Deprescribing Medications at the End of Life at a Community Hospice Setting

Shannon Dickson
University of Massachusetts Amherst

Follow this and additional works at: https://scholarworks.umass.edu/nursing_dnp_capstone

Dickson, Shannon, "Deprescribing Medications at the End of Life at a Community Hospice Setting" (2022). Doctor of Nursing Practice (DNP) Projects. 309.
Retrieved from https://scholarworks.umass.edu/nursing_dnp_capstone/309

This Open Access is brought to you for free and open access by the Elaine Marieb College of Nursing at ScholarWorks@UMass Amherst. It has been accepted for inclusion in Doctor of Nursing Practice (DNP) Projects by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.
Deprescribing Medications at the End of Life at a Community Hospice Setting

Shannon Dickson

Elaine Marieb College of Nursing, University of Massachusetts, Amherst

Chair: Hye young Park Ph.D., RN
Mentor: Julie Thurston AGPCNP-BC, ACHPN
Date of Submission: 4/8/2022
Table of Contents

Abstract .................................................................................................................................5

Introduction .......................................................................................................................6

Background ......................................................................................................................6

Problem Statement ..........................................................................................................8

Analysis of project ..........................................................................................................8

Review of Literature .......................................................................................................9

Search Strategy ..............................................................................................................9

Findings ............................................................................................................................11

Inappropriate medication uses at end of life .................................................................11

Definition of Deprescribing ..........................................................................................12

Perceptions of Deprescribing .........................................................................................12

Screening Tools for Deprescribing ..............................................................................13

Summary ..........................................................................................................................14

Theoretical Framework ..................................................................................................14

Project Design ...............................................................................................................15

Project Site and Population ..........................................................................................15

Design ..............................................................................................................................16

Ethical Considerations/Protection of Human Services ...............................................17

Timeline and Budget .....................................................................................................17

Methods ...........................................................................................................................17

Implementation ...............................................................................................................17
Measurements ..........................................................19
Data Collection Procedures ........................................20
Data Analysis ...........................................................21
Results .....................................................................22
Comparison of Pre-and post-Questionnaire ...................23
Deprescribing Medications .........................................24
Fiscal Impact of Deprescribing .................................26
Achievement of Outcomes .........................................27
Discussion ..................................................................28
Strengths ..................................................................29
Limitations ..............................................................30
Clinical Implications ................................................31
Conclusion ...............................................................32
Future Recommendations .........................................33
References ..................................................................34
Appendices ...............................................................41
Appendix A STOPP/Frail Criteria ................................41
Appendix B GPGP Garfinkel Algorithm ......................42
Appendix C Theoretical Framework: BUILD Model ..........43
Appendix D Education Design Outline .......................44
Appendix E Case Scenario ..........................................46
Appendix F Deprescribing Knowledge .........................47
Appendix G My Confidence Ruler ...............................48
Appendix H UMass IRB Letter .................................................................49
Appendix I HCIB IRB Letter ...............................................................50
Appendix J Cost Benefit Analysis ..........................................................51
Appendix K Timeframe .......................................................................52
Appendix L Educational Program Evaluation .........................................53
Appendix M Goals and Objectives ..........................................................54
Abstract

Background: Polypharmacy can yield various adverse outcomes for patients over the age of 65. The lack of a standardized process and education for hospice nurses to implement into their clinical practice can increase polypharmacy, which burdens patients and families at the end of life.

Purpose: This quality improvement project aimed to increase hospice nurses' knowledge and confidence to initiate deprescribing for non-essential or inappropriate medications with hospice patients.

Methods: A multimodal educational program that incorporated evidenced-based resources composed of STOPP Frail Criteria, Garfinkel algorithm, and the BUILD model was presented at a community hospice agency. Pre- and post-intervention questionnaires were used to assess the hospice nurses' level of knowledge and confidence with deprescribing. Meetings with the hospice nurses and retrospective chart reviews were also conducted to evaluate actual trends of deprescribing at the agency.

Results: The 25 hospice nurses who completed the program demonstrated increased confidence and knowledge of deprescribing, polypharmacy, and the identification of inappropriate medications using the STOPP Frail Criteria and Garfinkel algorithm. There was an increase in patients who had inappropriate medications deprescribed.

Conclusion: Deprescribing and polypharmacy are significant issues that impact older patients at end of life. Ongoing education and evaluation are recommended to improve patients' overall symptom management and quality of life.

Keywords: polypharmacy, deprescribing, end of life, hospice, nurses, discontinuing medications, pill burden
Deprescribing Medications at the End of Life at a Community Hospice Setting

Introduction

As patients age and are diagnosed with life-limiting illnesses, palliative and hospice care become an option to assist with their quality of life, symptom management, and treatment burden. In end-of-life care, the focus of care and drug therapy shifts from curative to comfort and palliation of symptoms (Duncan et al., 2020). Medications prescribed to prevent or treat illnesses or preserve life become futile when patients transition to end-of-life care. Hospice nurses must be educated on deprescribing medications. The education should include patient age-related considerations, the pharmacokinetics and pharmacodynamics of medications, and the value of discontinuing non-essential drugs at the end of life. By applying a combination of knowledge, algorithms, and evidence-based tools, hospice nurses will be able to deprescribe unnecessary medications, thus enhancing symptom management, improving patient outcomes, and lowering caregiver burden.

Background

Patients with advanced illness are prescribed multiple medications in the last year of life, intensifying the risk of adverse consequences related to polypharmacy. Thompson and colleagues (2019) defined polypharmacy as the "concomitant use of multiple medications, typically five or more medications, whose harms outweigh the benefits and use of medications are not indicated" (p. 172). A significant amount of medication burden is placed on patients with advanced illnesses. According to McNeil and colleagues (2016), "A substantial proportion of patients near the end of life were
prescribed medications to control or prevent non-life-threatening comorbidities." Patients may demonstrate increased drug toxicity, drug-to-drug interactions, and a lack of effectiveness of these medications (Garner, 2019). Medicines prescribed to treat or prevent illnesses at the end of life become ineffective due to the physical changes within the body. The Centers for Medicare and Medicaid Services (CMS) expect maintenance drugs used to treat or cure a condition should be discontinued as the focus of care shifts from curative to palliative and comfort (Duncan et al., 2020, p. 1077). Statins, anticoagulants, proton pump inhibitors, oral hyperglycemic agents, cholinesterase inhibitors, and bisphosphonates are frequently ineffective and can be deprescribed among patients nearing the end of life.

In 2017, more than 1.49 million Medicare beneficiaries enrolled in Hospice services (National Hospice and Palliative Care Organization (NHPCO), 2019). Of the beneficiaries enrolled in hospice, 30.6% were over 65 years of age, and 64.2% were over 80 years of age (NHPCO, 2019). Hospice patients are at considerable risk for polypharmacy due to the continuation of medicines for underlying medical conditions and the administration of new medications to assist with symptom burden (Duncan et al., 2020, p. 1076).

Due to polypharmacy, hospice patients are at higher risk for adverse effects. These negative effects include falls, confusion, medication interactions, and a longer medication half-life (Thompson et al., 2019). Thus, deprescribing is an essential intervention for improving patient outcomes, reducing polypharmacy, and reducing caregiver burnout caused by medication regimens (Thompson et al., 2019).

Deprescribing is defined as reducing or discontinuing the use of medications that
may cause harm or no longer be beneficial (Pype et al., 2018). Although the notion of deprescribing is growing within healthcare, there is little evidence that a systematic approach exists to assist hospice nurses in implementing it at the end of life.

