwise negotiated. We understand that for Ms. Long to achieve completion of the DNP program, dissemination of the project is required by the University and will include a public presentation related to the project and submission to the ECU digital repository, The ScholarShip. In addition, we understand that ECU College of Nursing encourages students completing exemplary scholarship to develop a manuscript for publication, but that is not a requirement. Our organization understands and agrees that the student will not use our organization's name in the formal project paper or any subsequent posters, presentations, or publications.

Our organization has deemed this project as a program or process development project. Our organization is aware that this project will be processed first through our organizational approval process and then through the ECU College of Nursing process, which may include a formal review through University and Medical Center Institutional Review Board of East Carolina University (UMCIRB), if needed. Our organization has a Nursing Research Council (NRC), and Ms. Long will submit her project to the NRC for approval. We are aware that this project will also be submitted through the ECU College of Nursing review process which may include UMCIRB review if needed.

Thank you,

[redacted]

Appendix E

DNP Project Budget

Item	Unit Cost	Quantity	Total Cost
Paper	$0.03	500	$15.00
Ink cartridge	$30.00	1	$30.00
Snack food	N/A	N/A	$50.00
Total			$95.00

Appendix F

Atrium IRB Approval Document

QI vs Research Form

* All fields on this form are required to be completed before submitting *

* Do not submit this form for projects already completed. Contact the IRB at IRBInfo@atriumhealth.org *

Response was added on 11/06/2019 5:29pm

ATRIUM HEALTH

Institutional Review Board/ Patient Privacy Board

IRB Review & Determination of QI vs. Research Projects

Submission Date:	11-06-2019
Project Lead:	[Lead Name] (Full Name)
Department:	Administration
Phone:	[site phone number]
E-mail:	[lead email address]
Project Title:	Reducing Medication Use in Hospice Patients Residing in Long-term Care

Purpose of the project:

(Provide a 2-3 sentence description.)

The outcome is to increase hospice and long-term care nursing knowledge regarding polypharmacy, identifying medications that may be stopped, and how to recommend deprescribing to the provider. This is not new knowledge but rather knowledge not frequently discussed. The aim is to evaluate whether education and the use of a standardized tool can result in a decrease in medications in the hospice patient in targeted drug categories.

Briefly describe project details, including how patients and/or providers will be involved: (Provide a 2-3 sentence description.)

Project methods will include: education of hospice and [SNF site] nursing staff, hospice implementation of the online MedStopper tool, and weekly review of hospice charts and hospice pharmacy vendor reports. Additional education may be provided to nursing staff according to the PDSA model as a result of chart review

Signatures

CERTIFICATION OF PROJECT LEAD:

I certify that the information provided in this IRB Review of QI and Research Projects screening form is complete and accurate. The above titled project has been/will be conducted in full compliance with the HHS/FDA Regulations and IRB requirements/policies governing human subject research. IRB review is required for projects meeting the criteria of, "Research" as noted above.

Signature of Project Lead:

[lead signature here]

Date:

11-06-2019 11:40:00

Are you a resident or student?

No

DNP Use Only

o

n

Forward to which chair?	[chair name]
Date:	11-11-2019 15:57:22 ((click "Now" if signing now.)}