**Problem Statement**

The risk of decreased quality of life among hospice patients is related to providers' overprescribing inappropriate medications. The shortfall in education and resources on deprescribing medications for hospice nurses is evidenced by inconsistent nursing practice, resulting in increased patient symptom burden, such as increased falls, nausea, pain, anxiety, and cognitive deficits. By integrating systematic evidence-based tools and education, hospice nurses will incorporate their knowledge of deprescribing into their clinical practice. The focus will decrease polypharmacy, lower pill burden, and improve patient outcomes.

**Analysis of Project Site**

Deprescribing medications at the end of life is a global issue since there is no standardized process for reducing polypharmacy among hospice patients. There is no standardized process for deprescribing medications for hospice patients within this community hospice agency. A lack of training for novice hospice nurses can lead to inconsistent practice and low competence. Inappropriate drug identification is seldom discussed with patients and families during clinical visits, resulting in polypharmacy, pill burden, ineffective symptom control, and poor patient outcomes. Current nursing education does not address the concepts of disease trajectory and deprescribing. Overall, the knowledge deficit among hospice nurses on deprescribing has identified the need for this quality improvement educational program. This program will address the deficits presented previously, including the lack of education for hospice nurses around
deprescribing medications and the absence of a standardized process for determining which medications should be discontinued by hospice nurses.

**Review of the Literature**

Despite the increased use of inappropriate medications among hospice patients, hospice nurses do not have enough educational preparation or the resources to integrate deprescribing into clinical practice. The purpose of this critical appraisal of literature was to identify and evaluate current deprescribing practices. According to the literature, evidence-based approaches to deprescribing non-essential drugs for patients at the end of life include the Good Palliative Care algorithm and the STOPP/Frail criteria.

The International Group designed the Garfinkel Good Palliative Geriatric Practice (GPGP) algorithm for Reducing Inappropriate Medication Use and Polypharmacy, founded in 2013. A group of physicians developed this tool to assist practitioners in deprescribing inappropriate medications or decreasing the dose of medicines that may be harmful (Bilek et al., 2019). The STOPP/Frail Criteria list of potentially inappropriate prescribing indicators was designed to assist physicians with stopping such medications in patients 65 years and older (Curtin et al., 2020). These evidence-based tools and education assisted hospice nurses in identifying potentially inappropriate and futile medications for hospice patients. These tools increased the clinician's knowledge base and clinical practice strategies to integrate this knowledge to reduce symptoms and improve patient safety and outcomes.

**Search Strategy**

A thorough review of the literature was conducted using four research databases, including the Cumulative Index of Nursing and Allied Health Literature (CINAHL),
Public Medline (PubMed), Science Direct, and Google Scholar. Inclusion criteria were articles published between 2015-2020, articles that studied the deprescribing process and tools, were peer-reviewed, written in the English language, and targeted patients at the end of life. Exclusion criteria focused on pediatric patients under the age of eighteen, articles not written in English, not peer-reviewed, and articles that did not pertain to end of life. The MeSH terms and key terms included: *polypharmacy, deprescribing, end of life, hospice, nurses, discontinuing medications, STOPP/Frail Criteria, and pill burden*.

Initial search results with CINAHL yielded 496 articles. Two hundred thirty-four articles were omitted since they did not fall within the five-year period (2015-2020). Two hundred thirty-two articles were excluded due to not meeting peer review and end of life deprescribing criteria. Thirty articles focused on deprescribing at the end of life. Search efforts through PubMed yielded 120 articles, but 118 were omitted due to the article's publication date or duplication of articles. Science Direct and Google Scholar yielded 829 articles. Due to the title or duplication of the articles, 825 articles were discarded. Four articles remained, which focused on deprescribing at the end of life. In total, 36 articles remained after the review of all the articles.

The John Hopkins, Nursing Evidence Rating Tool, appraised the strength and quality of evidence (Newhouse et al., 2005). The tool rates each article on the strength of evidence I-V and the quality of evidence from A (high quality) to C (low quality). The review of articles identified five articles Level I with an A rating for the quality of evidence (Bilek et al., 2019; Curtin et al., 2020; Fournier et al., 2020; Kutner et al., 2015; Martin & Tannenbaum, 2017). Ten articles were assigned Level IV for their strength of evidence and rated B for quality of evidence (Burgle et al., 2020; Duncan et
al., 2020; Farrell et al., 2015; Huisman et al., 2020; Morin et al. 2019; Paque et al., 2019; Poudel et al., 2019; Pype et al., 2018; Schnecker et al., 2019; Thompson et al., 2019).

In addition, the Bruyere Institute in Canada established four clinical practice guidelines, which were recognized (Farrell, Black, et al., 2017; Farrel, Ponte, et al., 2017; Pottie et al., 2018; (Reeve et al., 2019). The guidelines rated level IV by the evidence rating tool. Seven articles rated level V were reviewed as supportive data, which focused on deprescribing (Collier et al., 2013; Endsley, 2018; Holmes & Todd, 2017; Stinson et al., 2019; (Todd et al., 2018). Four level I articles were randomized control studies (RCT), and one was a non-randomized control study. The level IV articles were systematic reviews, cohort studies, literature reviews, and secondary analyses.

**Findings**

**Inappropriate medication uses at end of life**

Medicines prescribed for disease prevention become ineffective because the risk of adverse outcomes outweighs the medication benefit during the end of life. As patients near end-of-life, polypharmacy becomes a heightened factor that increases adverse effects from medications such as confusion, potential increased risk for falls, and symptom burden (Thompson et al., 2019). Three studies examined inappropriate medications for patients at the end of life (Morin et al., 2017; Poudel et al., 2019; Pype et al., 2018). Morin and colleagues conducted a randomized control trial with 58,415 participants in the last three months of life (2017). On average, patients had eight medications prescribed; of those medications, 33% of participants had at least one drug that was identified as futile or inappropriate, and 14% had one non-essential medicine prescribed. Pype and colleagues conducted a retrospective chart review of 210 patients
and identified 83% of participants within the last weeks of life were taking at least one inappropriate medication (2018).

Researchers reviewed the time of the last prescription before study participants' death, and polypharmacy occurred in 60% of the participants (Poudel et al., 2019). The most common medications prescribed and continued were statins (38%) and vitamins (30%). At the 6-month mark, 10% of patients were on statins. As the patients declined into the last week of life, 6% of patients were still on statins and vitamins. In summary, from these studies, it was apparent that hospice nurses and practitioners do not consistently identify inappropriate medications for patients with a limited life expectancy.

**Definition of deprescribing**

The concept of deprescribing among patients nearing the end of life is complex. Deprescribing is defined as reducing or discontinuing medications in a planned or supervised manner (Thompson et al., 2018). Deprescribing helps minimize inappropriate or potentially burdensome medications while optimizing the benefits of medication therapy for patients. As patients near the end of life, the clinician's role is to identify medicines that may be potentially futile or burdensome for the patient or family to continue. There is limited research on the role of the hospice nurse in deprescribing. Utilizing the systematic tools of the STOPP/Frail Criteria (See Appendix A) and Garfinkel Good Palliative Geriatric Practice Algorithm (GPGP) (See Appendix B) will assist hospice nurses in the identification of such medications.

**Perceptions of deprescribing**

Two articles focused on patients' and practitioners' perceptions of deprescribing. (Burgle et al., 2020; Holmes & Todd, 2017). One common theme identified within the
Burgle et al. (2020) study was that deprescribing medications involved the whole team of practitioners, patients, and families. Patient-centered care is an essential factor when a patient reaches end-of-life. At that time, the team should identify goals of care that are important to the patient. When it comes to deprescribing medications for patients nearing the end of their life, hospice nurses should consider the following factors: how the medication regimen affects patients' daily lives, their time with family, the adverse effects of the medication, and the convenience of the medication regimen.

**Screening Tools for Deprescribing**

The STOPP/Frail Criteria and GPGP Algorithm were used in six out of the thirty articles. These tools assist practitioners and hospice nurses in identifying futile medications for patients with terminal illnesses entering the final stages of the end of life.