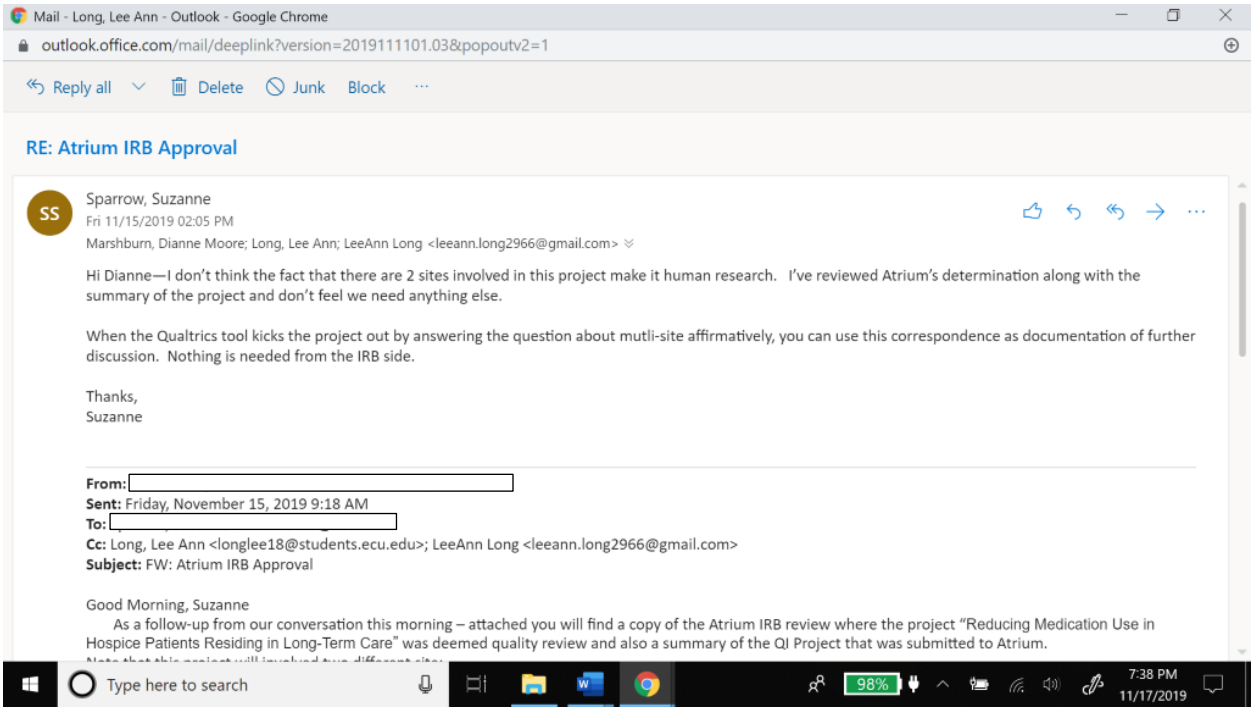
Chair Section

Require edits or changes?	No
The IRB has determined this project is:	Quality Improvement

Completed By:	[QI name here] ((Please Print Full Name))
IRB Chair Signature	[IRB Signature here]
Date:	11-14-2019 06:26:37 ((click "Now" if signing now.))

Appendix G

East Carolina University IRB Approval Document



Appendix H

Education Flyer

POLYPHARMACY

In the hospice patient

Come learn about what it is, how to recognize it, and how to talk with the provider about it!

WHO? All medication staff

When? January 14 2pm
January 16 2pm
January 20 2pm
January 24 2pm

Where? The Solarium

Appendix I

Pre-Education Nursing Staff Survey

Program Title: Polypharmacy in the Hospice Patient Residing in the LTC Facility

Date: _____

Please circle your answers

1. **What is your role?** LPN RN RN Supervisor

2. **How many years have you worked in long-term care?**
   < 1 year 2-5 years 5-10 years >10 years

3. **How comfortable would you say you are in recognizing polypharmacy?**
   Very uncomfortable Uncomfortable Comfortable Very Comfortable

4. **How comfortable would you say you are in suggesting deprescribing a medication to the provider?**
   Very uncomfortable Uncomfortable Comfortable Very Comfortable

Appendix J

Post-Education Nursing Staff Survey

Program Title: Polypharmacy in the Hospice Patient Residing in the LTC Facility

Date: _____

Please circle your answers

1. **What is your role?** LPN RN RN Supervisor
2. **How many years have you worked in long-term care?**
   < 1 year 2-5 years 5-10 years >10 years
3. **How comfortable would you say you are in recognizing polypharmacy?**
   Very uncomfortable Uncomfortable Comfortable Very Comfortable
4. **How comfortable would you say you are in suggesting deprescribing a medication to the provider?**
   Very uncomfortable Uncomfortable Comfortable Very Comfortable
5. **How likely are you to use any of the information provided today in your daily practice?**
   Very unlikely Unlikely Likely Very Likely
   If not likely, please state why:_____
   _____
6. **What specifically did you learn today that you intend to use in your daily practice?** (Please be as specific as possible) _____
   _____
   _____
   _____
7. **What do you wish you had learned more about during today's presentation**? (Please be as specific as possible). _____
   _____
   _____
   _____