The STOPP/Frail Criteria was developed in 2017 by a panel of 18 experts in geriatric pharmacology in the United Kingdom (Lavan et al., 2017). The purpose of these criteria is to guide practitioners in identifying potentially inappropriate medications.

The STOPP criteria has been utilized in many clinical trials, which has increased the validity and reliability of the tool. Fournier et al. (2020) used the STOPP criteria if the participants met specific criteria: end-stage irreversible pathology, poor one-year survival prognosis, and severe functional impairment. Three hundred six participants met all three criteria. Medications prescribed to these participants revealed that 13% were potentially inappropriate by the STOPP criteria.

Curtin et al. (2017) conducted a clinical trial in Ireland which utilized the STOPP criteria intervention for 51 participants within a sample size of 130. As a result of the intervention of the STOPP criteria, 91% of the participants received recommendations to
stop at least one inappropriate medication.

The Good Palliative Geriatric Practice (GPGP), also known as the Garfinkel algorithm, was developed by a panel of experts in 2019 to assist practitioners in deprescribing inappropriate medications at the end of life (Bilek et al., 2019). Bilek et al. (2019) conducted a study among practitioners who received education and those did not. The sample size was 100 patients. Overall, the study demonstrated that the practitioners who received training prescribed 18.5% fewer medications than the control group.

Summary

There is extensive research regarding the potential adverse effects of polypharmacy among patients at the end of life. The literature concludes that inappropriate medications become futile at the end of life (Burgle et al., 2020), and discontinuing inappropriate medications decrease polypharmacy for terminally ill patients (Collier et al., 2013; Fournier et al., 2020; Poudel et al., 2019). However, no studies identified the correlation between deprescribing and patient outcomes. In addition, there is no systematic process for deprescribing that hospice nurses can utilize during their daily practice. Hospice nurses needed more training to recognize ineffective drugs and enforce deprescribing medications using evidence-based resources. Systematic processes and evidence-based education can ensure hospice nurses take a consistent approach to deprescribe medications for hospice patients at the end of life.

Theoretical Framework

This project followed the BUILD Model (Collier et al., 2013) (See Appendix C). This model provided a framework for hospice nurses to develop relationships with their patients and families, gain information about their current understanding of their
medications, and facilitate discussions with patients and families about medication appropriateness. The five components of this model consisted of:

- **Build**: the hospice nurse should build a foundation of trust and respect by listening to and validating the patients'/families' concerns.
- **Understand**: the hospice nurse should assess the patient's understanding of the medications they are currently taking and their knowledge of deprescribing.
- **Inform**: the hospice nurse should provide evidence-based knowledge to the patient and family on the risks vs. benefits of continuing to take their current medications.
- **Listen**: the hospice nurse should provide time for the patient and family to express their wishes, concerns, and goals related to medication.
- **Develop**: the hospice nurse and patient/family should develop a patient-centered plan of care that incorporates discontinuing inappropriate medications which is aligned with the patients' goals.

**Project Design**

**Project Site and Population**

The project was implemented at a community hospice agency in a rural community with one local healthcare system. The population of the rural community in 2019 was 124,944. (U.S. Census, 2019). The hospice agency provided hospice services within the healthcare system, including long-term care facilities, assisted living communities, and independent homes. The hospice agency's rolling census averages approximately 110 patients daily.
The agency's largest referral source is the local healthcare system. The community primary care providers serve as the patients attending physicians when they elect the hospice service. Payment sources included Medicare, Medicaid, and commercial insurances. The hospice nurses' patients had a life-limiting diagnosis of cancer, end-stage cardiac disease, dementia, end-stage lung disease, or neurological disease such as Parkinson's Disease.

The educational project was offered to 30 hospice nurses with enrollment strategies, including flyers, staff meetings, word of mouth, and emails. There were 25 hospice nurses that voluntarily participated in the project.

The agency's nurse practitioner provided supervision for this quality improvement project. Additionally, the agency's Executive Director and Director of Quality Improvement supported the project's implementation (Appendix I).

**Design**

This quality improvement project provided hospice nurses with educational sessions to build a shared understanding of deprescribing. The deprescribing tool kit reviewed includes two screening tools, the STOPP Frail Criteria (Appendix A) and the GPGP algorithm (Appendix B). The DNP student administered two pretests (a) a knowledge questionnaire (Appendix F) and (b) a confidence ruler (Appendix G) before conducting the educational intervention. After each educational session, the hospice nurses completed a program evaluation (Appendix L).

The DNP student reviewed a skill-building case study during the last educational intervention. (Appendix E) Then three post-intervention questionnaires were administered to the participants (a) knowledge questionnaire, (b) confidence ruler, and (c)
program evaluation questionnaire. The DNP student observed the current deprescribing practices within this agency for 16 hours per week. In addition, the DNP student and the mentor met with the hospice nurses monthly to ensure accurate utilization and the identification of inappropriate medications that were being deprescribed.

**Ethical Considerations/Protection of Human Subjects**

The University of Massachusetts, Amherst (UMass) Institutional Review Boards (IRB) approval was obtained before initiating the DNP Project (See Appendix H). Since this is a quality improvement project, IRB approval for the clinical site was exempted (see Appendix I). The pre-and post-surveys were assigned a number and letter code, so staff remained anonymous. Patient records were assigned a patient ID to ensure that the identity of individual patients was protected. All data, including assessments, surveys, and deprescribing information, were stored in a locked cabinet in the Clinical Director's office at the participating agency. There was no ethical risk posed to the patients since the standard of care was provided regardless of their nurses' participation in the project.

**Timeline and Budget**

The project timeline details are in Appendix L. Detailed budget costs are in Appendix K.

**Methods**

**Implementation**

Four educational sessions were conducted; each session was 60 minutes in length and used a multimodal educational approach, including presentations, case studies, and role-playing to enhance learning for each nurse (Appendix E). The number of hospice nurses assigned to each session was between 7-10 people to conform to COVID safety protocols and minimize the risk of exposure to hospice nurses during interactions.
In educational session one, conducted in the first week of September 2021, the DNP student reviewed the concept of deprescribing and prescribing cascade. In educational session two, conducted in the second week of September 2021, the DNP student reviewed the GPGP algorithm, STOPP Frail criteria, and National Hospice and Palliative Care Deprescribing toolkit (*NHPCO_Deprescribing_Toolkit.*, 2020). The NHPCO tool kit integrates both the GPGP algorithm and STOPP criteria into patient scenarios to demonstrate how to proceed with deprescribing techniques to achieve patient-centered care. The DNP student provided each hospice nurse with a portable copy of the tools to use in the clinical setting to educate patients and families about inappropriate medications and deprescribing.

In educational session three, conducted in the third week of September 2021, the DNP student introduced the BUILD model, which provided the framework for facilitating discussions about deprescribing. During this session, the hospice nurses learned how to integrate each of the five components into their communication process with patients and families. The five components of this model consisted of:

- **Build:** the hospice nurse should build a foundation of trust and respect by listening to and validating the patients’/families’ concerns.
- **Understand:** the hospice nurse should assess the patient's understanding of the medications they are currently taking and their knowledge of deprescribing.
- **Inform:** the hospice nurse should provide evidence-based knowledge to the patient and family on the risks vs. benefits of continuing to take their current medications.
• **Listen**: the hospice nurse should provide time for the patient and family to express their wishes, concerns, and goals related to medication.

• **Develop**: the hospice nurse and patient/family should develop a patient-centered plan of care that incorporates discontinuing inappropriate medications that is aligned with the patients’ goals.

In educational session four, conducted in the fourth week of September 2021, the DNP student focused on role-playing case studies that required participants to practice integrating the knowledge gained through sessions one through three. Each nurse role-played the part of the nurse and the part of the patient in a supportive environment.