Appendix K

MedStopper® Tool Example

	Stopping Priority RED=Highest GREEN=Lowest	Medication/ Category/ Condition	May Improve Symptoms?	May Reduce Risk for Future Illness?	May Cause Harm?	Suggested Taper Approach	Possible Symptoms when Stopping or Tapering	Beers/ STOPP Criteria
X		warfarin (Coumadin) / Warfarin / **afib/valve**	☹	🙂 CALE / NNT	☹	Taper to INR targets		None
X		digoxin (Lanoxin, Digitek) / Digoxin / **heart failure**	☹	😐	☹	If used daily for more than 3-4 weeks. Reduce dose by 50% every 1 to 2 weeks. Once at 25% of the original dose and no withdrawal symptoms have been seen, stop the drug. If any withdrawal symptoms occur, go back to approximately 75% of the previously tolerated dose.	worsening of symptoms, increase in heart rate	Details
X		prednisone (Sterapred, Orasone, Deltasone) / Corticosteroid / **inflammatory conditions**	🙂	😐	☹	If used daily for more than 3-4 weeks. Reduce dose by 5mg/week until 10 mg/day is reached. Subsequent dosages should be decreased by 2.5mg/week until the medication is stopped. If withdrawal symptoms occur, increase the dosage and taper at 1mg/week.	return of symptoms, weakness, fatigue, decreased appetite, weight loss, nausea, vomiting, diarrhea, constipation, abdominal pain, low blood pressure, low blood glucose, joint pain, muscle aches, fever, mental changes	Details
X		pantoprazole (Protonix) / Proton pump inhibitor / **heartburn/GERD**	🙂	☹	😐	If used daily for more than 3-4 weeks. Reduce dose by 50% every 1 to 2 weeks. Once at 25% of the original dose and no withdrawal symptoms have been seen, stop the drug. If any withdrawal symptoms occur, go back to approximately 75% of the previously tolerated dose.	return of symptoms, heartburn, reflux	Details
X		fluticasone (Flovent) / Inhaled steroid / **asthma**	🙂	😐	😐	If used daily for more than 3-4 weeks. Reduce dose by 50% every 1 to 2 weeks. Once at 25% of the original dose and no withdrawal symptoms have been seen, stop the drug. If any withdrawal symptoms occur, go back to approximately 75% of the previously tolerated dose.	shortness of breath, limitation of activity, need for rescue puffer	None

Appendix L

Permission to use MedStopper® Tool

Re: Permission to use request

Alan Cassels <email address>
Thu 10/10/2019 05:23 PM
To:

- Long, Lee Ann <longlee18@students.ecu.edu>

Yes, go ahead. Let me know how it goes.

All the best,
Alan

Alan Cassels
Victoria, BC
office [phone number]
cell [phone number]

From: Long, Lee Ann <longlee18@students.ecu.edu>
Sent: October 10, 2019 2:06 PM
To: [email address]
Subject: Permission to use request

To Whom it May Concern:

My name is Lee Ann Long, I am a doctoral student enrolled in the East Carolina University College of Nursing. I am conducting a doctor of nursing practice (DNP) quality improvement project regarding polypharmacy and deprescribing in the hospice patient residing in the long-term care setting. I discovered your online tool, MedStopper® through my research on the topic and found it extremely easy to use.

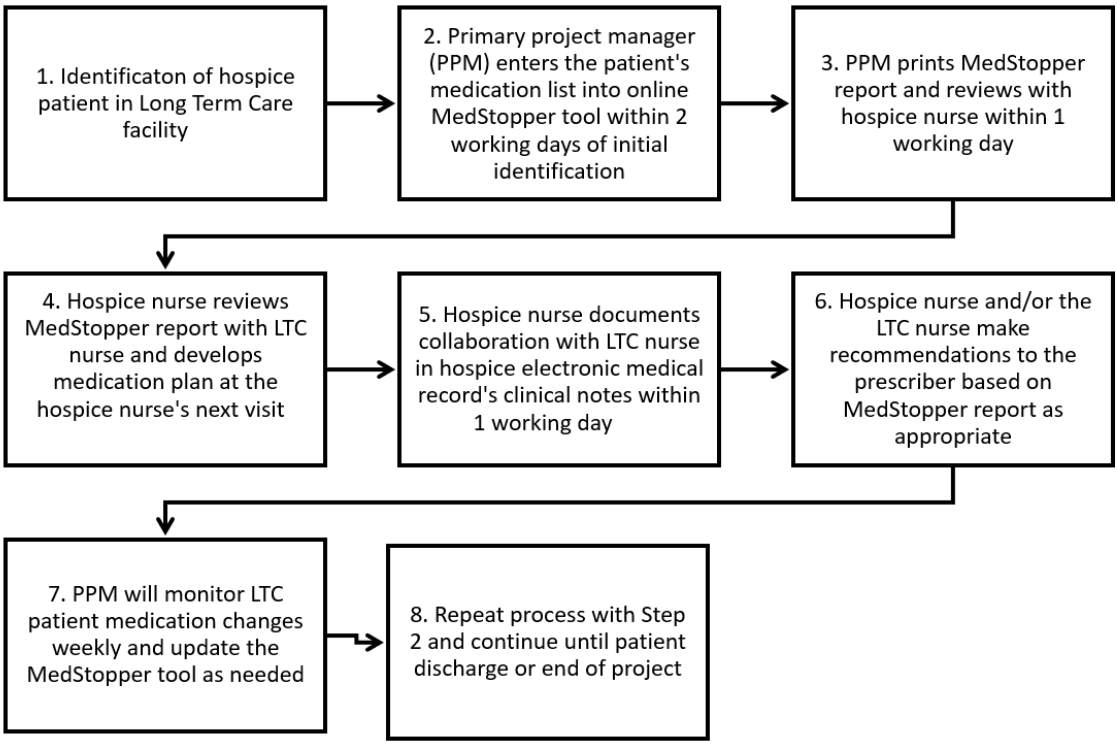
I would like to request your permission to use your tool in the education of nursing staff participating in our project.