**Measurements**

The DNP project used quantitative data collection methods: a pre-post questionnaire, a confidence ruler, retrospective chart reviews, and a program evaluation. The pre-post questionnaires allowed hospice nurses to evaluate their knowledge of deprescribing principles, prescribing cascade, polypharmacy, STOPP frail criteria, deprescribing algorithms, and the BUILD model. The prequestionnaire also included five questions on nursing experience, academic level, and experience as a hospice nurse.

The participants' responses were rated as either correct (1 point) or incorrect (0 points). Higher points meant a more substantial knowledge base. Five of the participating nurses tried the questionnaire to determine its clarity. All five hospice nurses completed the questionnaire without difficulty and reported that the questionnaire was easy to complete and understand. In the small sample test performed by five hospice nurses, the pre-and post-questionnaire demonstrated face validity. (See Appendix F)
The pre-and-post surveys and confidence rulers measured whether the hospice nurses who attended the educational sessions gained expertise and confidence. The Confidence ruler assessed the participant's confidence level of deprescribing (See Appendix G). The tool evaluated where the learner was on the confidence scale and identified what needed to occur to change their practice (Gold & Kokotailo, 2017).

In addition, an educational session evaluation tool was created that participants completed after each educational session. The evaluation tool consisted of seven questions that evaluated the content of the educational session (Appendix L). The skill-building case study review occurred during the last academic session. The case study was about a 66-year-old female diagnosed with Advanced Lung Cancer admitted to hospice services (Appendix E). Each participant was asked to assess the patient in the case study and identify inappropriate medications using the STOPP/Frail criteria. The completion of the skill-building case was designed to measure whether the hospice nurses demonstrated increased knowledge about the STOPP/Frail criteria and could apply the tool in practice.

In addition, retrospective chart reviews occurred over 60 days from January through February 2022 to identify whether conversations took place between the hospice nurse, patients, and families about inappropriate medications that had been identified and whether those conversations resulted in the deprescribing of medications.

**Data Collection Procedures**

**Pre-intervention phase:** The hospice nurse completed the pre-intervention survey and confidence ruler at the beginning of the first education session in September 2021. Each survey was coded with a number and letter to maintain anonymity. The sample size was 25 hospice nurses that the agency employed during September 2021.
**Intervention phase:** During the intervention phase in September 2021, four educational sessions were conducted. Each participant completed the education evaluation survey at the end of each session.

**Post-intervention phase:** Each participant completed the post-survey and the confidence ruler. After the educational sessions, the DNP student met individually with each hospice nurse to review medications for deprescribing. The DNP student conducted chart reviews during January and February 2022. The chart reviews focused on determining whether conversations occurred between the hospice nurse, patient, and family related to inappropriate medications that could be deprescribed and whether medications were discontinued. Monthly medication reports confirmed that medications were discontinued in conjunction with chart reviews. An Excel spreadsheet tracked each patient visit and the medications that were deprescribed. Additionally, a monthly pharmacy financial report was reviewed as well to collect information related to the fiscal impact of deprescribing.

**Data Analysis**

To assess the effectiveness of the intervention, descriptive and inferential statistics were used. Each participant's responses from the pre and post questionnaire, which focused on knowledge level, confidence level, and demographic data were compiled in an Excel spreadsheet. Responses were then coded appropriately to input into SPSS Version 26 for analysis and to produce frequency tables. The figures represent the pre and post chart reviews and differences between the number of medications the patient was on at the time of death and the fiscal impact of the intervention.

Descriptive analysis concentrated on the hospice nurses’ age, nursing experience, education level, and nursing experience as a hospice nurse. The paired T-test was used in
inferential statistics to analyze the pre- and post-questionnaires on knowledge and confidence level. The significance level was set at 0.05. The data on deprescribing medications obtained from the chart reviews were coded in an Excel spreadsheet and evaluated by the DNP student. Data was then coded appropriately to input into SPSS Version 26 for analysis. The deprescribed medications were categorized as follows: vitamins, aspirin, statins, diabetes, cardiac, and proton pump inhibitors. The medications were then divided into three groups: admission, pre-intervention, and post-intervention.

The project's goals were to increase hospice nurses' knowledge of deprescribing and increase confidence by utilizing the STOPP Frail Criteria and GPGP Algorithm within their clinical practice. Increase the ability of hospice nurses to detect inappropriate medications and engage in dialogues with patients and families about deprescribing using the BUILD model.

Results

A total of 25 hospice nurses participated in the project. The participants' demographics are presented in Table 1. The results of the demographic analysis showed that 32% of the hospice nurses had over 15 years’ experience as a nurse; however, 64% of the nurses were novices with less than five years' experience within the specialty of hospice. The participants were divided into four groups according to their level of education, 48% of participants had a bachelor's degree, 36% had an associate degree, and 12% were LPNs. One participant (4%) had a master's degree in nursing.

<table>
<thead>
<tr>
<th>Table 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Participant Characteristics (N=25)</strong></td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Comparison of Pre- and post-Questionnaire

Knowledge gained about deprescribing, the STOPP Frail Criteria, and the GPGP algorithm was measured by the post questionnaire, which results are represented in Table 2. In total, 25 hospice nurses completed the program. The overall mean score of knowledge increased from 8.40 to 9.56 and the mean score of confidence increased from 14.28 to 23.40.

Table 2
Descriptive Statistic - Hospice Nurses' Knowledge and Confidence (N=25)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>N</th>
<th>Standard Deviation</th>
<th>Standard Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>8.4000</td>
<td>25</td>
<td>.81650</td>
<td>.16330</td>
</tr>
<tr>
<td>Post-test</td>
<td>9.5600</td>
<td>25</td>
<td>.71181</td>
<td>.14326</td>
</tr>
<tr>
<td><strong>Confidence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>14.2800</td>
<td>25</td>
<td>6.21504</td>
<td>1.24301</td>
</tr>
<tr>
<td>Post-test</td>
<td>23.4000</td>
<td>25</td>
<td>5.28362</td>
<td>1.05672</td>
</tr>
</tbody>
</table>

Table 3 presents the results of a comparison between pre and post-test knowledge. There were significant differences in both knowledge (t=-5.642, p < .001) and confidence.
(t = 8.812, p < .001) between pre-post educational program.

### Table 3
Paired T-test

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>N</th>
<th>Std. deviation</th>
<th>Std. Mean Error</th>
<th>95% confidence interval of difference</th>
<th>One sided p</th>
<th>Two-sided p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-post know.</td>
<td>-1.1600</td>
<td>25</td>
<td>1.02794</td>
<td>.20559</td>
<td>-1.58431 - .73569</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Pre-post conf.</td>
<td>-9.1200</td>
<td>25</td>
<td>5.17462</td>
<td>1.03492</td>
<td>-11.2258 - 6.48402</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

## Deprescribing Medications

Table 4 displays the type of medications prescribed to the 99 patients that had their records reviewed prior to the hospice nurses receiving the education and how many medications they were on following the intervention. A total of 98 patients had medications deprescribed by the hospice nurses who participated in the intervention over a 90-day period. The most common categories of deprescribed medications included aspirin, statins, vitamins, cardiac medications (angiotensin-converting enzyme inhibitors, angiotensin II receptor blockers, diuretics, beta-blockers, antiarrhythmics), diabetes medications (oral medications, insulin), and proton pump inhibitors.

There were substantial variations between this project's preintervention and postintervention phases regarding medication deprescribing. As a result of the educational intervention, the six major medication categories that were deprescribed were aspirin (18%), statins (14%), vitamins (26%), cardiac medications (42%), diabetes medications (59%), and proton pump inhibitors (41%). As a result of the educational intervention, the number of medications patients were on at the time of death had
decreased significantly (p <.0001 - <.0006).

**Table 4**
*Number of patients on medications per drug category (N=99)*

<table>
<thead>
<tr>
<th>Drug Category</th>
<th>Admission</th>
<th>Pre-intervention</th>
<th>Post-intervention</th>
<th>Percent deprescribed</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin</td>
<td>22</td>
<td>20</td>
<td>4</td>
<td>18%</td>
<td>0.0002</td>
</tr>
<tr>
<td>Statins</td>
<td>43</td>
<td>39</td>
<td>6</td>
<td>14%</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Vitamins</td>
<td>47</td>
<td>44</td>
<td>11</td>
<td>26%</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Cardiac Medications</td>
<td>73</td>
<td>73</td>
<td>31</td>
<td>42%</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Diabetes Medications</td>
<td>32</td>
<td>32</td>
<td>19</td>
<td>59%</td>
<td>0.0006</td>
</tr>
<tr>
<td>Proton pump inhibitors</td>
<td>34</td>
<td>34</td>
<td>14</td>
<td>41%</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

The percentage of patients who received 0-9 medications increased to 59% post-intervention. The percentage of patients who received >20 medications decreased to 0%, as demonstrated in Figure 1 below.

**Figure 1**
*Medications at Time of Death Pre/Post Intervention*

The results showed a substantial number of deprescribed medications because of
this educational intervention. This is clinically significant because the hospice nurses' knowledge and confidence gained from these educational sessions were utilized in clinical practice to reduce the polypharmacy and adverse effects of medications during the end of life.

**Fiscal Impact of Deprescribing**

As a result of deprescribing, the agency saw a reduction in medication costs over the 90 days after the educational intervention, as illustrated in Figure 2. Before the intervention, the cost of medications over three months was $72,767.30. During the three months, October 2021 through December 2021, post-intervention, the total cost of medications was $54,250.00. Post-intervention the costs of the medications were reduced by $18,517.30. Additionally, the cost of medications per patient per day also decreased from $7.80 to $6.10.

**Figure 2**

*Medication costs pre/post intervention*
Achievement of Outcomes (Appendix M)

**Goals 1.** The outcome was to have 100% of participating hospice nurses self-assess their current knowledge of deprescribing principles, prescribing cascade, polypharmacy, STOPP frail criteria, deprescribing algorithms, and the BUILD model prior to and following educational sessions. This goal was met since 100% of hospice nurses completed self-assessments prior to and after the educational intervention.

**Goal 2.** The outcome was to have 100% of participating hospice nurses self-assess their confidence with deprescribing. This goal was met since 100% of hospice nurses completed their confidence with deprescribing before and after the intervention.

**Goals 3.** The outcome was to have at least 80% of hospice nurses participate in comprehensive education, including four 60-minute sessions. This goal was met since 89% of hospice nurses participated in all four educational sessions.

**Goal 4.** This outcome was to have at least 80% of hospice nurses demonstrate increased knowledge, confidence with deprescribing and the use of deprescribing tools as measured by their self-assessments. This goal was met since 88% of hospice nurses showed increased knowledge and confidence with deprescribing and utilizing screening tools in their clinical practice.

**Goal 5.** The outcome was to have at least 80% of patients under the care of participating hospice nurses had 1-2 futile medications deprescribed within 90 days of the educational sessions based on retrospective chart reviews. This goal was met since 99% of patients had at least one medication identified as inappropriate and then deprescribed.
Discussion

Hospice nurses improved their knowledge and confidence in clinical practice by attending these educational sessions on deprescribing, polypharmacy, and evidence based deprescribing screening tools. However, it is more than just the knowledge of and the utilization of screening tools. Deprescribing involves a higher-level skill set which includes critical thinking, strong clinical assessment skills, medication reconciliation, and a trusting relationship with patients and families. To develop clinical proficiency, participants needed to apply the skills gained in each of the four educational sessions.

The results demonstrate that the educational sessions increased the hospice nurse's knowledge and confidence level with deprescribing. As a result of the improved knowledge, hospice nurses expanded the number of conversations they had with patients and families. Hospice nurses developed greater confidence from the use of their tool kits and the increased understanding enabled them to undertake these conversations earlier in the patient treatment and earlier in the disease trajectory.

The educational session focused on the BUILD model shifted the participants' dialogues with patients and families by emphasizing a collaborative communication process between the hospice nurse, patient, family, and physician. The collaborative nature of these conversations encouraged patient-centered treatment decisions that were aligned with the patients' goals. As mentioned previously, the strengthening of relationships enabled hospice nurses to take the lead in initiating these difficult conversations. This project supported the theme identified in the Burgle et al. (2020) study, which states that deprescribing medications involves the whole team of practitioners, patients, and families.
The team-based approach during the educational sessions integrated the use of case studies to require participants to combine both theory and reality. Participants had to comprehend and apply the concepts and theories they learned to practical situations. Participants were to practice in a secure and supportive environment since the case studies were conducted in this way.

The hospice nurses participated indirect use of the GPGP algorithm and STOPP criteria in their individual meetings, which assisted them in identifying medications that were no longer appropriate for the patient. As a result, 99% of patients had 1-2 inappropriate medications deprescribed. The most significant impact of medication deprescribing occurred within three medication categories: diabetes medications (59% of patients), cardiac medications (42% of patients), and proton pump inhibitors (41% of patients). The results of this project support the notion that providing education to hospice nurses on deprescribing and the use of deprescribing tools and conversational frameworks strengthen their confidence level and expertise, allowing them to discuss the discontinuation of medications with patients and families. This pattern of results is consistent with the previous literature by Curtin et al. (2017), who conducted a clinical trial in Ireland which utilized the STOPP criteria intervention for 51 participants within a sample size of 130. As a result of the intervention of the STOPP criteria, 91% of the participants received recommendations to stop at least one inappropriate medication.

**Strengths**

The nurses expressed interest in learning about deprescribing medications near the end of life, which helped this project be successful. This passion created a path for practice transformation that improved patient outcomes. Additionally, the two
standardized screening tools, the STOPP Frail Criteria and the GPGP algorithm, assisted the hospice nurses in identifying inappropriate medications at the end of life and, when applied allowed them to provide standardized deprescribing practice. The findings of the pre- and post-questionnaires show a strong correlation between enhanced knowledge and confidence with deprescribing and integration in clinical practice and a reduction in polypharmacy.

Hospice nurses played a vital role in educating the patient and families about the benefits of deprescribing and how it could enhance the quality of life. As seen in previous literature, there was a correlation between the intricacy of the medication regimen and the patients and family's sense of pill burden. The opportunity to deprescribe became apparent when the patients and families became aware of polypharmacy's burden.

Another strength of this project was the collaboration among the interdisciplinary team members, including hospice nurses, physicians, pharmacists, patients, and families to develop patient-centered plans of care that aligned with the patients’ goals. The inclusion of a pharmacist and one-to-one meetings with the hospice nurses allowed the discovery of duplicative therapy, drug-to-drug interactions, inappropriate medications, and the efficacy of the patient's medication regimen. In addition, the hospice nurses felt empowered to initiate these conversations earlier along the disease trajectory. Inappropriate medications were deprescribed because of this strategy and patients' outcomes were improved.

Limitations

Although the present results clearly support that there is a correlation between increased practitioner knowledge, confidence, and strong patient/family relationships and
the deprescription of medication, it is appropriate to recognize potential limitations. One of the limitations of this project was the small sample size (n=25) of hospice nurses who could participate in all four educational sessions. The potential of unforeseen clinical emergencies that can occur at end of life prevented all hospice nurses from participating in the educational sessions. Furthermore, this agency's geographic region prevented participants from returning to the office to participate in the educational sessions. The COVID-19 pandemic caused significant staffing shortages which reduced the amount of time that hospice nurses were able to dedicate to the educational sessions due to each hospice nurses' higher patient census.