Thank you so very much for your tool and for your response.

Lee Ann Long, MSN, RN, CHPN
East Carolina University
College of Nursing DNP Student

Appendix M

MedStopper® Tool and Report Process Map



Appendix N

MedStopper® Compliance Tool

MedStopper® Initial and Weekly Compliance Tool

Yes = Tool discussion was documented in hospice clinical note
No = Tool discussion was not documented in hospice clinical note

Patient #	Initial	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
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37									
38									

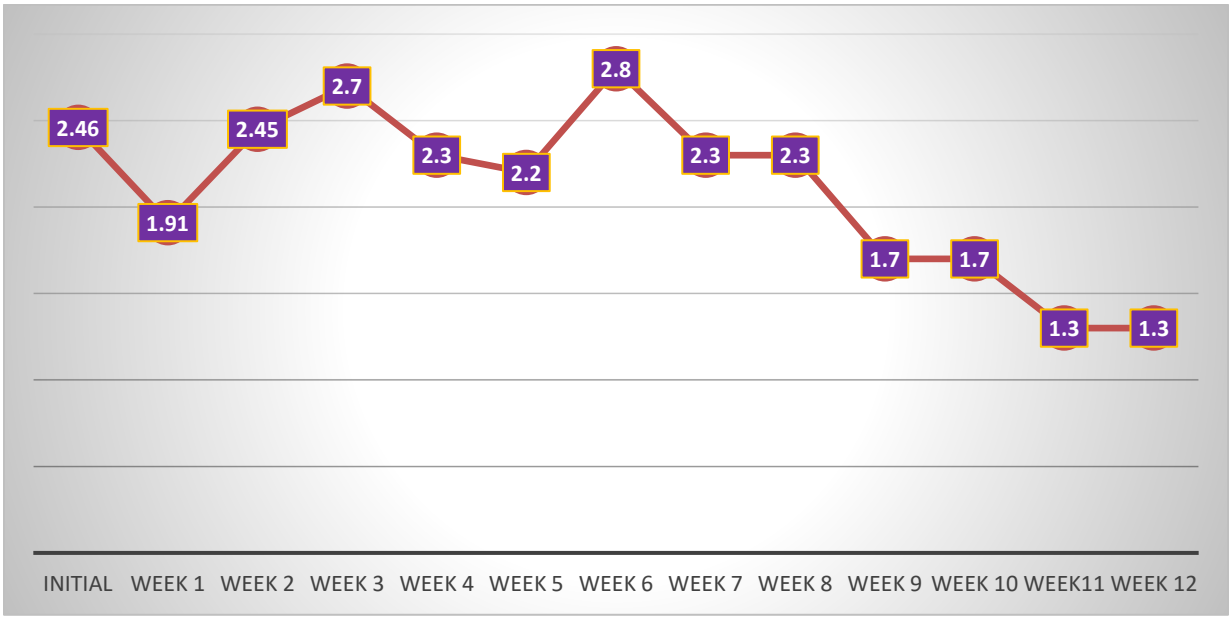
Appendix O

Targeted Drug Class Data Collection Tool

	Initial Data XX/XX/XXXX					
Patient #	Vitamins/ Supplements	Statins/cholesterol-lowering	Anticoagulants	Cognitive Enhancing drugs	Antihypertensives	Diabetic Medications
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Appendix P

Overall Mean of Targeted Medications per Week



Appendix Q

Overall Total Targeted Drug Count by Category per Week

WEEK	Vitamin Supplements	GI Reflux	Statins/ Cholesterol-lowering	Anti-coagulants	Cognitive enhancing	Anti-hypertensives	Diabetics
Initial	8	9	0	4	0	10	1
1	5	7	0	1	0	7	1
2	6	7	0	2	0	8	4
3	6	7	0	2	0	8	4
4	5	6	0	2	0	7	3
5	8	6	0	2	0	5	3
6	10	8	0	3	0	8	2
7	7	8	0	3	0	8	2
8	7	7	0	3	0	9	4
9	5	6	0	2	0	6	0
10	5	7	1	2	0	4	0
11	2	5	0	2	0	4	0
12	3	3	0	2	0	5	0