Another project drawback is that the pre-intervention patient group and the post-intervention patient group could not be compared due to the short length of stay of the pre-intervention group prior to death. The data on medicine deprescribing comes only from the post-intervention sample. The data compares the medications prescribed to each patient on admission to the medications that were deprescribed prior to the first educational session and medications that were deprescribed after all four educational sessions. Even though the project's data is only from the post-intervention patient population, it still demonstrated clinical significance. Despite these limitations, these results suggest theoretical and practical implications.

**Clinical Implications**

With enhanced understanding and confidence regarding deprescribing, hospice nurses are now more equipped to have these discussions with patients when their conditions change. Examples of the changes in condition that were seen by the hospice nurses included admission to hospice, dysphagia, change in cognitive status or
consciousness, increase in falls, increase in pain, and when the patient can no longer take in oral intake. Within the clinical practice of hospice nurses, the concepts of deprescribing and medication reconciliation became a standardized process. The hospice nurses were able to effectively address duplicative therapy, drug-to-drug interactions, and inappropriate medications after implementing the knowledge and confidence they acquired from this educational intervention. This improved patient outcomes and symptom management through the end of life. The clinical implication of this project was that medication safety in a hospice patient's paramount.

**Conclusion**

This project's results contribute to a growing body of evidence suggesting that the training contained in the educational program increased the hospice nurses' confidence and understanding about deprescribing. The training also enabled the hospice nurses to incorporate the knowledge gained into their clinical practice. The application resulted in behavioral shifts among the hospice nurses that significantly impacted hospice patients' quality of life and symptom management. Deprescribing medications for hospice patients is a complicated and pivotal process that requires a systematic approach. The educational intervention provided participants with the tools necessary to develop a tool kit. These tools included two evidence-based screening tools (i.e., STOPP Frail Criteria and GPGP algorithm) and a standardized framework (i.e., BUILD model). Furthermore, the project improved participants' clinical confidence and experience, allowing them to grow into seasoned hospice nurses. Patient safety necessitates the deprescribing of drugs at the end of life.
Future Recommendations

All nurses in any clinical practice can benefit from the educational intervention used in this project. The educational sessions could be used as part of a training program or continuing education. In terms of future research would be useful to extend the current findings by examining the impact of these interventions on varied patient populations across the healthcare industry. The educational program will be implemented at the organization's sister hospice agency. If, as the present study suggests, there is a correlation between the interventions utilized and deprescribing medications, more research into the influence of deprescribing on patient outcomes should be considered. Studies could focus on reducing adverse effects of polypharmacy at end of life, the potential for improved quality of life, and the impact across socioeconomic and ethnic subgroups.
References


https://doi.org/10.1371/journal.pone.0122246

https://doi.org/10.1007/s40266-020-00805-7


The 'OncPal deprescribing guideline.' Supportive Care in Cancer, 23(1), 71–78. https://doi.org/10.1007/s00520-014-2322-0


https://doi.org/10.1080/17843286.2017.1410606

https://doi.org/10.5694/mja2.50015

https://doi.org/10.1007/s00520-014-2445-3


Appendices

Appendix A STOPP/Frail Criteria

STOPP/Frail is a list of potentially inappropriate prescribing indicators designed to assist physicians with stopping such medications in older patients (≥65 years) who meet ALL of the criteria listed below:

1. End-stage irreversible pathology
2. Poor one year survival prognosis
3. Severe functional impairment or severe cognitive impairment or both
4. Symptom control is the priority rather than prevention of disease progression

**Section A: General**

A1. Any drug that the patient persistently fails to take or tolerate despite adequate education and consideration of all appropriate formulations.
A2. Any drug without clear clinical indication.

**Section B: Cardiovascular system**

B1. Lipid lowering therapies (statins, ezetimibe, bile acid sequestrants, fibrates, nicotinic acid and acipimox)

These medicines need to be prescribed for a long duration to be of benefit. For short-term use, the risk of ADEs outweighs the potential benefit [43–45].

B2. Alpha-blockers for hypertension

Stringent blood pressure control is not required in very frail older people. Alpha blockers in particular can cause marked vasodilatation, which can result in marked postural hypotension, falls and injuries [46].

**Section C: Coagulation system**

C1. Anti-platelets

Avoid anti-platelet agents for primary (as distinct from secondary) cardiovascular prevention (no evidence of benefit) [47].

**Section D: Central Nervous System**

D1. Neuroleptic antipsychotics

Aim to reduce dose and gradually discontinue these drugs in patients taking them for longer than 12 weeks if there are no current clinical features of behavioural and psychiatric symptoms of dementia (BPSD) [48–52].

D2. Memantine

Discontinue and monitor in patients with moderate to severe dementia, unless memantine has clearly improved BPSD (specifically in frail patients who meet the criteria above) [53–56].

**Section E: Gastrointestinal system**

E1. Proton Pump Inhibitors

Proton Pump Inhibitors at full therapeutic dose 28/52, unless persistent dyspeptic symptoms at lower maintenance dose [57].

E2. H2 receptor antagonist

H2 receptor antagonist at full therapeutic dose for ≥8/52, unless persistent dyspeptic symptoms at lower maintenance dose [57].

E3. Gastrointestinal antispasmodics

Regular daily prescription of gastrointestinal antispasmodics agents unless the patient has frequent relapse of colic symptoms because of high risk of anti-cholinergic side effects [57].

**Section F: Respiratory system**

F1. Theophylline

This drug has a narrow therapeutic index, requires monitoring of serum levels and interacts with other commonly prescribed drugs putting patients at an increased risk of ADEs [58–60].

F2. Leukotriene antagonists (Montelukast, Zafirlukast)

These drugs have no proven role in COPD, they are indicated only in asthma [61].

**Disclaimer (STOPP/FRAIL)**

Whilst every effort has been made to ensure that the potentially inappropriate prescribing criteria listed in STOPP/FRAIL are accurate and evidence-based, it is emphasized that the final decision to avoid or initiate any drug referred to in these criteria rests entirely with the prescriber. It is also to be noted that the evidence base underlying certain criteria in STOPP/FRAIL may change after the time of publication of these criteria. Therefore, it is advisable that prescribing decisions should take account of current published evidence in support of or against the use of drugs or drug classes described in STOPP/FRAIL.

The decision to prescribe/not prescribe medications to the patient, should also be influenced by the following issues:

1. Risk of the medication outweighing the benefit
2. Administration of the medication is challenging
3. Monitoring of the medication effect is challenging
4. Drug adherence/compliance is difficult

**Section G: Musculoskeletal system**

G1. Calcium supplementation

Unlikely to be of any benefit in the short term

G2. Anti-resorptive/bone anabolic drugs FOR OSTEOPOROSIS (bisphosphonates, strontium, teriparatide, denosumab)

Unlikely to be of any benefit in the short term

G3. SORMs for osteoporosis

Benefit unlikely to be achieved within 1 year, increased short-intermediate term risk of associated ADEs particularly venous thromboembolism and stroke [57].

G4. Long-term oral NSAIDs

Increased risk of side effects (peptic ulcer disease, bleeding, worsening heart failure, etc) when taken regularly for ≥2 months [62–64].

G5. Long-term oral steroids

Increased risk of side effects (peptic ulcer disease, etc) when taken regularly for ≥2 months. Consider careful dose reduction and gradual discontinuation [65].

**Section H: Urological system**

H1. 5-Alpha-reductase inhibitors

No benefit with long-term urinary bladder catheterisation [66, 67]

H2. Alpha blockers

No benefit with long-term urinary bladder catheterisation [66, 67]

H3. Muscarinic antagonists

No benefit with long-term urinary bladder catheterisation, unless clear history of painful detrusor hypertonicity [66, 67].

**Section I: Endocrine system**

I1. Diabetic oral agents

Aim for monotherapy. Target of HbA1c < 8%/64 mmol/mol. Stringent glycaemic control is unnecessary [68].

I2. ACE inhibitors for diabetes

Stop where prescribed only for prevention and treatment of diabetic nephropathy. There is no clear benefit in older people with advanced frailty with poor survival prognosis [69].

I3. Angiotensin receptor blockers

Stop where prescribed only for prevention and treatment of diabetic nephropathy. There is no clear benefit in older people with advanced frailty with poor survival prognosis [69].

I4. Systemic oestrogens for menopausal symptoms

Increases risk of stroke and VTE disease. Discontinue and only consider recommencing if recurrence of symptoms [57].

**Section J: Miscellaneous**

J1. Multi-vitamin combination supplements

Discontinue when prescribed for prophylaxis rather than treatment

J2. Nutritional supplements (other than vitamins)

Discontinue when prescribed for prophylaxis rather than treatment [70]

J3. Prophylactic antibiotics

No firm evidence for prophylactic antibiotics to prevent recurrent cellulitis or UTIs [71–73].
Appendix B GPGP Garfinkel Algorithm

Improving Drug Therapy in Elderly Patients – The Garfinkel Algorithm

DISCUSS THE FOLLOWING WITH THE PATIENT/GUARDIAN

<table>
<thead>
<tr>
<th>YES</th>
<th>NO / NOT SURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>An evidence-based consensus exists for using the drug for the indication given in its current dosing rate, in this patient's age group and disability level, and the benefit outweigh all possible known adverse effects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indication seems valid and relevant in this patient's age group and disability level</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do the known possible adverse reactions of the drug outweigh possible benefit in old, disabled patients?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Any adverse symptoms or signs that may be related to the drug?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Another drug that may be superior to the one in question</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Can the dosing rate be reduced with no significant risk?</td>
</tr>
</tbody>
</table>

STOP DRUG
SHIFT TO ANOTHER DRUG

CONTINUE WITH THE SAME DOSING RATE
REDUCE DOSE

Appendix C Theoretical Framework: BUILD model

B: Build a foundation of trust and respect.
U: Understand what the patient knows about the topic.
I: Inform the patient of evidence-based information.
L: Listen to the patient’s goals and expectations.
D: Develop a plan of care in collaboration with the patient, family and interdisciplinary team.

Source: Authors.
## Appendix D Education Design Outline

<table>
<thead>
<tr>
<th>Pre-intervention</th>
<th>Session One</th>
<th>Session Two</th>
<th>Session Three</th>
<th>Session Four</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>Learner objectives</td>
<td>Outline of the content/topic to be presented and indicate which objective(s) the content/topic is related.</td>
<td>Teaching strategies (audio/visual/discussion) used for each topic/content area.</td>
<td>Time</td>
</tr>
<tr>
<td><strong>Content</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Methodology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Time</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Pre-intervention
- Pre-intervention questionnaire

### Session One
- **Objectives**
  - Define Deprescribing and Polypharmacy
  - Define Prescribing Cascade
  - Identify indications for Deprescribing.
  - Identify adverse effects of polypharmacy.

- **Content**
  - Review and Define concepts of Deprescribing and Prescribing Cascade

- **Methodology**
  - Lecture (PP)

- **Time**
  - Total 60 min (45 min. and 15 min. for questions)

### Session Two
- **Objectives**
  - Identify Deprescribing Screening Tools
  - Review how to utilize tools in clinical practice.
  - Identify standard medication classes to target for deprescribing.

- **Content**
  - Review Deprescribing Tools:
    - STOPP/Frail Criteria
    - Garfinkel Deprescribing Algorithm
    - NHPCO Deprescribing Tool Kit

- **Methodology**
  - Lecture Format (PP)
  - Each participant will receive laminated copies of the Garfinkel algorithm and STOPP Frail Criteria

- **Time**
  - Total 60 min (45 min. and 15 min. for questions)

### Session Three
- **Objectives**
  - Review BUILD Model
  - Identify five components of the BUILD Model.
  - Define strategies on how the BUILD model is useful when deprescribing.

- **Content**
  - Theoretical Framework:
    - BUILD MODEL – formalized process to assist hospice nurses with deprescribing conversations.

- **Methodology**
  - Lecture (PP)
  - Each participant will receive a laminated copy of the BUILD Model

- **Time**
  - Total 60 min (45 min. and 15 min. for questions)

### Session Four
- **Objectives**
  - Reviewing components for deprescribing
  - Gain confidence with deprescribing tools
  - Perform deprescribing techniques through role-playing.
  - Assess personal knowledge, confidence after implementation of deprescribing.

- **Content**
  - Review Case studies and role-playing scenarios

- **Methodology**
  - Lecture (PP)
  - Case studies
  - Role-Playing using tools

- **Time**
  - Total 60 min (45 min. and 15 min. for questions)

- **Evaluation**
  - 80% of participants will implement deprescribing tools through role-playing a case study.
  - Posttest to be completed to reassess comfort and confidence of deprescribing.
| Post-intervention | Post-intervention questionnaire | Individual questionnaire | 15 min. | Assess knowledge of deprescribing before educational sessions |
**Appendix: E Case Scenario for Role Play**

SA is a 66-year-old female referred to a hospice following three hospitalizations in the last three months. She has a diagnosis of advanced Lung Cancer. She has metastasis to the liver, bone, and lymph nodes. She is short of breath with minimal exertion and experiencing significant pain. She has bilateral lower extremity edema 2+. She has decided that she does not want to return to the hospital. She is having difficulty with ambulation with a history of falls. Her appetite is decreasing. She has no caregiver in the home.

Current medications include:

- Simvastatin for Hyperlipidemia
- Alendronate for Osteoporosis
- Levothyroxine for Hypothyroidism
- Lasix for edema
- Trazadone for sleep
- Multi-vitamin
- MS Contin long-acting pain medication
- Morphine sulfate for pain and shortness of breath
- Docusate for constipation
- Ativan for anxiety

1. Would it be appropriate to discontinue any of these medications?

2. Utilizing the STOPP/Frail Criteria which medication(s) were identified that are no longer indicated or inappropriate for this patient?
Appendix F Deprescribing Knowledge

1. Polypharmacy and inappropriate medications may cause adverse effects for patients nearing end of life.
   True ☐ False ☐

2. Polypharmacy is defined as using multiple medications typically five or more, whose harms outweigh the benefits.
   True ☐ False ☐

3. In the deprescribing process, medication reconciliation is not required.
   True ☐ False ☐

4. Hospice nurses have no role in identifying potentially inappropriate medications.
   True ☐ False ☐

5. The STOPP/Frail Criteria tool is used to guide hospice nurses in the identification of inappropriate medications.
   True ☐ False ☐

6. Deprescribing algorithms are only used by providers.
   True ☐ False ☐

7. Prescribing cascade is a misinterpretation of an adverse drug reaction as a symptom of another condition.
   True ☐ False ☐

8. Deprescribing medications is a systematic process of reducing or discontinuing inappropriate medications.
   True ☐ False ☐

9. The BUILD Model is used to conduct research on medications.
   True ☐ False ☐

10. Medications that are frequently inappropriate at end of life are statins, anticoagulants, bisphosphonates, and proton pump inhibitors.
    True ☐ False ☐

Demographic Questions

1. How long have you been a nurse?
   ____ (0-5 yrs.) ____ (6-10 yrs.) ____ (11-15 yrs.) ____ (over 15 yrs.)

2. How long have you been working as a hospice nurse?
   ____ (0-5 yrs.) ____ (6-10 yrs.) ____ (11-15 yrs.) ____ (over 15 yrs.)

3. How old are you?
   ____ (20-30) ____ (31-40) ____ (41-50) ____ (over 50)

4. What is your highest degree in nursing?
   ____ Associates ____ Bachelors ____ Masters ____ LPN

Appendix G
Appendix G My Confidence Ruler

Name (ID Code) ___________ Date ___________

Using the scale below, rate how confident you are with deprescribing, zero describing not confident, and ten being extremely confident.

1. How confident are you today identifying inappropriate medications for patients at the end of life using the Garfinkel algorithm and STOPP/Frail criteria?

______________________________________________________________

0 1 2 3 4 5 6 7 8 9 10

Not at all Confident Extremely Confident

2. How confident are you today in recommending deprescribing of preventative medicines for hospice patients when life expectancy no longer justifies potential benefits?

______________________________________________________________

0 1 2 3 4 5 6 7 8 9 10

Not at all Confident Extremely Confident

3. How confident are you today in your ability to recommend appropriate deprescribing strategies for potentially inappropriate medications in clinical practice?

______________________________________________________________

0 1 2 3 4 5 6 7 8 9 10

Not at all Confident Extremely Confident

Why are you at _____ and not zero?

What would it take to go from ____ to _____ (highest number)?

(Gold & Kokotailo, 2017)
Appendix H UMASS IRB Letter

Human Research Protection Office

I. Memorandum – Not Human Subjects Research Determination

Date: July 2, 2021

To: Shannon Dickson, Nursing

Project Title: Deprescribing medications at end of life at a Community Hospice Agency

HRPO Determination Number: 21-125

The Human Research Protection Office (HRPO) has evaluated the above-named project and has made the following determination based on the information provided to our office:

☐ The proposed project does not involve research that obtains information about living individuals [45 CFR 46.102(f)].

☐ The proposed project does not involve intervention or interaction with individuals OR does not use identifiable private information [45 CFR 46.102(f)(1), (2)].

☒ The proposed project does not meet the definition of human subject research under federal regulations [45 CFR 46.102(d)].

Submission of an Application to UMass Amherst IRB is not required.

Note: This determination applies only to the activities described in the submission. If there are changes to the activities described in this submission, please submit a new determination form to the HRPO prior to initiating any changes. Researchers should NOT include contact information for the UMass Amherst IRB on any project materials.

A project determined as “Not Human Subjects Research,” must still be conducted ethically. The UMass Amherst HRPO strongly expects project personnel to:

- treat participants with respect at all times
- ensure project participation is voluntary and confidentiality is maintained (when applicable)
- minimize any risks associated with participation in the project
- conduct the project in compliance with all applicable federal, state, and local regulations as well as UMass Amherst Policies and procedures which may include obtaining approval of your activities from other institutions or entities.

Please do not hesitate to call us at 413-545-3428 or email humansubjects@ora.umass.edu if you have any questions.

Iris L. Jenkins

Iris L. Jenkins, Assistant Director
Human Research Protection Office
Appendix I HCIB IRB Letter

2/25/2021

To Whom It May Concern,

This is a letter regarding Shannon Dickson’s DNP Scholarly Project Deprescribing at End of Life at a Community Hospice Setting at Hospice Care in the Berkshires. She is a student in the DNP Program at the University of Massachusetts-Amherst. They are conducting a quality improvement project at Hospice Care in the Berkshires. The purpose of the project is to assess/educate our clinical nursing team with the focus of improving symptom management, polypharmacy, and patient outcomes through end of life.

Her proposal does not need to go through IRB approval at our site because it is a quality improvement intervention. If you have any questions, please feel free to contact me. Thank you for this consideration and for your academic support of this student.

Sincerely,

Michelle Chappell
Executive Director
Hospice Care in the Berkshires
413-443-2954
MChappell@hcbh.org
Appendix J Cost Benefit Analysis

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Printing GPGP and STOPP Frail Screening tools</td>
<td>$50.00</td>
</tr>
<tr>
<td>Lamination and key rings</td>
<td>$10.00</td>
</tr>
<tr>
<td>Clinical Staff cost in education ($35x 20)</td>
<td>$700.00</td>
</tr>
</tbody>
</table>

Programs

Total $760.
### Appendix K Timeframe

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Meet with key stakeholders, Executive Director, and Management team.</td>
<td>XX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposal Approved by DNP Committee</td>
<td>XX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtain IRB approval</td>
<td>XX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-intervention questionnaire to all hospice nurses on deprescribing</td>
<td>XX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational sessions for hospice nurses on Build Model, STOPP Criteria, Role-playing, algorithms will commence.</td>
<td>XX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation of data collection on deprescribing</td>
<td>XX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-intervention questionnaire to hospice nurses</td>
<td>XX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data analysis and evaluation of outcomes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>XX</td>
<td></td>
</tr>
<tr>
<td>Review outcomes with ED and Senior Management of Agency. Consider practice change.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>XX</td>
</tr>
</tbody>
</table>
Appendix L Educational Program Evaluation

Date __________ Name _____________________

1. Was the program presented at a convenient time? Yes____ No ____
2. Was the program conducted at a convenient location? Yes _____ No____
3. Was the room conducive to learning? Yes _____ No ______
4. What did you learn from this educational presentation?
5. What recommendations do you have for improvement?
6. What recommendations do you have for facilitator or participant engagement?
7. What other learning opportunities would you like related to this topic?
## Appendix M Goals and Outcomes

<table>
<thead>
<tr>
<th>Goal</th>
<th>Objective(s)</th>
<th>Projected Outcome(s)</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>The DNP student assessed hospice nurses' current knowledge of deprescribing principles, the definition of prescribing cascade, and current confidence in deprescribing.</td>
<td>The DNP student conducted a pre-questionnaire knowledge and confidence rating screen of hospice nurses' before providing the educational workshops in September 2021.</td>
<td>100% of hospice nurses completed the pre-questionnaire.</td>
<td>Met: 100% of hospice nurses completed the pre-questionnaire.</td>
</tr>
<tr>
<td>The DNP student provided comprehensive education, including a portable toolkit that focuses on deprescribing to hospice nurses.</td>
<td>The DNP student provided four (4) sixty-minute educational workshops during September 2021.</td>
<td>80% of hospice nurses attended all four of the sixty-minute educational presentations measured through attendance sheets.</td>
<td>Met: 89% of hospice nurses attended all educational sessions. (N25)</td>
</tr>
<tr>
<td>The DNP student measured knowledge and confidence with deprescribing of hospice nurses after the educational sessions.</td>
<td>The DNP student conducted a post-knowledge questionnaire and confidence rating screen of hospice nurses after the education sessions at the end of September 2021.</td>
<td>80% of hospice nurses increased their knowledge and confidence about deprescribing and screening tools, as evidenced through their post-questionnaire.</td>
<td>Met: 88% demonstrated increased knowledge and confidence on the post-questionnaire.</td>
</tr>
<tr>
<td>The DNP student monitored the hospice nurse's implementation of screening tools to identify inappropriate medications while performing medication reconciliation with patients.</td>
<td>The DNP student conducted chart reviews, joint visits and had a 1 to 1 meeting with hospice nurses to review the medication identified for deprescribing by December 2021. The DNP student conducted chart</td>
<td>80% of hospice nurses recorded the medication(s) identified as inappropriate for their patients and documented their conversations with patients in their chart.</td>
<td>Met: 100% of nurses documented medications within the EMR that were identified for deprescribing.</td>
</tr>
</tbody>
</table>
reviews to monitor documentation for conversations with patients/families about deprescribing inappropriate medications by December 2021.

| The DNP student evaluated hospice nurses' implementation of deprescribing utilizing screening tools and algorithms. | The DNP student performed chart reviews to gather data on medications that have been deprescribed by December 2021. | 80% of patients under the care of participating hospice nurses had 1-2 futile medications deprescribed within 60 days of the educational sessions. | Met: 99% of patients had 1-2 futile medications deprescribed. |